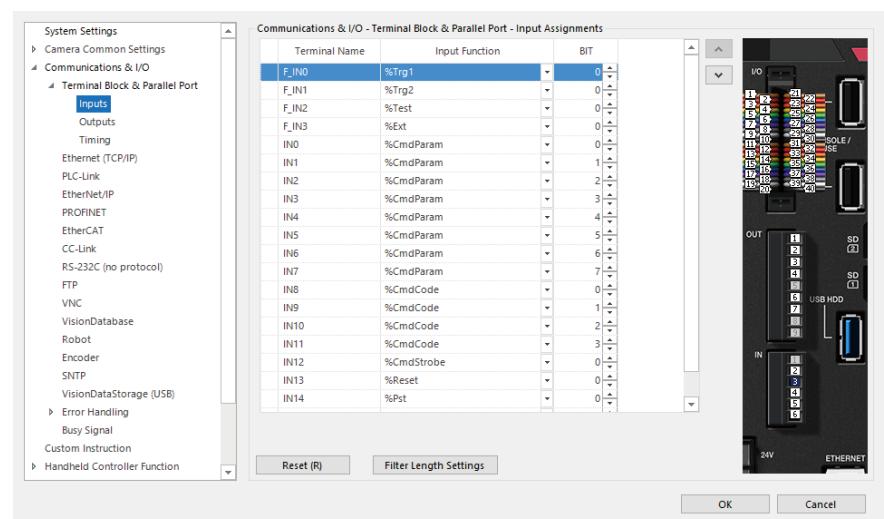


Customizable Vision System

XG-X Series

Communications Control Manual

Read this manual before use.
Keep this manual in a safe place for future reference.



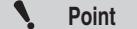
Introduction

The XG-X Series uses a 2-way approach (either on the controller or on a PC) to build inspection programs. The controller can be used to carry out adjustments in the field, add vision units and perform product changeovers. A PC can be used to establish inspection methods and build new programs with original operation menus and other essential GUI elements. The available PC programs are the XG-X VisionEditor development environment and the XG-X VisionTerminal log data collection program.

Notations used in this manual

Symbols

The following warning symbols are used to ensure safety and to prevent human injury and/or damage to property when using the system.

	DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	NOTICE	Indicates a situation which, if not avoided, could result in product damage as well as property damage.
	Important	Indicates cautions and limitations that must be followed during operation.
	Point	Indicates additional information on proper operation.
	Reference	Indicates tips for better understanding or useful information.

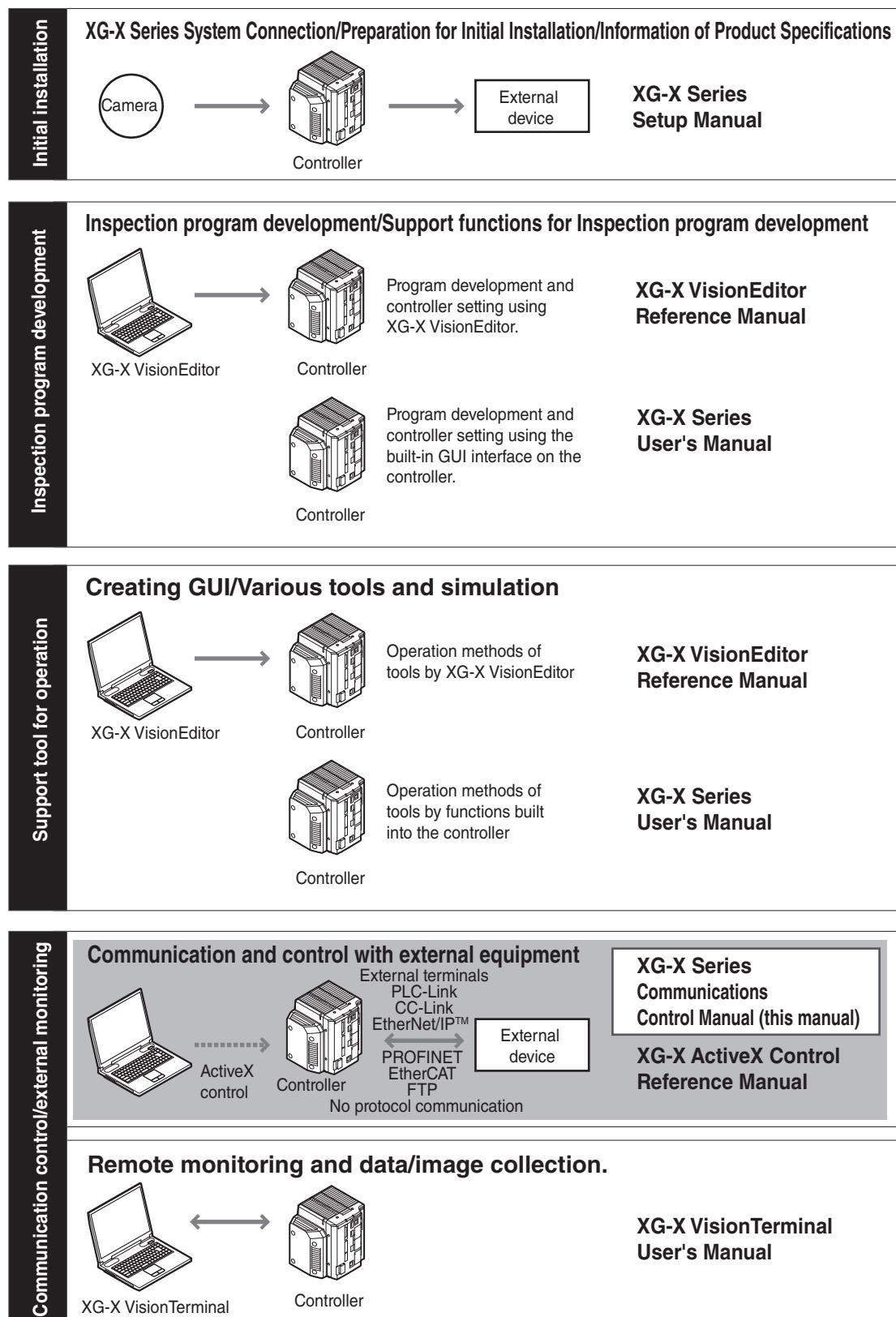
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This manual and related manuals

This manual explains setting procedures, related information, and various data lists used for communication controls of the XG-X Series (hereinafter, "the controller"). Read this manual thoroughly in order to understand how the controller works and to maximize the performance of the controller. Always keep this manual in a safe place for future reference.

Please ensure that the manual is passed to the end user of the software.



Safety information for XG-X Series

Safety Precautions

 DANGER	<ul style="list-style-type: none"> Do not use this product for the purpose to protect a human body or a part of human body. This product is not intended for use as explosion-proof product. Do not use this product in a hazardous location and/or potentially explosive atmosphere. Do not use this product in an application that may cause death, serious injury or serious property damage due to a failure with this product should occur, such as nuclear power plants, on aircraft, trains, ships, or vehicles, used within medical equipment, playground equipment, roller coasters and other rides, etc.
 WARNING	<ul style="list-style-type: none"> If the product is used in a manner not specified by this manual, the protection provided by the product may be impaired. You must perform a sufficient risk assessment and confirm that risks have been reduced for the machine where this product is to be installed prior to installing this product. Provide appropriate protective failsafe measures on the machine independent from this product to ensure this machine operates safely in case a failure with this product should occur.
 CAUTION	<p>You must verify that this product is operating correctly in terms of functionality and performance before the start and the operation of this product.</p>
 NOTICE	<ul style="list-style-type: none"> If the system is operated beyond its published specifications or if the system is modified, its functions and performance cannot be guaranteed. When this product is used in combination with other instruments, functions and performance may be degraded, depending on the operating conditions and surrounding environment. Do not subject the controller or connected devices to a sudden change in temperature. There is the risk of condensation occurring.

General cautions for the controller

 WARNING	<ul style="list-style-type: none"> Do not use with any power voltage other than 24 VDC. Doing so may cause fire, electric shock, or product malfunction. Do not disassemble or modify the unit. Doing so may cause fire or electric shock.
---	--

Operating environment and conditions

 CAUTION	<p>To use the system properly and safely, avoid installing this unit in the following locations. Doing so may cause fire, electric shock, or product malfunction.</p> <ul style="list-style-type: none"> Locations that contain moisture or dust, or that are poorly ventilated. Locations where the system is exposed to direct sunlight or temperature increases. Locations where there are flammable or corrosive gases. Locations where the unit may be directly subjected to vibration or impact. Locations where water, oil or chemicals may splash onto the unit. Locations where static electricity is present or electric discharge may occur.
 NOTICE	<ul style="list-style-type: none"> Keep this unit and cables away from high-tension cables and power lines. Otherwise, noise may cause malfunction or accidents. Bundle cables with the camera cable protector (OP-88208) or protective material like spiral tubing. Direct bundling will concentrate the cable load on the bindings, which can result in cable damage or a short circuit. The controller and optional devices are precision components. To maintain performance, do not subject them to vibration or shock.

Measures to be taken when an abnormality occurs

 CAUTION	<p>In the following cases, turn the power OFF immediately. Using the unit in an abnormal condition may cause fire, electric shock, or product malfunction. Contact your local Keyence office for repair.</p> <ul style="list-style-type: none">• If water or debris enters the system• If the system is dropped or the case is damaged• If smoke or a burning smell emits from the controller
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Usage

 NOTICE	<ul style="list-style-type: none">• Before making any connections/disconnections, be sure to turn off the power of this unit and connected devices. Failure to do so may result in a malfunction of the controller and connected devices.• Do not turn the power off while you are programming. Otherwise, all or part of the program settings may be lost.• Do not block the ventilation holes. Otherwise, the inside temperature may rise and a malfunction may occur.• Do not allow an excessive amount of sunlight or bright indoor light to enter the camera for a long period of time. Doing so may cause damage to the CCD inside the camera.
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Maintenance

 NOTICE	<ul style="list-style-type: none">• Do not clean with benzene, thinner, or alcohol. Doing so may cause discoloration or deformation of the unit.• If the unit has any dirt on it, wipe it off with a cloth moistened with a mild detergent, then wipe with a dry cloth.
--	--

Precautions on Regulations and Standards

CE and UKCA Markings

Keyence Corporation has confirmed that this product complies with the essential requirements of the applicable EU Directive(s) and UK regulations, based on the following specifications.

Be sure to consider the following specifications when using this product in the Member States of European Union and in the United Kingdom.

EMC Directive (CE) and Electromagnetic Compatibility Regulations (UKCA)

- Applicable standard (BS)EN61326-1, Class A
- This product is intended to be used in an industrial environment.
- Use cables shorter than or equal to 30 m to connect this product and its external devices.
- Be sure to connect the ground terminal to a grounding.
- When connecting a CC-Link unit CA-NCL20E, attach a ferrite core (OP-84364, optional) within 300 mm on the CA-NCL20E side of the CC-Link dedicated cable.
- When connecting the LJ-V input unit CA-E100LJ/E110LJ/E200LJ, for the head cables, wind the following ferrite core (furnished accessory of CA-E100LJ/E110LJ/E200LJ) with them to within 200 mm of the controller's head connector.

Model: ZCAT2035-0930A-BK (manufactured by TDK Corporation)

Remarks: These specifications do not give any guarantee that the end-product with this product incorporated complies with the essential requirements of EMC Directive and Electromagnetic Compatibility Regulations. The manufacturer of the end-product is solely responsible for the compliance on the end-product itself according to EMC Directive and Electromagnetic Compatibility Regulations.

FCC Regulations

This product complies with the following regulations specified by the FCC.

- Applicable regulation FCC Part 15 Subpart B Class A
- This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

KC mark (Republic of Korea)

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Chapter 1

Operation

Operation

Documentation for the installation and configuration methods of the controller, software, and CAD data can be downloaded from the following URL.

www.keyence.com/xgxus

Overview of System Control/Data Output

► Overview of System Control/ Data Output

Control/Data Output via
External Terminals

Control/Data Output via
PLC-Link

Control/Data Output via
CC-Link

Control/Data Output via
EtherNet/IP

Control/Data Output via
PROFINET

Control/Data Output via
EtherCAT

Control/Data Output via
No protocol communication

FTP Client/Server Function

System Control/ Data Output

This section will overview the various interfaces and commands that can be used to control the system or to output data related to image processing.

Control Methods/Protocols available with this System

The XG-X Series supports the following methods for control and data output.

- External terminals (terminal block and parallel I/O) (Page 1-6)
- PLC Link (RS-232C or Ethernet) (Page 1-71)
- CC-Link (Page 1-113)
- EtherNet/IP (Page 1-148)
- PROFINET (Page 1-210)
- EtherCAT (Page 1-252)
- Standard instruction (Page 2-9)
- Custom instruction (Page 2-116)
- No protocol communication (RS-232C (Page 1-290) or Ethernet (Page 1-295))
- USB interface
- SD card output
Archive output, result output (data and image) and target classification output can be transferred from the flowchart or the Image Viewer on the controller to the SD Card 1 or SD Card 2 in the controller.
- USB HDD output
Archive output, result output (data and image) and target classification output can be transferred from the flowchart or the Image Viewer on the controller to the USB HDD connected to the controller.
- PC program output
Archive output and result output (data and image) can be output from the controller to the XG-X VisionTerminal or ActiveX control.
- FTP client and server functions archive output, result output (data and image) and target classification output can be output from the controller to the FTP server. In addition, by directly accessing the controller's SD card from an external FTP client, you can send/receive/delete files and create/delete folders.
- VisionDataStorage output
Results data, image data, archive data, and image and results data of target classification can be output to a VisionDataStorage (sold separately) connected to the controller with a dedicated VisionDataStorage USB cable (OP-88263) or an Ethernet cable.

Point

- The response time for commands and their resulting output will depend on the settings and processing load on the controller, with the exception of direct control through the external terminals. If this variation in response time is problematic, use direct control through the external terminals.
- To use an interface other than USB interface, the settings for that interface need to be changed. For more details on configuring each of these interfaces, refer to the individual interfaces in this chapter and "Controller System Settings" in the XG-X VisionEditor Reference Manual.
- The USB interface is used exclusively to communicate with the KEYENCE PC application softwares and does not require any interface settings.
- The USB interface does not support connecting of multiple KEYENCE PC application softwares at the same time to a single controller.
- To use the CC-Link, it is necessary to connect the CC-Link unit CA-NCL20E (optional) to the controller.
- To use EtherCAT, it is necessary to connect an EtherCAT unit CA-NEC20E (optional) to the controller.
- EtherNet/IP and PROFINET can be used with the Ethernet port of the XG-X or by connecting the EtherNet/IP unit CA-NEP20E or the PROFINET unit CA-NPN20E (both of which are optional).
- No protocol communication is not able to handle binary data such as images and program files for system control and data output.

Reference

- For more details on no protocol communication, refer to the XG-X Series User's Manual, "Standard Instruction" (Page 2-9) and "Custom Instruction" (Page 2-116) in this manual.
- For more details on SD card output, refer to "Data Output Unit," "Image Output Unit," and "Archives" in the XG-X VisionEditor Reference Manual.
- For more details on PC program output, refer to the XG-X VisionTerminal User's Manual, the ActiveX Control User's Manual, and "Data Output Unit," "Image Output Unit," and "Archives" in the XG-X VisionEditor Reference Manual. To use ActiveX control, you need to download the software (free of charge). Ask your nearest sales representative for more details.
- For more details on the basic specifications of protocols and connection and wiring to the controller, refer to the XG-X Series User's Manual.

Setting the System Control/Data Output

This section shows the typical flow for setting the system control and data output. For more details on the description and setting procedures of each protocol, refer to the sections describing the individual protocol.

Selecting an Interface

Select a protocol and communication mode.

Typical selection examples

To perform trigger inputs or total status outputs at high speed

- Terminal Block Interface
- Parallel I/O Interface

To easily achieve command control and data output with a PLC

- PLC link (RS-232C or Ethernet) communication mode
- CC-Link Interface (CC-Link unit CA-NCL20E (optional required))
- EtherNet/IP Interface
- PROFINET Interface
- EtherCAT Interface (EtherCAT Interface (EtherCAT unit CA-NEC20E (optional)) required)

-  Point
- PLC Link, CC-Link, EtherNet/IP, PROFINET and EtherCAT cannot be used simultaneously.
 - EtherNet/IP and PROFINET can be used with the Ethernet port of the XG-X or by connecting the EtherNet/IP unit CA-NEP20E or the PROFINET unit CA-NPN20E (both of which are optional).

Communicate with a PC

- Using the XG-X VisionTerminal or ActiveX control: Ethernet, USB (XG-X VisionTerminal only)
- Using no protocol communication: RS-232C, Ethernet
- Using FTP output: Ethernet

Changing the Protocol and Communication Mode Settings

In the offline [System Configuration] menu, change the settings according to the protocol and communication mode to be used. To use a custom instruction (Page 2-116), you need to also define the custom instruction in the [Custom Functionality] menu.



- To use the XG-X VisionEditor to change the control and output settings, ensure that the XG-X VisionEditor System settings are the same as the settings of the actual controller to be used.
- If the system settings between the XG-X VisionEditor and the actual controller are different, the uploaded program may not operate properly.

Changing the Input/Output settings

Ethernet interface

Set the basic parameters such as the controller's IP address and port numbers to be used.

PLC Link communication mode (Page 1-71)

Set the communication parameters, PLC model, and DM (data memory) address to use the PLC Link.

CC-Link interface (Page 1-113)

Set the communication parameters to use the CC-Link and assign system variables.

EtherNet/IP interface (Page 1-148)

Set the communication parameters to use the EtherNet/IP and assign system variables related to the terminal control for bit address, processing priority, etc.

PROFINET interface (Page 1-210)

Set the communication parameters to use PROFINET and assign system variables related to the terminal control for bit address, processing priority, etc.

EtherCAT interface (Page 1-252)

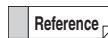
Set the communication parameters to use EtherCAT and assign system variables such as those related to the terminal control for bit addresses.

RS-232C interface

Set the communication parameters to use RS-232C.

Terminal block interface, parallel I/O interface (Page 1-6)

Assign system variables to terminals and set the output time and other items.



The USB interface is used exclusively for communication with the KEYENCE PC application software and does not require any interface settings on the XG-X VisionEditor.

Setting a Custom Instruction

In the [Custom Instruction Settings] menu, set a custom instruction by combining standard instructions. See "Custom instruction" (Page 2-116) for more details.



To use the PLC Link, CC-Link, EtherNet/IP, PROFINET, EtherCAT, terminal block interface, or parallel I/O interface for the command control, you need to define the command(s) to be used as a custom instruction in advance.

Changing the Data Output Settings of the Controller

To output data, change the settings of the parallel terminal output unit, data output unit, or image output unit to be used.

For more details, see the XG-X Series User's Manual.



The settings of the parallel terminal output unit and data output unit may not change if the system settings have not been set properly.

Control/Data Output via External Terminals

Overview of System Control/ Data Output

▶ Control/Data Output via External Terminals

Control/Data Output via PLC-Link

Control/Data Output via CC-Link

Control/Data Output via EtherNet/IP

Control/Data Output via PROFINET

Control/Data Output via EtherCAT

Control/Data Output via No protocol communication

FTP Client/Server Function

Overview of Control/Data Output via External Terminals

The XG-X Series controller has the following external terminals:

- **Parallel I/O interface (40 pins)**: Use a specialized parallel connection cable (3 m) OP-51657 (Page 1-8).
- **Terminal block interface (OUT: 9 pins/IN: 8 pins)**: Detachable terminal block included with the controller (Page 1-10).

Functions available with the external terminals

In addition to supplying the 24 VDC power to the controller, the external terminals offer the following control input/output, command control, and data output functions when the system variables that are related to parallel output control are assigned to relevant terminals.

- **Control**: Controls trigger and other image capture operations, or operates and resets the controller.
- **Status**: Outputs the status of the controller, such as "error" or "busy".
- **Data input/output**: Outputs the total status data or the data of parallel terminal output units, or inputs the terminal input for terminal I/O delay units.
- **Command**: Executes custom instructions (Page 2-116).



Using the external terminals requires some settings such as the assignment of system variables in the controller system settings. The description in this manual assumes the default assignment in the controller system settings unless otherwise specified.



- For more details on the pin assignments of the controller and default assigned state of the system variables, refer to "Checking the terminal assignment of the controller" (Page 1-8).
- For more details on the system variables, refer to "List of System Variables" (Page 3-451).
- For the timing chart for control operations, refer to "Timing Chart" (Page 1-31).
- For more details on the circuit diagram and wiring of the controller, refer to the XG-X Series User's Manual.

Operation Flow

Checking specifications/Wiring (Page 1-8)
<ul style="list-style-type: none">Check the terminals used for data output/control.Set the terminal assignment with the XG-X VisionEditor or the controller.Verify electric connections utilizing the I/O monitor & Diagnostics.



Data output (Page 1-28)
<ul style="list-style-type: none">Set the items that you want to output from the parallel terminal output unit.Set the output device terminal with "Output Assignments" (Page 1-18).Data is output from the parallel terminal output unit.To read the output data, synchronize the timing with the leading edge of the %Sto output.

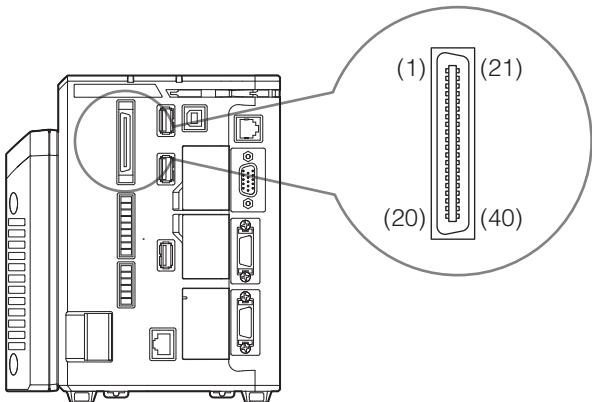


Command control (Page 1-25)
<ul style="list-style-type: none">Custom commands that are setup in advance can be executed.When %CmdReady is ON, a command can be executed.Turn ON the bits corresponding to the command code and the command parameter, and execute the command by turning the %CmdStrobe input ON.Check the command result with %Ack (normal execution) and %Nack (abnormal execution).

Preparing parallel port connections

Checking the terminal assignment of the controller

Parallel I/O Interface



Reference

Use the dedicated parallel connection cable (3 m) OP-51657 (sold separately) to connect devices to the connector.

Pin layout: The cable color when the OP-51657 (option) is used.

No.	Terminal name	Terminal explanation	Signal direction	Assigned default state ^{*1}			Circuit diagram (Page 1-12)	Cable color
				Assigned variable	Variable function ^{*2}	Bit		
1	COMIN2	Connector input common	-	-	-	-	-	Brown
2	IN0	General purpose input 0	Inputs	%CmdParam	Custom instruction parameter input	0	-	Red
3	IN1	General purpose input 1	Inputs	%CmdParam		1	-	Orange
4	IN2	General purpose input 2	Inputs	%CmdParam		2	-	Yellow
5	IN3	General purpose input 3	Inputs	%CmdParam		3	-	Green
6	IN4	General purpose input 4	Inputs	%CmdParam		4	-	Blue
7	IN5	General purpose input 5	Inputs	%CmdParam		5	-	Purple
8	IN6	General purpose input 6	Inputs	%CmdParam		6	-	Gray
9	IN7	General purpose input 7	Inputs	%CmdParam		7	-	White
10	IN8	General purpose input 8	Inputs	%CmdCode		0	-	Black
11	IN9	General purpose input 9	Inputs	%CmdCode	Custom instruction	1	-	Brown
12	IN10	General purpose input 10	Inputs	%CmdCode	No. input	2	-	Red
13	IN11	General purpose input 11	Inputs	%CmdCode		3	-	Orange
14	IN12	General purpose input 12	Inputs	%CmdStrobe	Custom instruction execution input (terminal)	0	-	Yellow
15	IN13	General purpose input 13	Inputs	%Reset	Reset input	0	-	Green
16	IN14	General purpose input 14	Inputs	%Pst	Output data input switch	0	-	Blue
17	COMOUT2	Connector output common	-	-	-	-	-	Purple
18	OUT0	General purpose output 0	Output	%Ack	Command success confirmation output	0	N.O.	Gray
19	OUT1	General purpose output 1	Output	%Nack	Command failure confirmation output	0	N.O.	White
20	OUT2	General purpose output 2	Output	%Busy	Busy output	0	N.O.	Black
21	OUT3	General purpose output 3	Output	%CmdReady	Permission output for command input	0	N.O.	Brown
22	OUT4	General purpose output 4	Output	%Trg1Ready	Permission output for trigger 1 input	0	N.O.	Red
23	OUT5	General purpose output 5	Output	%Trg2Ready	Permission output for trigger 2 input	0	N.O.	Orange

No.	Terminal name	Terminal explanation	Signal direction	Assigned default state ^{*1}			Circuit diagram (Page 1-12)	Cable color
				Assigned variable	Variable function ^{*2}	Bit		
24	OUT6	General purpose output 6	Output	%OutDataA		0	N.O.	C Yellow
25	OUT7	General purpose output 7	Output	%OutDataA		1	N.O.	C Green
26	OUT8	General purpose output 8	Output	%OutDataA		2	N.O.	C Blue
27	OUT9	General purpose output 9	Output	%OutDataA		3	N.O.	C Purple
28	OUT10	General purpose output 10	Output	%OutDataA		4	N.O.	C Gray
29	OUT11	General purpose output 11	Output	%OutDataA		5	N.O.	C White
30	OUT12	General purpose output 12	Output	%OutDataA		6	N.O.	C Black
31	OUT13	General purpose output 13	Output	%OutDataA	Data output of system variable %OutDataA	7	N.O.	C Brown
32	OUT14	General purpose output 14	Output	%OutDataA		8	N.O.	C Red
33	OUT15	General purpose output 15	Output	%OutDataA		9	N.O.	C Orange
34	OUT16	General purpose output 16	Output	%OutDataA		10	N.O.	C Yellow
35	OUT17	General purpose output 17	Output	%OutDataA		11	N.O.	C Green
36	OUT18	General purpose output 18	Output	%OutDataA		12	N.O.	C Blue
37	OUT19	General purpose output 19	Output	%OutDataA		13	N.O.	C Purple
38	OUT20	General purpose output 20	Output	%OutDataA		14	N.O.	C Gray
39	OUT21	General purpose output 21	Output	%OutDataA		15	N.O.	C White
40	COMOUT2	Connector output common	-	-		-	-	Black

*1 The default assigned state refers to the default system variables assigned to each pin in the System Configuration menu. These assignments may vary if the System settings have been changed.

*2 Refer to "List of System Variables" (Page 3-451) for more details on the functions of individual variables.

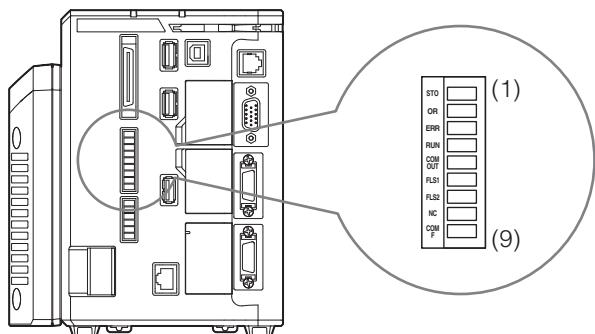
-  Point
- COMOUT2 for Pin 17 and Pin 40 are common.
 - Power source 0 V, COMIN1, COMIN2, COMOUT1, COMOUT2 and COMOUT_F are all isolated.
 - COMIN2 is a common terminal exclusively for input pins 2 to 16 on the parallel I/O connector.
 - COMOUT2 is a common terminal exclusively for output pins 18 to 39 on the parallel I/O connector.

Terminal block interface (OUT)

Terminal block OUT connector specifications for the system are as follows.



Tightening above the specified torque may cause damage to the terminal block



Suitable wiring

AWG 16 - 28

Terminal block screw torque

0.25 Nm or less

Pin layout

No.	Terminal name	Terminal explanation	Signal direction	Assigned default state ^{*1}		Circuit diagram		
				Assigned variable	Variable function ^{*2}	Bit	N.O./N.C	(Page 1-12)
1	OUT22 (STO)	General purpose output 22	Output	%Sto	Strobe output for reading parallel terminal output unit data (Data Ready)	0	N.O.	C
2	OUT23 (OR)	General purpose output 23	Output	%JAHold	Total Status Output (OR)	0	N.O.	C
3	F_OUT2 (ERR)	High-speed general purpose output 2	Output	%Error0	Error 0 output	0	N.O.	C
4	F_OUT3 (RUN)	High-speed general purpose output 3	Output	%Run	Online/Offline Mode output	0	N.O.	C
5	COMOUT1 (COMOUT)	Common for terminal block outputs	-	-	-	-	-	-
6	F_OUT0 (FLS1)	High-speed general purpose output 0	Output	%Flash1	Strobe light output 1	0	N.O.	C
7	F_OUT1 (FLS2)	High-speed general purpose output 1	Output	%Flash2	Strobe light output 2	0	N.O.	C
8	N.C	-	-	-	-	-	-	-
9	COMOUT_F (COMF)	Common for high-speed general purpose outputs	-	-	-	-	-	-

*1 The default assigned state refers to the default system variables assigned to each pin in the System Configuration menu. These assignments may vary if the System settings have been changed.

*2 Refer to "List of System Variables" (Page 3-451) for more details on the functions of individual variables.



- Power source 0 V, COMIN1, COMIN2, COMOUT1, COMOUT2 and COMOUT_F are all isolated.
- COMOUT1 is the common terminal for output exclusive for OUT connectors 1 and 2.
- COMOUT_F is the common terminal for output exclusive for OUT connectors 3, 4, 6 and 7.

() indicates labels printed on terminal blocks at time of shipment

Terminal block interface (IN)

Terminal block IN connector specifications for the system are as follows.

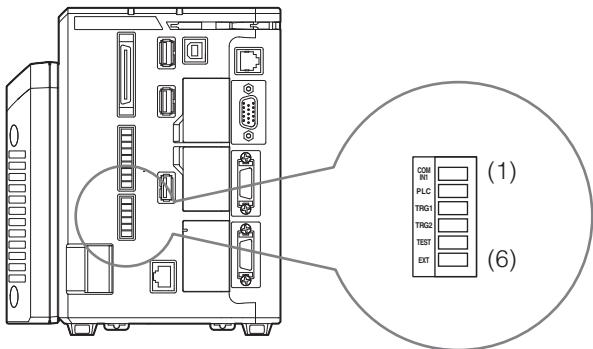
- Point** Tightening above the specified torque may cause damage to the terminal block

Suitable wiring

AWG 16 - 28

Terminal block screw torque

0.25 Nm or less



Pin layout

No.	Terminal name	Terminal explanation	Signal direction	Assigned default state ^{*1}		Bit	N.O/ N.C	Circuit diagram (Page 1-12)
				Assigned variable	Variable function ^{*2}			
1	COMIN1 (COMIN1)	Common for terminal block inputs	-	-	-	-	-	-
2	IN15 (PLC)	General purpose input 15	Inputs	%Plc	Custom instruction execution input (PLC Link)	0	-	B
3	F_IN0 (TRG1)	High-speed general purpose input 0	Inputs	%Trg1	Trigger 1 input	0	-	A
4	F_IN1 (TRG2)	High-speed general purpose input 1	Inputs	%Trg2	Trigger 2 input	0	-	A
5	F_IN2 (TEST)	High-speed general purpose input 2	Inputs	%Test	Trial run input (Disable Outputs)	0	-	A
6	F_IN3 (EXT)	High-speed general purpose input 3	Inputs	%Ext	Disable trigger input	0	-	A

*1 The default assigned state refers to the default system variables assigned to each pin in the System Configuration menu. These assignments may vary if the System settings have been changed.

*2 Refer to "List of System Variables" (Page 3-451) for more details on the functions of individual variables.

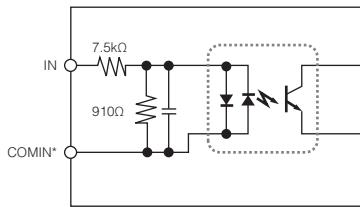
- Point**
- Power source 0 V, COMIN1, COMIN2, COMOUT1, COMOUT2 and COMOUT_F are all isolated.
 - COMIN1 is the common terminal for input exclusive for IN connectors 2 to 6.

() indicates labels printed on terminal blocks at time of shipment

Connecting

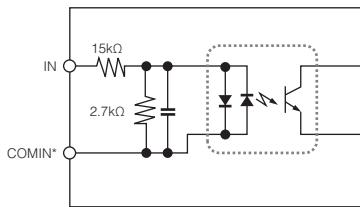
Input circuit diagram

Circuit A (For F_IN0 - 3 only, EV)



- Max. applied voltage: 26.4 V
- ON voltage: 19 V or greater
- ON current: 2.2 mA or greater
- OFF voltage: 5 V or less
- OFF current: 1 mA or less

Circuit B (other inputs)



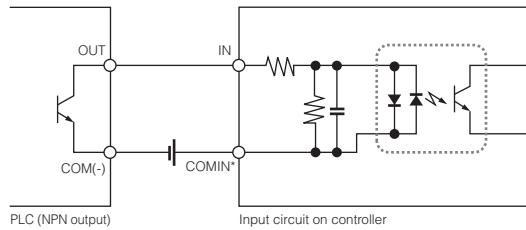
- Max. applied voltage: 26.4 V
- ON voltage: 19 V or greater
- ON current: 1.2 mA or greater
- OFF voltage: 3 V or less
- OFF current: 0.3 mA or less



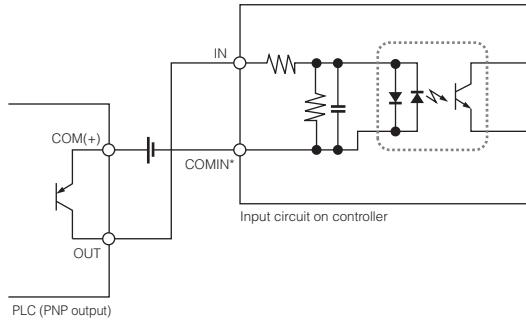
* The common that is connected differs according to the IN terminals. The common terminal for IN connectors 2 - 6 is COMIN1, and the common terminal for parallel I/O connectors 2 - 16 is COMIN2.

Example of connections

When connecting an NPN PLC output to the system input

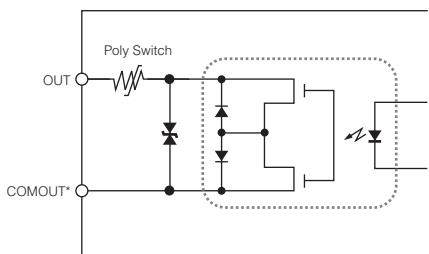


When connecting a PNP PLC output to the system input



Output circuit diagram

Circuit C (common for all output terminals)



- Max. applied voltage: 30 V
- Max. sink current: 50 mA
- Leakage current: 0.1 mA or less
- Residual voltage:
1.4 V or less (50 mA)
1.0 V or less (20 mA)



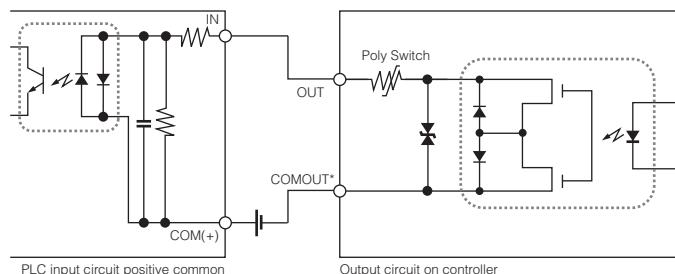
Since this system utilizes a photo MOSFET in the output elements, any one of the NPN inputs, or PNP inputs is connectable.

Connection example: when connecting this system's outputs via a positive common

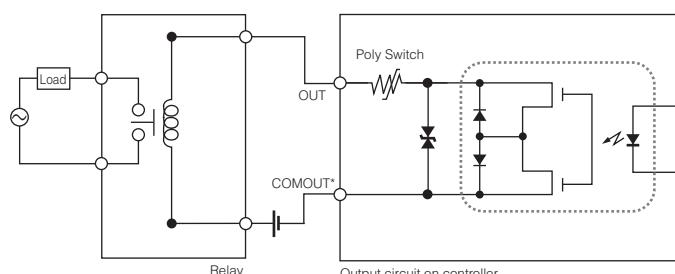


If the input device is compatible with the NPN open collector outputs, then refer to this connection example.

When connecting the output from the controller to a PLC with a positive common



When connecting the output from the controller to a relay



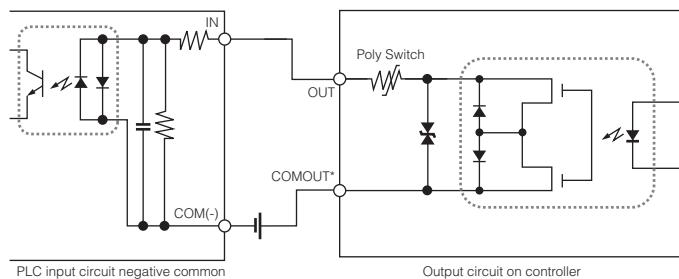
* The common that is connected differs according to the OUT terminals. The common terminal for OUT connectors 1 - 2 is COMOUT1, and the common terminal for OUT connectors 3 - 4/6 - 7 is COMOUT_F, and the common terminal for parallel I/O connectors 18 - 39 is COMOUT2.

Connection example: when connecting this system's outputs via a negative common

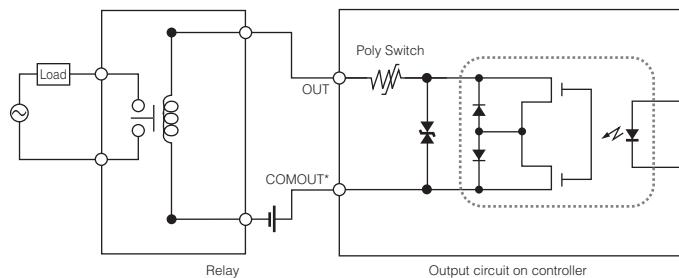


If the input device is compatible with the PNP open collector outputs, then refer to this connection example.

When connecting the output from the controller to a PLC with a negative common



When connecting the output from the controller to a relay



* The common that is connected differs according to the OUT terminals. The common terminal for OUT connectors 1 - 2 is COMOUT1, and the common terminal for OUT connectors 3 - 4/6 - 7 is COMOUT_F, and the common terminal for parallel I/O connectors 18 - 39 is COMOUT2.

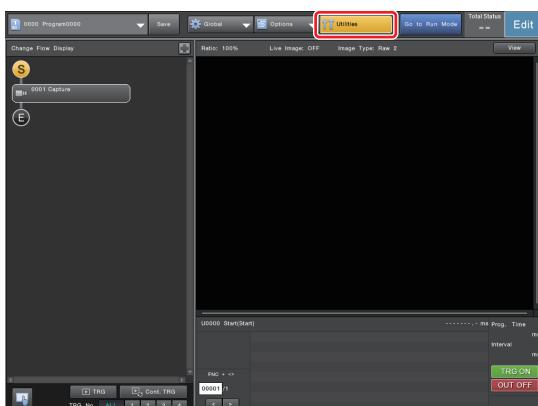
Verifying the Connection Status using the I/O Diagnostic

Checking the Input Signal

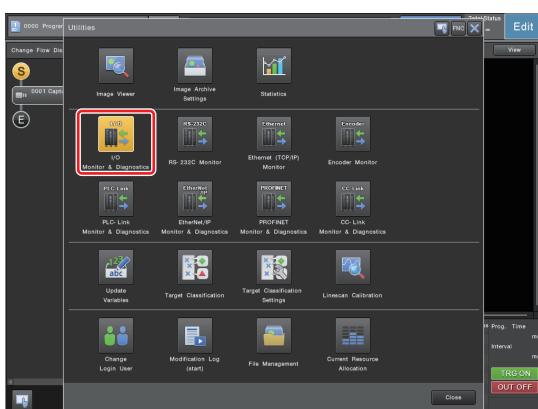
Input a trigger signal from the PLC or synchronization sensor into the controller and check that the trigger is correctly input.

You can check whether the trigger signal is correctly input into the controller by using the I/O monitor that is in the [Utilities] menu.

- Select [Utilities] on the top part of the Setup mode screen.



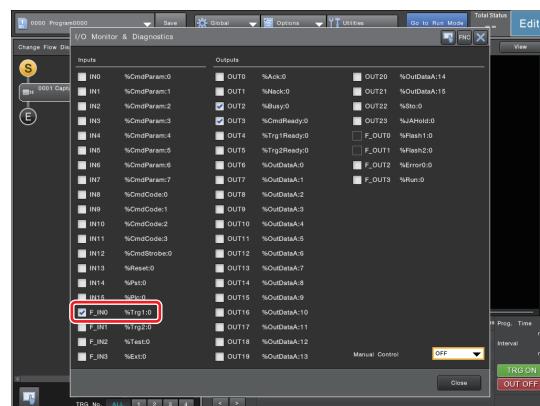
- Select [I/O Monitor & Diagnostics].



- Input a trigger signal from the PLC to the controller and check that the [F_IN0 (%Trg1:0)] check box is selected. If the signal is correctly input from the PLC to the controller, the check box will be selected.



If the signal input time is short, the screen refresh rate cannot keep up and the check box may not be selected even if the signal was correctly input. Input the signal for a sufficiently long amount of time.



Checking the Output Signal

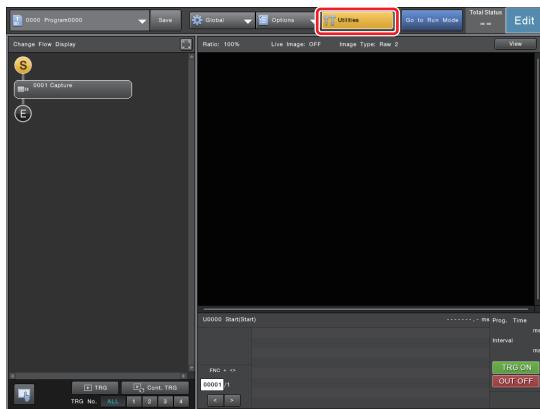
Check whether a signal is output correctly from the controller to the PLC.

On the I/O monitor, forcibly output a signal output by the controller and check that you can check that signal on the PLC.

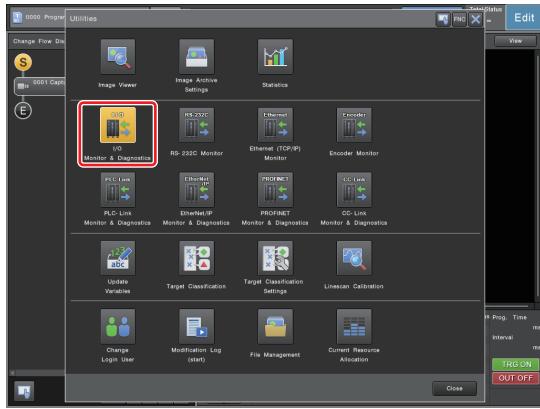


If you selected [Utilities] - [I/O Monitor & Diagnostics] from the Function menu in Run mode, you cannot forcibly output a signal. To perform forcible output, switch to Setup mode.

- 1 Select [Utilities] on the top part of the Setup mode screen.

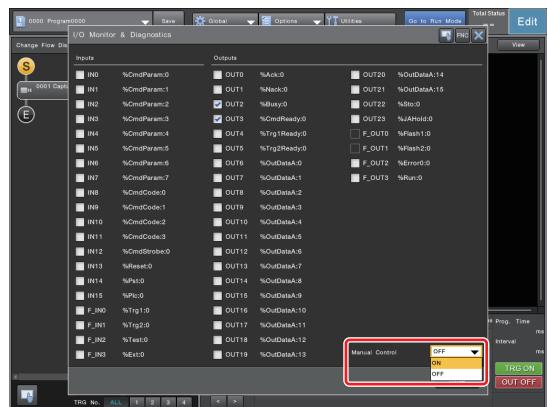


- 2 Select [I/O Monitor & Diagnostics].



- 3 For [Manual Control], select [ON].

If you select the check box for a terminal in this state, that terminal will turn on.



- 4 Tick the check box for a wired terminal, and check that you can check on the PLC.

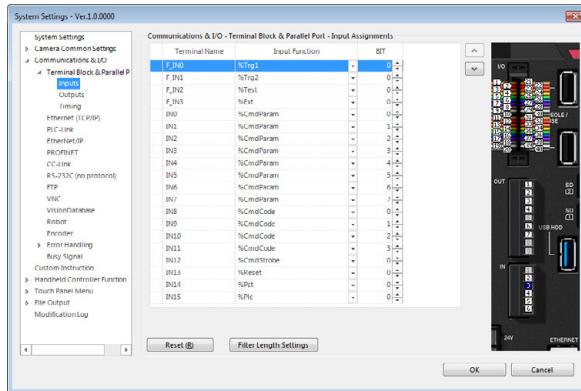
Changing the Parallel Port Input/Output settings

Displaying the setting screen of the parallel port

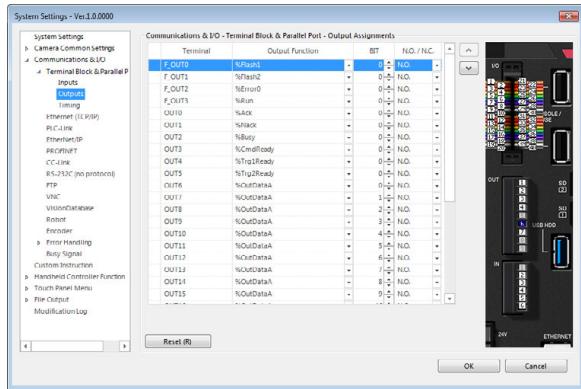
Changing settings with XG-X VisionEditor

On the [Inputs], [Outputs] and [Timing] menus in XG-X VisionEditor system settings, various settings for data input/output with the parallel port can be changed.

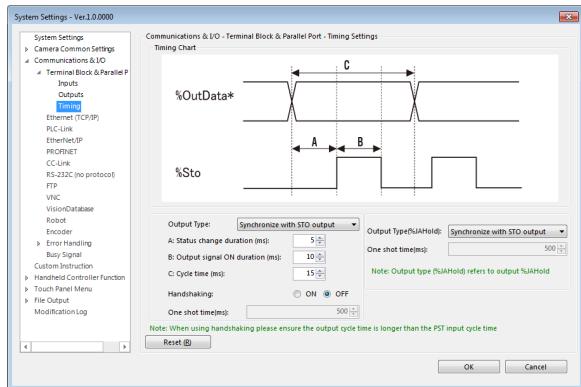
[Inputs] menu



[Outputs] menu



[Timing] menu



1 Select/While in the [Program Setting] tab and, in the [Various Settings] group on the ribbon, select [System Settings].

2 In the left pane of the [System Settings] menu, select [Communications & I/O] - [Terminal Block & Parallel Port] - [Inputs] or [Outputs] or [Timing].
A menu to select items and data from for the item type selected appears.

3 Change the settings as required.

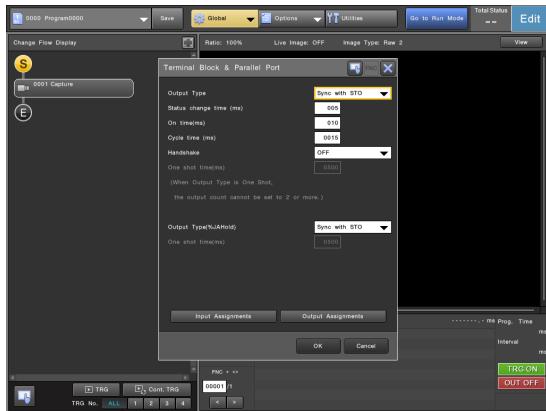
See "Parallel port setting items which can be set in this system" (Page 1-18) for more details on each setting.

4 Click [OK].

Point To apply the change to the controller, you need to upload the system settings file (env.dat) to the controller and then restart the controller.

Changing settings with the controller

On the [Terminal Block & Parallel Port] menu in the Global Settings, various settings for data input/output with the parallel port can be changed.



- 1 On the [Global] menu at the top of the screen, select [Communications & I/O] - [Terminal Block & Parallel Port].

The [Terminal Block & Parallel Port] menu appears.

- 2 On the [Terminal Block & Parallel Port] menu, select [Input Assignments] or [Output Assignments].

A menu to select items and data from for the item type selected appears.

- 3 Change the settings as required.

See "Parallel port setting items which can be set in this system" (Page 1-18) for more details on each setting.

- 4 To finish setting, click [OK].

Point If you changed the input and output assignments, you need to restart the controller to apply the changes (recommended but not necessary).

Parallel port setting items which can be set in this system

Input Assignments

Review/edit input terminal assignments.

Reference

- For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).
- Multiple assignment of the same bit on the same system variable redundantly to input terminals on the parallel port, RY addresses using CC-Link, Ethernet/IP, PROFINET and EtherCAT output data bit areas is not allowed.
- The filter length is the shortest input time that the terminal is recognized as OFF→ON, ON→OFF. Keyence recommends that you normally use the default value.

Point

If you changed the input assignments, you need to restart the controller to apply the changes (recommended but not necessary).

Output Assignments

Review/edit output terminal assignments.

Reference

- You can change the Flash output settings on the capture unit's [External Flash Settings] screen.
- For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).
- Multiple assignment of the same bit on the same system variable redundantly to input terminals on the parallel port, RY addresses using CC-Link, Ethernet/IP, PROFINET and EtherCAT output data bit areas is not allowed.
- For each output terminal, you can switch between N.O. (Normal Open) and N.C. (Normal Close).

Point

If you changed the output assignments, you need to restart the controller to apply the changes (recommended but not necessary).

Output Type

With the exception of %JAHold, you can select the signal output type.

- **Sync with STO** (default): Turn the output on and off for parallel terminal output units in synchronization with the %Sto state.
- **One shot**: Turn the output on for the time specified in [One shot time (ms)] and turn off immediately after.

 Specify %JAHold behavior in Output Type(%JAHold).

Status change time (ms)

Set the length of time from when the output data is ready to the leading edge of %Sto within the range 1 to 999 (ms). (Default: 5 ms)

On time (ms)

Set the time from the leading edge of %Sto to the trailing edge of %Sto within the range 1 to 999 (ms).

(Default: 10 ms)

 Reference

- This setting is used in common with the output on time for %Ack and %Nack.
- Only when [Handshake: ON] is selected, 0 ms can be set. When 0 ms is set, the timeout function of handshaking is cancelled. The duration of %Ack and %Nack is changed simultaneously when the cycle time is reached.

Cycle time (ms)

Set the time between two consecutive leading edges of %Sto within the range 2 to 1000 (ms). (Default: 15 ms)

 Reference

When the duration is set to 0 ms, set it from 1 to 1000 ms. Cycle time should be greater than or equal to Status change time + On time.

Handshake

Select [OFF] (default) or [ON] to perform handshaking for parallel terminal input and output.

One shot time (ms)

With the exception of %JAHold, set the signal one shot time to a value between 1 and 9999 (ms) (default setting: 500 ms). This is enabled only if Output Type is set to [One shot].

Output Type(%JAHold)

Select the method used to control the operation of %JAHold output.

- **Latching**: Latch the output of a NG result for the next inspection and beyond. (To unlatch, either reset the controller, change the program, or turn the outputs off.)
- **Sync with STO** (default): Turn the output on and off for parallel terminal output units in synchronization with the %Sto state.
- **One shot**: Turn the output on for the time specified in [One shot time (ms)] and turn off immediately after.

 Point

- Even if you select [Sync with STO output], %Sto will not be output unless at least one parallel terminal output unit is executed in the flowchart.
- A parallel terminal output unit must be executed to synchronize the output of %JAHold with %Sto. In this case, the terminal output unit does not have to be set with output data if there is no other data to output to the parallel port.

One shot time (ms)

Set the %JAHold one shot time to a value between 1 and 9999 (ms) (default setting: 500 ms). This is enabled only if Output Type(%JAHold) is set to [One shot].

Controlling the System via External Terminals

(Direct Control)

You can control the system directly by assigning system variables to the external I/O terminals. This section describes the system variables used for each operation.



Point Assignment of the same bit on the same system variable to multiple input terminals, RY addresses using CC-Link, EtherNet/IP, PROFINET and EtherCAT output data bit area is not allowed.



- For information on all system variables, including the system variables related to parallel output control, refer to "List of System Variables" (Page 3-451).
- For timing charts related to the direct control, refer to "4. Typical Operations of the Major Control Input/Output Terminals" (Page 1-63) and "2. Typical Operations for External Trigger Input" (Page 1-33).

System Variables Used for Direct Control

To provide trigger input/strobe light output

%Trg1 to 4 (Trigger 1 to 4 input)

Used to input a leading edge synchronized trigger signal to a capture unit.

%Trg1 to 4Ready (Permission for trigger 1 to 4 input)

This output turns on when each trigger input can be accepted. When this output is off, the corresponding trigger input is ignored.

%Flash1 to 4 (Strobe light 1 to 4 output)

These are strobe light outputs to be used by assigning them individually to one of cameras 1 to 4. The on-delay and duration can be specified for individual flashes in [External Flash Settings] of the capture unit.



The system variables %Trg1 to 4 can only be assigned to F_IN0 to 3 respectively. Additionally, %Flash1 to 4 can only be assigned to F_OUT0 to 3 respectively.

To output the judgment results from units



These data outputs are available in run mode only. Data is not output in other modes.

%JAHold (Total status result output (Latching/Sync with STO/One shot selectable))

Used to output the OR of the results of the tolerance judgment for the units specified in the [Total Status Output] menu.

- The behavior when the result is NG can be selected from latched, synchronized with STO, or one shot. See "Changing the Settings of System Variables Required for Direct Control" (Page 1-23) for more details.
- When latching is selected, the latched state is canceled when the controller is reset, program No. is changed, output is disabled with the OE command, operation mode is changed between run and setup, or %Test is input.

%OutDataA to H (Terminal data output (Synchronized with STO/One shot selectable))

Used to output the result data specified in the Parallel Terminal Output unit in synchronization with STO or by One shot. For Sync with STO, up to eight separate time delayed outputs are possible for each unit with the setting of the parallel terminal output unit.

%Sto (Strobe output for reading parallel terminal output unit data)

Used to read the data output of %OutDataA to H which stores data of parallel terminal output units, based on leading edge synchronization.

%Pst (Terminal output data switch input)

Used to give an order to change data when handshake output is used (leading/trailing edge synchronization).

%OutDataAsyncA to H (Terminal data output asynchronous with STO)

Used as the destination of data writing by the WP command to output data in real time.

To input numerical data directly to the controller

%InDataAsyncA to H

(Terminal data input asynchronous with flowchart)

The system variables %InDataAsyncA to H allow the user to change data via the terminals and are used to input data in real time (level input).



- The variables %InDataAsyncA to H reflect terminal inputs within 1 ms. To input a value using several bits, consider the variations in the reflection timing among the bits.
- To change the values of %InDataAsyncA to H during flowchart processing, control the reading timing by using a terminal I/O delay unit to stop the flowchart until the change is complete.

To control the system

%Ext (Disable trigger reception)

While this input is on, all image capture operations (level input).



The capture units for which [Trigger Wait] is disabled also stop.

%Test (Test input)

While this input is on, data output from all ports as well as the %JAHold and %Sto outputs are forced to stop and the output buffer is cleared (level input).

- The terminal outputs are immediately reset to their normal state and the other data outputs will stop after the data output for the current unit is complete.
- Although outputs are enabled again when this input is turned off, the canceled data is not output.

%Reset (Reset input)

Used to reset the controller (leading edge synchronization).



For more details on the control-related operations, refer to "4. Typical Operations of the Major Control Input/Output Terminals" (Page 1-63).

%Error0/1Clear (Error 0/1 clear input)

Used to clear the state of error 0 or 1 (leading edge synchronization).

To check the controller status

%Error0/1 (Error 0/1 output)

This output turns on when an error occurred due to the cause assigned to %Error0 or %Error1. The error handling setting can be changed in [Error handling] of the XG-X VisionEditor system settings.

%Error0/1 Code (Error cause 0/1 output)

Used to output the error code of the error assigned to %Error0 or %Error1 (whichever occurred last).

%Run (Operation mode output)

Used to output the current operation mode of the controller (0: Setup mode, 1: Run mode).

%UnitEditStatus (Edit unit menu activation status)

This output turns on when the controller is in Setup mode, in Edit Flowchart in Run mode status, or Edit Unit in Run mode status (after the top menu).

%WaitReady (Waiting state output)

This output turns on when a timing unit (except for a timer setup unit) is waiting for a synchronization event in the flowchart.

%Busy (Busy output)

This output turns on when the process set in Busy Signal Settings is being executed. The busy condition setting can be changed in [System Settings] - [Communications & I/O] - [Busy Signal] on the XG-X VisionEditor.

%Hist0 to 31Status (Status of image archive conditions 0 to 31)

Used to output the status of the image archive conditions 0 to 31.

- Bit 0: Archive operation (0: Paused, 1: Active)
- Bit 1: Remaining archived output data (0: No, 1: Yes)
- Bit 2: Hold status (0: No, 1: Yes)

%Cam1 to 4Ready (Status of camera 1 to 4)

These outputs turn on when the corresponding camera is ready for image capture.

%Cam1 to 4Status (Camera 1 to 4 image capture buffer status)

Outputs the image capture buffer status of each camera.

- Bit 0: Presence of image capture buffer image (0: No image/1: With image Image present)
- Bit 1: Image Capture buffer full (0: Not full/1: Full)

%Cam1 to 4Num (Number of images used for camera 1 to 4 image capture buffers)

Outputs the number of images stored in the image capture buffer of each camera.

%Trg1 to 4CurrentUnit (Capture flow status of triggers 1 to 4)

Indicates the capture unit number that the capture conditions are applied to when triggers 1 to 4 are input.

%VdbImg0 to 7Status (Status of VisionDatabase image output conditions 0 to 7)

Used to output the status of VisionDatabase image output conditions 0 to 7.

%OutputVdbImgBusy

This output turns on during VisionDatabase image output.

To control the system with custom instructions

Refer to "Controlling the System via External Terminals (Command Control)" (Page 1-25) for more details.

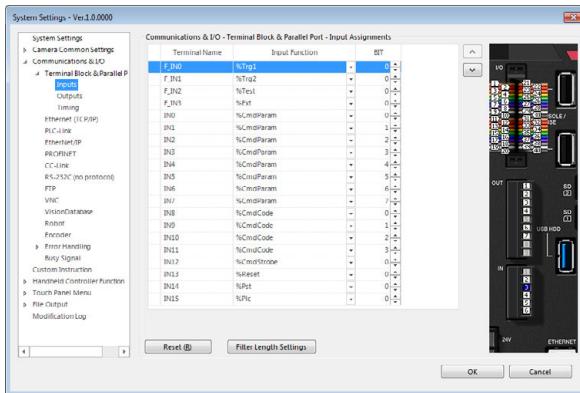
Changing the Settings of System Variables Required for Direct Control

1 Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

2 In the left pane of the [System Settings] menu, select [Communications & I/O] - [Terminal Block & Parallel Port] - [Inputs].

The [Communications & I/O - Terminal Block & Parallel Port - Input Assignments] menu appears.



3 Specify necessary system variables and bits as the input variables assigned to F_IN0 to 3 and IN0 to 15.



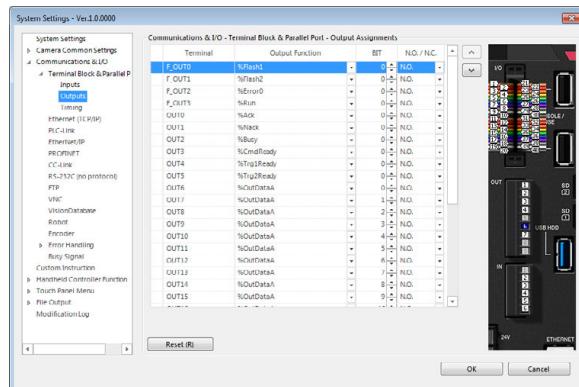
- Assignment of the same bit on the same system variable redundantly to multiple input terminals, RY addresses using CC-Link, EtherNet/IP, PROFINET and EtherCAT output data bit area is not allowed.
- %Trg1 to 4 can only be assigned to F_IN0 to 3 respectively.



- Since major system variables have already been assigned by default, it is possible to change them if necessary. Refer to "Checking the terminal assignment of the controller" (Page 1-8) for more details on the default assigned state.
- Selecting and right clicking system variables of the same type and selecting [Consecutive bit assignment] will assign bits consecutively in ascending order from the top of the selected variables.

4 Select [Communications & I/O] - [Terminal Block & Parallel Port] - [Outputs].

The [Communications & I/O - Terminal Block & Parallel Port - Output Assignments] menu appears.



5 Specify necessary system variables and bits as the output variables assigned to F_OUT0 to 3 and OUT0 to 23.



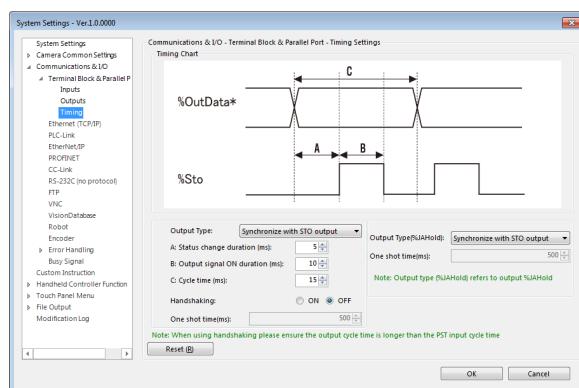
%Flash1 to 4 can only be assigned to F_OUT0 to 3 respectively.



- Since major system variables have already been assigned by default, it is possible to change them if necessary. Refer to "Checking the terminal assignment of the controller" (Page 1-8) for more details on the default assigned state.
- Selecting and right clicking system variables of the same type and selecting [Consecutive bit assignment] will assign bits consecutively in ascending order from the top of the selected variables.

6 Select [Communications & I/O] - [Terminal Block & Parallel Port] - [Timing].

The [Communications & I/O - Terminal Block & Parallel Port - Timing Settings] menu appears.



7 Set the terminal output.

Output Type

- **Synchronize with STO output** (default): Turn the output on and off for parallel terminal output units in synchronization with the %Sto state.
- **One shot**: Turn the output on for the time specified in [One shot time (ms)] and turn off immediately after.



If Output Type is set to [One shot], you cannot select [Synchronize with STO output] for Output Type(%JAHold).

A: Status change duration

Set the length of time from when the data is ready for output to the leading edge of %Sto within the range 1 to 999 (ms). (Default: 5 ms)

B: Output signal ON duration

Set the time from the leading edge of %Sto to the trailing edge of %Sto within the range 1 to 999 (ms). (Default: 10 ms)



- This setting is used in common with the output on time for %Ack and %Nack.
- Only when [Handshake: ON] is selected, 0 ms can be set. When 0 ms is set, the timeout function of handshaking is cancelled. The duration of %Ack and %Nack is changed simultaneously when the cycle time is reached. See "Terminal data output timing (Handshake: ON)" (Page 1-61) for more details.

C: Cycle time

Set the time between two consecutive leading edges of %Sto within the range 2 to 1000 (ms). (Default: 15 ms)



When the duration is set to 0 ms, set it from 1 to 1000 ms.



- The time to be set should be $A + B \leq C$ (excluding the duration of 0 ms).
- If the cycle time is longer than the actual execution cycle of a parallel terminal output unit, the result output falls behind in processing, resulting in an output buffer overflow or skipped output. For more details, refer to "Parallel Terminal Output Unit" in the XG-X VisionEditor Reference Manual.
- The output of %Sto requires the execution of at least one parallel terminal output unit during measurement. %Sto is not output for a measurement generation where no parallel terminal output unit was executed due to conditional branch or unit execution availability.

Handshaking

Select [OFF] (default) or [ON] to perform handshaking for parallel terminal input and output.

One shot time (ms)

Set the one shot time within the range 1 to 9999 (ms) (Default: 500 ms). This is only valid if the [Output Type] is set to [One shot].

8 Change the output type for %JAHold as required.

Output Type(%JAHold)

Select the method used to control the behavior of %JAHold.

- **Latching**: Latch the output of an NG result for the next inspection and beyond. (To unlatch, either reset the controller, change the program, or turn the outputs off.)
- **Synchronize with STO output** (default): Turn the output on and off for parallel terminal output units in synchronization with the %Sto state.
- **One shot**: Turn the output on for the time specified in [One shot time (ms)] and turn off immediately after.



- Even if you select [Synchronize with STO output], %Sto will not be output unless at least one parallel terminal output unit is executed in the flowchart.
- A parallel terminal output unit must be executed to synchronize the output of %JAHold with %Sto. In this case, the terminal output unit does not have to be set with output data if there is no other data to output to the parallel port.

One shot time

Set the one shot time within the range 1 to 9999 (ms). (Default: 500 ms) This is only valid if the [Output Type(%JAHold)] is set to [One shot].

9 Click [OK].



To apply the change to the controller, you need to upload the global settings file to the controller and then restart the controller.

Controlling the System via External Terminals

(Command Control)

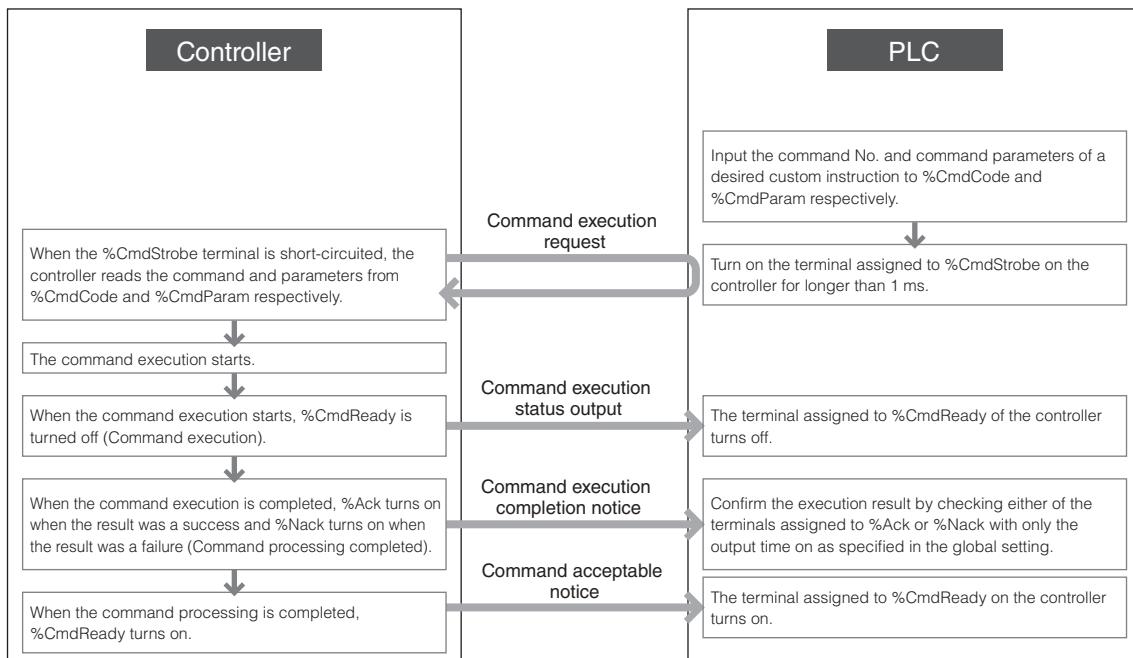
The system can be controlled with commands by using predefined custom instructions (Page 2-116).

- Point To use commands to control the system via the external terminals, it is necessary to define the command beforehand as a custom instruction. For details on setting custom instructions, refer to "Custom instruction" (Page 2-116). For commands which can be used via the external terminals, refer to "Command List (Available Operation vs. Situation)" (Page 2-9).
- Assignment of the same bit on the same system variable redundantly to multiple input terminals, RY addresses using CC-Link, EtherNet/IP, PROFINET and EtherCAT output data bit area is not allowed.

Reference

For timing charts related to command control, refer to "5. Typical Operations when a Command is Executed via the External Terminals" (Page 1-68).

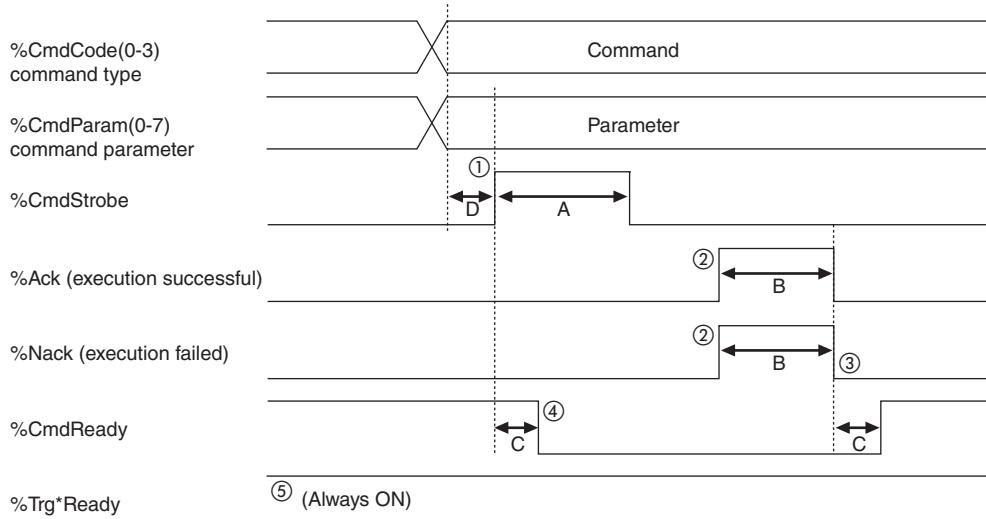
Typical Command Processing Flow to Execute a Custom Instruction via the External Terminals



*1 The behavior of %Busy varies depending on the busy condition in the controller global settings.

Also see the timing chart on the next page.

Basic flow (an example of real-time command execution)



A: 1 msec or more B: Same as the STO output time. C: Within 1 msec D: 500 μ sec or more

- (1) A command input is confirmed at the leading edge of %CmdStrobe.
- (2) The result of the command execution (success or failure) can be checked by either %Ack or %Nack being turned on for STO output ON time.
- (3) %CmdReady turns on when %Ack or %Nack turns off.
- (4) %CmdStrobe is ignored if it is input while %CmdReady is turned off. In this case, neither an %Ack nor %Nack response is given for %CmdStrobe.
- (5) If a command is not based on real-time execution, %Trg*Ready turns off during execution of the command.

For more details about commands compatible with real-time execution, see "Command List (Available Operation vs. Situation)" (Page 2-9).

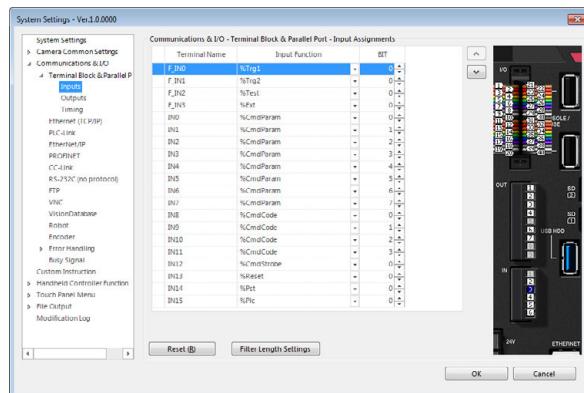
Changing the Settings of System Variables Required for Command Control

1 Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

2 In the left pane of the [System Settings] menu, select [Communications & I/O] - [Terminal Block & Parallel Port] - [Inputs].

The [Communications & I/O - Terminal Block & Parallel Port - Input Assignments] menu appears.



3 Specify the following system variables and bits as input variables assigned to F_IN0 to 3 and IN0 to 15.

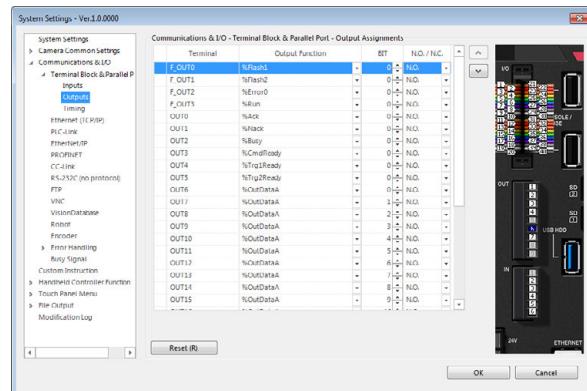
- **%CmdCode:** System variable for the custom instruction number
- **%CmdParam:** System variable for command parameters (This variable is input to the custom instruction argument *01.)
- **%CmdStrobe:** Instruction confirmation input (leading edge synchronization)

Reference

- Since major system variables have already been assigned by default, it is possible to change them if necessary. Refer to "Checking the terminal assignment of the controller" (Page 1-8) for more details on the default assigned state.
- Selecting and right clicking system variables of the same type and selecting [Consecutive bit assignment] will assign bits consecutively in ascending order from the top of the selected variables.
- This is designed under the presumption that %CmdCode, %CmdParam, and %CmdStrobe will be used for command control on the terminal. Although these can also be assigned to CC-Link, EtherNet/IP, PROFINET, EtherCAT, and the like, they use signals that are especially for command control. For more details, see the description for each communication mode.

4 Select [Communications & I/O] - [Terminal Block & Parallel Port] - [Outputs].

The [Communications & I/O - Terminal Block & Parallel Port - Output Assignments] menu appears.



5 Specify the following system variables and bits as the output variables assigned to F_OUT0 to 3 and OUT0 to 23.

- **%CmdReady:** Permission for command input via external terminals
- **%Ack:** Confirmation of normal completion of the command received via external terminals
- **%Nack:** Confirmation of abnormal completion of the command received via external terminals

Reference

- Major system variables have already been assigned by default. Refer to "Checking the terminal assignment of the controller" (Page 1-8) for more details on the default assigned state.
- Selecting and right clicking system variables of the same type and selecting [Consecutive bit assignment] will assign bits consecutively in ascending order from the top of the selected variables.
- This is designed under the presumption that %CmdReady, %Ack, and %Nack will be used for command control on the terminal. Although these can also be assigned to CC-Link, EtherNet/IP, PROFINET, EtherCAT, and the like, they use signals that are especially for command control. For more details, see the description for each communication mode.

6 Click [OK].

Point

To apply the change to the controller, you need to upload the global settings file to the controller and then restart the controller.

Reference

If the bits assigned to %CmdParam are insufficient in the default setting, increase the terminals assigned to %CmdParam to increase the number of bits or use %CmdParamOffset to input a command parameter of a large value by adding offset.

Outputting the Measurement Data via External Terminals (Result Output)

You can output the data from parallel terminal output units through the external terminals.



The measurement data output is available only when the controller is in run mode. The outputs including %Sto are disabled in the other modes.



For timing charts related to the result output, refer to "3. Typical Operations of the Data Output Terminals" (Page 1-60).

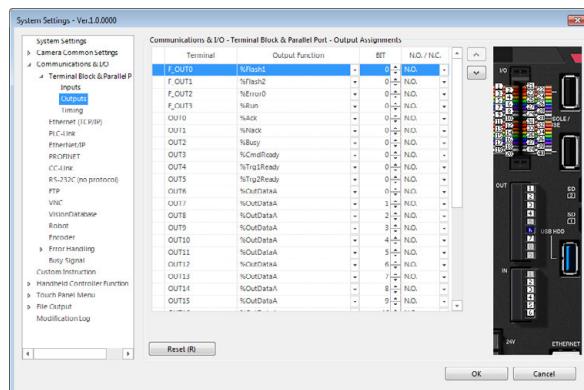
Changing the Settings of System Variables Required for Data Output

1 Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

2 Select [Communications & I/O] - [Terminal Block & Parallel Port] - [Outputs].

The [Communications & I/O - Terminal Block & Parallel Port - Output Assignments] menu appears.



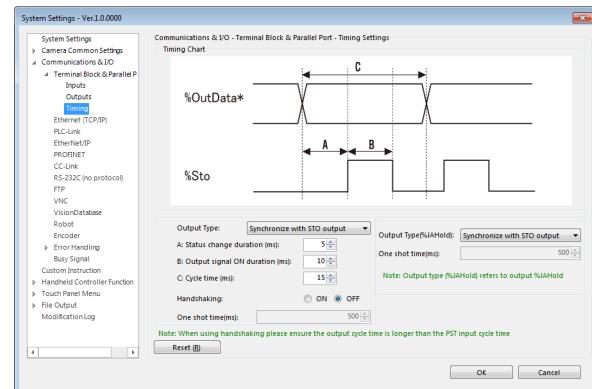
3 Specify the system variables %OutDataA to H for terminal data output synchronized with STO, relevant bits (0 to 31), and the N.O./N.C. settings as the output variables assigned to F_OUT0 to 3 and OUT0 to 23.



- By default, OUT0 to OUT15 have already been assigned bits 0 to 15 of %OutDataA.
- Selecting and right clicking system variables of the same type and selecting [Consecutive bit assignment] will assign bits consecutively in ascending order from the top of the selected variables.

4 Select [Communications & I/O] - [Terminal Block & Parallel Port] - [Timing].

The [Communications & I/O - Terminal Block & Parallel Port - Timing Settings] menu appears.



5 Set the terminal output.

Output Type

- Synchronize with STO output** (default): Turn the output on and off for parallel terminal output units in synchronization with the %Sto state.
- One shot**: Turn the output on for the time specified in [One shot time (ms)] and turn off immediately after.



If Output Type is set to [One shot], you cannot select [Synchronize with STO output] for Output Type(%JAHold).

A: Status change duration

Set the length of time from when the data is ready for output to the leading edge of %Sto within the range 1 to 999 (ms). (Default: 5 ms)

B: Output signal ON duration

Set the time from the leading edge of %Sto to the trailing edge of %Sto within the range 1 to 999 (ms). (Default: 10 ms)



- This setting is used in common with the output on time for %Ack and %Nack.
- Only when [Handshake: ON] is selected, 0 ms can be set. When 0 ms is set, the timeout function of handshaking is cancelled. The duration of %Ack and %Nack is changed simultaneously when the cycle time is reached. See "Terminal data output timing (Handshake: ON)" (Page 1-61) for more details.

C: Cycle time

Set the time between two consecutive leading edges of %Sto within the range 2 to 1000 (ms). (Default: 15 ms)



When the duration is set to 0 ms, set it from 1 to 1000 ms.

Point

- The time to be set should be $A + B \leq C$ (excluding the duration of 0 ms).
- If the cycle time is longer than the actual execution cycle of a parallel terminal output unit, the result output falls behind in processing, resulting in an output buffer overflow or skipped output. For more details, refer to "Parallel Terminal Output Unit" in the XG-X VisionEditor Reference Manual.
- The output of %Sto requires the execution of at least one parallel terminal output unit during measurement. %Sto is not output for a measurement generation where no parallel terminal output unit was executed due to conditional branch or unit execution availability.

Handshaking

Select [OFF] (default) or [ON] to perform handshaking for parallel terminal input and output.

One shot time (ms)

Set the one shot time within the range 1 to 9999 (ms) (Default: 500 ms). This is only valid if the [Output Type] is set to [One shot].

6 Change the output type for %JAHold as required.**Output Type(%JAHold)**

Select the method used to control the behavior of %JAHold.

- Latching:** Latch the output of an NG result for the next inspection and beyond. (To unlatch, either reset the controller, change the program, or turn the outputs off.)
- Synchronize with STO output** (default): Turn the output on and off for parallel terminal output units in synchronization with the %Sto state.
- One shot:** Turn the output on for the time specified in [One shot time (ms)] and turn off immediately after.

Point

- Even if you select [Synchronize with STO output], %Sto will not be output unless at least one parallel terminal output unit is executed in the flowchart.
- A parallel terminal output unit must be executed to synchronize the output of %JAHold with %Sto. In this case, the terminal output unit does not have to be set with output data if there is no other data to output to the parallel port.

One shot time

Set the one shot time within the range 1 to 9999 (ms). (Default: 500 ms) This is only valid if the [Output Type(%JAHold)] is set to [One shot].

7 Click [OK].**Point**

To apply the change to the controller, you need to upload the global settings file to the controller and then restart the controller.

Specifying the Data that You Want to Output and the Output Method

Specify the combination of output variables already assigned to the terminal block and the data that you want to output as well as the output method on the parallel terminal output unit.



Refer to "Parallel Terminal Output Unit" in the XG-X VisionEditor Reference Manual.

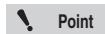
1 In Flowchart View, double-click the parallel terminal output unit to change its settings.

The properties menu of the parallel terminal output unit is displayed.

2 Click the [Output Settings] tab.

3 To use time-delayed separated outputs, specify the data output count (1 to 8) in the [No. Items] field (Default: 1).

4 Specify the result data or the variable, value, and bits (0 to 31) you want to output for the output variable set in [Data Settings].



If you want to output with a time delay, specify the number of times that you want to output data in the output variables.

5 At [Full output buffer], select which should take priority when the output buffer becomes full: Image processing (flowchart transition) or data output.

- **Skip output item:** Give priority to image processing and skip the current data output.
- **Wait for free space (Default):** Give priority to data output.



- When the output buffer becomes full, resume image processing after the data output is complete. You can check for the skipping of data output by checking if [Data Transferred] of the result data remains 0 after the output unit execution.
- Alternatively, you can increase the output buffer capacity at [Output buffer capacity setting] to increase the program memory assigned to the output buffer. See the XG-X VisionEditor Reference Manual for more details.
- If there is free space in the output buffer, the behavior is the same as [Skip output item] even when [Wait for free space] is selected.

6 If the unit does not execute, select whether to skip the result data in [Skip unexecuted items].

If you change [OFF] (default setting) to [ON], if there are units that did not execute due to a branch in the flow or the like or there are units set to [Never Execute] and data for the nth argument is set to the result of a non-executed unit or only a blank field, data output for the nth argument is skipped.

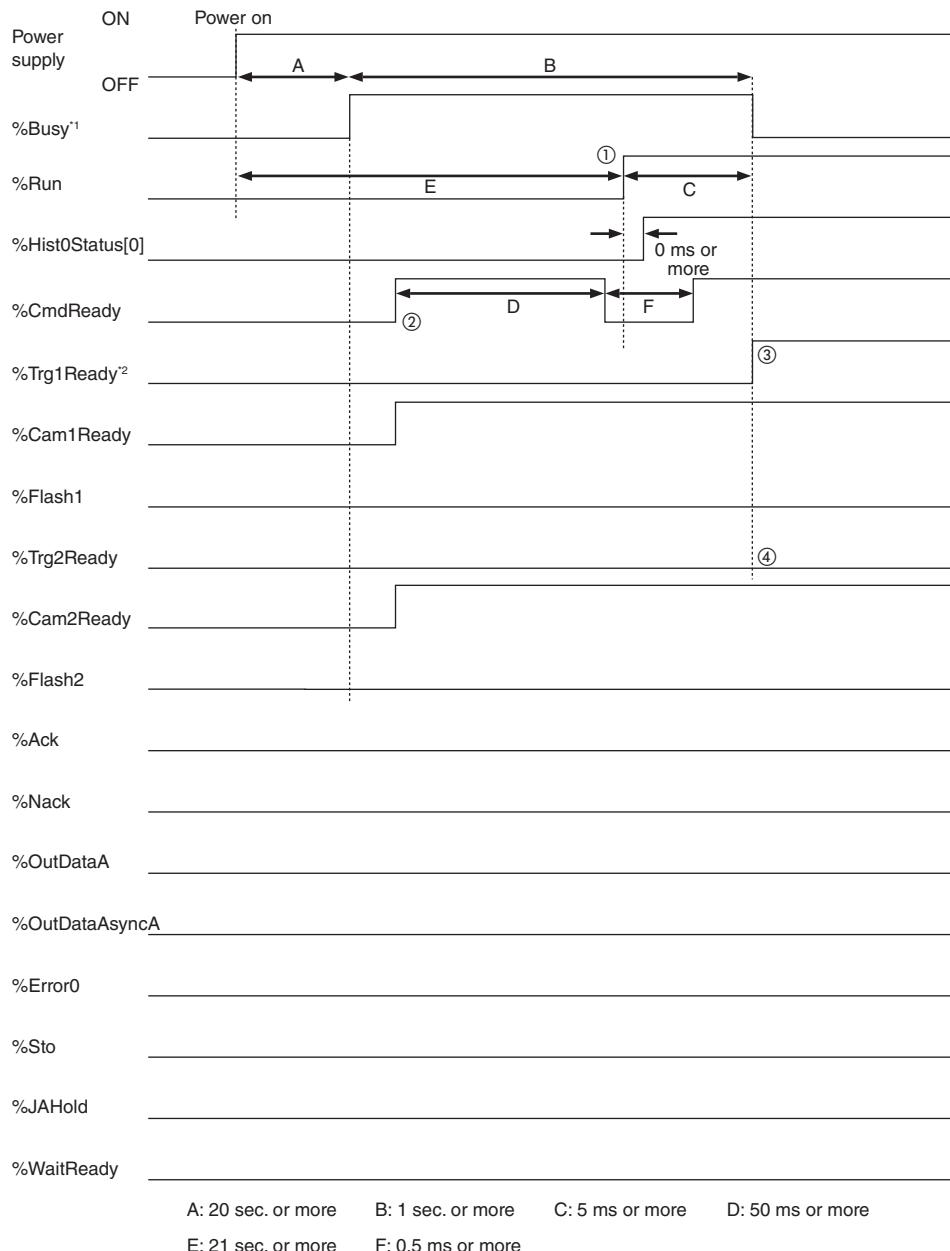
7 Click [OK].

If there is any other parallel terminal output unit in the flowchart, repeat the steps from step 1 for each unit.

Timing Chart

1. Operations at Startup

Typical operations at startup

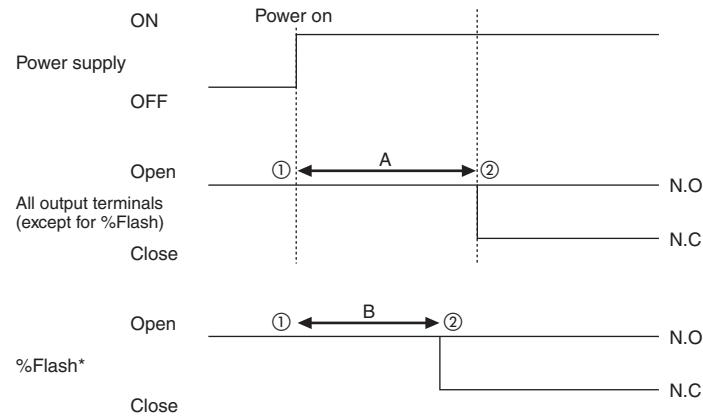


- (1) If [Startup Mode] is set to [Run Mode], the %Run terminal turns ON after startup. If [Startup Mode] is set to [Setup Mode], the terminal stays OFF.
- (2) Command inputs will be accepted when %CmdReady turns on and off once after startup and then turns on again.
- (3) When the first capture unit is executed, %Trg1Ready turns on. After %Trg1Ready turns on, the input of %Trg1 is accepted.
- (4) This terminal remains off unless %Trg2 has been enabled in the settings. When %Trg2 has been enabled, this terminal turns on in the same way as %Trg1Ready.

*1 The example above shows a waveform when the default busy condition setting is used.

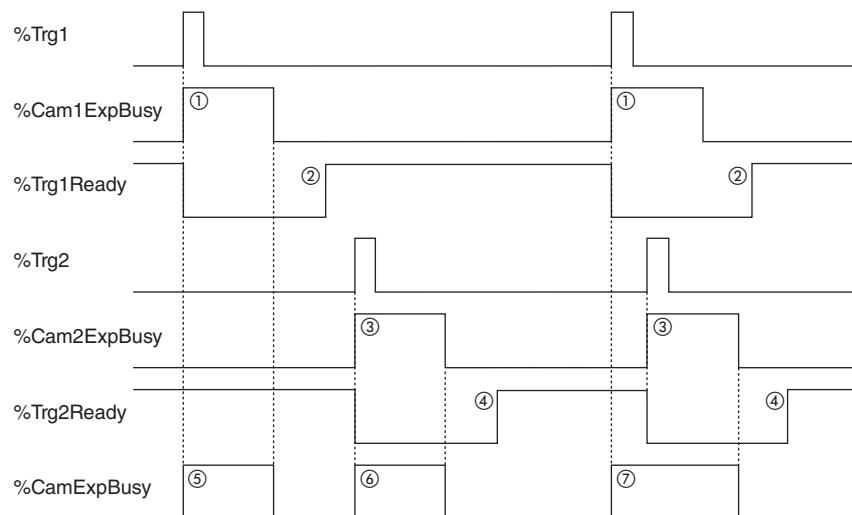
*2 The example above shows a waveform when the capture unit for which the %Trg1 external trigger was set is positioned immediately below the start unit.

Normally open (N.O.)/normally closed (N.C.) reflection timing



- (1) The system enters normally open state immediately after startup, regardless of the settings.
- (2) The normally closed settings are reflected after a certain period of time.

Typical operation of signals during exposure



- (1) %Cam1ExpBusy turns on during exposure.
- (2) %Trg1Ready turns on after image transfer of Camera 1.
- (3) %Cam2ExpBusy turns on during exposure.
- (4) %Trg2Ready turns on after image transfer of Camera 2.
- (5) %CamExpBusy turns on for either one of the cameras (Camera 1 in this case) during exposure.
- (6) %CamExpBusy turns on for either one of the cameras (Camera 2 in this case) during exposure.
- (7) %CamExpBusy turns on for either one of the cameras (Camera 1 and then Camera 2 in this case) during exposure.

Reference

When using an XT camera, the timing of each output corresponding to trigger input is different. For details, refer to "Typical operations when an XT camera is used" (Page 1-47).

2. Typical Operations for External Trigger Input

Using the image capture buffer

When the image capture buffer setting is ON, trigger inputs (image capture actions) are allowed asynchronously with the measurement flow. This allows the next trigger input to be accepted as soon as the %Trg1(-4)Ready terminal turns on even if the current image processing is not complete, so that the waiting time for capturing target images can be minimized.

Reference If there are multiple capture units in the flow, pre-capture can be immediately performed by using the capture setting parameters for a capture unit that has been determined to be executed next (supported in Ver.1.2.0000 or later).

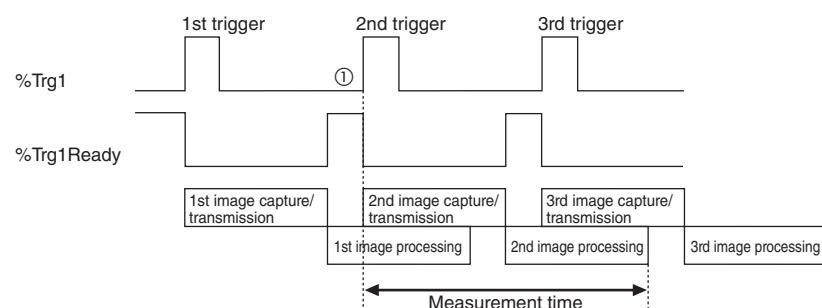
Image capture with the line scan camera or LJ-X/LJ-V series head

- Selecting [Fixed] capture: The concept for the time chart is the same as the area camera. The capture for the number of lines set from the trigger input is the image capture.
- Selecting [Continuous] capture: Refer to "Typical operations when a linescan camera is used (When [Continuous] is set, and [Total Number of Lines] and [End capture by EXT signal] are disabled)" (Page 1-45), "Typical operations when the LJ-X/LJ-V Series sensor head is used (When [Continuous] is set, and [Total Number of Lines] is disabled)" (Page 1-49).

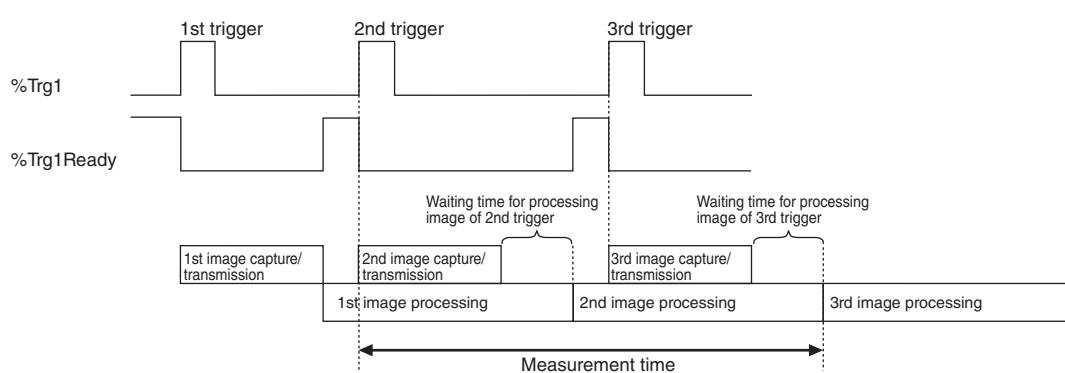
Image capture with an XT camera

- When a program that uses an XT camera meets certain conditions, the next trigger input can be accepted when the image capturing of the XT camera finishes (leading trigger function).
- For details on the leading trigger function, refer to "Typical operations when an XT camera is used" (Page 1-47).

Measurement using the image capture buffer (When the image capture buffer is reserved for one fixed image and the image processing time is shorter than the image capture/transmission time)

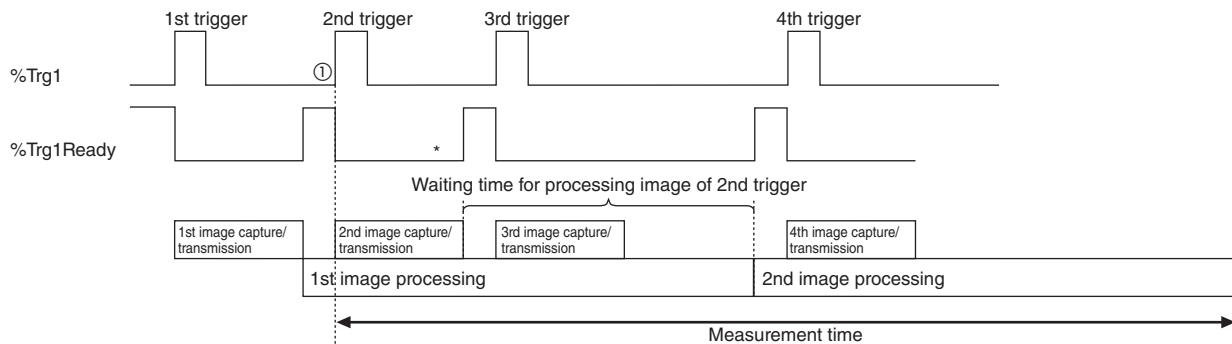


Measurement using the image capture buffer (When the image capture buffer is reserved for one fixed image and the image processing time is longer than the image capture/transmission time)



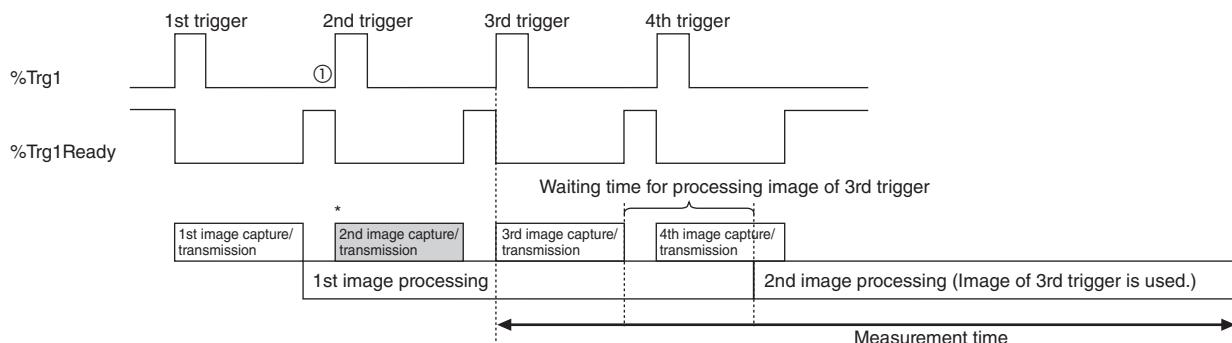
* When the next trigger is input during image processing, the measurement time shown on the screen also includes the waiting time for completion of image processing.

Measurement using the image capture buffer (When the image capture buffer is reserved for two fixed images and the image processing time is longer than the image capture/transmission time)



- * When the buffer capacity is reserved for two images, up to three triggers (including the one for current image processing) can be input in the shortest amount of time.
- Increasing the buffer capacity within the range of the free image memory allows a specific number of image capture actions in advance during the processing of the previous image.

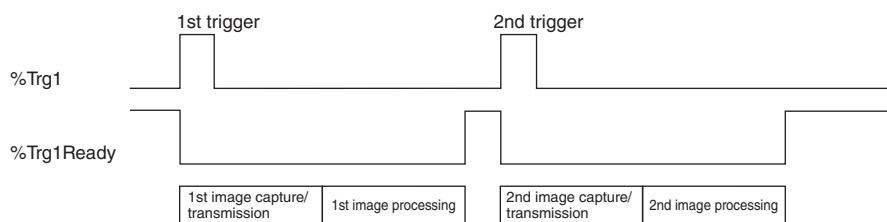
Measurement using the image capture buffer (When the image capture buffer is reserved for one image with overwriting allowed and the image processing time is longer than the image capture/transmission time)



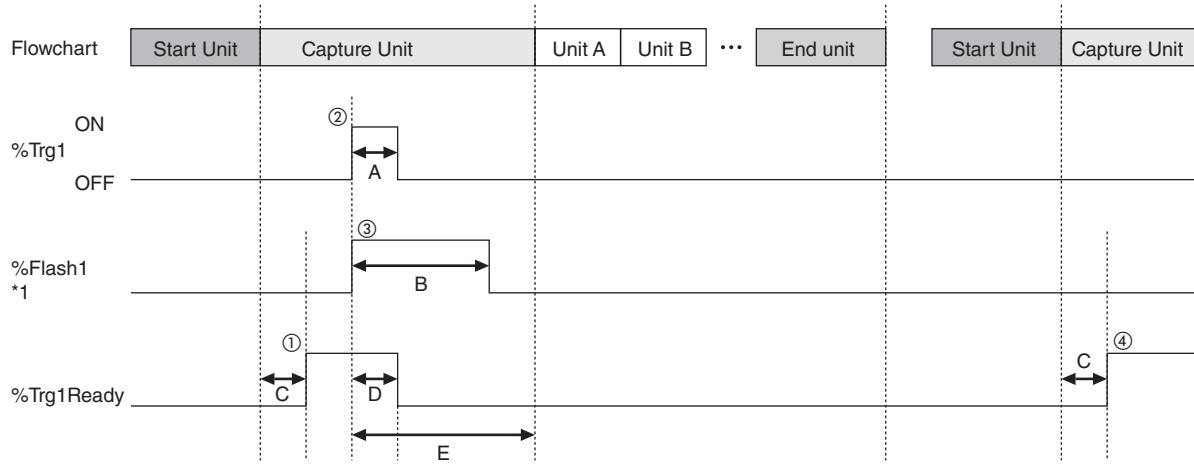
- * By the time the second image processing starts, the third image capture/transmission is complete and the image for the second trigger in the buffer is overwritten and thus not used in image processing.

Measurement when the image capture buffer is set to OFF

When the image capture buffer operation is disabled, trigger inputs are not accepted during the execution of the preceding flowchart.



Typical operations with a single trigger (When the image capture buffer is set to OFF)



A: Minimum trigger input time 1ms or more

B: FLASH duration Depends on the setting.

C: Response delay for %Trg1Ready leading edge

Between 0 ms and 5 ms
(Value of a capture unit with one camera. The delay time varies depending on the flowchart settings.)

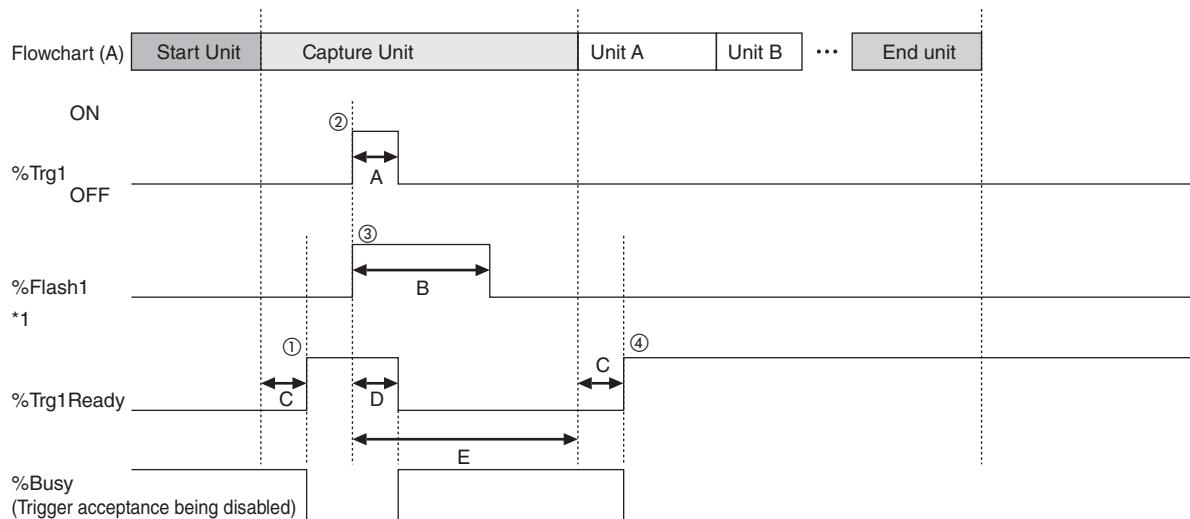
D: Response delay for %Trg1Ready trailing edge 1ms or less

E: Image capture/transmission time (Depends on camera settings of the capture unit)

- (1) When the process moves to a capture unit, %Trg1Ready turns on and the capture unit starts waiting for a trigger.
- (2) The input of %Trg1 is accepted while the %Trg1Ready output is on. When a trigger is input, the camera starts image capturing.
- (3) The trigger input turns on FLASH for the specified duration (can be changed with setting). See "Image capture and FLASH output timing for the trigger operation" (Page 1-55) for more details.
- (4) When the next capture unit starts waiting for a trigger, %Trg1Ready turns on and another trigger input is accepted.

*1 The assignment of the trigger terminals and FLASH terminals can be changed. The above example shows the setting which assigns Flash 1 to camera 1.

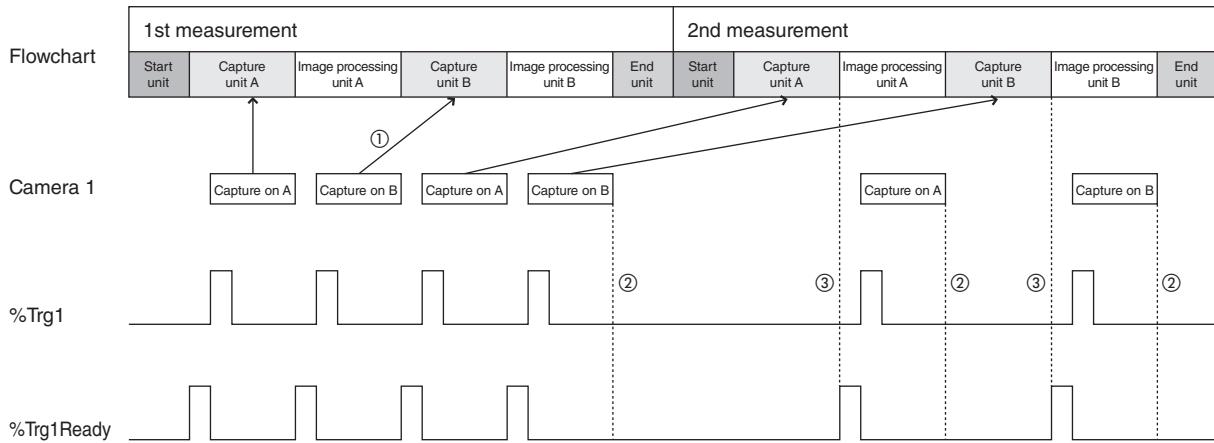
Typical operations with a single trigger (When the image capture buffer is reserved for one fixed image)



- (1) When the process moves to a capture unit for the first time after the controller is turned on, the image capture buffer operation starts. %Trg1Ready turns on and the unit starts waiting for a trigger input.
- (2) The input of %Trg1 is accepted while the %Trg1Ready output is on. When a trigger is input, an image is captured and transmitted by camera 1. %Trg1Ready turns off during this time.
- (3) The trigger input turns on FLASH for the specified duration (can be changed with setting). See "Image capture and FLASH output timing for the trigger operation" (Page 1-55) for more details.
- (4) If there is space in the image capture buffer after image capture and transmission is complete, %Trg1Ready turns on to accept the next trigger input even when the flowchart is in the course of image processing.

*1 The assignment of the trigger terminals and FLASH terminals can be changed. The above example shows the setting which assigns %Flash1 to camera 1.

Typical operations with a single trigger (when the image capture buffer is reserved for two fixed images and two capture units are used)

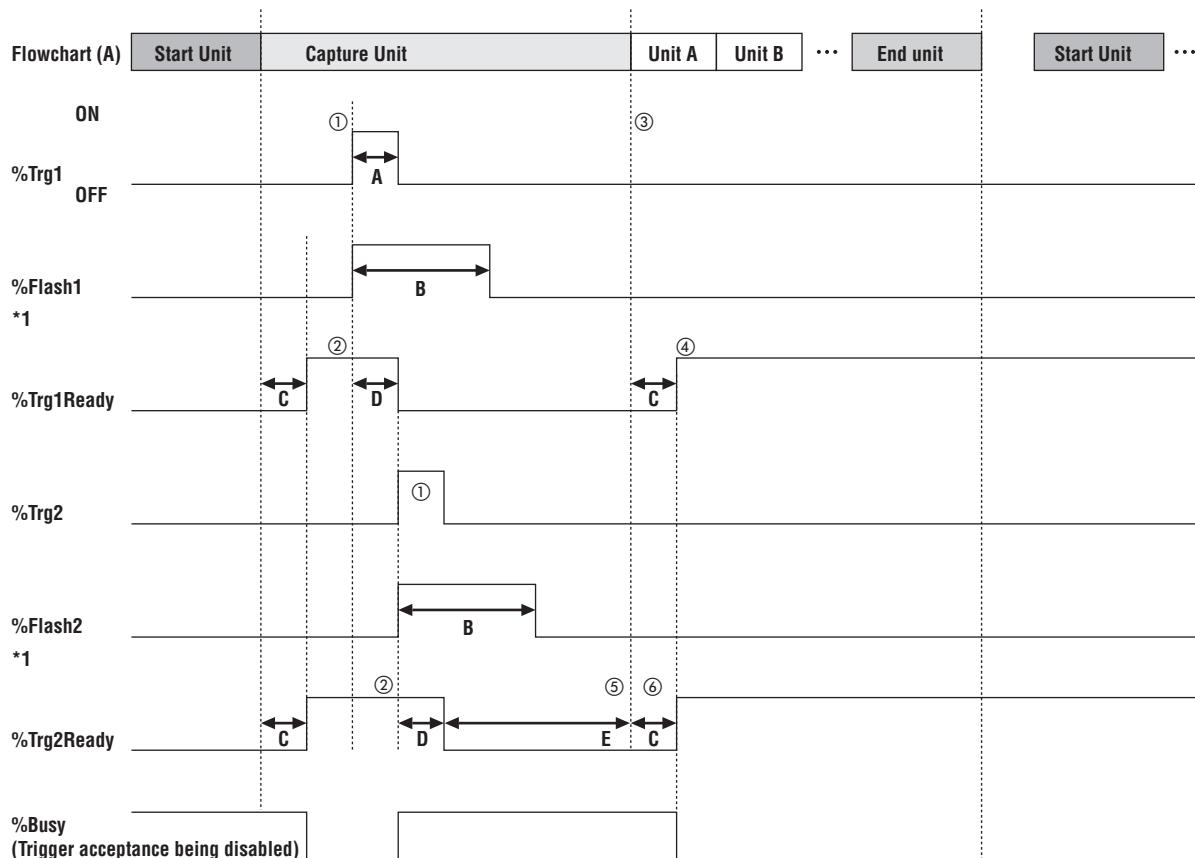


- (1) The above diagram assumes that capture unit B is to be executed next after completion of capture by capture unit A. In this case, camera 1 performs pre-capture by using the capture setting parameters for capture unit B while image processing unit A is being executed. The pre-captured image is stored in the image capture buffer and is used later when the process reaches capture unit B.
- (2) If the image capture buffer becomes full with pre-captured images, the pre-capturing function is temporarily disabled until a space becomes available in the buffer. The %Trg1Ready is OFF during this period.
- (3) When pre-captured images are used by a capture unit and a space becomes available in the image capture buffer, the pre-capturing function is enabled and the %Trg1Ready turns ON.

Reference

- If the flow includes branches or repetitions, a time delay may occur in determination of the capture unit that is to be executed next, and this may make it impossible to perform pre-capture even when a space has become available in the buffer.
- The operations represented by this timing chart are supported by the controller of Ver. 1.2.0000 or later.

Typical operations with individual triggers (When the image capture buffer is reserved for one fixed image, both trigger 1 and trigger 2 are used, and one condition is set to complete the capture unit)



A: Minimum trigger input time 1ms or more

B: FLASH duration Depends on the setting.

C: Response delay for %Trg1Ready leading edge Between 0 ms and 5 ms
(Value of a capture unit with one camera. The delay time varies depending on the flowchart settings.)

D: Response delay for %Trg1Ready trailing edge 1ms or less

E: Image capture/transmission time (Depends on camera settings of the capture unit)

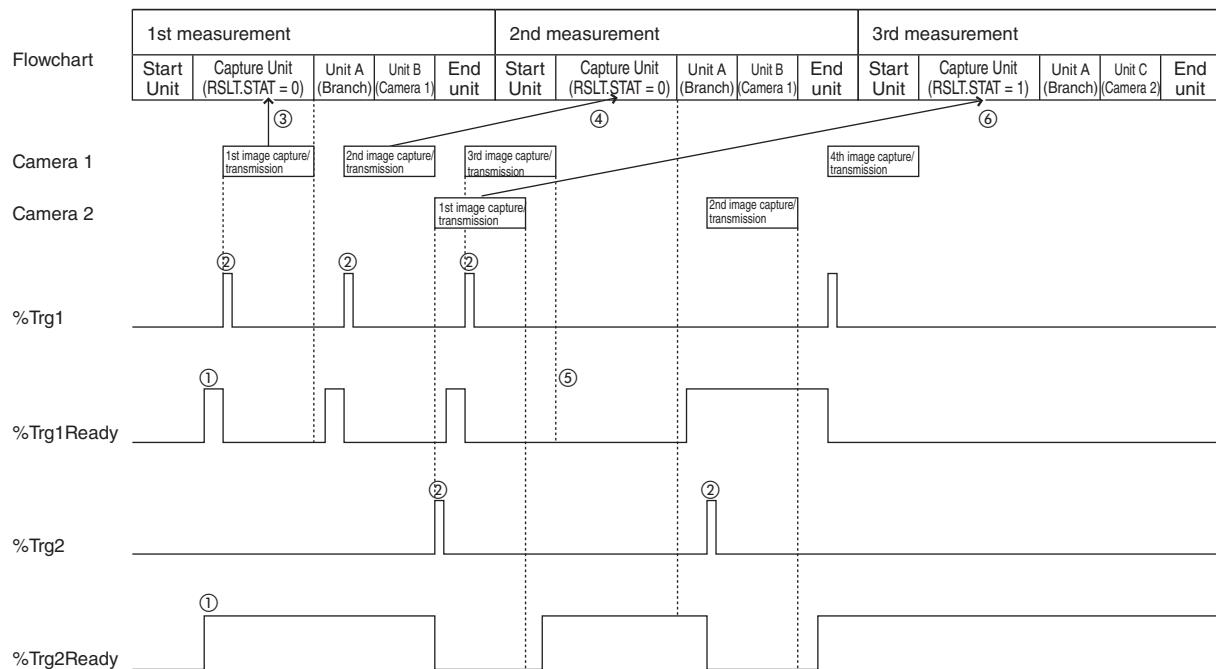
- (1) Although %Trg1 and %Trg2 can be input in any order, the same trigger cannot be input consecutively. To input the same trigger consecutively, the image capture buffer must be reserved for two or more images.
- (2) The input of %Trg1 is accepted while %Trg1Ready is on. The input of %Trg2 is accepted while %Trg2Ready is on.
- (3) When the cameras assigned to the triggers finish all image capture operations, the capture unit is complete and the subsequent units are executed.
- (4) When the image capture buffer is reserved for only one image, %Trg1Ready for camera 1, which completed image capture and transmission earlier, does not turn on until the buffer regains some space when camera 2 completes image capture and transmission to satisfy the conditions for the completion of the capture unit.
- (5) When the cameras assigned to the triggers finish all image capture operations and satisfy the capture unit completion conditions, the capture unit is complete and the subsequent units are executed.
- (6) If there is space in the image capture buffer after the image has been captured and transmitted, %Trg2Ready for camera 2 (which completed image capture and transmission) turns on to allow reception of the next trigger input even when the flowchart is in the middle of image processing.

*1 The assignment of the trigger terminals and FLASH terminals can be changed. The above example shows the setting which assigns %Flash1 to camera 1 and %Flash to camera 2.

Typical operations with individual triggers (When the image capture buffer is reserved for two fixed images, both trigger 1 and trigger 2 are used, and several conditions (of the same priority) are set to complete the capture unit)

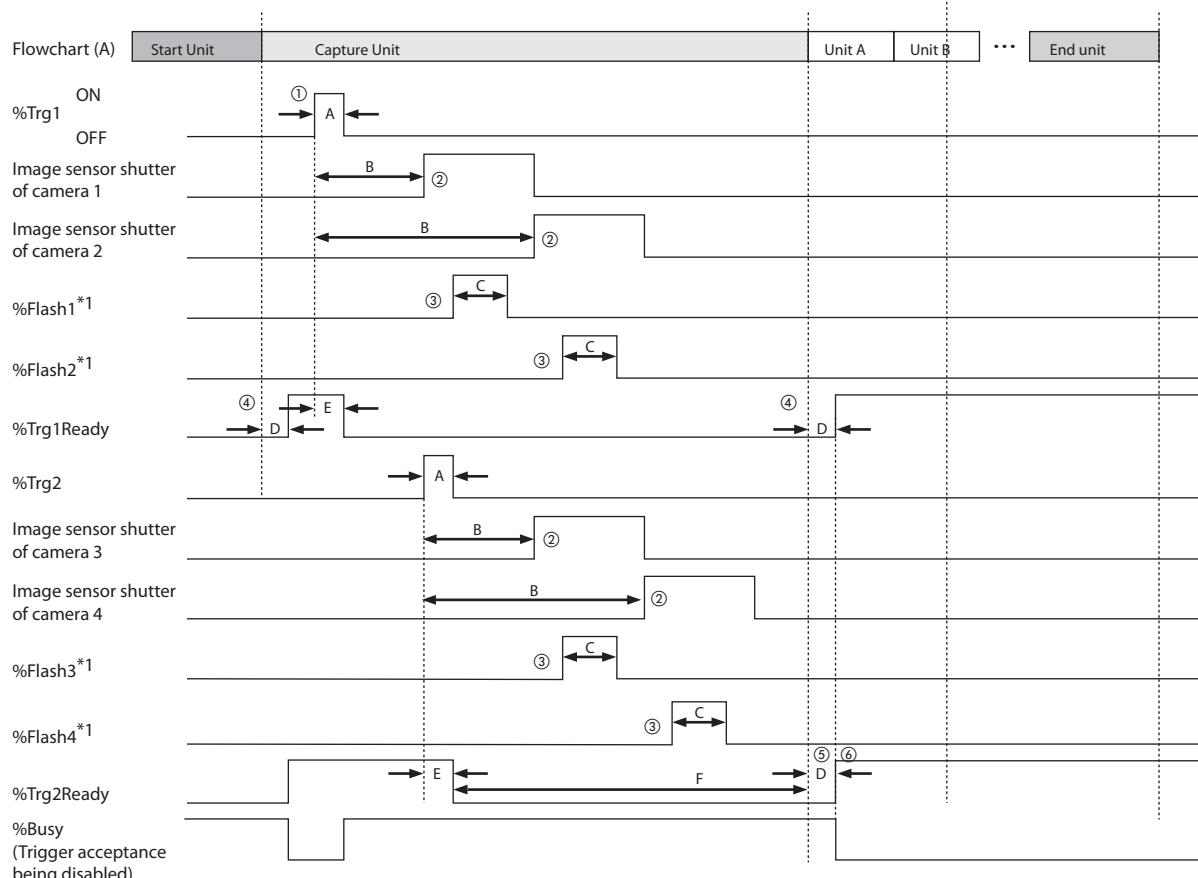
If you configured the following settings on the capture unit

Trigger	Camera 1: Trigger 1 Camera 2: Trigger 2
Capture priority	Camera 1: Condition 0 Camera 2: Condition 1



- (1) When the process moves to a capture unit for the first time after the controller is turned on, the image capture buffer operation starts. %Trg1Ready and %Trg2Ready turn on and the unit starts waiting for trigger inputs.
- (2) %Trg1 and %Trg2 can be input in any order. Images can consecutively be captured asynchronously with the flowchart operation until the buffer becomes full.
- (3) When conditions to complete the capture unit have the same priority, the images in the image capture buffer are referenced from the oldest unused one and priority is given to whichever condition is satisfied first. In this example, the first image captured with camera 1 is used to complete the capture unit in the first measurement, then the next unit is executed. If the camera to be used varies in every measurement like this example, you can position a branch unit under the capture unit in the flowchart to evaluate RSLT.STATUS (Status value) of the capture unit, so that only the measurement units which use the camera included in the completion condition are executed.
- (4) In the second measurement, the capture unit references the image capture buffer. As in the case of (3), priority is given to whichever condition is satisfied first, the second image of camera 1 is used to complete the capture unit, and then the next unit is executed.
- (5) When the image capture buffer for camera 1 becomes full, %Trg1Ready turns off until the buffer is referenced by a capture unit. If [Overwriting] is selected for the image capture buffer operation, the trigger input continues because the oldest image is overwritten.
- (6) In the third measurement, the capture unit references the image capture buffer. As in the case of (3), priority is given to whichever condition is satisfied first, the first image of camera 2 is used to complete the capture unit, and then the next unit is executed.

Typical operations with individual triggers (both trigger 1 and trigger 2) when trigger delay is set



A: Minimum trigger input time 1ms or more

B: Trigger delay time (0 to 999.999 ms)

C: FLASH duration Depends on the setting.

D: Response delay for %Trg1Ready leading edge Between 0 ms and 5 ms
(Value of a capture unit with one camera. The delay time varies depending on the flowchart settings.)

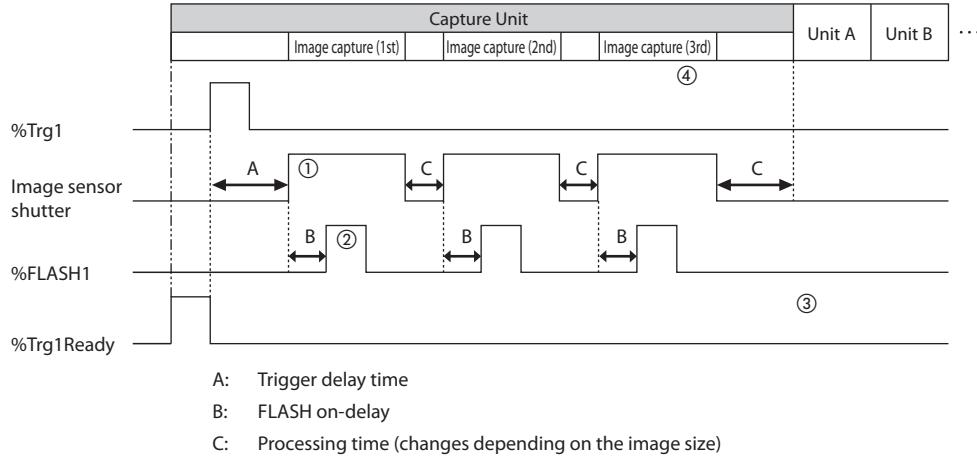
D: Response delay for %Trg1Ready trailing edge 1ms or less

F: Time between the start of image capture by camera 3 or 4 (whichever is earlier) and the completion of transmission by camera 3 or 4 (whichever is later, depends on camera settings of the capture unit)

- (1) Although %Trg1 and %Trg2 can be input in any order, the same trigger cannot be input consecutively. To input the same trigger consecutively, the image capture buffer must be reserved for two or more images.
- (2) When a trigger is input, the camera assigned to the trigger starts image capture after the trigger delay time set to each camera in the capture unit.
- (3) The FLASH output (%Flash1 to %Flash4) is linked to the image capture timing of the camera to which the trigger delay was applied, and will turn on according to the settings of the capture unit. (The above example shows the case where the on-delay for the FLASH output is a positive value.)
- (4) When the image capture buffer is reserved for only one image, %Trg1Ready for cameras 1 and 2 (which completed image capture and transmission earlier) will not turn on until the buffer regains some space when cameras 3 and 4 complete image capture and transmission, and satisfy the conditions to complete the capture unit.
- (5) When the cameras assigned to the triggers finish all image capture operations and satisfy the capture unit completion conditions, the capture unit is complete and the subsequent units are executed.
- (6) If there is space in the image capture buffer after the image has been captured and transmitted, %Trg2Ready for cameras 3 and 4, which completed image capture and transmission, turn on to allow reception of the next trigger input even when the flowchart is in the middle of image processing.

*1 The assignment of the cameras and FLASH terminals can be changed. The above example shows the setting which assigns %Flash1 to camera 1, %Flash2 to camera 2, %Flash3 to camera 3, and %Flash4 to camera 4.

Typical operations using the HDR processing in the image capture unit

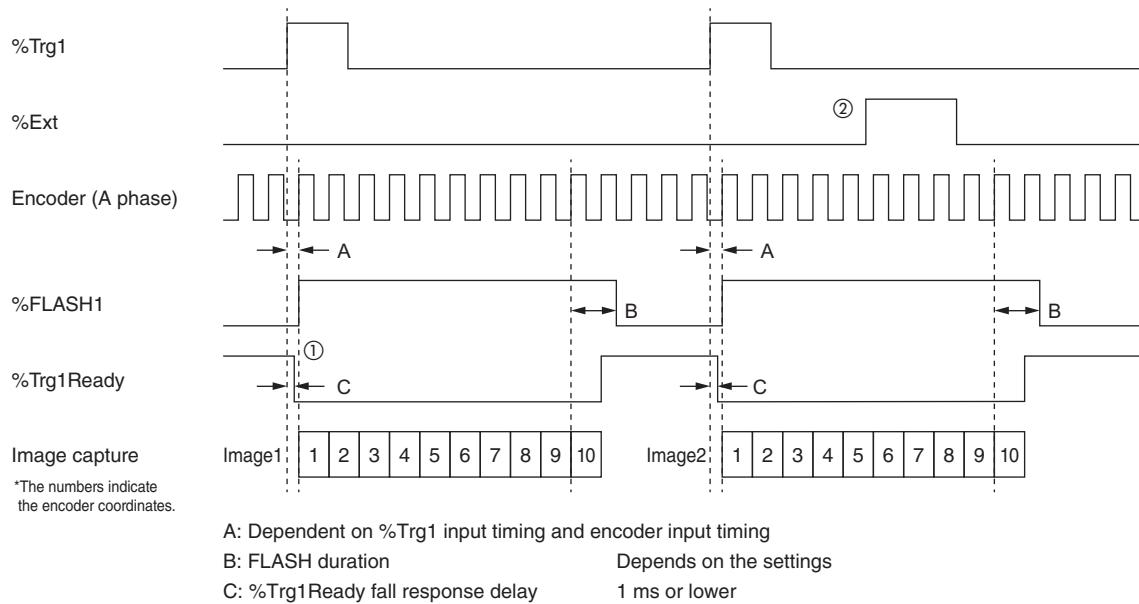


- (1) Trigger delay applies to the first captured image only.
- (2) The FLASH on-delay applies to all captured images.
- (3) When the HDR image capture is valid, the background image capture is OFF. The timing when %Trg1Ready is ON (image capture ready) is the point reaching the next image capture unit.
- (4) The number of images in the image capture unit for HDR image depends on the HDR settings.

Typical operations when a linescan camera is used (When [Fixed Length] is set and [End capture by EXT signal] is disabled)

Capture unit settings

Number of Lines	10
Line Scan Interval	Specify Encoder 1 pulse/line
Sampling mode	x1
End capture by EXT signal	Disabled



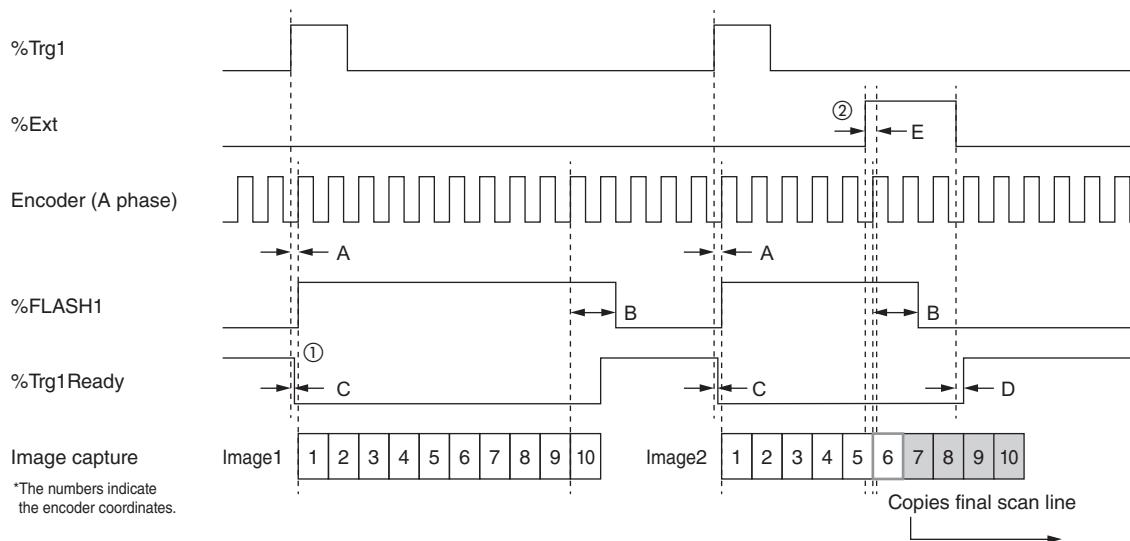
(1) Capture starts with trigger input to %Trg1 and %Trg1Ready is always off during capture.

(2) %Ext input is ignored.

Typical operations when a linescan camera is used (When [Fixed Length] is set and [End capture by EXT signal] is enabled)

Capture unit settings

Number of Lines	10
Line Scan Interval	Specify Encoder 1 pulse/line
Sampling mode	x1
End capture by EXT signal	Enabled

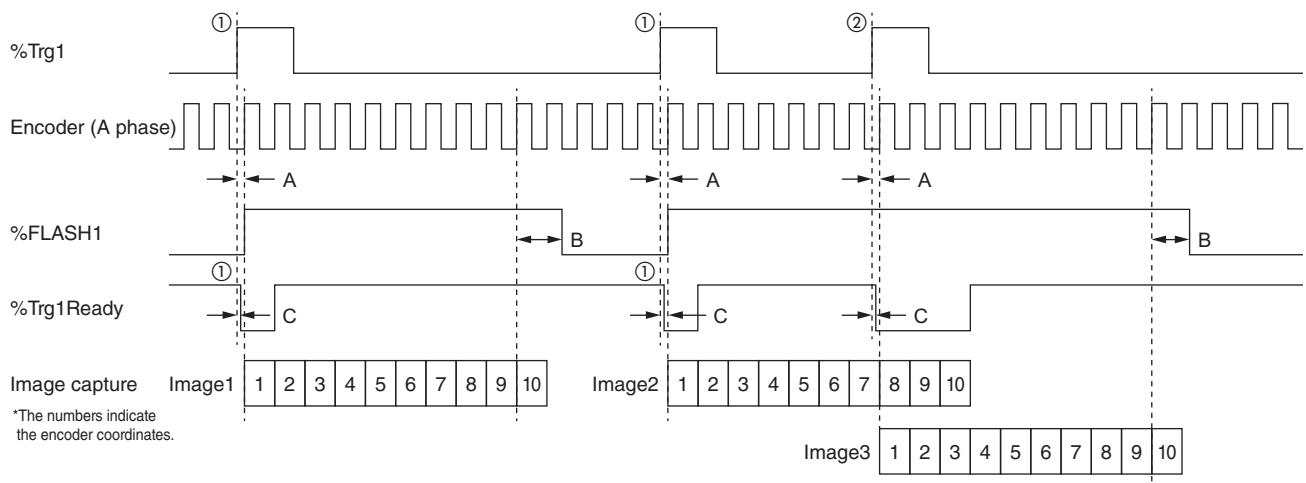


- (1) Capture starts with trigger input to %Trg1 and %Trg1Ready is always off during capture.
(2) Capture finishes with %Ext input and the final scan line is copied to the remaining lines.

Typical operations when a linescan camera is used (When [Fixed Length] is set and [Allow Trigger Input During Line Capture] is enabled)

Capture unit settings

Number of Lines	10
[Allow Trigger Input During Line Capture]	Enabled
Line Scan Interval	Specify Encoder 1 pulse/line
Sampling mode	x1



(1) Capture starts with trigger input to %Trg1 and %Trg1Ready is off during one line capture.

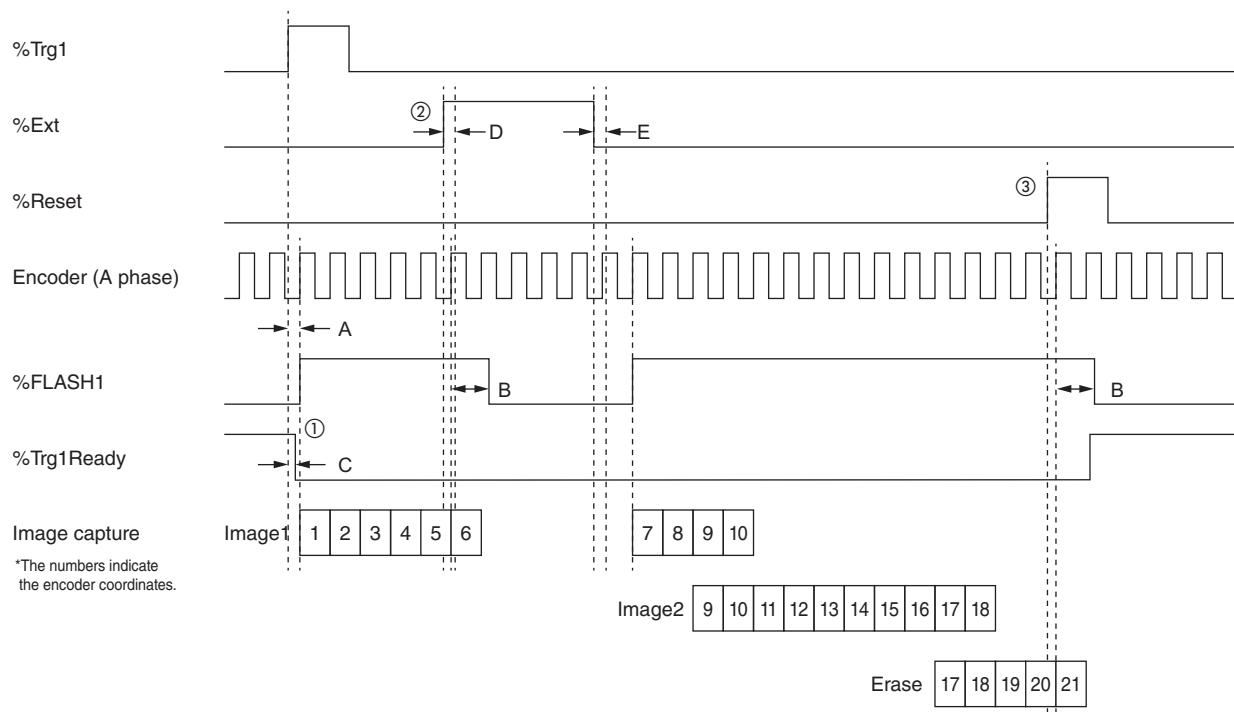
(2) You can start capture of the next image by inputting a trigger to %Trg1 during capture.

Typical operations when a linescan camera is used (When [Continuous] is set, and [Total Number of Lines] and [End capture by EXT signal] are disabled)

Capture unit settings

Number of Lines	10*
Overlapping Lines	Two lines*
Total Number of Lines	Disabled
Line Scan Interval	Specify Encoder 1 pulse/line
Sampling mode	x1
End capture by EXT signal	Disabled

* For the purposes of this description, the number of lines is 10 and number of overlap lines is two. If you specify the number of overlap lines, the minimum number of lines that you can actually set is 128 and the minimum number of overlap lines is 64.



A: Dependent on %Trg1 input timing and encoder input timing

B: FLASH duration Depends on the settings

C: %Trg1Ready fall response delay 1 ms or lower

D: %Ext rise response delay 1 ms or lower

E: %Ext fall response delay 1 ms or lower

(1) Capture starts with trigger input to %Trg1 and %Trg1Ready is always off during capture.

(2) Image capture is paused with %Ext input.

(3) Continuous capture stops with %Reset input and data that was in the middle of being captured is deleted by reset processing.

Reference

- If [External Trigger] is set to [Reset Pulse Count and Trigger], the encoder count and coordinates are reset when an external trigger is input.
- The behavior for %Ext input when [End capture by EXT signal] is enabled is the same as Fixed Length. For more details, see the timing chart below.

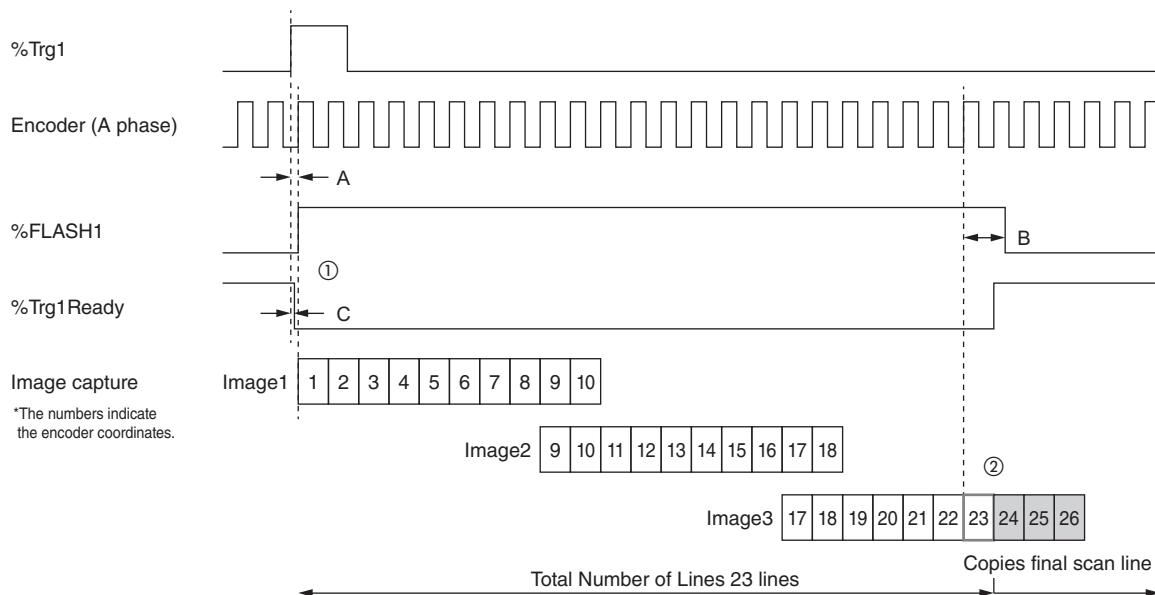
"Typical operations when a linescan camera is used (When [Fixed Length] is set and [End capture by EXT signal] is enabled)" (Page 1-43)

Typical operations when a linescan camera is used (When [Continuous] is set, and [Total Number of Lines] is enabled)

Capture unit settings

Number of Lines	10*
Overlapping Lines	Two lines*
Total Number of Lines	Enabled, 23 lines*
Line Scan Interval	Specify Encoder
	1 pulse/line
Sampling mode	x1

* For the purposes of this description, the number of lines is 10, the number of overlap lines is two, and the number of total lines is 23. If you specify the number of overlap lines, the minimum number of lines that you can set when the total number of lines is enabled is 128, the minimum number of overlap lines is 64, and the minimum total number of lines is 128.



A: Dependent on %Trg1 input timing and encoder input timing

B: FLASH duration

Depends on the settings

C: %Trg1Ready fall response delay

1 ms or lower

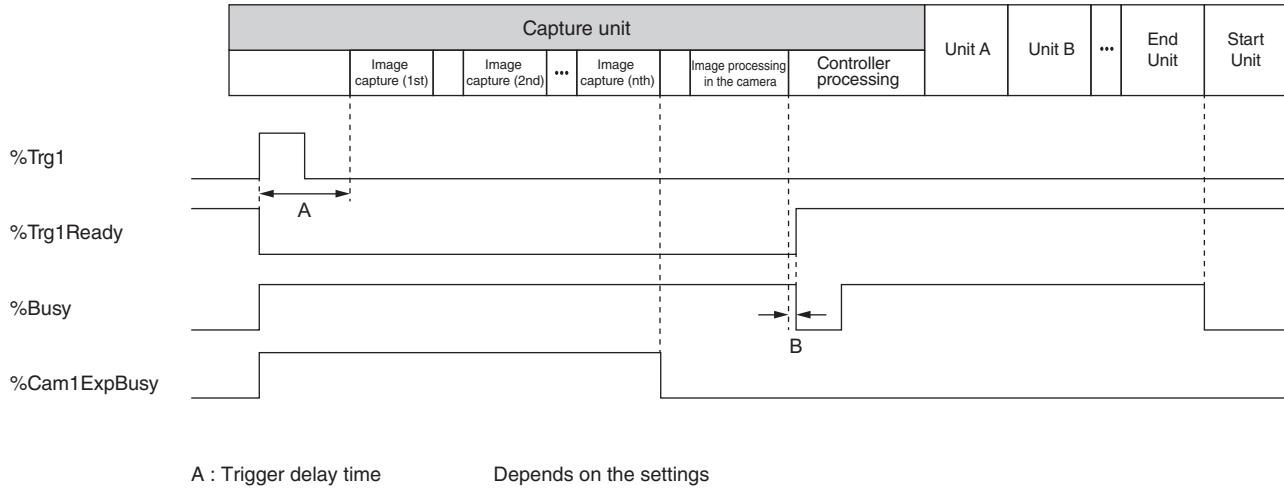
(1) Capture starts with trigger input to %Trg1 and %Trg1Ready is always off during line capture.

(2) Capture finishes if the number of capture lines reaches the total number of lines and the final scan line is copied to the remaining lines.

Reference

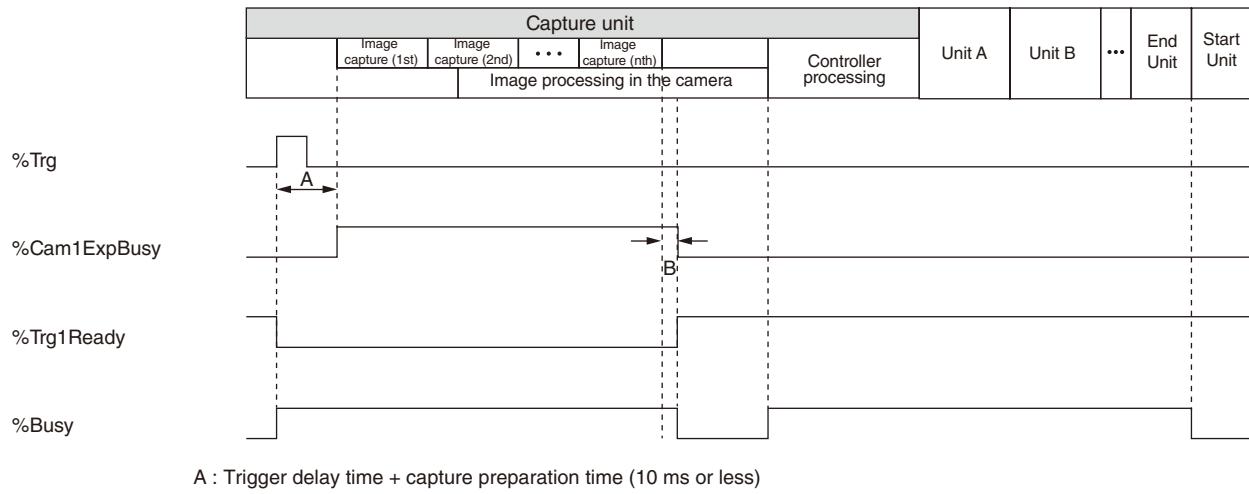
- If [External Trigger] is set to [Reset Pulse Count and Trigger], the encoder count and coordinates are reset when an external trigger is input.
- The behavior for %Ext input is the same as Fixed Length.
For more details, see the timing chart below.
"Typical operations when a linescan camera is used (When [Fixed Length] is set and [End capture by EXT signal] is disabled)" (Page 1-42)
"Typical operations when a linescan camera is used (When [Fixed Length] is set and [End capture by EXT signal] is enabled)" (Page 1-43)

Typical operations when an XR camera is used



- The number of captures depends on the 3D measurement settings.
- The processing time after capturing each image depends on the image size and the 3D measurement settings.
- The above figure shows operations when the image capture buffer is on.

Typical operations when an XT camera is used

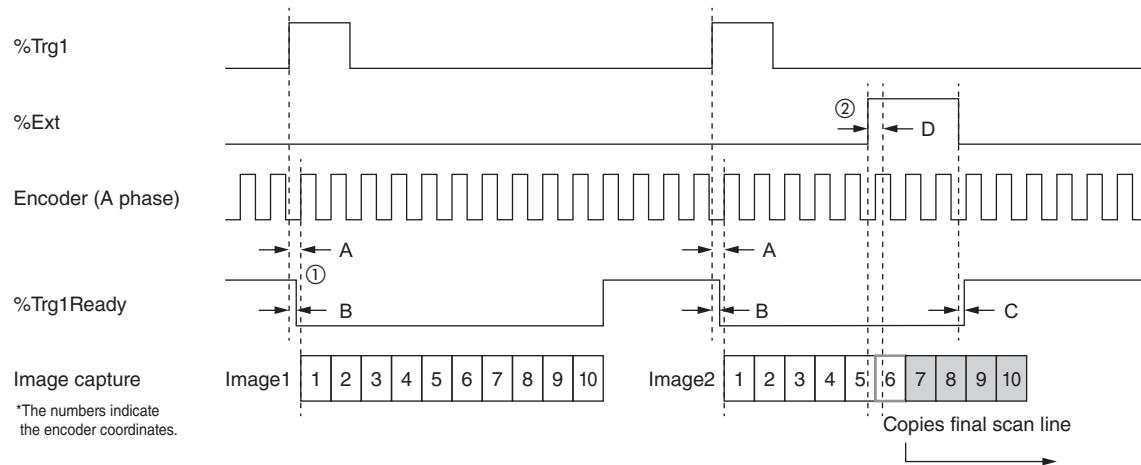


- The number of captures depends on the image capturing parameter settings.
- The processing time of the image within the camera depends on the image size and the image capturing parameter settings.
- The above figure shows operations when the leading trigger function is enabled.
When the program meets all the conditions shown below and provided the image capturing within the XT camera is finished, this device can accept the next trigger without waiting for the image processing within the camera to finish (leading trigger function).
 - The image capture buffer is on.
 - There is only one image capture unit in the inspection flowchart.
 - Only one XT camera responds to the same trigger. (Or, when there are two XT cameras, they each respond to a separate trigger.)
 - The height is being captured and two or more light emissions (T + B, L + R, or T + B + L + R) are selected with the projector selection.

Typical operations when the LJ-X/LJ-V series head is used (When [Fixed Length] is set)

Capture unit settings

Number of Lines 10
 Line Scan Interval Specify Encoder
 1 pulse/line
 Sampling mode x1



A: Dependent on %Trg1 input timing and encoder input timing

B: %Trg1Ready fall response delay 1 ms or lower

C: %Trg1Ready rise response delay 1 ms or lower

D: %Ext rise response delay 1 ms or lower

(1) Capture starts with trigger input to %Trg1 and %Trg1Ready is always off during capture.

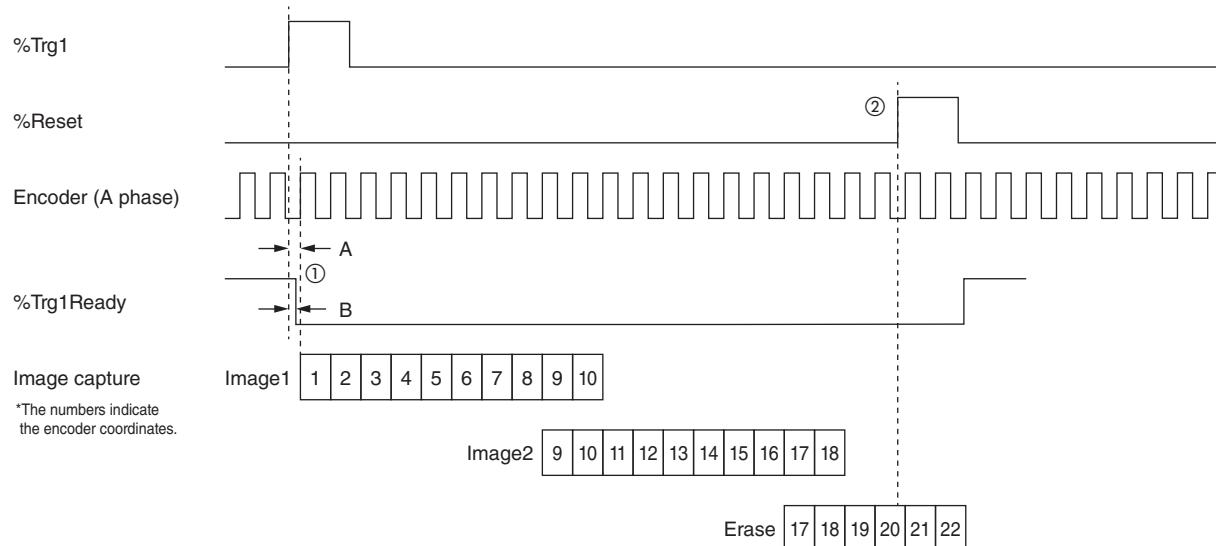
(2) Capture finishes with %Ext input and the final scan line is copied to the remaining lines.

Typical operations when the LJ-X/LJ-V Series sensor head is used (When [Continuous] is set, and [Total Number of Lines] is disabled)

Capture unit settings

Number of Lines	10*
Overlapping Lines	Two lines*
Total Number of Lines	Disabled
Line Scan Interval	Specify Encoder
	1 pulse/line
Sampling mode	x1

* For the purposes of this description, the number of lines is 10 and number of overlap lines is two. If you specify the number of overlap lines, the minimum number of lines that you can actually set is 128 and the minimum number of overlap lines is 64.



A: Dependent on %Trg1 input timing and encoder input timing

B: %Trg1Ready fall response delay 1 ms or lower

(1) Capture starts with trigger input to %Trg1 and %Trg1Ready is always off during capture.

(2) Continuous capture stops with %Reset input and data that was in the middle of being captured is deleted by reset processing.

Reference

- If [External Trigger] is set to [Reset Pulse Count and Trigger], the encoder count and coordinates are reset when an external trigger is input.
- The behavior for %Ext input is the same as Fixed Length.
For more details, see the timing chart below.

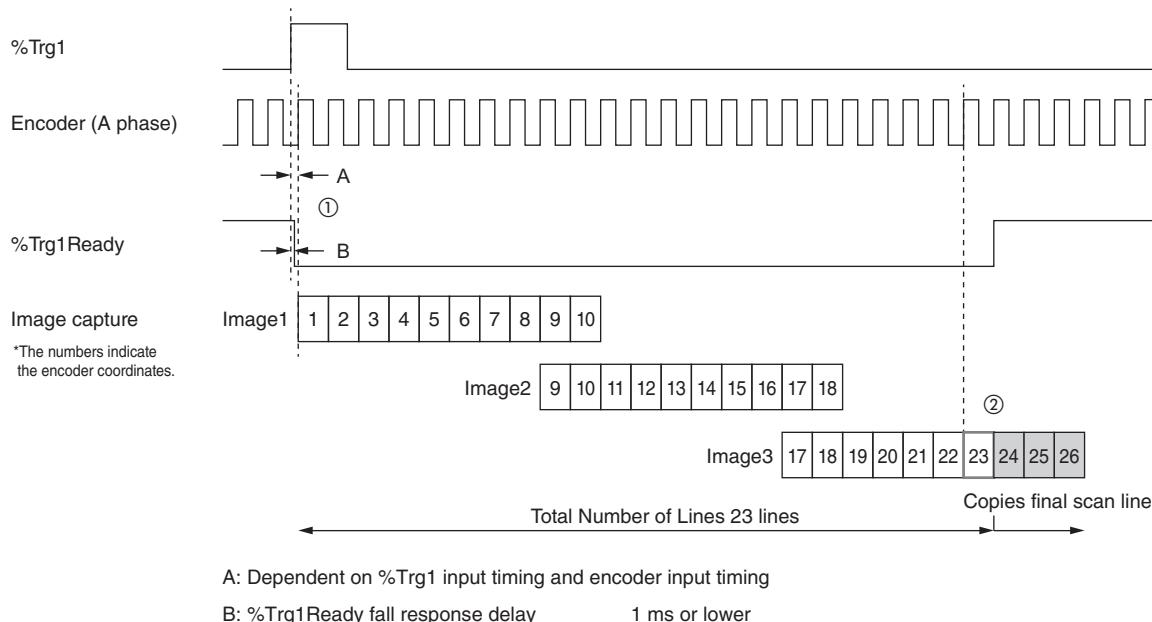
"Typical operations when the LJ-X/LJ-V series head is used (When [Fixed Length] is set)" (Page 1-48)

Typical operations when the LJ-X/LJ-V series head is used (When [Continuous] is set, and [Total Number of Lines] is enabled)

Capture unit settings

Number of Lines	10*
Overlapping Lines	Two lines*
Total Number of Lines	Enabled, 23 lines*
Line Scan Interval	Specify Encoder
	1 pulse/line
Sampling mode	x1

* For the purposes of this description, the number of lines is 10, the number of overlap lines is two, and the number of total lines is 23. If you specify the number of overlap lines, the minimum number of lines that you can set when the total number of lines is enabled is 128, the minimum number of overlap lines is 64, and the minimum total number of lines is 128.



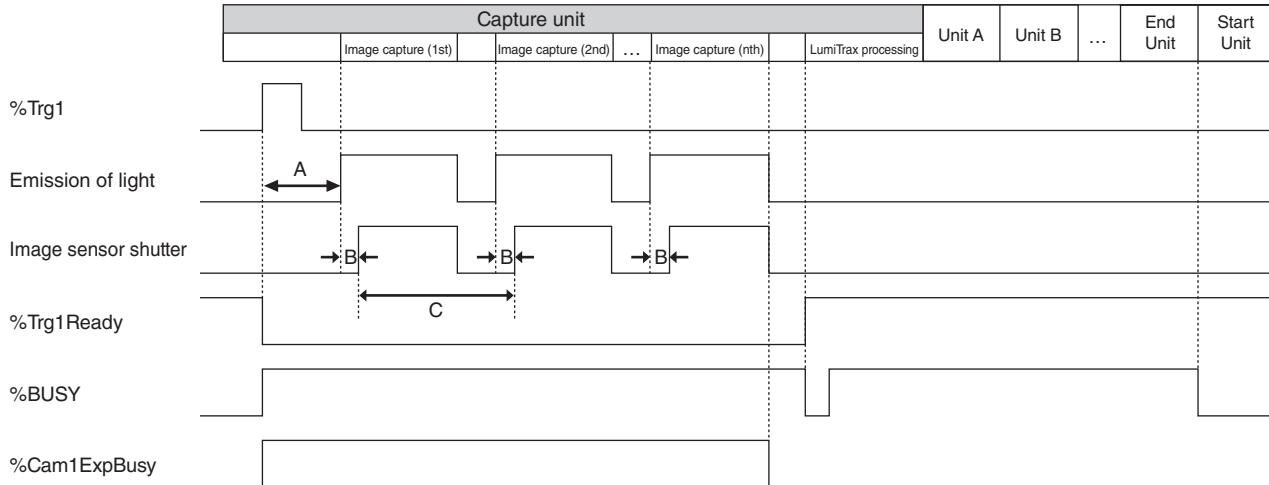
(1) Capture starts with trigger input to %Trg1 and %Trg1Ready is always off during capture.

(2) Capture finishes if the number of capture lines reaches the total number of lines and the final scan line is copied to the remaining lines.

Reference

- If [External Trigger] is set to [Reset Pulse Count and Trigger], the encoder count and coordinates are reset when an external trigger is input.
- The behavior for %Ext input is the same as Fixed Length.
For more details, see the timing chart below.
"Typical operations when the LJ-X/LJ-V series head is used (When [Fixed Length] is set)" (Page 1-48)

Representative Operation when LumiTrax Mode is Used in the Capture Unit



A: Trigger delay set time

CA-H048CX/H048MX/HX048C/HX048M

Trigger delay set time + 90 µs (Normally open (N.O.)) or 230 µs (Normally closed (N.C.))
(when the shutter time is 1/10000 or more)

Trigger delay set time + 60 µs (Normally open (N.O.)) or 200 µs (Normally closed (N.C.))
(when the shutter time is below 1/10000)

CA-H200CX/H200MX/HX200C/HX200M

Trigger delay set time + 60 µs (Normally open (N.O.)) or 200 µs (Normally closed (N.C.))

CA-H500CX/H500MX/HX500C/HX500M

Trigger delay set time + 60 µs (Normally open (N.O.)) or 200 µs (Normally closed (N.C.))

CA-HF6400C/HF6400M/HF2100C/HF2100M

Trigger delay set time + 60 µs (Normally open (N.O.)) or 200 µs (Normally closed (N.C.))

B: Time from start of light emitting to start of image capturing

When using the CA-DRW*X

60 µs (internal fixed value)

When using the CA-DRM*X

220 to 240 µs (internal fixed value)

When using the CA-DQP*X

100 µs (internal fixed value)

When using the CA-DQW40X

100 µs (internal fixed value)

C: Shutter interval

CA-H048CX/H048MX/HX048C/HX048M (512×480) Color camera: 1700µs, Monochrome camera 1660µs, or exposure time + 260 µs, whichever is longer

CA-H048CX/H048MX/HX048C/HX048M (640×480) Color camera: 1920µs, Monochrome camera 1880µs, or exposure time + 260 µs, whichever is longer

CA-H048CX/H048MX/HX048C/HX048M (784×596) Color camera: 2605µs, Monochrome camera 2560µs, or exposure time + 260 µs, whichever is longer

CA-H200CX/H200MX (1600×1200) Color camera: 4150µs, Monochrome camera 4130µs, or exposure time + 300 µs, whichever is longer

CA-H500CX/H500MX (1600×1200) Color camera: 4150µs, Monochrome camera 4130µs, or exposure time + 300 µs, whichever is longer

CA-HX200C/HX200M (1600×1200) Color camera: 3500µs, Monochrome camera 3490µs, or exposure time + 260 µs, whichever is longer

CA-HX500C/HX500M (1600×1200) Color camera: 3500µs, Monochrome camera 3490µs, or exposure time + 260 µs, whichever is longer

CA-H500CX/H500MX (2432×2040) Color camera: 6930µs, Monochrome camera 6905µs, or exposure time + 300 µs, whichever is longer

CA-HX500C/HX500M (2432×2040) Color camera: 5895µs, Monochrome camera 5880µs, or exposure time + 260 µs, whichever is longer

CA-HF6400C/HF6400M/HF2100C/HF2100M Exposure time + transmission time* + 2 ms of software processing or more

(depends on the program and the controller status)

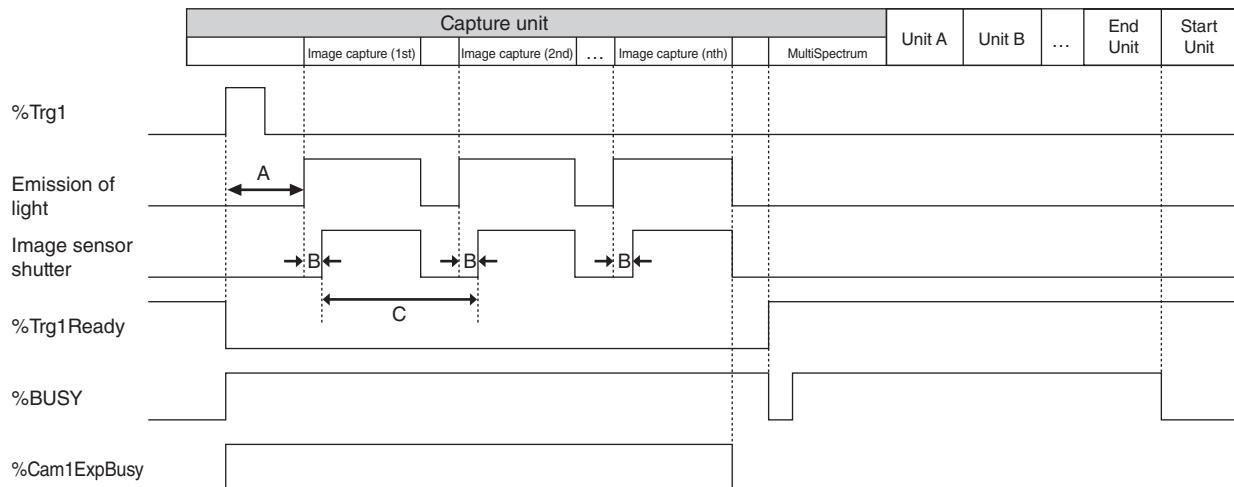
*: Transmission time (ms)

Camera	Pixel count	Channels Used		
		1	2	4
CA-HF6400C	5104 × 4092	83.3	39.2	28.9
CA-HF6400M	5104 × 4092	83.2	39.2	28.9
CA-HF2100C	5104 × 4092	83.2	39.4	20.2
CA-HF2100M	5104 × 4092	83.2	39.3	20.2
CA-HF2100C	2432 × 2050	23.6	10.8	-
CA-HF2100M	2432 × 2050	23.5	10.8	-

Reference

- The number of capture depends on the LumiTrax setting.
- The light emitting time is the sum of the shutter speed and B (time from start of light emitting to start of image capturing).
- The LumiTrax processing time after each capturing depends on the image size, camera type (color/monochrome), and LumiTrax setting.
- The figure above shows the operation wherein the Image Capture Buffer is on.

Representative Operation when MultiSpectrum Mode is Used in the Capture Unit



A: Trigger delay set time
CA-H048MX/HX048M Trigger delay set time + 70 µs (when the shutter time is 1/10000 or more)
Trigger delay set time + 40 µs (when the shutter time is below 1/10000)
CA-H200MX/H500MX Trigger delay set time + 40 µs
CA-HX200M/HX500M Trigger delay set time + 40 µs

B: FLASH ON-Delay 220 to 240 µs (internal fixed value)

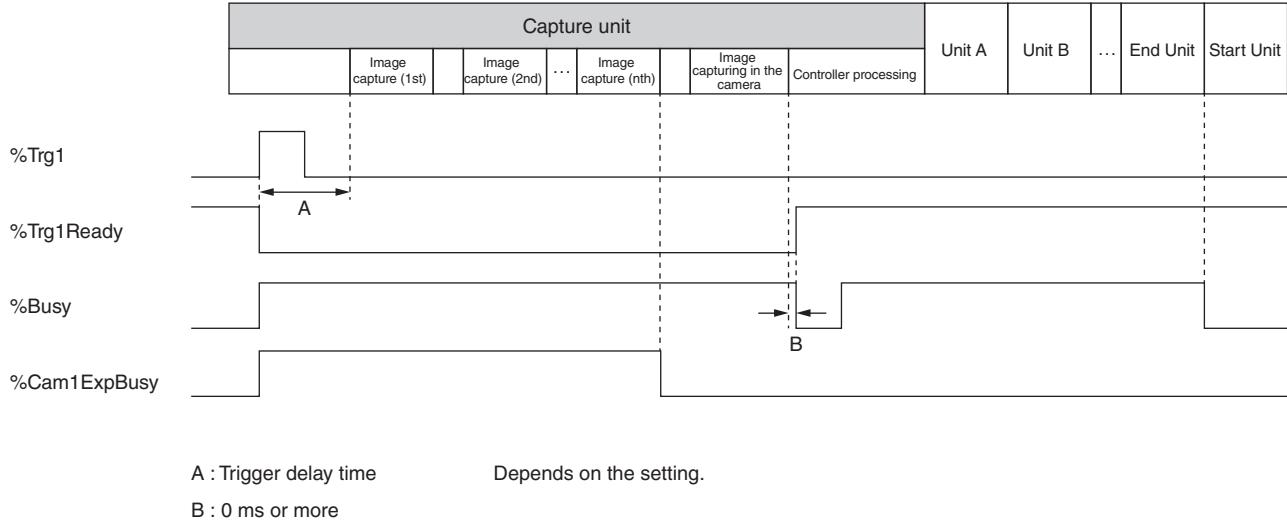
C: Shutter interval (the greater of the time values in (1) or (2) below)

1) CA-H048MX/HX048M (512×480)	1660µs
CA-H048MX/HX048M (640×480)	1880µs
CA-H048MX/HX048M (784×596)	2560µs
CA-H200MX (1600×1200)	4130µs
CA-HX200M (1600×1200)	3490µs
CA-H500MX (1600×1200)	4130µs
CA-H500MX (2432×2040)	6905µs
CA-HX500M (1600×1200)	3490µs
CA-HX500M (2432×2040)	5880µs
2) CA-H048MX	Exposure time +260 µs
CA-H200MX/H500MX	Exposure time +300 µs
CA-HX048M/HX200M/HX500M	Exposure time +260 µs

Reference

- The number of capture depends on the MultiSpectrum mode setting.
- The light emitting time is the sum of the shutter speed and B (time from start of light emitting to start of image capturing).
- The length of time for MultiSpectrum processing after each capture depends on the image size and MultiSpectrum mode setting.
- The figure above shows the operation wherein the Image Capture Buffer is on.

Typical operations when 3D Capture mode is used in the capture unit



A : Trigger delay time

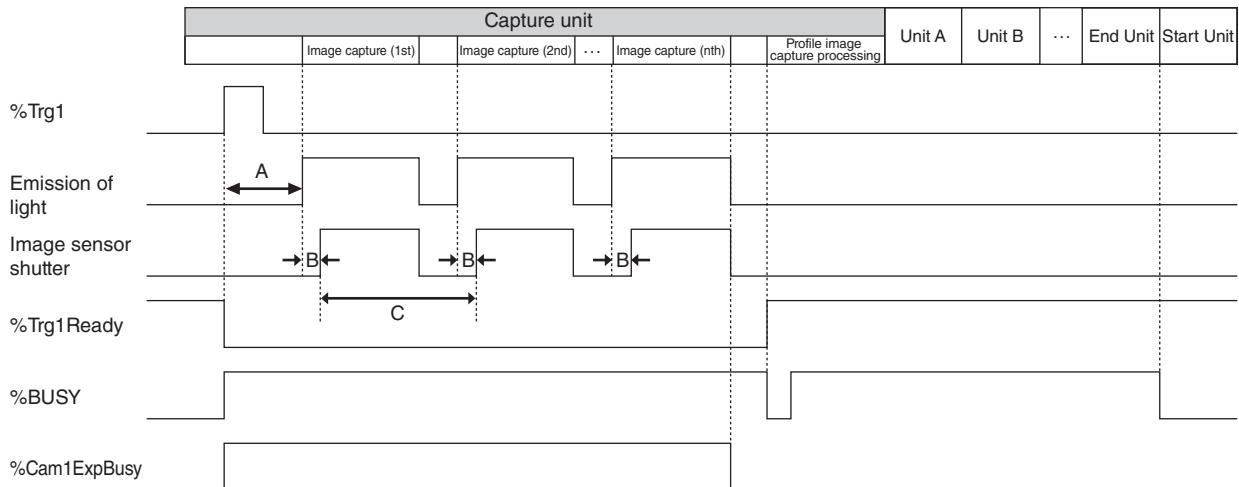
Depends on the setting.

B : 0 ms or more

Reference

- The number of captures depends on the 3D capture settings.
- The processing time after capturing each image depends on the image size and the 3D capture settings.
- The figure above shows the operation wherein the Image Capture Buffer is on.

Typical operations when Outline Capture mode is used in the capture unit



A: Trigger delay set time

CA-H048CX/H048MX

Trigger delay set time + 70 µs (when the shutter time is 1/10000 or more)

Trigger delay set time + 40 µs (when the shutter time is below 1/10000)

Trigger delay set time + 40 µs

B: FLASH ON-Delay

CA-DQP*X : 100µs (internal fixed value)

C: Shutter intervals (the longer time from the values in (1) or (2) below)

1) CA-H048CX/H048MX (512×480)

Color camera: 1700 µs, Monochrome camera: 1660 µs

CA-H048CX/H048MX (640×480)

Color camera: 1920 µs, Monochrome camera: 1880 µs

CA-H048CX/H048MX (784×596)

Color camera: 2605 µs, Monochrome camera: 2560 µs

CA-H200CX/H200MX (1600×1200)

Color camera: 4150 µs, Monochrome camera: 4130 µs

CA-H500CX/H500MX (1600×1200)

Color camera: 4150 µs, Monochrome camera: 4130 µs

CA-H500CX/H500MX (2432×2040)

Color camera: 6930 µs, Monochrome camera: 6905 µs

2) CA-H048CX/H048MX

Exposure time +260µs

CA-H200CX/H200MX/H500CX/H500MX

Exposure time +300µs

Reference

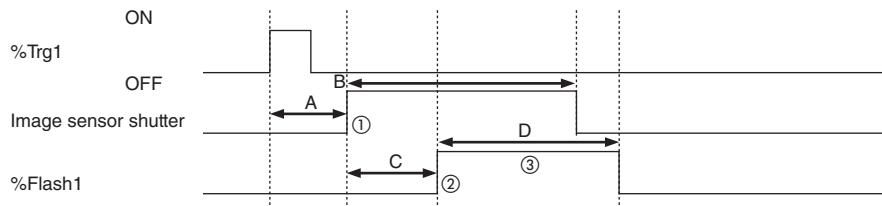
- The number of captures depends on the outline capture settings.
- The outline image capture processing time after capturing each image depends on the image size, the camera type (color/monochrome), and the outline capture settings.
- The figure above shows the operation wherein the Image Capture Buffer is on.

Image capture and FLASH output timing for the trigger operation



- If external flash (%Flash 1 - 4) is assigned to the illumination expansion unit (CA-DC40E/50E/60E; sold separately), start and finish for (B) is accelerated only by the length of (A) at maximum. Moreover, the lighting control response for LIGHTOFF on the CA-DC40E/50E/60E is within 1 ms.
- If one trigger is selected for multiple cameras with different trigger delay settings, FLASH is outputted multiple times when the cameras capture images, therefore the second and later outputs may overlap with the preceding output. If a startup signal is required for each image capture, such as when using a strobe light device, adjust the FLASH duration so that the outputs do not overlap.
- If you use an external light and an illumination expansion unit at the same time, assign the External Flash to the external light and Emission Timing to the illumination expansion unit.
- The timing in which light is actually emitted corresponding to the timing in which the controller's FLASH output rises differs according to factors such as the response time of the light used.

When FLASH on-delay is a positive value



A: CA-035C/035M, CA-HS035C/HS035M XG-035C/035M, XG-S035C/S035M CA-H035C/H035M, XG-H035C/H035M CA-200C/200M, CA-HS200C/HS200M XG-200C/200M, XG-S200C/S200M CA-H200C/H200M, XG-H200C/H200M CA-H500C/H500M XG-H500C/H500M XG-HL02M HL04M HL08M CA-H2100C/H2100M CA-H048CX/H048MX, CA-HX048C/HX048M CA-H200CX/H200MX, CA-HX200C/HX200M CA-H500CX/H500MX, CA-HX500C/HX500M CA-HL02MX/04MX/08MX CA-HF2100C/HF2100M CA-HF6400C/HF6400M	: 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 50 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 20 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 10 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs) : 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs)
When trigger delay is set: (All models) Trigger delay set time + 60 µs (Normally open) or 200 µs (Normally closed) (Response delay: 0 to 5 µs)	

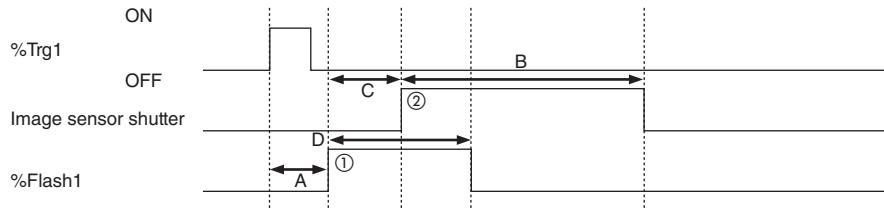
B: Shutter time

C: FLASH on-delay (0 to 50000 µs) ±10 µs

D: FLASH duration (0 to 999.9 ms)

- After receiving the %Trg1 input, the controller gives an order for a camera to operate the Image sensor shutter.
- The FLASH on-delay is the time to start the FLASH output based on ordering timing of the Image sensor shutter operation.
- The FLASH duration is the length of time the FLASH output is turned on.

When FLASH on-delay is a negative value



A: 60 µs (Normally open) or 200 µs (Normally closed) ($\pm 10 \mu\text{s}$)¹

When trigger delay is set: (All models) Trigger delay set time +60 µs (Normally open) or 200 µs (Normally closed) (Response fluctuation: -10 to +5 µs)

B: Shutter time

C: CA-035C/035M, CA-HS035C/HS035M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
XG-035C/035M, XG-S035C/S035M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-H035C/H035M, XG-H035C/H035M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-200C/200M, CA-HS200C/HS200M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
XG-200C/200M, XG-S200C/S200M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 50 µs)
CA-H200C/H200M, XG-H200C/H200M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-H500C/H500M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
XG-H500C/H500M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 20 µs)
XG-HL02M/HL04M/HL08M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-H2100C/H2100M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-H048CX/H048MX, CA-HX048C/HX048M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-H200CX/H200MX, CA-HX200C/HX200M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-H500CX/H500MX, CA-HX500C/HX500M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-HL02MX/04MX/08MX	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 10 µs)
CA-HF2100C/CA-HF2100M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)
CA-HF6400C/CA-HF6400M	: Absolute value of FLASH on-delay (-50000 to 0 µs) (Response delay: 0 to 5 µs)

D: FLASH duration (0 to 999.9 ms)

(1) When FLASH on-delay is negative, the %Flash1 output turns on first after the %Trg1 input is received.

(2) After a delay for the absolute value of %Flash1 on-delay, the controller gives an order for a camera to operate the Image sensor shutter.

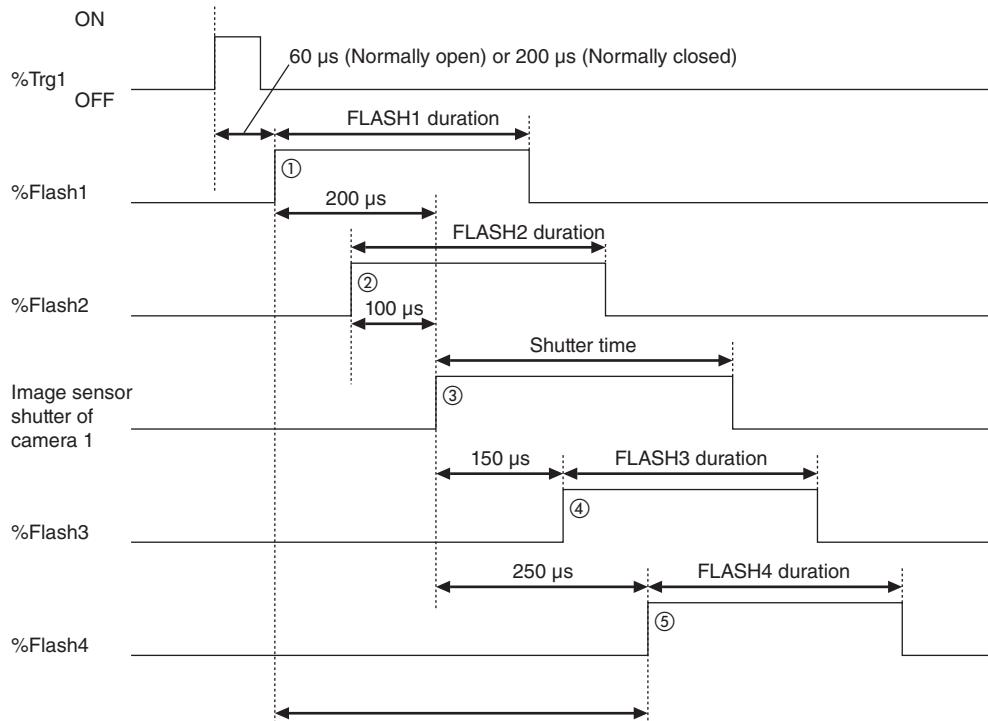
*1 When one FLASH terminal is assigned to %Trg1

When several FLASH terminals are assigned

It is also possible to assign several FLASH terminals to a single camera. The timing chart in this instance is shown below.

Setting example

- %Trg1 is assigned to camera 1.
- %Flash1 on-delay: -200 µs
- %Flash2 on-delay: -100 µs
- %Flash3 on-delay: 150 µs
- %Flash4 on-delay: 250 µs

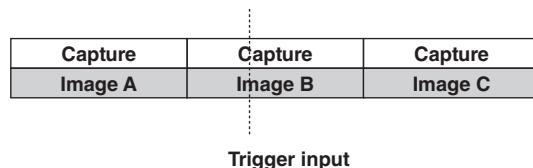


- (1) After the %Trg1 input is received, the %Flash1 output turns on because its on-delay is a negative value with the largest absolute value.
- (2) The %Flash2 output turns on.
- (3) After a delay for the absolute values of the on-delays of %Flash1 and %Flash2, the controller gives an order for camera 1 to operate the Image sensor shutter.
- (4) The %Flash3 on-delay is the time to start the %Flash3 output based on ordering timing of the Image sensor shutter operation.
- (5) The %Flash4 on-delay is the time to start the %Flash4 output based on ordering timing of the Image sensor shutter operation.

Reference: Current image display through continuous updating

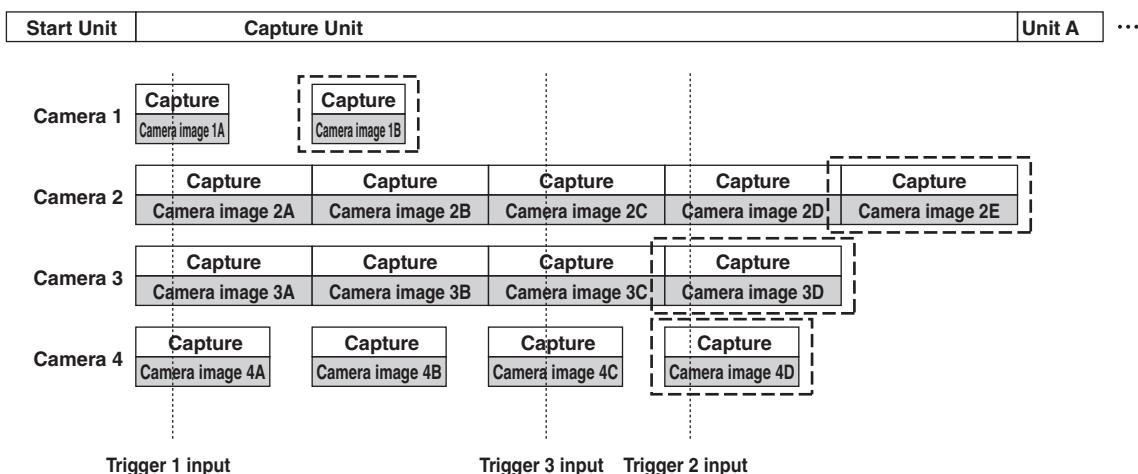
When [Multi-Image] is set as the screen update mode for a capture unit, images are captured continuously with the assigned camera. When the image capture buffer setting is OFF, images are captured continuously only when the capture unit is waiting for a trigger. When the image capture buffer setting is ON, images are captured continuously when image capture is enabled and there is available space in the image capture buffer.

When a trigger is input, the next image captured will become the current image, instead of the image captured at the trigger input.



When several triggers are set in continuous update mode, the image captured next to a trigger input will be the current image for the trigger. When the image capture buffer setting is OFF, the camera activated with a trigger input stops image capturing until the process moves to the next unit.

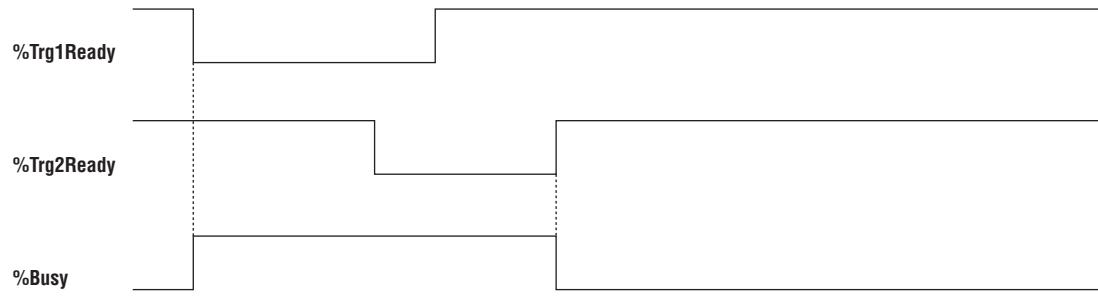
For example, when the image capture buffer setting is OFF and triggers are assigned as follows, the current images will change from camera images 1B, 2E, 3D, to 4D.



Reference: Relationship among the %Busy terminal, trigger, and capture unit

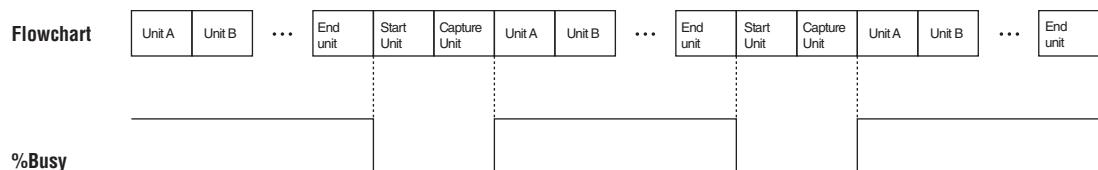
When the busy condition is [Trigger acceptance being disabled]

When the busy condition is set while trigger acceptance is disabled, %Busy turns on when any of %Trg1Ready to %Trg4Ready is turned off.



When the busy condition is [Image being processed]

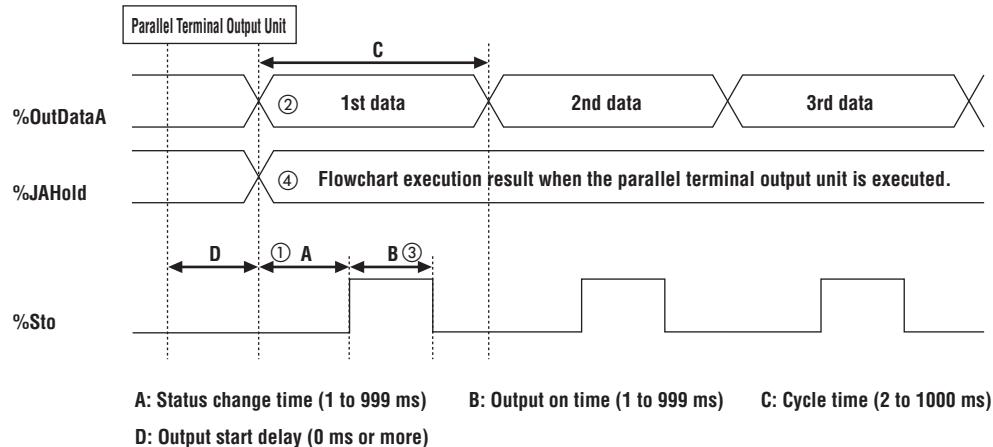
When the busy condition is set while an image is being processed, %Busy turns on when a unit other than the start unit and capture unit is executed.



3. Typical Operations of the Data Output Terminals

Terminal data output timing (Handshake: OFF)

 This example shows an instance where the output count is set to three for a parallel terminal output unit.



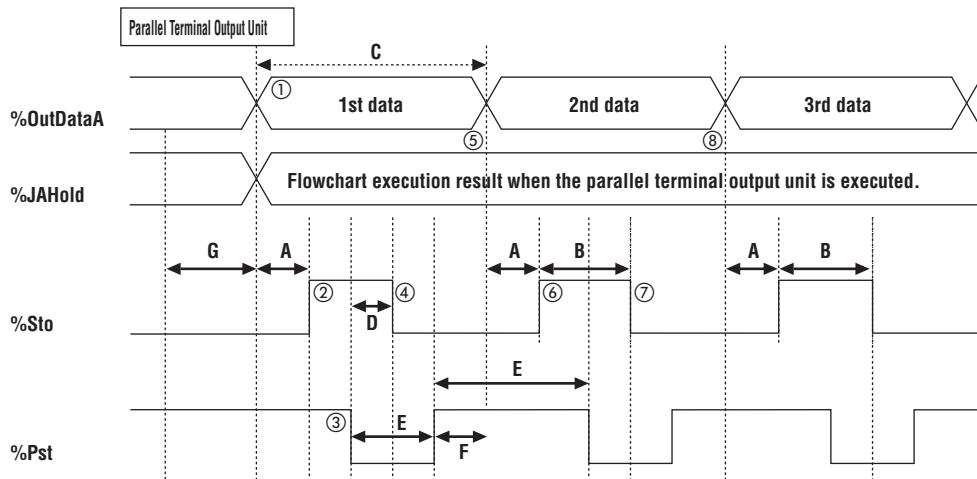
- (1) Time A to C can be changed with settings. For more details, refer to "Controller System Settings" in the XG-X VisionEditor Reference Manual.
- (2) The measurement result data is output to %OutDataA. The data is output sequentially every time %OutDataA is switched on and off.
- (3) When handshake is OFF, the data is switched automatically for each preset time. The %Sto output turns on every time the data is switched, and turns off after the output time passes.
- (4) The %JAHold operation is enabled only when the Output Type(%JAHold) setting is [Sync with STO] and the parallel terminal output unit is executed.

The %Sto output turns on when time A (Status change time) passes after the parallel terminal output unit finishes output of the first data. The %Sto output turns off after time B ms (Output time) passes.

Terminal data output timing (Handshake: ON)

Reference

This example shows an instance where the output count is set to three for a parallel terminal output unit.



A: Status change time (1 to 999 ms) B: Output on time (1 to 999 ms) C: Cycle time (2 to 1000 ms)

D: Response time for %Pst OFF (0.5 ms or less) E: Minimum input time for %Pst (1.0 ms or more)

F: Response time for %Pst ON (0.5ms or less) G: Output start delay (0 ms or more)

- (1) The output data is sent to %OutDataA. The data is output sequentially every time %OutDataA is switched on and off.
- (2) The %Sto output turns on when time A ms (Status change time) passes after the parallel terminal outputs the first data.
To read each output, synchronize the timing with the leading edge of %Sto.
- (3) When handshake is ON, the data is switched at the trailing edge of %Pst input.
- (4) When the on state of %Sto is confirmed and the %Pst input is turned from on to off, the %Sto output turns off.
- (5) When the %Pst input is turned from off to on, the data is switched.
- (6) The %Sto output turns on when time A ms (Status change time) passes after the data is switched. Repeating steps 4 to 6 switches the output data sequentially. After all of the data from the parallel terminal has been outputted, repeating these steps no longer switches the data or turns the %Sto on and off.
- (7) If the %Pst input does not turn from on to off after the %Sto output is turned on, the %Sto output automatically turns off after time B ms (Output on time) passes.
- (8) If the %Pst input does not turn from off to on after the %Sto output turns off, %OutDataA automatically switches after output for C ms (Cycle time). In other words, if there is no handshake operation by %Pst input, [Handshake: ON] acts in the same as [Handshake: OFF].
- (9) The %JAHold operation is enabled only when the Output Type(%JAHold) setting is [Sync with STO] and the parallel terminal output unit is executed.

Reference

When the Handshake is set to [ON] and the On Time (ms) is set to [0] in the Terminal Block & Parallel Port menu (Page 1-23) of the system settings, the timeout function is disabled and the data can be changed at the desired timing.

Point

When the timeout function is disabled, the output after the first %Sto leading edge stops if the handshake control of the %Pst input is not available. The output data of the parallel terminal output unit during stop is stored in the buffer memory. When the buffer memory is full, new output data cannot be stored in the buffer. In this case, the parallel terminal output unit which is set to 'output priority' must wait for free space in the buffer with the handshake control. Therefore, the flow processing itself stops.

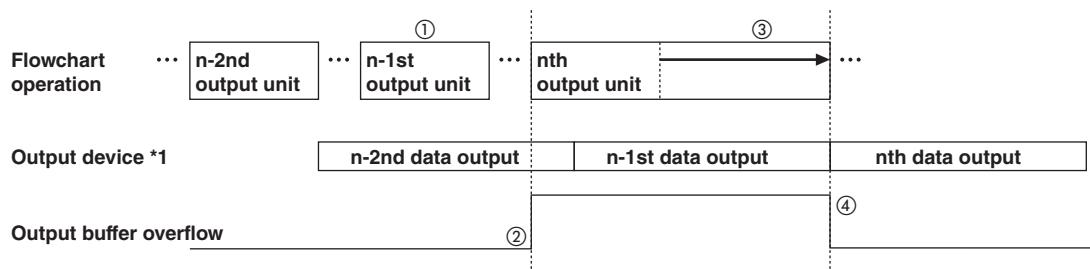
Typical operations when the output cycle is longer than the execution cycle of an output unit

When the output cycle is longer than the execution cycle of an output unit (parallel terminal output unit, image output unit, and data output unit), the unit execution time may become longer because the system will wait for free space in the output buffer to output result data, or the data output process itself may be skipped.

The output cycle may be longer than the execution cycle of an output unit in the following cases:

- When the execution time of the flowchart is short and trigger inputs are issued continuously
- When many output units are positioned consecutively
- When an output unit is executed repeatedly

When the output process is prioritized ([Wait for free space] was selected)

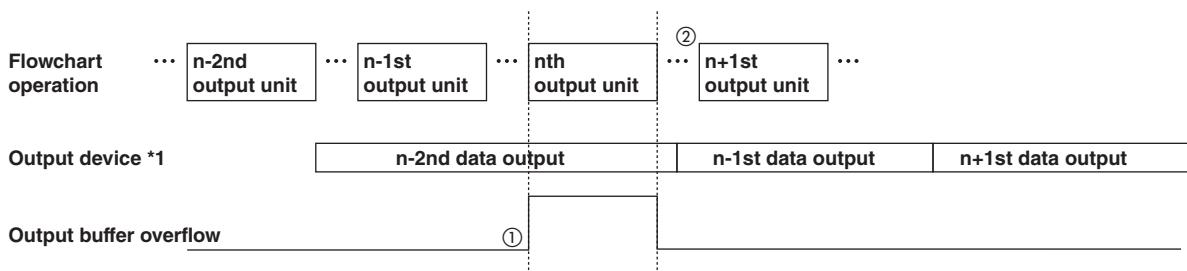


- (1) When the output cycle is longer than the output unit execution cycle, the output data is stored in the output buffer in the controller before being output.
- (2) When the system attempts to store data of the nth data output to the output buffer but there is no available space, the output buffer overflows.
- (3) When the output buffer overflows, the process halts at the output unit until space becomes available in the output buffer.
- (4) In the diagram above, space becomes available in the output buffer after the n-1st data output finishes, and then the nth data output starts.

In the instance that the output cycle continues to be longer than the output unit execution cycle in this way, the output unit execution time increases.

To prevent this, set the output unit execution cycle longer than the output cycle.

When the image processing is prioritized ([Skip output item] was selected)

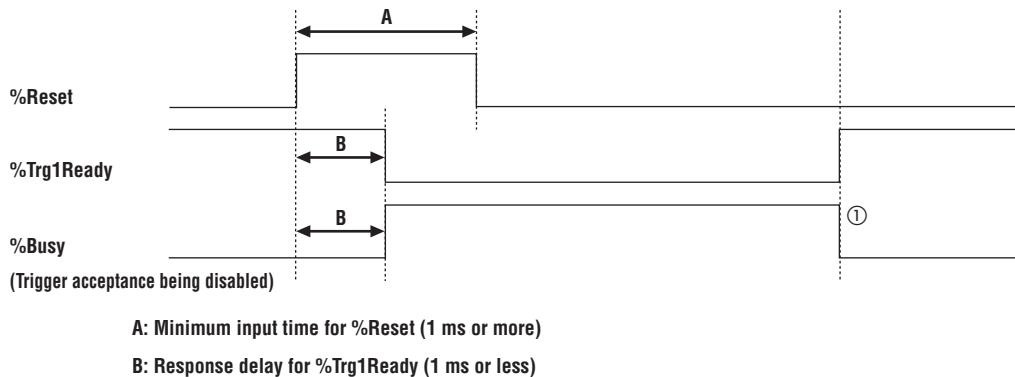


- (1) If the output buffer for each output device becomes full, the output data is thinned out.
In the above example, when the system attempts to output the result for the nth trigger, the data is skipped because the output buffer is full.
- (2) If there is free space in the output buffer when the n+1th output unit is executed, the n+1th data output is performed.

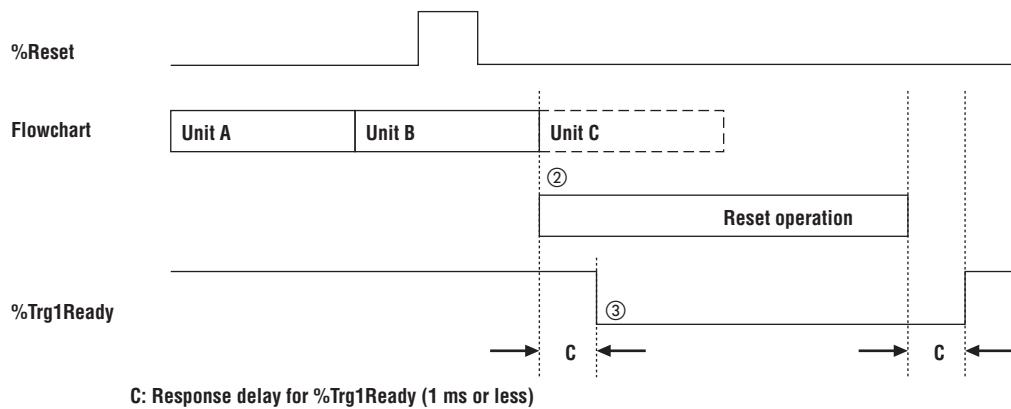
*1 The output device refers to the terminal, SD1, SD2, RS-232C, Ethernet, PLC link, CC-Link, EtherNet/IP, PROFINET, EtherCAT, PC program, FTP, VisionDataStorage (USB) or USB HDD, and each device has a separate output buffer.

4. Typical Operations of the Major Control Input/Output Terminals

%Reset terminal operation (in trigger waiting state)

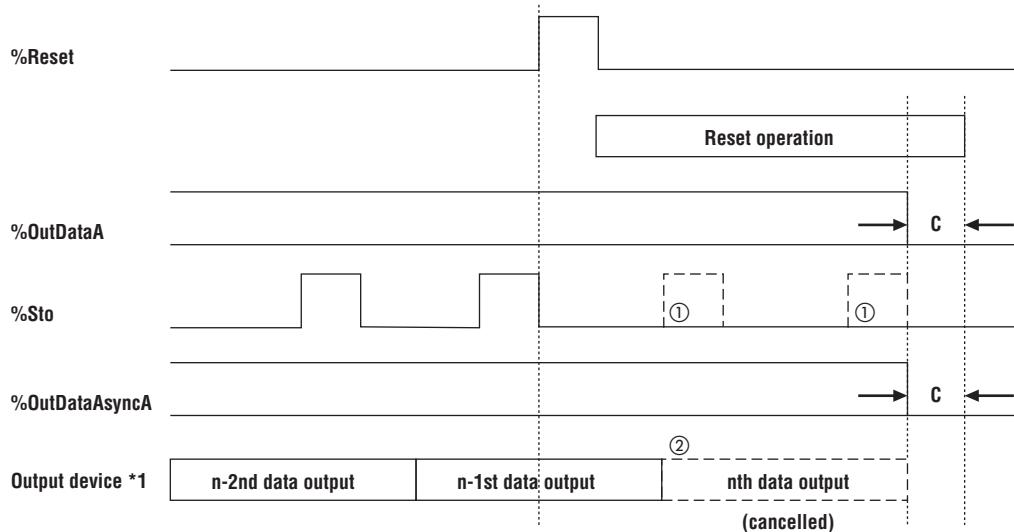


%Reset terminal operation (during flowchart execution)



- (1) The completion of the RESET operation is confirmed by monitoring of the trailing edge of %Busy.
- (2) When the %Reset input turns on during flowchart execution, the RESET operation is immediately applied to the current unit if it is a calculation, timing, or capture unit in a waiting state. If the current unit is not one of these, the RESET operation is applied after execution of the unit is complete.
- (3) During the RESET operation, the %Trg1Ready terminal is forcibly turned off once and turned back on after the reset operation is complete. The RESET operation also cancels the input waiting state of any of %Trg2 to 4 and resets it to the state before the trigger input.

%Reset terminal operation (during data output)



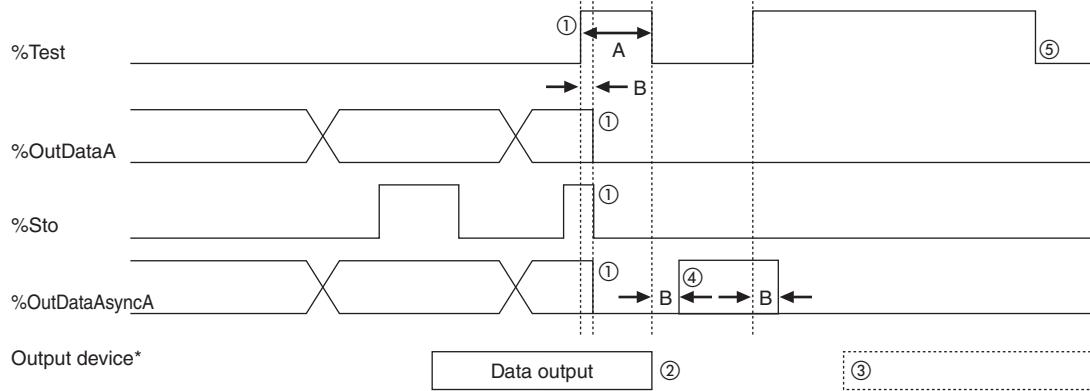
C: 0 ms or more (Delay time depends on the flowchart settings.)

- (1) If %Reset is input before data output, no data is output.
- (2) When % Reset is input, data output is canceled after the current unit is finished outputting data, and no more data will be output until the RESET operation is complete. In the above example, the n-1st data output is performed, however, all of the nth and subsequent data outputs are canceled. As for the output of archived data, the reset is executed after completing transmission of all archived data for the measurement cycle currently being output and then interrupting the output of the remaining data.

*1 The output device refers to the SD1, SD2, RS-232C, Ethernet, PLC link, CC-Link, EtherNet/IP, PROFINET, EtherCAT, PC program, FTP, VisionDataStorage (USB) or USB HDD.

%Test terminal operation

The input from the %Test terminal can be used to stop the output operation of each output unit.



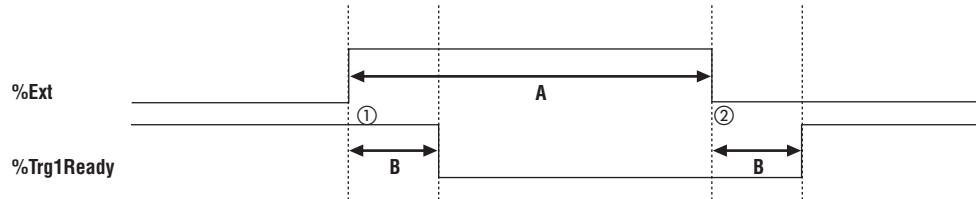
A: Minimum input time for %Test (1 ms or more) B: Response delay for %Test (0.5 ms or less)

- (1) When the %Test input turns on, output terminals are turned off.
 - (2) As for output to RS-232C, Ethernet, PLC, CC-Link, EtherNet/IP, PROFINET, EtherCAT, SD card, PC program, FTP, VisionDataStorage (USB) or USB HDD, even when the %Test terminal turns on during the data output of a unit, that data output does not stop.
 - (3) If the %Test terminal is on when the system attempts to start data output from an output unit to RS-232C, Ethernet, PLC, CC-Link, EtherNet/IP, PROFINET, EtherCAT, SD card, PC program, FTP, VisionDataStorage (USB) or USB HDD, the data output is not performed.
 - (4) When the %Test input turns off, %OutDataAsyncA returns to the state before %Test was input.
 - (5) The data output which was interrupted by the %Test terminal is not resumed even when the terminal turns off.
- * Output devices are SD1 and SD2, RS-232C, Ethernet, PLC link, CC-Link, EtherNet/IP, PROFINET, EtherCAT, PC programs, FTP, VisionDataStorage (USB) and USB HDDs.
When CC-Link, PROFINET, EtherCAT, and EtherNet/IP are used, the state during the time of %Test input is held (update stopped).



When the %Test turns on data archiving is also stopped, however, the output of the remaining archived data continues.

%Ext terminal operation



A: Minimum input time for %Ext (1 ms or more) B: Response delay for %Trg1Ready (0.5 ms or less)

(1) When the %Ext input turns on, %Trg1Ready turns off. When this occurs, new image capture operations stop for all cameras and trigger inputs are not accepted (all of the terminals, RS-232C, CC-Link, EtherNet/IP, PROFINET, EtherCAT, PLC link, Ethernet, and internal triggers).

(2) When the %Ext input turns off, the %Trg1Ready output returns to a state based on the current camera condition.

Reference

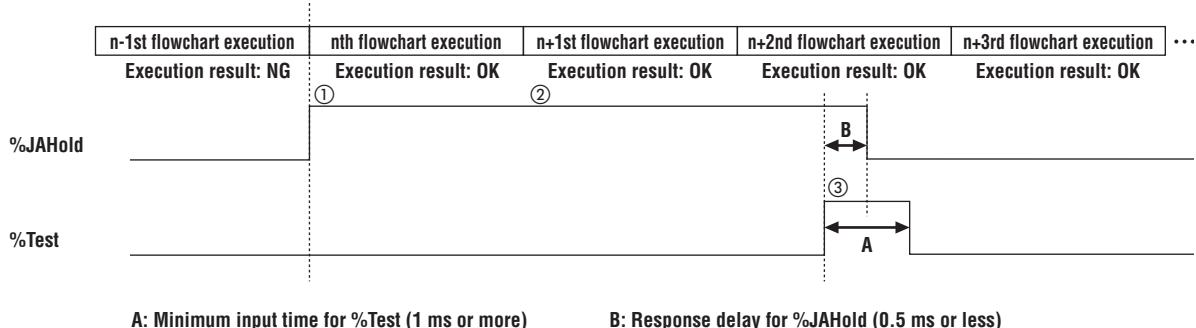
- If the %Ext input turns ON during image capture, image capture is continued in the area camera (including when HDR is enabled and LumiTrax/MultiSpectrum mode is used) and the 3D camera until capture of all necessary images is completed.
- For more details about operations when %Ext input turns ON during image capture with a linescan camera and LJ-X/LJ-V Series sensor head, see the timing chart below.
"Typical operations when a linescan camera is used (When [Fixed Length] is set and [End capture by EXT signal] is disabled)" (Page 1-42)
"Typical operations when a linescan camera is used (When [Fixed Length] is set and [End capture by EXT signal] is enabled)" (Page 1-43)
"Typical operations when a linescan camera is used (When [Continuous] is set, and [Total Number of Lines] and [End capture by EXT signal] are disabled)" (Page 1-45)
"Typical operations when the LJ-X/LJ-V series head is used (When [Fixed Length] is set)" (Page 1-48)
- If you are using the unit for LJ-X/LJ-V input (CA-E100LJ/E110LJ/E200LJ), you can stop laser emissions by opening the circuit between the REMOTE terminal and the RMT COM terminal. This behavior is equivalent to the %Ext terminal.

Point

- Trigger inputs can be disabled by the %Ext input when the controller is in run mode or setup mode.
- When the %Ext input is on, trigger inputs are disabled and no more new images are captured. If, however, unused images remain in the image capture buffer, the capture unit continues operation. Consequently, the processing of the flowchart itself may not stop immediately after %Ext is turned on.

%JAHold terminal operation

When the output type is [Latching]

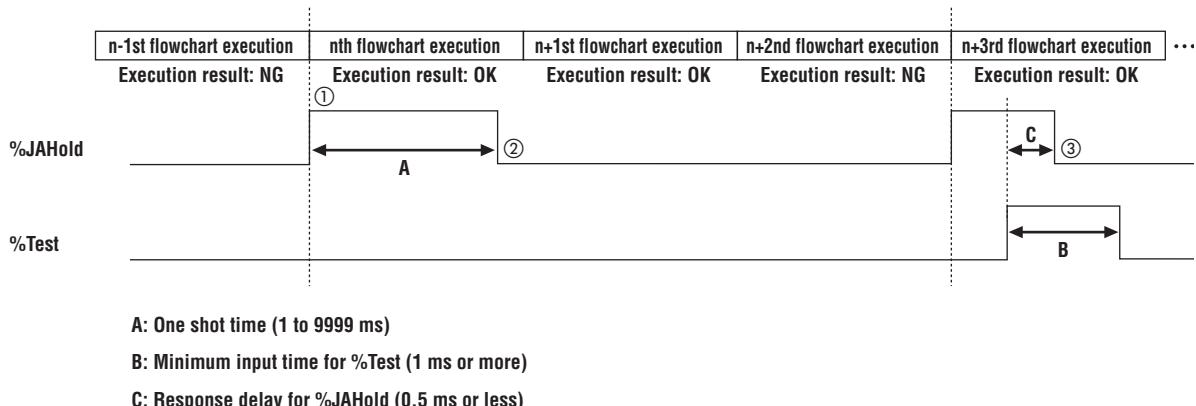


- (1) When the result of the n-1st flowchart execution is NG, %JAHold turns on when the flowchart ends.
- (2) When the result of the preceding flowchart is NG, %JAHold remains on regardless of the results of the subsequent flowcharts.
- (3) When %Test input is turned from off to on, %JAHold turns off, and this state is updated when the next flowchart ends. %JAHold also turns off when the controller is reset, the program is changed, the operation mode is switched between run and setup mode, the output is disabled with the OE command, or the output is disabled in the flow editor or unit properties menu.

When the output type is [Sync with STO]

Refer to "Terminal data output timing (Handshake: OFF)" (Page 1-60) and "Terminal data output timing (Handshake: ON)" (Page 1-61).

When the output type is [One shot]



- (1) When the result of flowchart execution is NG, %JAHold turns on when the flowchart ends.
- (2) The NG state is held for the specified one shot time, and then the NG state is canceled.
- (3) When %Test input is turned from off to on, %JAHold turns off, and this state is updated when the next flowchart ends. %JAHold also turns off when the controller is reset, the program is changed, the operation mode is switched between run and setup mode, the output is disabled with the OE command, or the output is disabled in the flow editor or unit properties menu.



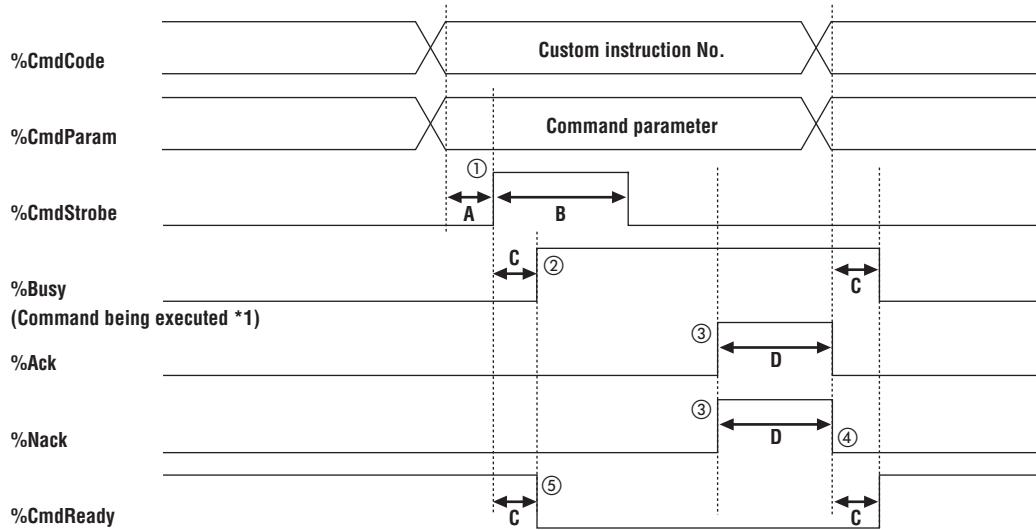
For one shot, %Sto is not output.

5. Typical Operations when a Command is Executed via the External Terminals

Basic flow of command execution



- While a command which affects the measurement processing time is being executed, %Trg1 to 4Ready may turn off.
- For more details on the commands available via external terminal communication, refer to "Command List (Available Operation vs. Situation)" (Page 2-9).



- (1) A command input is confirmed at the leading edge of %CmdStrobe.
- (2) %Busy turns on to indicate that a command is being executed.
- (3) The result of the command execution (success or failure) can be checked by either %Ack (success) or %Nack (failure) being turned on for the duration of the external terminal output on time.
- (4) %CmdReady turns on when %Ack or %Nack turns off.
- (5) %CmdStrobe is ignored if it is input while %CmdReady is turned off. In this case, neither %Ack nor %Nack response is given for %CmdStrobe.

*1 The waveform of %Busy varies depending on the busy condition in the global settings. The diagram above shows a waveform when only [Executing a command] is selected for the busy condition. Note that as the default settings also include other conditions, the behavior such as the above does not occur. Furthermore, [Executing a command] only refers to commands from the terminal block. In other words, this condition cannot be used to check the commands executed via other methods (PLC link, etc.).

Troubleshooting

Common operational errors that may occur

When the trigger is input for inspection at constant intervals, and after a certain period of time, the triggers are not accepted.

The data from the external terminal cannot be output in time and an overflow from the output buffer of the parallel terminal output unit may have occurred.

This occurs when the priority of the parallel terminal output unit is set to [Wait for free space] and the cycle time is longer than the execution cycle of the parallel terminal output unit. Set "Cycle time (ms)" (Page 1-19) to be shorter than the execution cycle of the parallel terminal output unit.

The %JAHold is to be read using the %Sto strobe signal, but the %Sto is not outputting.

The output of %Sto requires the execution of at least one parallel terminal output unit during measurement.

Even if [Sync with STO output] is selected, %Sto will not be output unless at least one parallel terminal output unit is executed in the flowchart.

Even if Output Type(%JAHold) is set to [One shot], %Sto is not output.

Need to confirm if the wiring of an external device is correct.

The I/O Monitor & Diagnostic tool (Page 1-15) allows for the checking of the status of incoming and outgoing signals via the inputs and outputs of the terminal block and parallel port.

This is very useful for verifying the connection status of external equipment wired to the terminals on the controller. However, if the system variables %Flash1 to %Flash4 are assigned to F_OUT terminal outputs, these terminals cannot be monitored through the I/O diagnostic function.

The I/O Monitor & diagnostic function monitors ON/OFF of the %Sto, but the actual operation is not displayed in real time.

The I/O diagnostic may not follow fast changes of the terminal status due to restricted display update speed. To check changes at a high speed, use the Trace Log Viewer. See the XG-X VisionEditor Reference Manual for more details on the Trace Log Viewer.

The controller is switched to run mode, but %Trg*Ready is not output.

There is a possibility that the flow is in waiting status at a non-image capture unit.

Check the waiting status of the timing unit including the wait terminal I/O unit, using %WaitReady.

Error Messages

Errors Messages not Assigned to System Variables %Error0 or %Error1

These errors by default are not assigned to %Error0 or %Error1 but can be assigned through the XG-X Vision Editor software.

Error Message	Cause	Corrective Action	Error Code
External command error has occurred.	An error occurred when executing a command from one of these devices: <ul style="list-style-type: none">• PC Program• PLC-Link• Ethernet• RS-232C• CC-Link• External terminals• EtherNet/IP• PROFINET• EtherCAT	Review the command being sent, the program settings or the device status.	128
Unable to write to the parallel / terminal I/O output buffer.	The controller output buffer for outputting using the parallel / terminal outputs is full.	Reduce the amount of data to be output through the terminal outputs or increase the trigger interval. (Results are not output when the output buffer is full.)	195
Parallel / terminal I/O output buffer is full.	The controller output buffer for outputting using the parallel / terminal outputs is full.	Reduce the amount of data to be output through the terminal outputs or increase the trigger interval. (You have to wait for measurement until the buffer has space when the output buffer is full.)	196

Control/Data Output via PLC-Link

Overview of System Control/ Data Output

Control/Data Output via External Terminals

▶ Control/Data Output via PLC-Link

Control/Data Output via CC-Link

Control/Data Output via EtherNet/IP

Control/Data Output via PROFINET

Control/Data Output via EtherCAT

Control/Data Output via No protocol communication

FTP Client/Server Function

Overview of Control/ Data Output via PLC-Link

PLC-Link is an intelligent dedicated link between the controller and the PLC that allows direct input/output access to data memories in a PLC (programmable logic controller) via the RS-232C or Ethernet interface.

The controller can execute commands in addition to the data output of measurement results. Command execution can be configured to use polling or the system's PLC terminal control input.



- PLC-Link cannot be used on the RS-232C and Ethernet interfaces simultaneously.
- The RS-232C interface cannot be used in general no protocol mode when it is used for PLC link.
- The PLC-Link, CC-Link, EtherNet/IP, PROFINET, and EtherCAT cannot be used at the same time (PLC-Link cannot be used when CC-Link, EtherNet/IP, PROFINET or EtherCAT is enabled).
- If the mode is changed to Setup mode during PLC-Link communication, data output stops and commands other than some that can be executed in Setup mode are disabled. For more details, see "Chapter2 Commands" (Page2-1).
- Other than the Ethernet port on some models, target PLCs are only compatible with connections via the link unit. For details about PLCs that can be used in combination with controllers, see "Via Ethernet interface" (Page 1-75).

Using the PLC-Link enables the following operations.

Controlling the system via PLC-Link

You can control the system by specifying a desired command in the DM (data memory) of a PLC. There are two types of control methods: Polling (Page 1-90) and PLC terminal (Page 1-95).

Outputting data via PLC-Link

You can output measurement data in the controller directly to the DM (data memory) of a PLC (Page 1-87).



DM (data memory) is referred to as data register (D) for the Mitsubishi Electric PLC, as data memory (D) for the Omron PLC, and as data register (M) for the YASKAWA Electric PLC.



When you upload the system settings modified for [PLC-Link] communication mode and then restart the controller to start operation, initialization is repeated until a connection to the PLC is established. If there is no response from the connected PLC, the "PLC communication has failed" warning is displayed every time initialization is performed (Default setting). If the warning continues to appear, check to see if the PLC is connected correctly.

Operation Flow

Set connection settings of the PLC-Link
RS-232C interface <ul style="list-style-type: none">• Connect to the controller according to the PLC in use (Page 1-73).• Make changes to the appropriate settings to connect the controller to the PLC-Link device (Page 1-82). Main settings: Communication speed, stop bit, flow control, command execution method, command specification method, and various addresses (data output device address)
Ethernet interface <ul style="list-style-type: none">• Use the LAN cable for connection. (When the controller is directly connected to the PLC, use a crossover cable)• Make changes to the appropriate settings to connect the controller to the PLC-Link device (Page 1-82) Main settings: IP addresses of the controller and PLC-Link device, port number, command execution method, command specification method and various addresses (data output device address)



Establishing the PLC link
<ul style="list-style-type: none">• When the "Initializing PLC-Link" in the lower right of the screen goes off in a few seconds at the restart, the link communication is established.• If the PLC-Link communication is not established, "PLC communication has failed" is displayed.



Executing necessary processing
Data output (Page 1-87) <ul style="list-style-type: none">• The data from the data output unit is written on the Data Memory Address.• After the writing is complete, 1 is written to the Result Memory Address.
Command control (Page 1-90, 1-95) <ul style="list-style-type: none">• The custom commands (Page 2-116) set in advance can be executed.• Two methods are available for control of the command; By Command No. and By Execute Flags.• Available execution methods of the commands are polling method and PLC terminal.

Preparing PLC-Link connection

The following PLCs are compatible with the PLC-Link connection.

- Except for certain models only connections via a link unit are supported.
- The range of data memories differ depending on the system. For more details, refer to the manual for each PLC.

Via RS-232C interface

Keyence Corporation

Series name	PLC Controller	Link unit	PLC operation mode	PLC type
KV	KV-700	KV-L20	KV BUILDER mode	KV-L20 Series
	KV-1000	KV-L20R	KV STUDIO mode	KV-L20 Series
	KV-3000, KV-5000, KV-5500	KV-L20V, KV-L21V	KV STUDIO mode	KV-L20 Series
	KV-7300, KV-7500, KV-8000	KV-XL202, KV-L20V, KV-L21V	KV STUDIO mode	KV-L20 Series
	KV Nano	KV-N10L, KV-NC10L, KV-NC20L	KV STUDIO mode	KV-L20 Series

Mitsubishi Electric Corporation

Series name	PLC Controller	Link unit	PLC operation mode	PLC type
MELSEC-AnS	A1S, A1SH, A1SJ, A1SJH1, A2S, A2SH, A171S, A171SH	A1SJ71 (U) C24-R2, A1SJ71 (U) C24-PRF	Exclusive protocol format 1	MELSEC AnN Series
	A1CPU24-R2	Calculator link port	Exclusive protocol format 1	MELSEC AnN Series
	A2US, A2USH	A1SJ71 (U) C24-R2, A1SJ71 (U) C24-PRF	Exclusive protocol format 1	MELSEC AnN Series
MELSEC-A0J2	A0J2, A0J2H	A0J2-C214-S1	Exclusive protocol format 1	MELSEC AnN Series
MELSEC-AnN	A1N, A2N, A3N	AJ71C24, AJ71C24-S3, AJ71C24-S6, AJ71C24-S8, AJ71UC24	Exclusive protocol format 1	MELSEC AnN Series
MELSEC-AnA	A2A, A3A	AJ71C24-S6, AJ71C24-S8, AJ71UC24	Exclusive protocol format 1	MELSEC AnN Series
MELSEC-AnU	A2U, A3U, A4U	AJ71C24-S6, AJ71C24-S8, AJ71UC24	Exclusive protocol format 1	MELSEC AnN Series
MELSEC-QnA	Q2A, Q2A-S1, Q3A, Q4A	AJ71QC24 (N), AJ71QC24 (N) R2, AJ71QC24 (N) R4	Exclusive protocol format 5	MELSEC Q/L Series
	Q2AS, Q2AS-S1, Q2ASH, Q2ASH-S1	A1SJ71QC24, A1SJ71QC24-R2	Exclusive protocol format 5	MELSEC Q/L Series
MELSEC-Q	Q00CPU, Q01CPU	QJ71C24, QJ71C24 (N)-R2	MC protocol format 5	MELSEC Q/L Series
	Q02CPU, Q02HCPU, Q02UCPU, Q03UDECPU, Q04UDEHCPU, Q06UDEHCPU, Q10UDEHCPU, Q13UDEHCPU, Q20UDEHCPU, Q26UDEHCPU, Q06HCPU, Q12HCPU, Q25HCPU, Q02UCPU, Q03UDVCPU, Q04UDVCPU, Q06UDVCPU, Q13UDVCPU, Q26UDVCPU	QJ71C24, QJ71C24 (N)-R2	MC protocol format 5	MELSEC Q/L Series
	Q02CPU-A, Q02HCPU-A, Q06HCPU-A	A1SJ71 (U) C24-R2, A1SJ71 (U) C24-PRF	Exclusive protocol format 1	MELSEC AnN Series
	L02CPU, L26CPU-BT	LJ71C24, LJ71C24-R2	MC protocol format 5	MELSEC Q/L Series
	R04CPU	RJ71C24	MC protocol format 5	MELSEC Q/L Series
MELSEC-iQ-F	FX5U, FX5UC	None *	MC protocol format 5	MELSEC Q/L Series
MELSEC-FX	FX1S	FX1N-232-BD, FX2NC-232ADP	Exclusive protocol communication	MELSEC FX Series
	FX3G	FX3G-232-BD, FX3U-232ADP	Exclusive protocol communication	MELSEC FX Series
	FX3U, FX3UC	FX3U-232-BD, FX3U-232ADP	Exclusive protocol communication	MELSEC FX Series

* Connections via a link unit are not supported.

Omron Corporation

Series name	PLC Controller	Link unit	PLC operation mode	PLC type
SYSMAC SPM1	SRM1-C01, SRM1-C02	CPM1-C1F01	Upper link (SYSWAY)	SYSMAC C Series
SYSMAC CPM1 SYSMAC CPM1A	CPM1, CPM1A	CPM1-C1F01	Upper link (SYSWAY)	SYSMAC C Series
SYSMAC CPM2A	CPM2A-30CD□□, CPM2A-40CD□□, CPM2A-60CD□□	CPM1-C1F01	Upper link (SYSWAY)	SYSMAC C Series
SYSMAC CPM2C	CPM2C-10CD□□, CPM2C-20CD□□	CPM1-C1F01 CPM2C-C1F01	Upper link (SYSWAY)	SYSMAC C Series
SYSMAC CQM1H	CQM1H-CPU11*, CQM1H-CPU21*, CQM1H-CPU51/61	CPM1-C1F01 CQM1H-SCB41	Upper link (SYSWAY)	SYSMAC C Series
SYSMAC C	C120, C120F	C120-LK201-V1	Upper link (SYSWAY)	SYSMAC C Series
	C200H	C200H-LK201 (-V1)	Upper link (SYSWAY)	SYSMAC C Series
	C200HS-CPU01, C200HS-CPU03, C200HS-CPU21/23, C200HS-CPU31/33	C200H-LK201 (-V1)	Upper link (SYSWAY)	SYSMAC C Series
	C500, C500F, C1000H, C1000HF, C2000, C2000H	C120-LK201-V1, C500-LK201-V1, C500-LK203	Upper link (SYSWAY)	SYSMAC C Series
	C200HE-CPU11, C200HE-CPU32, C200HE-CPU42 C200HG-CPU33, C200HG-CPU43, C200HG-CPU53, C200HG-CPU63	C200H-LK201 (-V1) C200H-LK201 (-V1)	Upper link (SYSWAY)	SYSMAC C Series
SYSMAC α	C200HX-CPU34, C200HX-CPU44, C200HX-CPU54, C200HX-CPU64, C200HX-CPU65-Z, C200HX-CPU85-Z	C200H-LK201 (-V1)	Upper link (SYSWAY)	SYSMAC C Series
	CJ1M-CPU11-ETN, CJ1M-CPU12, CJ1M-CPU12-ETN, CJ1M-CPU13, CJ1M-CPU13-ETN, CJ1M-CPU22, CJ1M-CPU23, CJ1G-CPU44ACJ1G-CPU45,	CJ1W-SCU21 (-V1), CJ1W-SCU22, CJ1W-SCU41	Upper link (SYSWAY)	SYSMAC CJ/CS1/CP1 Series
	CJ1G-CPU42H, CJ1G-CPU43H, CJ1G-CPU44H, CJ1G-CPU45H, CJ1H-CPU64H-R, CJ1H-CPU65H, CJ1H-CPU65H-R, CJ1H-CPU66H, CJ1H-CPU66H-R, CJ1H-CPU67H, CJ1H-CPU67H-R, CJ2M-CPU11,			
	CJ2M-CPU12, CJ2M-CPU13, CJ2M-CPU14, CJ2M-CPU15, CJ2M-CPU31, CJ2M-CPU32, CJ2M-CPU33, CJ2M-CPU34, CJ2M-CPU35, CJ2H-CPU64-EIP, CJ2H-CPU65-EIP, CJ2H-CPU66-EIP, CJ2H-CPU67-EIP, CJ2H-CPU68-EIP			
	CP1H-Y20DT-D, CP1H-XA40D□-□, CP1H-X40D□-□, CP1L-M60D□-□, CP1L-M40D□-□, CP1L-M30D□-□, CP1L-L20D□-□, CP1L-L14D□-□, CP1E-NA20D□-□, CP1E-N60D□-□, CP1E-N40D□-□, CP1E-N30D□-□	CP1W-CIF01	Upper link (SYSWAY)	SYSMAC CJ/CS1/CP1 Series
SYSMAC CS1	CS1G-CPU42 (H), CS1G-CPU43 (H), CS1G-CPU44 (H), CS1G-CPU45 (H), CS1H-CPU63 (H), CS1H-CPU64 (H), CS1H-CPU65 (H), CS1H-CPU66 (H), CS1H-CPU67 (H)	CS1W-SCU21 (-V1)	Upper link (SYSWAY)	SYSMAC CJ/CS1/CP1 Series

* The CQM1H-SCB41 link unit cannot be used.

YASKAWA Electric Corporation

Series name	PLC Controller	Link unit	PLC operation mode	PLC type
MP2000	MP2200, MP2300, MP2310, MP2300S	217IF-01, 218IF-01 218IF-02	MEMOBUS	YASKAWA MP Series
MP900	MP920*, MP930*	217IF**	MEMOBUS	YASKAWA MP Series

* Also compatible with the built-in RS-232C interface on the system.

** Cannot be connected to MP930.

NOTICE	For modules that do not support automatic reception or connect via a link unit, you need to describe the MSG-RCV processing in the ladder.
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Via Ethernet interface

Keyence Corporation

Series name	PLC Controller	Link unit	PLC type
KV	KV-700, KV-1000	KV-LE20, KV-LE20A	KV Series
	KV-3000, KV-5000*, KV-5500*	KV-LE20V, KV-LE21V, KV-EP21V**	KV Series
	KV-7300, KV-7500*, KV-8000*	KV-XLE02, KV-LE20V, KV-LE21V, KV-EP21V	KV Series
	KV Nano	KV-NC1EP	KV Series

* Also compatible with connection to the built-in Ethernet interface on the system.

** Only CPU version 2 or later can be used in the case of KV-3000, KV-5000 and KV-5500.

Mitsubishi Electric Corporation

Series name	PLC Controller	Link unit	PLC type
MELSEC-Q	Q00CPU, Q01CPU, Q02CPU, Q02HCPU, Q02UCPU, Q03UDECPU*, Q04UDEHCPU*, Q06UDEHCPU*, Q10UDEHCPU*, Q13UDEHCPU*, Q20UDEHCPU*, Q26UDEHCPU*, Q06HCPU, Q12HCPU, Q25HCPU, Q03UDVCPU*, Q04UDVCPU*, Q06UDVCPU*, Q13UDVCPU*, Q26UDVCPU*	QJ71E71, QJ71E71-100	MELSEC Q/L Series
MELSEC-L	L02CPU*, L26CPU-BT*	OFF**	MELSEC Q/L Series
MELSEC iQ-R	R04CPU*, R04ENCPU*	RJ71EN71	MELSEC Q/L Series
MELSEC iQ-F	FX5U*/FX5UC*	OFF**	MELSEC Q/L Series

* Also compatible with connection to the built-in Ethernet interface on the system.

** Connections via a link unit are not supported.

Omron Corporation

Series name	PLC Controller	Link unit	PLC type
SYSMAC CJ	CJ1M-CPU11-ETN*, CJ1M-CPU12, CJ1M-CPU12-ETN*, CJ1M-CPU13, CJ1M-CPU13-ETN*, CJ1M-CPU22, CJ1M-CPU23, CJ1G-CPU44, CJ1G-CPU45, CJ1G-CPU42H, CJ1G-CPU43H, CJ1G-CPU44H, CJ1G-CPU45H, CJ1H-CPU64H-R, CJ1H-CPU65H, CJ1H-CPU65H-R, CJ1H-CPU66H, CJ1H-CPU66H-R, CJ1H-CPU67H, CJ1H-CPU67H-R, CJ2M-CPU11, CJ2M-CPU12, CJ2M-CPU13, CJ2M-CPU14, CJ2M-CPU15, CJ2M-CPU31*, CJ2M-CPU32*, CJ2M-CPU33*, CJ2M-CPU34*, CJ2M-CPU35*, CJ2H-CPU64-EIP*, CJ2H-CPU65-EIP*, CJ2H-CPU66-EIP*, CJ2H-CPU67-EIP*, CJ2H-CPU68-EIP*	CJ1W-ETN11, CJ1W-ETN21	SYSMAC CJ/CS1/CP1 Series
SYSMAC CP1	CP1H-Y20DT-D, CP1H-XA40D□-□, CP1H-X40D□-□	CP1W-CIF41, CJ1W-ETN21**	SYSMAC CJ/CS1/CP1 Series
	CP1L-M60D□-□, CP1L-M40D□-□, CP1L-M30D□-□, CP1L-L20D□-□, CP1L-L14D□-□, CP1E-NA20D□-□, CP1E-N60D□-□, CP1E-N40D□-□, CP1E-N30D□-□	CP1W-CIF41	SYSMAC CJ/CS1/CP1 Series
SYSMAC CS1	CS1G-CPU42 (H), CS1G-CPU43 (H), CS1G-CPU44 (H), CS1G-CPU45 (H), CS1H-CPU63 (H), CS1H-CPU64 (H), CS1H-CPU65 (H), CS1H-CPU66 (H), CS1H-CPU67 (H)	CS1W-ETN11, CS1W-ETN21	SYSMAC CJ/CS1/CP1 Series

* Also compatible with connection to the built-in Ethernet interface on the system.

** CJ unit adapter CP1W-EXT01 is required.

YASKAWA Electric Corporation

Series name	PLC Controller	Link unit	PLC type
MP2000	MP2200, MP2300, MP2310*, MP2300S*, MP2400*	218IF-01, 218IF-02	YASKAWA MP Series

* Also compatible with connection to the built-in Ethernet interface on the system.

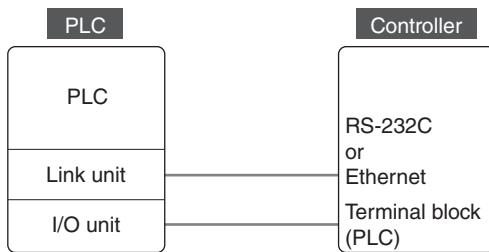
NOTICE

For modules that do not support automatic reception or connect via a link unit, you need to describe the MSG-RCV processing in the ladder.

Connecting to the PLC-Link/setting the link unit

1. Wiring overview

The PLC is wired to the controller in the following way.



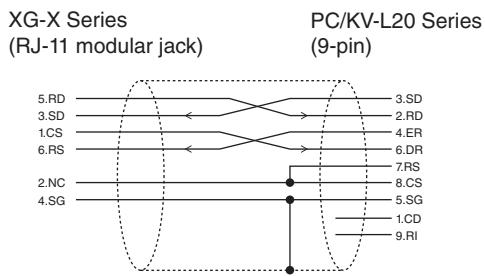
Reference

- When the controller is not receiving commands from the PLC or when it is polling, the PLC does not need to be connected to the terminal block (PLC).
- Since the controller complies with the modem definition, when connecting the controller to a device that complies with the terminal definition via RS-232C, connect the SD signal of the controller to the SD signal of the device and the RD signal of the controller to the RD signal of the device.

2. Wiring for the PLC-Link and setting the link unit (RS-232C)

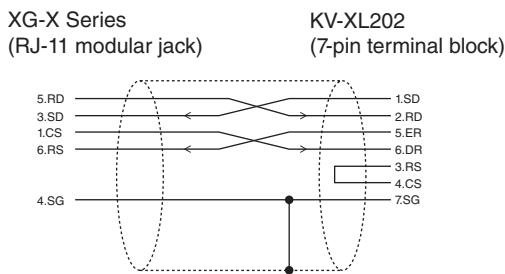
When connecting to a Keyence KV Series (other than the KV-XL202)

- Use OP-26486 (D-sub 9-pin female connector) and OP-26487 (2.5 m straight cable).
- Set the link unit operation mode to [KV-Builder mode] (for the KV-700) or [KV-STUDIO mode] (for the KV-Nano, KV-1000/3000/5000/5500/7300/7500/8000).



When connecting to a Keyence KV-XL202 Series PLC

- Process the KV-side connector of the OP-26487 (2.5 m straight cable) into loose wires, and then wire it directly to the terminal block of the KV as shown in the following figure.
- Set the link unit operation mode to [KV-STUDIO mode].

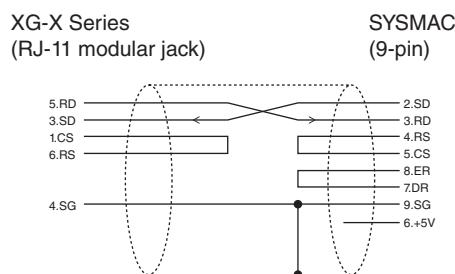


When connecting to an Omron SYSMAC PLC

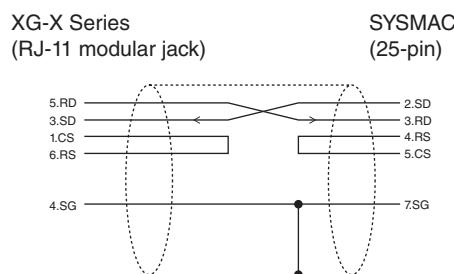
Reference When connecting to a SYSMAC C, adapt the wiring described here to the pins on the actual connectors used for the connection.

- Use OP-84384 (D-sub 9-pin male connector) and OP-26487 (2.5 m straight cable) for the SYSMAC (9-pin).
- Set the link unit operation mode to "upper link (SYSWAY)".
- Set the 1:1 or 1:N process to "1:N process".
- Set the unit number to "No. 0".
- Set the CS control to "None".
- When enabling settings using CX-Programmer 6.0 or later, make sure to set the [Optional settings on/off] item to [On]. When set to "Off", changes to other settings will not be enabled.

For 9-pin



For 25-pin



Point

- If OP-26486 and OP-26487 are used as is to connect to a SYSMAC (9-pin), it may cause damage to the controller and the connected device. Do not use this connector.
- The controller's signal GND is isolated from the power GND.

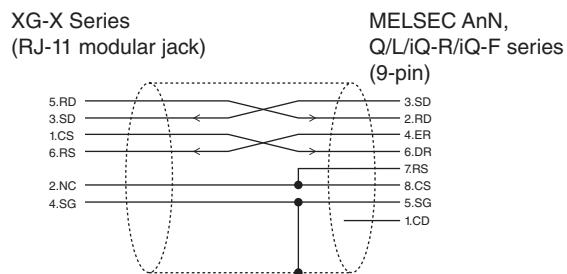
When connecting to a MELSEC AnN, Q/L/iQ-R/iQ-F Series PLC

- Use OP-86930 (D-sub 9-pin male connector)* and OP-26487 (2.5 m straight cable).
- Set the operation mode for the communication port on the PLC side to [MC protocol format 5] (for Q, L, iQ-R and iQ-F Series) or [Exclusive protocol format 1] (for A Series).
- Set the checksum setting to [On].

* For the MELSEC iQ-F Series, use OP-26486 (D-sub 9-pin female connector).

Reference

- When connected to the A Series, "RS-232C CD terminal unchecked" must be defined in the ladder. Refer to the manual for the Mitsubishi Electric computing link unit for more details.
- For Q Series and iQ-R Series, set [Authorize writing during RUN] to [Authorize].
- To use the Q Series link unit QJ71C24 (N)-R2 with a setting of "Baud rate 115200 bit/s, data length 8 bits, stop bit 1, even parity", the switch setting in the PC parameters will be "0BEE (hexadecimal)".

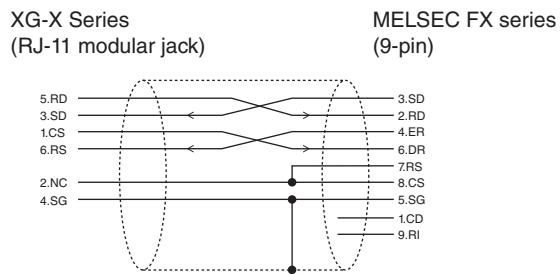


Point

The controller's signal GND is isolated from the power GND.

When connecting to a MELSEC PLC of the FX Series (excluding the FX5 Series)

- Use OP-26486 (D-sub 9-pin female connector) and OP-26487 (2.5 m straight cable).
- Assignment of the communication channels starts from the "communication function expansion board" and the "communication special adapter" which are closer to the CPU.
- Set the link unit operation mode to [Exclusive Protocol Communication]. Set the checksum setting to [On].
- Set the H/W type to [Normal/RS-232C], the transmission control procedure to [Type 1 (without CR, CF)], the station number to [00H].



Point

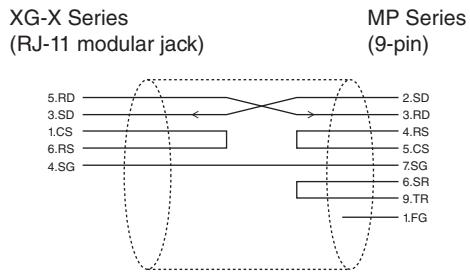
The controller's signal GND is isolated from the power GND.

Reference

For connection to a MELSEC FX5 Series PLC, see "When connecting to a MELSEC AnN, Q/L/iQ-R/iQ-F Series PLC".

When connecting to a YASKAWA MP Series PLC

- Work on OP-26487 (2.5 m straight cable) and connect it to the commercially available D-sub 9 pin male connector as shown in the figure below.
- Set the communication protocol to "MEMOBUS".
- Set Master/Slave to "Slave".
- Set the transmission mode to "RTU".
- Set the device address to "1".
- Describe the MSG-RCV processing in the ladder. (Set the automatic reception to "Specified" for a module that allows automatic reception.) Refer to the manual for the YASKAWA Electric communication unit for more details.



Point

- If OP-26486 and OP-26487 are connected as they are, it may result in damage to the controller and the connected device. Do not use this connector.
- The controller's signal GND is isolated from the power GND.

3. Wiring for the PLC-Link and setting the link unit (Ethernet)

- Make sure that the specified IP address is unique and different from the IP addresses for other devices.
- When directly connecting, leave the subnet mask settings in their default settings. For other connections, match them and configure them to the network configuration, however the connected equipment all need to be set to identical settings.
- Port number [9010] in the communication port setting is reserved for the controller and cannot be used.
- Use a category 5e or greater shielded twisted pair (STP) cable for connection.

When connecting to a Keyence KV Series PLC

Use KV BUILDER or KV STUDIO for setting.

- **IP address:** Set the IP address which is specified for the PLC-Link settings on the controller.
- **Port number (VT):** Set the port number which is specified for the PLC-Link settings on the controller.

When connecting to an Omron SYSMAC PLC

Change the settings using CX-Programmer. Before starting this setting, complete NODE No. for the PLC-Link settings on the controller. (Normally specify "1" for the number.)

- **IP address:** Set the IP address which is specified for the PLC-Link settings on the controller.
- **FINS UDP port:** Select [User-defined], and set the specified port number which is specified for the PLC-Link settings on the controller.
- **IP address table:** Set the IP address and node address specified in the [Ethernet] screen of the global settings on the controller. The node address is normally [1].
- **IP router table:** Set this item only when using a router. In router address, set the IP address for the router. In IP address, set the IP address specified in the [Ethernet] screen of the global settings on the controller.



Specify a NODE No. for the link unit which is different from the NODE No. for the PLC-Link setting on the controller.

When connecting to a Mitsubishi MELSEC link unit

Q/L Series

Change settings using the network parameters in GX Developer or GX Works 2.

- MELSECNET/Ethernet
 - **Network type:** Select [Ethernet].
 - **Mode:** Select [Online].
- Operation settings
 - **Communication data code setting:** Select [Binary code communication].
 - **Initial timing setting:** Select [Always OPEN].
 - **IP address setting:** Set the IP address which is specified for the PLC-Link settings on the controller.
 - **Send frame setting:** Select [Ethernet (V2.0)].
 - **Authorize writing during RUN:** Select [Authorize].

iQ-R Series

Change settings using the unit parameters in GX Works 3. Add [UDP Connection Device] from the unit list displayed by selecting [Basic Settings] > [Remote Device Connection Configuration Settings] > [Advance][Basic Settings] to the Ethernet configuration, and then configure the settings as shown below.

- **Telecommunication Method:** Select [Fixed Buffer (With Protocol)] or [Random Access Buffer].
- **Sequencer (Port Number) or Sensor/Device (Port Number):** Set both of these to the PLC's port number (setting ranges: 1025 to 4999 and 5010 to 65534 (excluding 9010)).
- **Sensor/Device (IP Address):** Set this to the IP address of the controller.
- **Living Confirmation:** Select [Without Living Confirmation].
- **Authorize writing during RUN:** Select [Authorize].

Connecting to a Mitsubishi MELSEC PLC with built-in Ethernet port

 Point

- The built-in Ethernet port does not support Auto open UDP port (port number default: 5000) like the QJ71E71-100. Specify the communications port on the controller to a value from 1025 to 4999, or 5010 to 65535 (excluding 9010).
- Do not set more than one controller to the same port number. When connecting multiple controllers via a hub, set each controller with a different communication port number, and set multiple local port numbers that correspond to them.

Q/L Series

Change settings using the PC parameters in GX Developer or GX Works 2.

- Built-In Ethernet Port Settings**

- IP address:** Set the IP address which is specified for the PLC-Link settings on the controller.
- Communication data code setting:** Select [Binary codecommunication].
- Authorize writing during RUN:** Check [Authorize].

- Open Settings**

Add these settings.

- Protocol:** Select [UDP].
- Open method:** Select [MCprotocol].
- Local node port number:** Specify a hexadecimal value within the range 0401 to 1387, and 1392 to FFFE. Numbers from 1388 to 1391 and 2332 (5000 to 5009 and 9010 in decimal) are reserved. Specify the [Port] setting in the controller with the decimal notation of the hexadecimal value specified here. (Example, if the local node port number is 1387, specify 4999 in the controller).

iQ-R/iQ-F Series

Change settings using the unit parameters in GX Works 3.

- Own node settings**

- IP address:** Set the IP address which is specified for the PLC-Link settings on the controller.
- Communication data code setting:** Select [Binary].
- Authorize writing during RUN:** Select (SLMP) for batch authorization (for iQ-R only).

- Remote Device Connection Configuration Settings:**

Select [Basic Settings] > [Remote Device Connection Configuration Settings] > [Advance] to display the unit list, add [SLMP Connection Device] from the unit list to the Ethernet configuration, and then configure the settings as shown below.

- Protocol:** Select [UDP].
- Sequencer (Port Number):** Set to the PLC's port number (setting ranges: 1025 to 4999 and 5010 to 65534 (excluding 9010)).
- Sensor/Device (IP Address):** Set this to the IP address of the controller.

When connecting to a YASKAWA MP Series PLC

Use MPE720 for setting.

- Communication protocol:** Select [Extended MEMOBUS].
- Master/Slave:** Select [Slave].
- Code:** Select [BIN].
- Connection type:** Select [UDP].
- IP address:** Set the IP address which is specified for the PLC-Link settings on the controller.
- Port number:** Set the port number which is specified for the PLC-Link settings on the controller.
- Describe the MSG-RCV processing in the ladder. (Set the automatic reception to "Specified" for a module that allows automatic reception.)

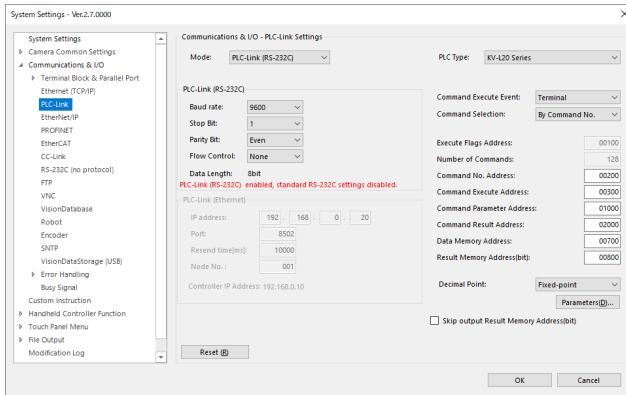
Refer to the manual for the YASKAWA Electric communication unit for more details.

Changing PLC link connection settings

Displaying PLC link setting screen

Changing settings with XG-X VisionEditor

The settings for the PLC-Link module can be changed in the [PLC-link] menu of the XG-X VisionEditor system settings.



- Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

- In the left pane of the [System Settings] menu, select [Communications & I/O] - [PLC-Link].

The [PLC-Link] menu appears.

- Change the settings as required.

See "PLC-Link setting details" (Page 1-83) for more details on each setting.

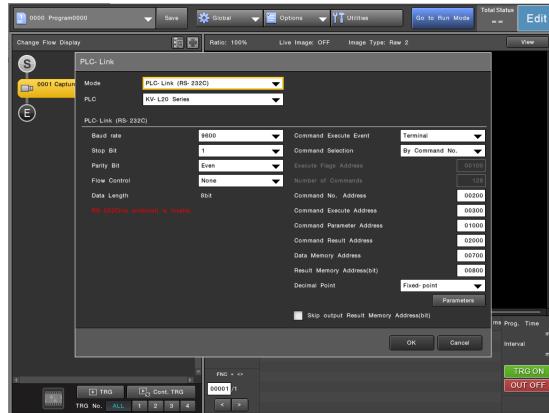
- Click [OK].



To apply the change to the controller, you need to upload the system settings file to the controller and then restart the controller.

Changing settings with the controller

The settings for the PLC-Link module can be changed in the [PLC-link] menu of the global settings.



- If any settings other than the [Decimal Point] setting are changed, the controller must be restarted for changes to take effect.
- After making changes to [Mode] and then restarting, the controller will repeat the connection process until a connection to the PLC-Link is established. If there is no response from the connected PLC, the confirmation screen "PLC communication has failed" is displayed repeatedly.

- On the [Global] menu at the top of the screen, select [Communications & I/O] - [PLC-Link].

The [PLC-Link] menu appears.

- Select [PLC-link (RS-232C)] or [PLC-link (Ethernet)] in [Mode].

- Select the Series name to be connected in [PLC Type].

The settings for the selected PLC type appear.

- Change the settings as required.

See "PLC-Link setting details" (Page 1-83) for more details on each setting.

- Click [OK].

PLC-Link setting details

 Point

The data memory ranges that the controller can actually write to the PLC with the data memory specifications of the setting items are as follows.

- KV-L20 series: 0 to 65535 (When PLC is KV Nano, the range is 0 to 32767.)
- MELSEC AnN series: 0 to 8191
- MELSEC Q/L/iQ-R/iQ-F series: 0 to 32767
- MELSEC FX series: 0000 to 7999
- SYSMAC C series: 0 to 9999
- SYSMAC CJ/CS1/CP1 series: 0 to 32767
- YASKAWA MP series: 0 to 4095

If data located outside the specified portion in the data memory is written, an error message informing you of communication disconnection appears. As the portion of the data memory actually available differs depending on individual PLC specifications and settings even in the same series, the maximum use of the portion may not be ensured.

Mode

Select the method for communicating with the PLC.

- Disable:** Disable the PLC-Link.
- PLC-Link (RS-232C):** Enable the PLC-Link with the PLC connected to the RS-232C link unit.
- PLC-Link (Ethernet):** Enable the PLC-Link with the PLC connected to the Ethernet unit.

 Point

When the PLC-Link is enabled, other inputs/outputs may be restricted. See the table below for details.

	Ethernet	RS-232C	CC-Link/ EtherNet/IP/ PROFINET/ EtherCAT
PLC-Link (RS-232C)	Available	Not available	Not available
PLC-Link (Ethernet)	Available	Available	Not available

 Reference

USB, external terminals, and FTP are always available.

PLC type

Select the model of the device to connect to.

The settings for the selected PLC type appear.

 Point

When you change the PLC type, all PLC-Link settings are initialized.

PLC-Link (RS-232C)

Change the RS-232C communication settings when [PLC-Link (RS-232C)] is selected for [Mode].

Communication speed

Select 9600 (default), 19200, 38400, 57600, 115200, or 230400 (bps) for the baud rate.

 Point

- If [SYSMAC C series] is selected in [PLC Type], only "19200" or "9600" can be selected.
- If [MELSEC FX series] is selected in [PLC Type], only "38400", "19200" or "9600" can be selected.
- [230400] can be selected only when the [KV-L20 series], [MELSEC Q/L series], or [SYSMAC CJ/CS1/CP1 series] is selected for the [PLC type].

Stop Bit

Select [1] (default) or [2] for the stop bit.

 Point

If you selected [KV-L20 Series] in [PLC Type], the stop bit is fixed to [1].

Parity Bit

Select [None], [Odd], or [Even] (default) for the parity bit.

 Point

If you selected [KV-L20 Series] in [PLC Type], the parity bit is fixed to [Even].

Flow Control

The flow control is fixed to either [None] (default) or [CTS/RTS] with [PLC Type] and cannot be changed.

 Point

- If [KV-L20 Series], [SYSMAC C Series], [SYSMAC CJ/CS1/CP1 Series], or [YASKAWA MP series] is selected for the [PLC type], the flow control is fixed to [None].
- If you selected [MELSEC AnN Series], [MELSEC Q/L Series] or [MELSEC FX Series] in [PLC Type], the flow control is fixed to [CTS/RTS].

PLC-Link (Ethernet)

Change the Ethernet communication settings when [PLC-Link (Ethernet)] is selected for [Mode].

IP address

Enter the IP address for the unit that the controller is communicating with (default: 192.168.0.20).

-  Point The IP address must be different from the controller's IP address.

Port

Enter the port number of the port to use for PLC-Link (default: 8502 for the KV Series, 5000 for the MELSEC Q/L Series, 9600 for the SYSMAC CJ/CS1/CP1 Series, and 1024 for the YASKAWA MP Series).

-  Point
- Changing the [PLC Type] returns the value to the default setting.
 - Port number [9010] is reserved for the controller and cannot be used.

Resend time

Enter the retry interval (ms) for use if a communication error occurs (default: 10000 ms).

NODE No.

Enter the node number used to identify the controller. Make sure that the node number is different from that of other devices on the same network (default: 001).

-  Reference This option is enabled only when [SYSMAC CJ/CS1/CP1 Series] is specified in [PLC Type].

Common settings for the PLC-Link

PLC link settings regardless of communication type.

Command Execute Event

Specify the method used to execute commands issued over the PLC-Link.

- **Terminal (default):** Execute commands on the leading edge of the terminal assigned as the PLC terminal.
- **Polling:** Execute commands when the value in a data memory designated as the control address changes from 0 to 1.

-  Point
- Only custom instructions (Page 2-120) can be executed using the PLC-Link.
 - Depending on the communication quality, polling may result in slower command execution when compared to using terminal.

Command Selection

Select the method used to specify commands issued over the PLC-Link.

- **By Command No. (default):** Commands are specified by using the custom command number in the data memory designated as the [Command No. Address].
- **By Execute Flags:** Commands are specified by using 1's in data memory words that correspond to the custom command to be executed. This data memory begins at the [Execute Flags Address].

Specifying commands (By Command No.)

Command No. Address

Specify the address (default: 00200) of the data memory used for custom command numbers.

- The specification uses 1 word addresses.
- The command is executed by entering the custom command number (0 to 127).

Command Execute Address

Specify the address (default: 00300) of the data memory word used for executing commands that are entered by their command number. This address is used to verify command results (0: Success, Error Code: Fail), and for executing commands using the polling method (1: execute). The specification uses 1 word addresses.

Specifying commands (By Execute Flags)

Execute Flags Address

Specify the starting address (default: 00100) of the data memory used for specifying commands individually.

- The number of data memory addresses is specified in the [Number of Commands] field (1 word per command, max 128 words).
- In addition to specifying individual commands to execute and verifying command results, this address that is also used to execute commands by polling.

-  **Point**
- Custom commands are always specified from a 0-based address. Non 0-based addresses cannot be used.
 - If a "1" is entered in two or more data memory words at the same time, only the command from the lower address number will be executed.

Number of Commands

Specify the number of data memory words (commands) used when executing commands by flags. (0 to 128, default: 128)

-  **Reference**
- Response time for executing commands using the polling method can be improved by specifying the smallest number required.

Common settings for commands

Command Parameter Address

Specify the starting address (default: 01000) of the data memory used for command parameters (*01 to *16).

- This uses 2 words of addresses for each parameter from the data address (max 32 words for 16 parameters).
- Enter values for the parameters defined in commands and specify the command parameters for execution.



For commands that use text string parameters, the parser will read 2 words per character (1 byte) from the designated parameter data address (terminate strings with "0" or "NULL").

Command Result Address

Specify the starting address (default: 02000) of the data memory used for storing data from commands that return results.

- The specification uses 2 words per data item (or 2 words per character (1 byte) if the command returns text strings).
- The actual range of data memory used to receive command results depends on how the command is defined.

Specifying result data output

Data Memory Address

Specify the starting address (default: 00700) of the data memory used for storing data from data output units.

- This uses 2 words per data item (or 2 words per character (1 byte) if the command returns text strings).
- The range of data memories required for storing data depends on the settings in the [Advance] tab of the data output unit.

Result Memory Address (bit)

Specify the address (default: 00800) of the data memory used for confirming the data has been output.

- The specification uses 1 word addresses.
- A "1" will be written if the result output for one data output unit completes normally.
- The location in the data memory where the result output completion status is written depends on the settings in the [Advance] tab of the data output unit.

Decimal Point

Choose the method for handling numbers from output units, parameters used with MW/MR/MS/MWX/MRX/MXS commands, and for command data and results.

- **Fixed-point** (default): Process the number by multiplying it by 1000 and storing it as 32 bits of signed integer data in the data memory (address m: lower 16 bits, address m+1: upper 16 bits). Select [Parameters] to specify the [Decimal Precision] (1/10, 1/100, 1/1000, or 1/10000; set to 1/1000 by default).



Depending on the [Decimal Precision] setting: 1/10, 1/100, 1/1000, or 1/10000, the measurement result is multiplied by 10, 100, 1000, or 10000 (respectively) and is used as 32 bits of signed integer data.

- **Floating-point**: Processes the number as single-precision floating point data (32 bits) in the data memory.

Skip Output Result Memory Address

When this option is checked as enabled, writing to the Result Memory Address is not performed. (Default: Disabled)



When this setting is enabled, the communication time for writing the result memory completion signal can be reduced. However, the output completion timing at the controller cannot be detected from the PLC. Therefore, the setting must be performed so that the output completion timing is determined from the output of the result data set on the output unit.

Revert to initial values

Returns all settings of [PLC-Link] to their initial values.

Outputting Measurement Data via PLC-Link (Data Output)

The PLC-Link can be used to output data from data output units.

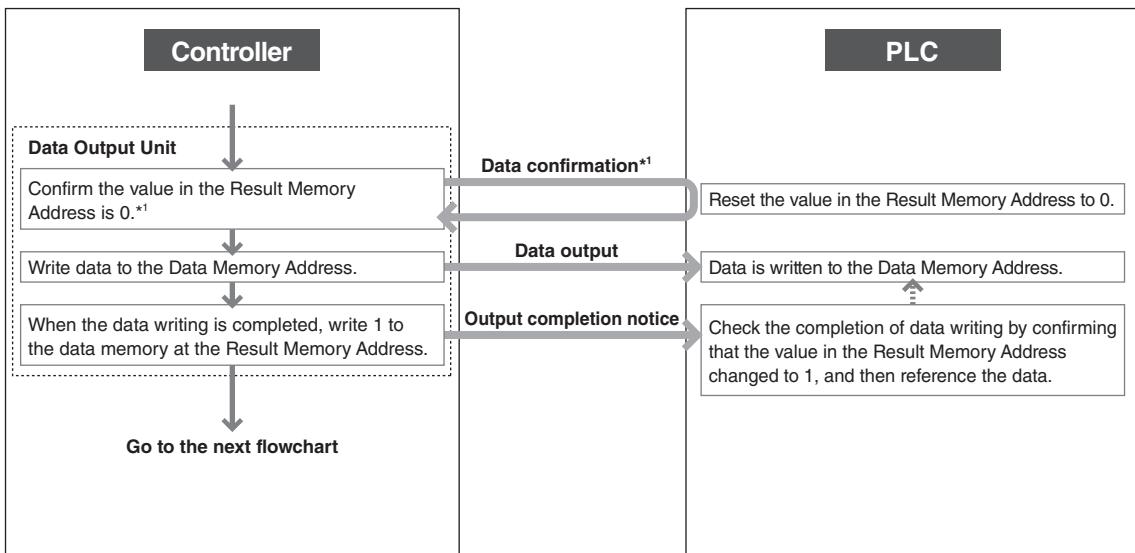
- The PLC-Link cannot be used while the CC-Link, EtherNet/IP, PROFINET, or EtherCAT is enabled.
- When you upload the system settings modified for PLC-Link and then restart the controller to start operation, initialization is repeated until a connection to the PLC is established. If there is no response from the connected PLC, the "PLC communication has failed" warning is displayed every time initialization is performed (Default setting). If the warning continues to appear, check to see the PLC is connected correctly.

Data Output Flow

The controller outputs data via the PLC-Link in the following manner.

Reference

- The data output via the PLC-Link is performed only when the controller is in run mode. Data cannot be output in setup mode.
- Images and other binary data cannot be output with the PLC-Link.
- No data is output unless all data output units in the flowchart have been executed. In this case, nothing is written to the Result Memory Address.

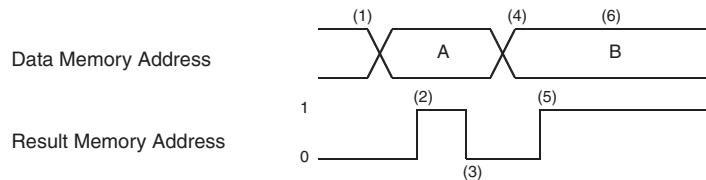


^{*1} The above procedure is the flow when handshake is set to [ON] in the [Protocol Details] tab of the data output unit.

When handshake is set to [OFF], the data in the Result Memory Address is not checked. Consequently, output data is written to the Data Memory Address as soon as writing is available, regardless of the status of the Result Memory Address. When "Skip Output Result Memory Address" (Page 1-86) is enabled in the system settings, the output completion notice data is not written to the Result Memory Address from the controller.

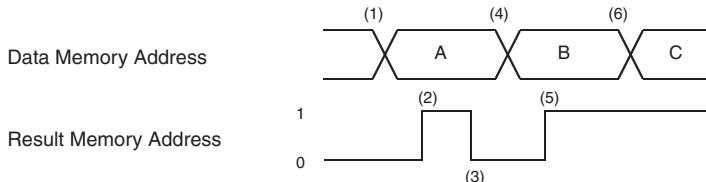
Timing Chart (Measurement Data Output Flow)

When handshake is set to [ON]



- (1) If the Result Memory Address is 0, the measurement data (A) is written to the Data Memory Address.
- (2) After the measurement data is written, 1 is written to the Result Memory Address.
- (3) After the PLC reads the measurement data, the Result Memory Address is changed (from 1) to 0.
- (4) Upon the completion of the changing of the Result Memory Address to 0, the next measurement data (B) is written to the Data Memory Address.
- (5) In the same manner as step (2), after the measurement data is written, 1 is written to the Result Memory Address.
- (6) After the PLC reads the measurement data, the subsequent measurement data is not written to the Data Memory Address and is instead stored in the output buffer until the Result Memory Address is changed (from 1) to 0.

When handshake is set to [OFF]



- (1) The measurement data (A) is written to the Data Memory Address.
- (2) After the measurement data is written, 1 is written to the Result Memory Address.
- (3) After the PLC reads the measurement data, the Result Memory Address is changed (from 1) to 0.
- (4) This enables the writing of the next measurement data (B), and it is written to the Data Memory Address.
- (5) In the same manner as step (2), after the measurement data is written, 1 is written to the Result Memory Address.
- (6) After the PLC reads the measurement data, as soon as the subsequent measurement data (C) can be written, it is written to the Data Memory Address even if the Result Memory Address has not been changed (from 1) to 0. Also, the 1 in the Result Memory Address is overwritten.

Changing the Data Output Unit Settings

Change the settings of the data output unit to output measurement data via the PLC-Link.

1 In Flowchart View, double-click the data output unit to change its settings.

The properties menu of the data output unit is displayed.

2 Click the [Output settings] tab.

3 Select data to output via the PLC-Link.

All of the output data and output order via the PLC-Link is specified in the [Output settings] tab of the data output unit.

- In the PLC-Link, all items are handled in units of 32 bits (2 words) regardless of the data type. All data with decimal points is written according to the settings of [Decimal Point] (Page 1-86).
- Every time a data output unit is executed, the measurement results specified in the output data setting are written to the Data Memory Address.
- After the data writing is complete, 1 is written to the Result Memory Address.

4 On the [Protocol Details] tab of the data output unit, specify the detailed settings for data output via the PLC-link.

Output Address Offset

Specify the offset value of the address to output the result data from the [Data Memory Address] set in the [Global PLC-Link] menu in the System Settings. The address to which the result data is output is displayed in the [Absolute Address] field.



If this address is the same as the output address of the other data output unit, the data will be overwritten.

Result Memory Address Offset

Specify the offset value of the address to output the output completion data from the [Result Memory Address] set in the [PLC-Link] menu in the System Settings. The address to which the output completion data is output is displayed in the [Absolute Address] field.



If this address is the same as the output address of the other data output unit, the data will be overwritten.

Handshake

Select whether to output result data after the output completion data is confirmed.

- ON:** Output result data after 0 is written in the Result Memory Address.
- OFF:** Output result data without waiting for 0 to be written in the Result Memory Address.

5 Click [OK].



The change will not take effect until you upload the program file to the controller.

Controlling the System via PLC-Link Using Polling Method (Command Control)

Set the controller to perform constant monitoring (polling) on the change in bits in the Command Execute Address to execute a specified custom command.



Point

- The PLC-Link cannot be used while the CC-Link, EtherNet/IP, PROFINET, or EtherCAT is enabled.
- When the polling method is selected, the overall response of the PLC-Link, including for only data output, may deteriorate when compared to being controlled by the PLC terminal.
- When you upload the system settings modified for PLC Link and then restart the controller to start operation, initialization is repeated until a connection to the PLC is established. If there is no response from the connected PLC, the "PLC communication has failed" warning is displayed every time initialization is performed (Default setting). If the warning continues to appear, check to see the PLC is connected correctly.



Reference

Refer to "List of Custom Instructions" (Page 2-120) for more details on the custom commands.

Command control via PLC-Link

To perform command control via the PLC-Link, commands can be specified in two ways:

[By Command No. \(Page 1-91\)](#)

Use the Command No. Address and Command Execute Address. Specify a desired command by writing its command number in the Command No. Address.

[By Execute Flags \(Page 1-93\)](#)

Use the Execute Flags Address. Specify a desired command by writing 1 in the Execute Flags Address corresponding to the command number.

Differences between the command specification methods

The table below shows the addresses used for control through each command specification method.

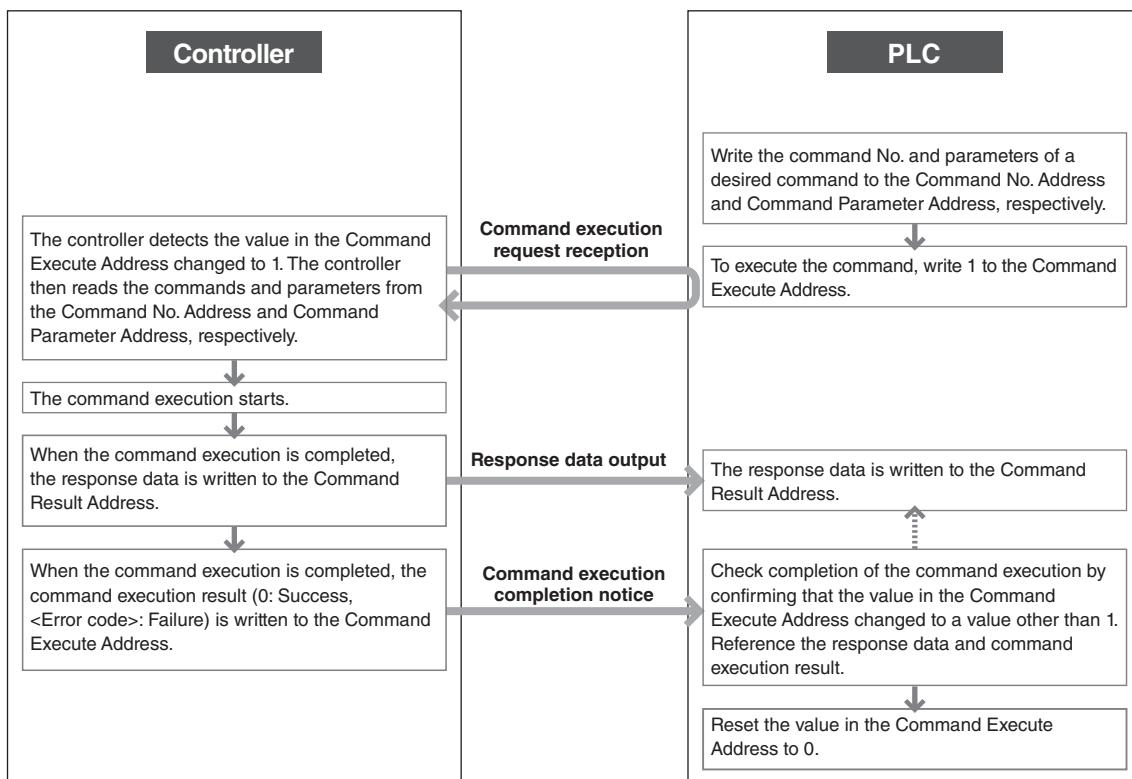
	Command specification	Parameter specification	Command execution	Command data output	Completion confirmation
By Command No.	Command No.		Command Execute	Command	Execute
No.	Address	Command Parameter	Address	Command Result	Address
By Execute Flags	Execute Flags	Address	Execute Flags	Address	Execute Flags
Flags			Address		Address

Control Using Command No. Address (By Command No.)

Send a command to the controller by inputting the appropriate command number in the Command No. Address. When the polling method is used, the controller detects the change in bits in the Command Execute Address and executes the corresponding command.

Command processing flow using the polling method and By Command No.

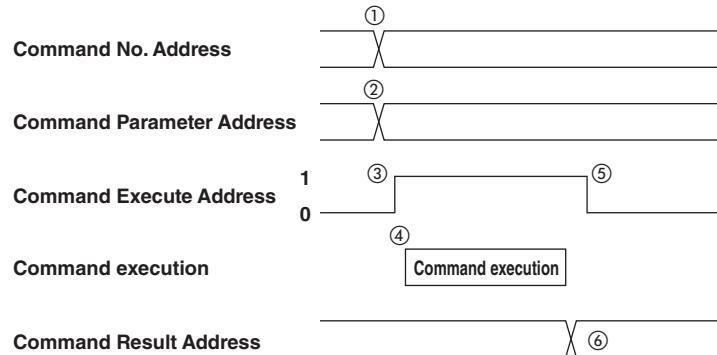
A command is executed between the controller and the PLC in the following manner.



Reference

Refer to "When an error occurs on command acceptance" (Page 2-6) for more details on error codes.

Timing Chart (Command processing flow using the polling method and By command number)



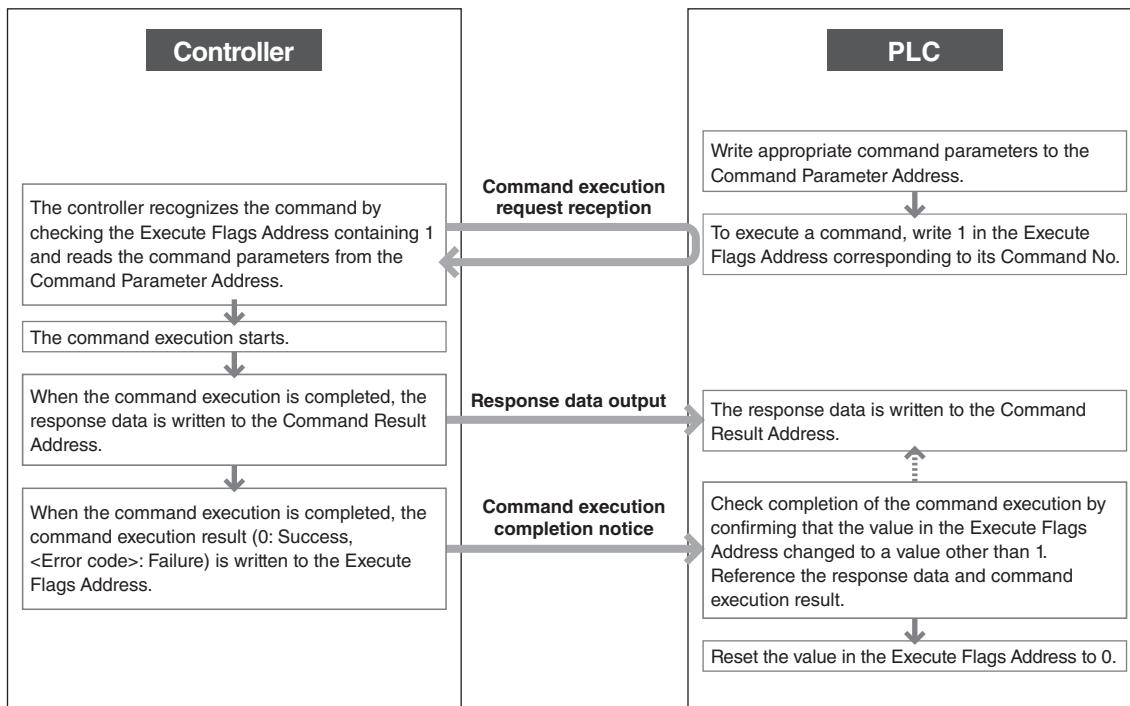
- (1) Write a desired custom command number in the command number address.
- (2) If a command parameter is required, write the command parameter in the command parameter address.
- (3) Change the Command Execute Address (from 0) to 1 at a desired timing to execute the command.
- (4) Command is executed.
- (5) When the command execution is normally ended, 0 is written in the Command Execute Address. (If the command cannot be executed and an abnormal end occurs, the error code is written.)
- (6) If a response data is available, the Command Result Address is read synchronously with (5).

Control Using Execute Flags Address (By Execute Flags)

Control the system by entering "1" in the data memory that corresponds to a desired custom instruction. This data memory begins at the [Execute Flags Address]. When the polling method is used, the controller detects the change in any bits in the Execute Flags Addresses and executes the corresponding command.

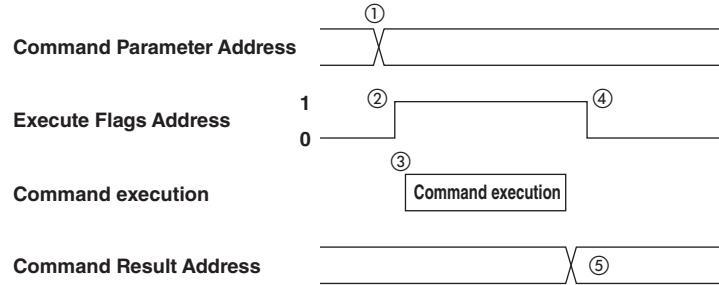
Command processing flow using the polling method and By Execute Flags

A command is executed between the controller and the PLC in the following manner.



Reference

Refer to "When an error occurs on command acceptance" (Page 2-6) for more details on error codes.

Timing Chart (Command processing flow using the polling method and By Execute Flags)

- (1) If a command parameter is required for the desired command to be executed, write the command parameter in the command parameter address.
- (2) Change the Execute Flags Address (from 0) to 1 corresponding to the desired custom command to be executed.
- (3) Command is executed.
- (4) When the command execution is normally ended, 0 is written in the Execute Flags Address in (2). (If the command cannot be executed and an abnormal end occurs, the error code is written.)
- (5) If a response data is available, the Command Result Address is read synchronously with (4).

Controlling the System via PLC-Link Using a PLC Terminal (Command Control)

Custom instructions are executed when the input terminal assigned with %Plc is directly turned on or off.

- %Plc needs to be assigned to one of the terminals via the controller global setting “Input Assignments” screen. See “1. Wiring overview” (Page 1-76) for more details.
- The wiring needs to be connected to the terminal to which %Plc has been assigned. See “1. Wiring overview” (Page 1-76) for more details on the controller and PLC wiring.



- The PLC-Link cannot be used while the CC-Link, EtherNet/IP, PROFINET, or EtherCAT is enabled.
- When you upload the system settings modified for PLC-Link and then restart the controller to start operation, initialization is repeated until a connection to the PLC is established. If there is no response from the connected PLC, the “PLC communication has failed” warning is displayed every time initialization is performed (Default setting). If the warning continues to appear, check to see if the PLC is connected correctly.



Refer to “Control via commands” (Page 2-2) for more details on the custom commands.

Command control via PLC-Link

To perform command control via the PLC-Link, commands can be specified in two ways:

[By Command No. \(Page 1-96\)](#)

Use the Command No. Address and Command Execute Address. Specify a desired command by writing its command number in the Command No. Address.

[By Execute Flags \(Page 1-98\)](#)

Use the Execute Flags Address. Specify a desired command by writing 1 in the Execute Flags Address corresponding to the command number.

Differences between the command specification methods

The table below shows the addresses used for control through each command specification method.

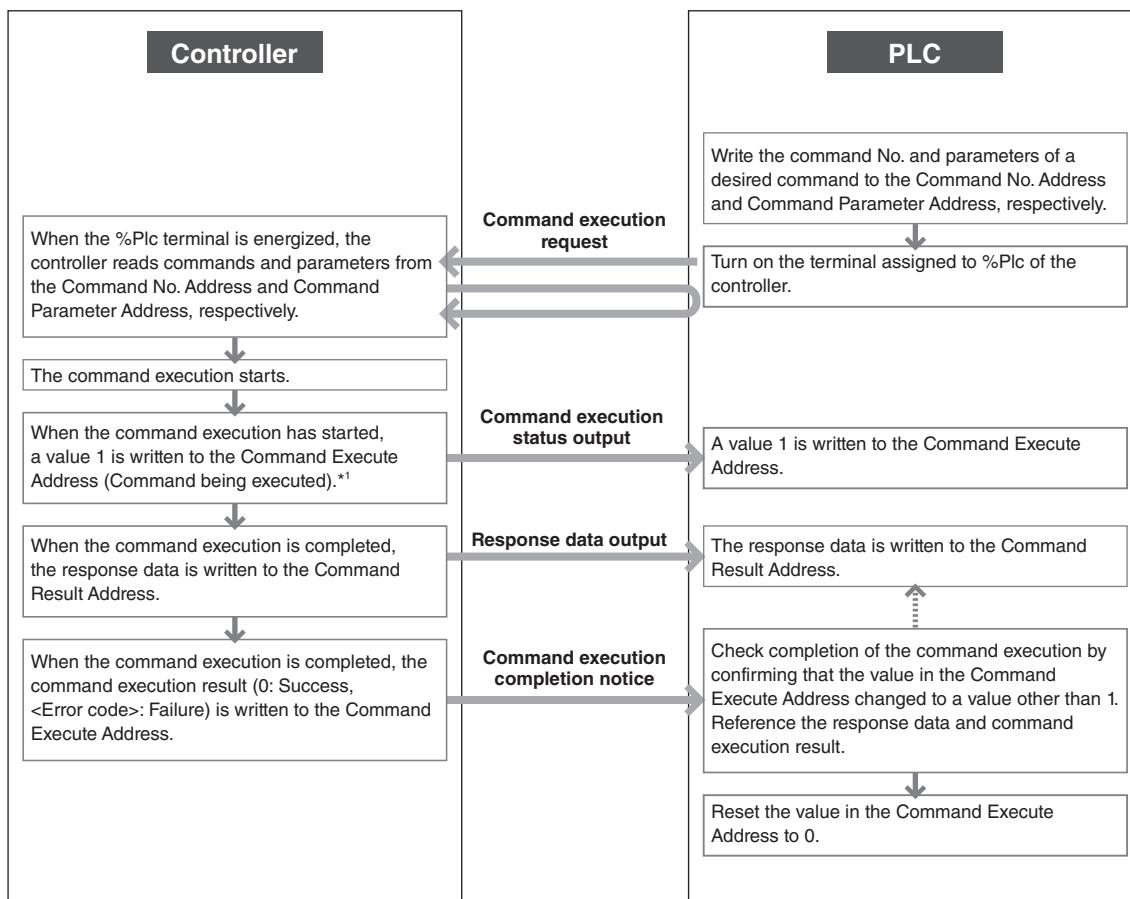
	Command specification	Parameter specification	Command execution	Command data output	Completion confirmation
By Command No.	Command Address				Command Execute Address
No.		Command Parameter	PLC terminal	Command Result Address	
By Execute Flags	Execute Flags Address			Address	Execute Flags Address

Control Using Command No. Address (By Command No.)

Control the system by inputting the command number of a desired custom command in the Command No. Address.

Command processing flow using the PLC terminal and By Command No.

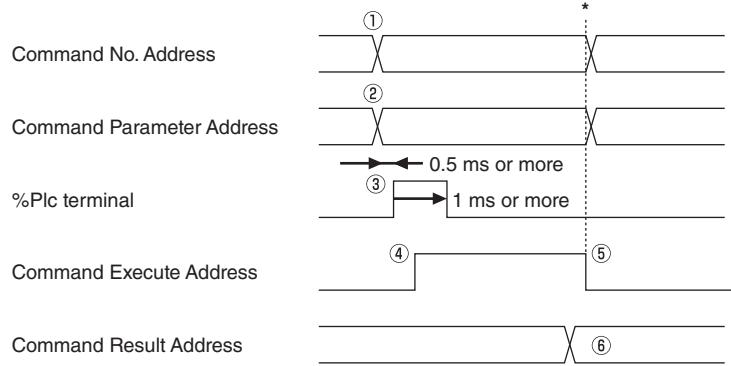
A command is executed between the controller and the PLC in the following manner.



*1 In some cases where the command could not be executed, an error code may be written to the Command Execute Address instead of "1".

Reference Refer to "When an error occurs on command acceptance" (Page 2-6) for more details on error codes.

Timing Chart



* The values of the Command No. Address or command parameters must be kept on until the Command Execute Address is changed to 0.

- (1) Write a desired custom command number in the command number address.
- (2) If a command parameter is required, write the command parameter in the command parameter address.
- (3) Energize (turn ON) the %Plc terminal at the desired timing to execute the command.
- (4) When the command execution is started, 1 is written in the Command Execute Address.
- (5) When the command execution is normally ended, 0 is written in the Command Execute Address. (If the command cannot be executed and an error occurs, the error code is written to the Command Execute Address.)
- (6) If a response data is available, the Command Result Address is read synchronously with (5).

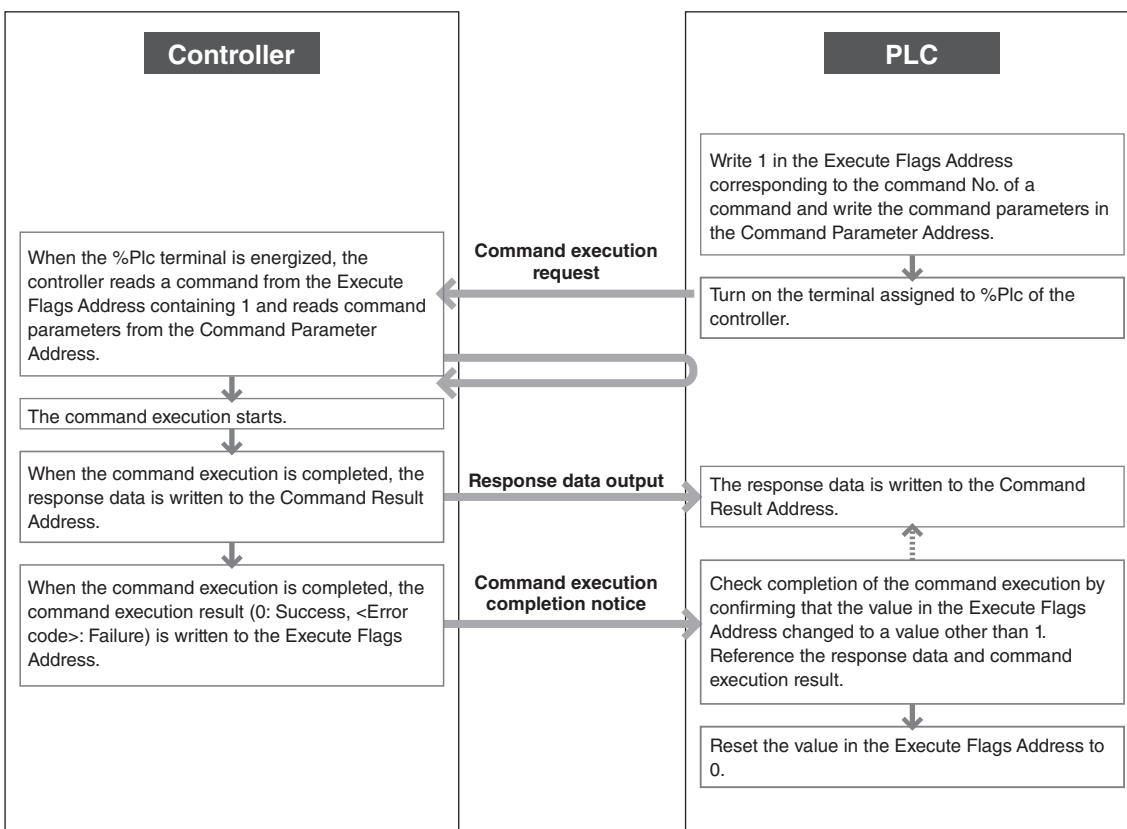
Control Using Execute Flags Address (By Execute Flags)

Control the system by entering "1" in the data memory that corresponds to a desired custom instruction. This data memory begins at the [Execute Flags Address].

Command processing flow using the PLC terminal and By Execute Flags

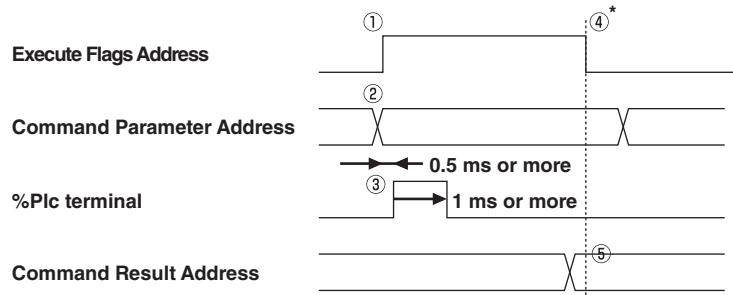
A command is executed between the controller and the PLC in the following manner.

Reference When command execution is attempted while two or more Execute Flags Addresses store 1, only one command, that with the smallest command number, will be executed.



Reference Refer to "When an error occurs on command acceptance" (Page 2-6) for more details on error codes.

Timing Chart



* The values of the command parameters must be kept on until the Execute Flags Address is changed to 0.

- (1) Change the Execute Flags Address from 0 to 1 corresponding to the desired custom command to be executed.
- (2) If a command parameter is required, write the command parameter in the command parameter address.
- (3) Energize (turn ON) the %Plc terminal at the desired timing to execute the command.
- (4) When the command execution is normally ended, 0 is written in the Execute Flags Address. (If the command cannot be executed and an error occurs and the error code is written.)
- (5) If response data is available, the command data output address is read synchronously with (4).

Typical PLC-Link Setting Procedure

This section explains the operation example to connect the XG-X Series to the Keyence KV Series, output measured/judgment values and control the controller with the PW command using PLC-link.

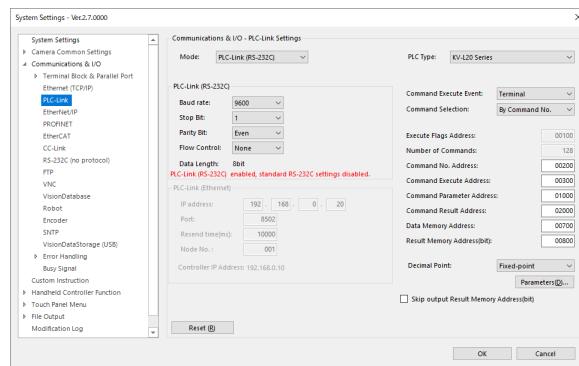
Connecting to the PLC (For the RS-232C interface)



If the settings pertaining to the KV series PLC link are not completed, first set the KV series side settings (Page 1-101).

1. Checking the system settings of the XG-X Series

- 1** Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.
- 2** On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.
- 3** In the [System Settings] screen, select [Communications & I/O] - [PLC-Link].
- 4** Change the PLC-Link settings.



The following setting values are used in this example
(Change them according to the device to be connected.).

[Communications & I/O - PLC-Link Settings]

- **Mode:** PLC-Link (RS-232C)
- **PLC Type:** KV-L20 Series
- **Command Execute Event:** Polling
- **Command Selection:** By Command No.
- **Command No. Address:** 00200
- **Command Execute Address:** 00300
- **Command Parameter Address:** 01000
- **Command Data Address:** 02000
- **Data Memory Address:** 00700
- **Result Memory Address(bit):** 00800
- **Decimal Point:** Fixed-point (Decimal Precision: 1/1000)

[PLC-Link (RS-232C)]

- **Baud rate:** 115200
- **Stop Bit:** 1
- **Parity Bit:** Even
- **Flow Control:** None
- **Data Length:** 8 bit (Fixed)

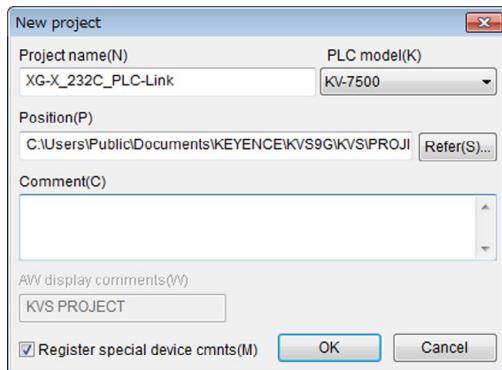
- 5** Select [OK].

The changes are saved.

- 6** Upload the system settings to the controller and then restart the controller.

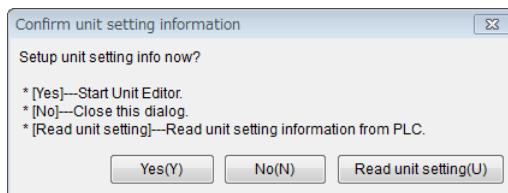
2. Changing the KV series settings

- 1** Start up the KV STUDIO with the computer and PLC connected, select [New project] from the [File] menu.
- 2** After entering the [Project name], select [PLC model], then click [OK].

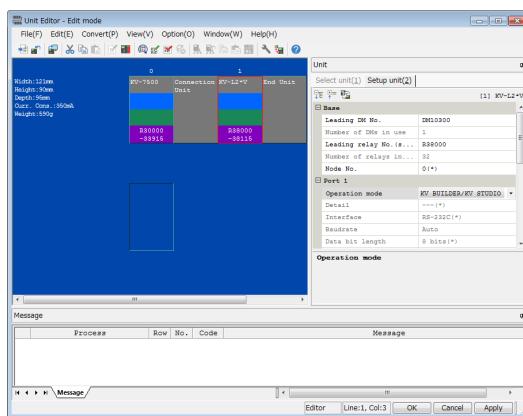


The [Confirm unit setting information] screen is displayed.

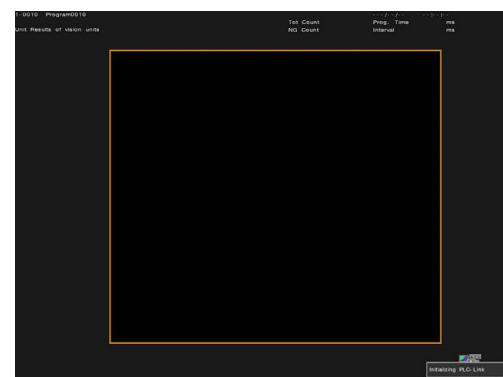
- 3** Click [Read unit setting].



- 4** Select inside the workspace the link unit which is to be connected to the XG-X series via RS-232C, and after starting up the [Unit Editor], change the [Operation mode] for [Port 1] in the [Setup unit(2)] tab to [KV BUILDER/KV STUDIO mode].



- 5** Select [Convert] - [Auto-assign relay/DM] in the Unit Editor, and assign the devices.
- 6** Save the changes, then close the Unit Editor.
- 7** Select [Transfer to PLC] from the KV STUDIO [Monitor/Simulator] menu, and forward the setting details to the KV series.
- 8** Restart both the XG-X series and the KV series.



If [Initializing PLC-Link] disappears after being momentarily displayed at the bottom right of the screen, then the link establishment is successful.

When [PLC-Link communication has failed.] is displayed.

The establishment of the link has failed. Confirm the XG-X series and KV series settings.

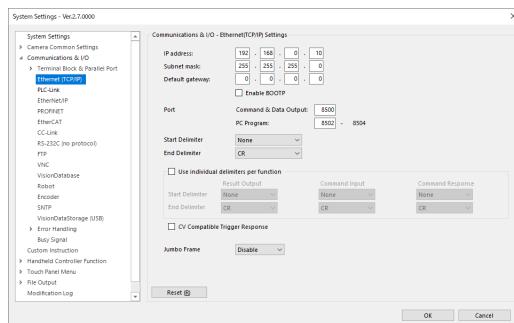
Connecting to the PLC (For the Ethernet interface)



If the settings pertaining to the KV series PLC links are not completed, first set the KV series side settings (Page 1-101).

1. Checking the system settings of the XG-X Series

- 1** Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.
- 2** On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.
- 3** In the [System Settings] screen, select [Communications & I/O] - [Ethernet (TCP/IP)].
- 4** Change the Ethernet settings.

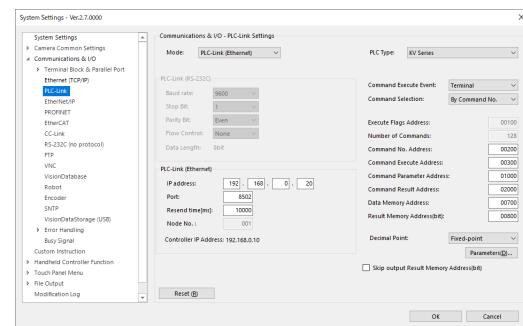


The following setting values are used in this example
(Change them according to the device to be connected.).

- **IP address:** 192.168.0.10
- **Subnet mask:** 255.255.255.0
- **Default gateway:** 0.0.0.0

- 5** In the [System Settings] screen, select [Communications & I/O] - [PLC-Link].

- 6** Change the PLC-Link settings.



The following setting values are used in this example
(Change them according to the device to be connected).

[Communications & I/O - PLC-Link Settings]

- **Mode:** PLC-Link (Ethernet)
- **PLC Type:** KV Series
- **Command Execute Event:** Polling
- **Command Selection:** By Command No.
- **Command No. Address:** 00200
- **Command Execute Address:** 00300
- **Command Parameter Address:** 01000
- **Command Result Address:** 02000
- **Data Memory Address:** 00700
- **Result Memory Address(bit):** 00800
- **Decimal Point:** Fixed-point (Decimal Precision: 1/1000)

[PLC-Link (Ethernet)]

- **IP address:** 192.168.0.20
- **Port:** 8502
- **Resend time[ms]:** 10000



Since the communications destination will be the KV series, enter the KV series IP address and port which are to be connected to in the [PLC-Link (Ethernet)] field.

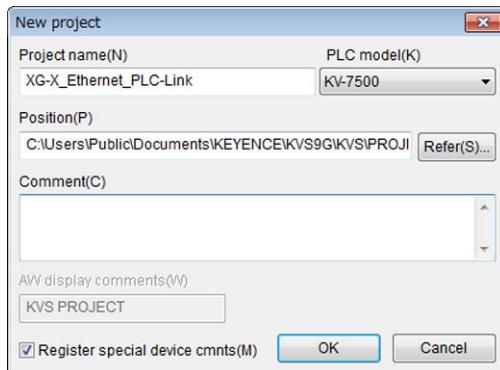
- 7** Select [OK].

The changes are saved.

- 8** Upload the system settings to the controller and then restart the controller.

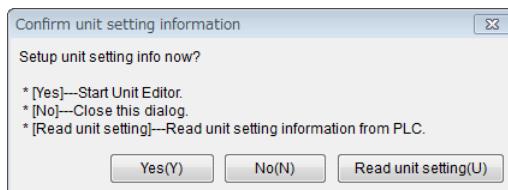
2. Changing the KV series settings

- 1 Start up the KV STUDIO with the computer and PLC connected, select [New project] from the [File] menu.**
- 2 After entering the [Project name], select the [PLC model], then click [OK].**



The [Confirm unit setting information] screen is displayed.

- 3 Click [Read unit setting].**

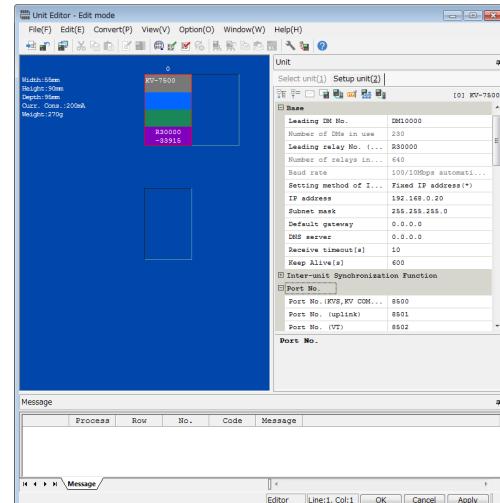


- 4 Select inside the workspace the link unit which is to be connected to the XG-X series via Ethernet, and after starting up the [Unit Editor], set the KV series IP address and port number in the [Setup unit(2)] tab.**

- IP address: 192.168.0.20 (enter the [IP address] which was set via step 6 of "1. Checking the system settings of the XG-X Series" (Page 1-102))
- Subnet mask: 255.255.255.0
- Port number (VT): 8502

Reference

When connecting multiple devices whose IP addresses are different, there is not a problem even if the port numbers are identical.

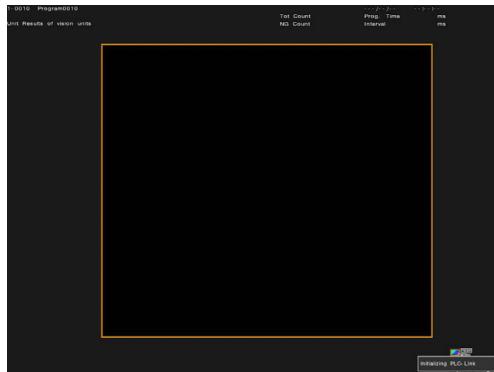


- 5 Select [Convert] - [Auto-assign relay/DM] in the Unit Editor, and assign the devices.**

- 6 Save the changes, then close the Unit Editor.**

- 7 Select [Transfer to PLC] from the KV STUDIO [Monitor/Simulator] menu, and forward the setting details to the KV series.**

8 Restart both the XG-X series and the KV series.



If [Initializing PLC-Link] disappears after being momentarily displayed at the bottom right of the screen, then the link establishment is successful.

When [PLC-Link communication has failed.] is displayed.

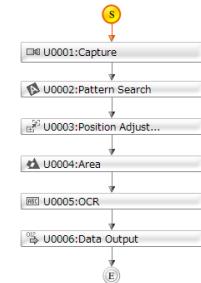
The establishment of the link has failed. Confirm the XG-X series and KV series settings.

Outputting Measured/Judgment Values

1. Setting the output data (Data output unit)

To output various kinds of measured/judgment values, use the "Data output unit." This section describes how to assign the measured/judgment values of the following units to a data output unit as data to be output.

- Total status judgment of the flowchart (%JgAll)
- U0002: Pattern search (Position X)
- U0002: Pattern search (Position XY)
- U0004: Area (Area)
- U0005: OCR (Line 1 result string)
- Variable #a
- Variable #b
- U0002: Pattern search (Unit judgment value)
- U0004: Area (Unit judgment value)
- Processing time (%PrcTime)
- Processing start date (%PrcDay)

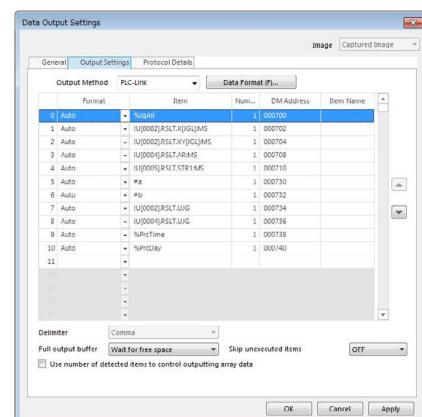


1 Add a "Data output unit" at the end of the flowchart.

The setting screen of the added "data output unit" is displayed.

2 Select [PLC-Link] for [Output Method] on the [Output Settings] tab.

3 From the parts list, drag and drop measured/judgment values you want to output to assign them into the [Item] column.



Other than dragging and dropping from the parts list, you can enter values directly.

4 Check the DM address used for the output.

- When you assign data in the [Item] column, the output destination DM address is automatically displayed in the [DM Address] column.
- The DM address start position will be the place which is specified via the [Data Memory Address] in [Communications & I/O - PLC-Link Settings] of the XG-X VisionEditor [System Settings] screen (In the above example, it is DM700).

2. Checking output forms and output flows to the DM

1 Check the DM and word counts which are going to be used in the result outputs.

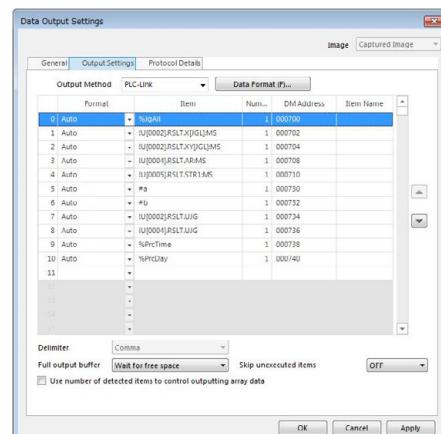
See the [Data Memory Address] and the [Result Memory Address] of the [Communications & I/O - PLC-Link Settings] in the XG-X VisionEditor [System Settings] screen.

- Data Memory Address: Specify the first data memory address of the addresses which are going to store the result data from the Data output unit. The addresses which are to be used are 2 words per 1 data item (for characters, 2 words per 1 character). The DM700 is first in the example on the left, and 1 result data is stored in 2 word increments.
- Result Memory Address: specifies the data memory which writes the [1] that denotes the output completion of the result data.

The address which is used is 1 word.

2 Checking storage examples to the result data DM.

The Data output unit in the flow is set to output the result data as per the following.



- Total status (OK=0 / NG=1)
- U0002: Pattern search position X (284.868)
- U0002: Pattern search position XY (X=284.868 / Y=196.223)
- U0004: Area (17839)
- U0005: OCR 1st row character string. (KEYENCE)
- Variable #a (95)
- Variable #b (348.267)
- U0002: Pattern search unit judgment value (OK=0 / NG=1)
- U0004: Area unit judgment value (OK=0 / NG=1)
- Processing time (67.477ms)
- Processing start date (%PrcDay) (24)

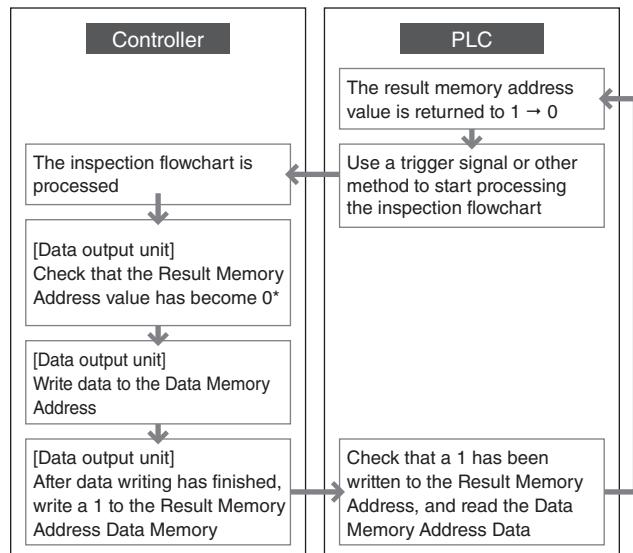
For the PLC data is stored as per the following

This is an example of the screen when the KV STUDIO [Registration monitor] functions are used for checking.

Program	Device	destina	Current value	Display format
Global	DM700	-	1	DEC 32BIT
Global	DM702	-	284868	DEC 32BIT
Global	DM704	-	284868	DEC 32BIT
Global	DM706	-	196223	DEC 32BIT
Global	DM708	-	17839	DEC 32BIT
Global	DM710	-	K ASCII116BIT	
Global	DM712	-	E ASCII116BIT	
Global	DM714	-	Y ASCII116BIT	
Global	DM716	-	E ASCII116BIT	
Global	DM718	-	N ASCII116BIT	
Global	DM720	-	C ASCII116BIT	
Global	DM722	-	E ASCII116BIT	
Global	DM724	-	- ASCII116BIT	
Global	DM726	-	- ASCII116BIT	
Global	DM728	-	- ASCII116BIT	
Global	DM730	-	95000	DEC 32BIT
Global	DM732	-	348267	DEC 32BIT
Global	DM734	-	0	DEC 32BIT
Global	DM736	-	1	DEC 32BIT
Global	DM738	-	67477	DEC 32BIT
Global	DM740	-	24	DEC 32BIT
Global	DM600	-	1	DEC 16BIT

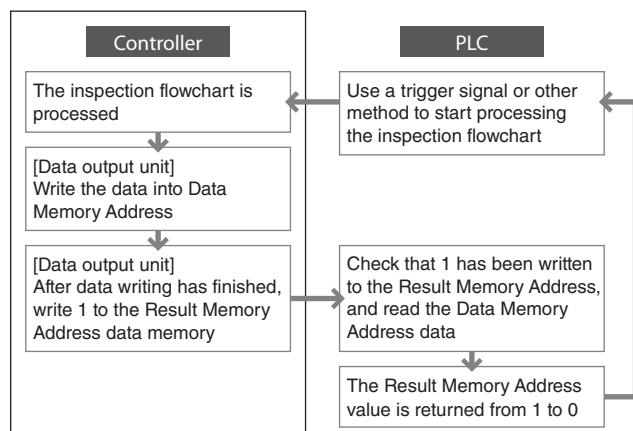
- Judgment values are stored by using two words to show 0 (OK) or 1 (NG).
- Decimal type data is multiplied by 1000 and stored by using two words: 284.868 to 284868
- When XY data is output, the data is stored in the order of X and Y by using two words for each.
- Integer type data is stored directly by using two words.
- Character data is stored as ASCII code by using two words for each character (Only in the case of OCR2 unit Trimmed String is one byte used for one character so that two words are used to store a unit of four characters.).
- When data is output as "string", the number of DM used varies depending on the specified number of characters. This example outputs the "number of characters on the first line" of the OCR unit and the string is seven characters of "KEYENCE". However, since [L1: Number of Characters] for [Block Setup] is set to 10, the range of 20 words (10 characters) from DM710 to DM729 are used. Changing the number of characters setting affects all the subsequent DM settings. It is recommended to set an item which may be changed at the end of the Data output unit.
- Variables are multiplied by 1000 and stored by using two words: 95 to 95000, 348.267 to 348267
- Judgment values are stored by using two words to show 0 (OK) or 1 (NG).
- For system variables, integer type data is stored as is while decimal type data is multiplied by 1000. They are stored by using 2 words.
- Result Memory Address (1 when data output is completed)

Typical data output flow (Handshake: ON)



- If the Result Memory Address value is left as a 1, the data is stored in the output buffer, but it is not written to the output address. The data which is stored in the buffer is written the next time the Result Memory Address becomes 0. If the inspection flowchart keeps on being executed with the Result Memory Address left as a 1, the output buffer will overflow, so be aware that trigger inputting will no longer be usable.

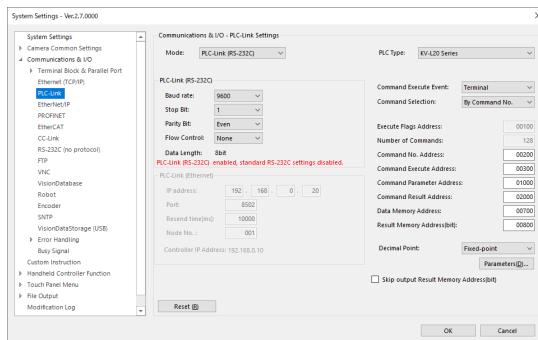
Typical data output flow (Handshake: OFF)



Controlling the Controller

1. Checking the system settings of the XG-X Series

- 1 Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.
- 2 On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.
- 3 In the [System Settings] screen, select [Communications & I/O] - [PLC-Link].
- 4 Check the various setting items required for controlling the controller.



Command Execute Event and Command Selection

Here the procedures for when the command execute event: Polling, and the command selection: By command no. were selected are explained.

The data memory which is to be used

The data memory address which is to be used can be optionally changed. Be careful here so that the specified address does not conflict with the data memory which is being used by the PLC's other programs.

- Command No. Address
- Command Execute Address
- Command Parameter Address
- Command Data Address

5 Select [OK].

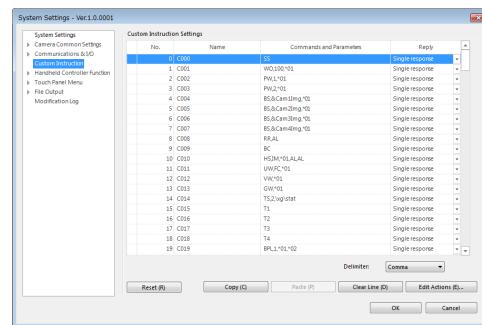
The changes are saved.

6 Upload the system settings to the controller and then restart the controller.

2. Example of command execution procedure: Switch program No. (PW)

The following is a typical example of the command execution procedure. This example uses the PW command (Change Program) which uses a command parameter.

- 1 In the [System Settings] screen of the XG-X VisionEditor, select [Custom Instruction] and check the command details.



- With the default setting assignments, there are the PW commands, [PW, 1, *01] which switches to an SD1 setting number and the [PW, 2, *01] which switches to an SD2 setting number.

- Here the procedures for executing the [PW, 1, *01] that switches to an SD1 setting number are explained.
- The command No. is [2], and, since [*01] is written in the Commands and Parameters column, we know that a command parameter is used.

Specify the program setting number that is to be switched to for [*01] (this time it is switched to program setting number 11).

- 2 Enter the command No. to the data memory which corresponds to the PLC's Command No. Address and enter the program setting No. to switch to in the data memory that corresponds to the Command Parameter Address.

Here enter the [2] which is the PW command number into DM200, and here enter the switching destination program setting number [11] into DM1000.

The addresses which are to be used, are a command no. address that is 1 word, and a command parameter address that is 2 words.

- 3 Write a 1 to the data memory (here DM300) which corresponds to the PLC command number execute address.

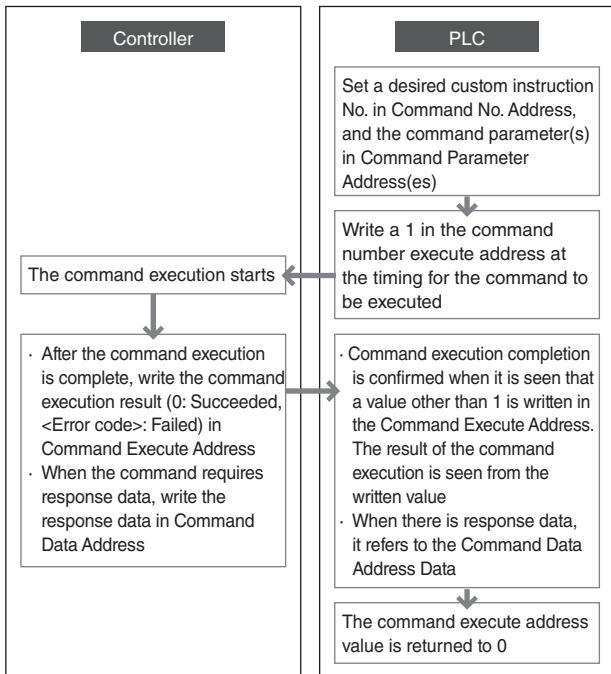
The address used is 1 word.

The PW command (program setting number switching) will be executed.

4 Check the change in the value in the data memory (here DM300) which corresponds to the PLC command number execute address.

- Command instruction success: the XG-X series writes [0].
- Command instruction failure: the XG-X series writes [Error code].

Typical command processing flow



Checking the PLC-Link Communication Status

(PLC-Link Monitor & Diagnostics)

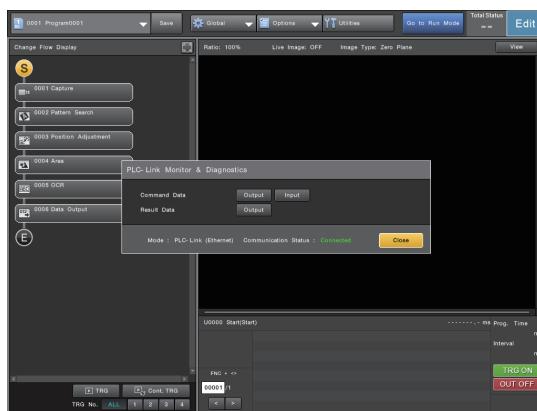
You can check the system's PLC-Link I/O signal communication status with this function. This function is convenient because it allows you to check communications content when connected to an external device in situations such as when the appropriate data cannot be communicated between connected devices.



The monitor cannot be used when [Enable/Disable] for PLC-Link is [Disable] or when PLC-Link is not connected. First establish a PLC-Link connection before using the monitor.

1 From the [Utilities] menu at the top of the screen, select [PLC-Link Monitor & Diagnostics].

The [PLC-Link Monitor & Diagnostics] screen is displayed.

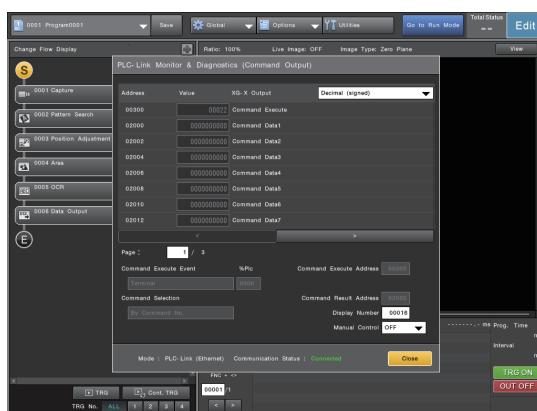


2 Select the item you wish to check.

Select the command data (output from the system/input to the system) or result data.

3 Now check the communication status.

Command Output screen

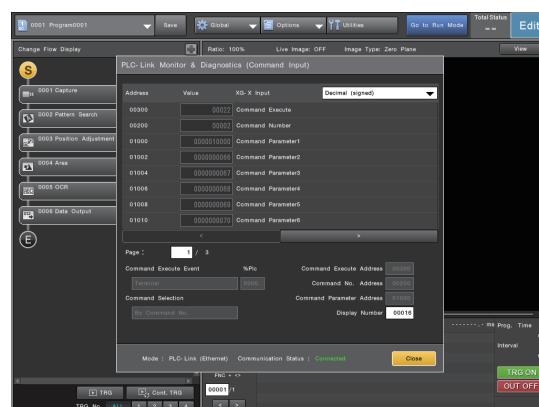


Since the Command Execute Address of address 300 is 22, the command to be executed is found to be an error (22 is a parameter error code).

- Command Execute Event:** Displays the command execution method (not to be changed) by the controller selected in the system settings when the PLC-Link is used.
- %Pc:** It is displayed when the Command Execute Event is "Terminal": It indicates the number of times when %Pc is ON (not to be changed).
- Command Selection:** Displays the Command Execute Event (not to be changed) selected in the system settings.
- Command Execute Address:** Displays the command No. input control address (not to be changed) selected in the system settings.
- Command Result Address:** Displays the command data output address (not to be changed) selected in the system settings.
- Display Number:** The display number for desired data to be monitored can be set.
- Manual Control:** ON/OFF can be selected only in setup mode. When it is ON, the address value can be forcibly changed.
- Using the down arrow at the upper right corner of the screen, you can select the value to monitor from Hexadecimal, Decimal (unsigned), or Decimal (signed).

Command Input screen

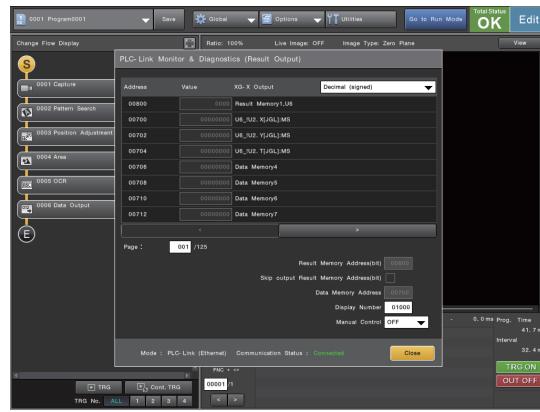
Example when "PW,1,*1" is set to custom command No. 2



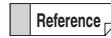
When the Command No. Address of address 200 is 2 (Program No. is switched) and the command is executed with the Command Parameter 1 of address 1000 being 10000 (switched-to setting No. 10000), the Command Execute Address of address 300 is 22, which points out to a parameter error. (Setting of No. 10000 cannot be selected.)

Result Output screen

Example of the setting where you output the XYθ data of the vision unit 0002 from the data output unit 0006.



You can see that the XYθ data of the unit 0002 in the controller is output to address 700 (X), address 702 (Y), and address 704 (θ).



In setup mode, communication output other than response for external input commands is not performed. If you want to check the data output operation, switch to run mode.

4 Select [Close].

Troubleshooting

If operation is not correct

A message "Initializing PLC-Link *th time" appears repeatedly in the lower right of the screen.

The PLC-Link communication with the PLC has failed. Initializing must be performed for re-connection. Check the PLC-Link communication settings, connecting cable and connecting device.

When the trigger command is issued through PLC-Link, the image capture time is delayed compared to the trigger signal input from the terminal block.

There may be a slight lag between the command request and command execution compared to the command request over the terminal block. Variation can be large, especially when polling is used.

Data cannot be correctly retrieved due to change of the %Sto output at the leading edge from the external terminal.

Since %Sto is the data strobe signal of the parallel terminal output unit, it cannot be used as the strobe signal of the data output unit.

For the data read timing with the PLC-Link, refer to the Result Memory Address.

Although PLC-Link communication is established, data cannot be written to the PLC.

The range of the writable data memory is limited. Check the writable range of the PLC.

The communication status is monitored with the RS-232C monitor, but characters are garbled.

The RS-232C monitor is not compliant with monitoring of communications used in the PLC link communication.

Error Messages

Error Messages Assigned to System Variable %Error0.

The errors messages below are assigned to %Error0 by default.

The errors assigned to %Error0 can be removed or switched to %Error1 as desired.

Error Message	Cause	Corrective Action	Error Code
PLC-Link communication has failed.	A connection error occurred with the PLC when the [PLC-Link (RS-232C)] or [PLC-Link (Ethernet)] function was enabled.	<ul style="list-style-type: none"> Check the connection with the PLC and the settings of the PLC. If PLC-Link is not used, change communication mode to [Disable]. If the error message is displayed after a trigger input, check that the data memory destination specified is in the range that meets the PLC format. 	112

Errors Messages not Assigned to System Variables %Error0 or %Error1

These errors by default are not assigned to %Error0 or %Error1 but can be assigned through the XG VisionEditor software.

Error Message	Cause	Corrective Action	Error Code
The controller output buffer for outputting via PLC-Link is full.	The controller output buffer for outputting via PLC-Link is full.	Extend the time between triggers / processing to allow for data to be output. Note: Results data are not written when the buffer is full.	115
PLC-Link output buffer is full.	The controller output buffer for outputting via PLC-Link is full due to the amount of data attempting to be outputted.	Reduce the amount of data to be output via PLC-Link, so the buffer does not start filling up. Extend the time between triggers / processing to allow for data to be output. Note: Inspections can be put on hold until the buffer becomes free.	116
External command error has occurred.	An error occurred when executing a command from one of these devices: <ul style="list-style-type: none"> PC Program PLC-Link Ethernet RS-232C CC-Link External terminals EtherNet/IP PROFINET EtherCAT 	Review the command being sent, the program settings or the device status.	128

Control/Data Output via CC-Link

Overview of System Control/
Data Output

Control/Data Output via
External Terminals

Control/Data Output via PLC-
Link

▶ Control/Data Output via CC-Link

Control/Data Output via
EtherNet/IP

Control/Data Output via
PROFINET

Control/Data Output via
EtherCAT

Control/Data Output via
No protocol communication

FTP Client/Server Function

Overview of the Control/ Data Output via CC-Link

When the controller is connected to the CC-Link unit CA-NCL20E (option), it can be operated as a remote device station using CC-Link Ver. 1.10/Ver. 2.00.

The CC-Link connection enables the following functions.

- Controlling the system via CC-Link: Custom instructions can be sent through CC-Link to control the system.
- Outputting data via CC-Link: The output destination of the data output unit can be set to CC-Link to output data from the word devices.
- I/O control via CC-Link: When control system variables are assigned to the CC-Link bit devices, the input/output can be controlled in the same way as the terminal block interface or parallel I/O interface of the controller.
- Changing variable values via CC-Link: When special system variables are assigned to the CC-Link, their values can be changed efficiently from an external device (variable synchronization).



Point

- Since the CC-Link performs communications through the link scan, if the signal fluctuates at high speed, the CC-Link may not be able to pick up these fluctuations.
- The scan cycle varies depending on the "Count," "Cycles," and "Settings of other devices on the network." Keep this and the signal variation time in mind when using the CC-Link.
- CC-Link and PLC-Link, EtherNet/IP, PROFINET or EtherCAT cannot be used at the same time (CC-Link cannot be used when PLC-Link, EtherNet/IP, PROFINET or EtherCAT is enabled).



The controller communicates with the master station as a remote device station.

Operation Flow

Checking the CC-Link specifications (Page 1-115)

- Check the specifications of the CC-Link unit, CA-NCL20E, and precautions for wiring.
- Check the reserved address status or the customer-defined address of the word device.
- Check the reserved address assignment status or the customer-defined address of the bit device.



Changing the CC-Link Settings (Page 1-120)

To connect the controller via CC-Link, change the settings with the XG-X VisionEditor or the controller.

- Set the communication items such as station number, communication speed, protocol version, number of exclusive stations, etc.
- Check the assignment status of the word device and set offset.
- Check the assignment status of the bit device.



Establishing the CC-Link

- If the message "CC-Link communication has failed" appears, the link is not established.
- The link is established unless the error light of the master station (PLC) turns on.



Executing inspection process

Data output (Page 1-127)

- The data from the data output unit is written on the word device (RWr).
- Check data write completion with the Result ready flag.
- When the Result ack flag is ON, read completion is notified.

I/O control (Page 1-129)

- I/O can be controlled by assigning the System Variables to CC-Link.

Command control (Page 1-130)

- The custom command (Page 2-116) set in advance can be executed.
- Store the command code and the command parameter in the word device (RWw) and turn ON the command request flag to execute the command.
- When the command ready flag is ON, the command can be executed.
- Check execution of the command with the command complete flag.

Variable synchronization (Page 1-132)

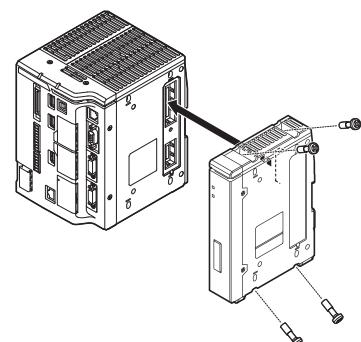
- The value of a special system variable for variable synchronization (%InDataFieldbus[]) assigned to the word device can be changed.

Preparing the CC-Link connection

Installing the CC-Link Unit

The optional CC-Link unit CA-NCL20E is used when communicating over CC-Link.

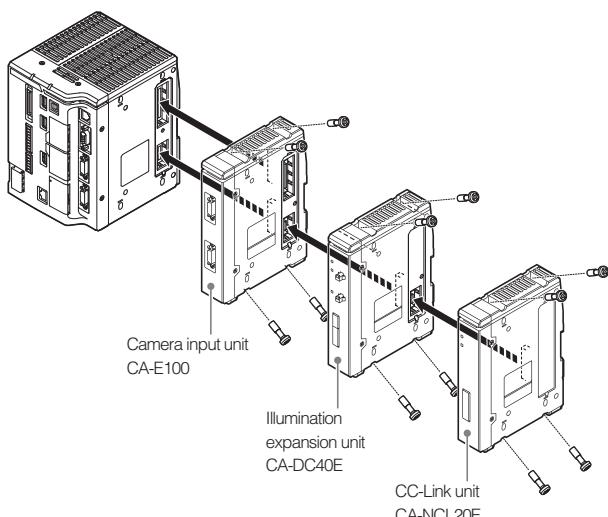
Remove the protective cover from the expansion unit connector on the right side of the controller and install the CC-Link unit as shown below.



- The controller must be turned off before connecting or disconnecting the CA-NCL20E.
- Restart the controller and master station after changing the CC-Link settings.

When Using the Illumination Expansion Unit and CC-Link Unit Together

Mount the camera input unit directly to the controller, then mount the illumination expansion unit and CC-Link unit to the right side of the camera input unit.



- Illumination expansion units and CC-Link units cannot be installed between camera input units and controllers.

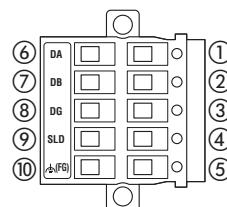
CA-NCL20E CC-Link Unit Specifications

Standard specifications

Item

CC-Link station type	Ver. 1.10 remote device station Ver. 2.00 remote device station
Communication speed	156 kbps, 625 kbps, 2.5 Mbps, 5 Mbps, 10 Mbps
Connection cable	Ver. 1.10 compatible CC-Link cable FANC-110SBH, FA-CBL200PSBH, CS110 OP-79426, OP-79427
Max. total cable length	156 kbps 1200 m 625 kbps 900 m 2.5 Mbps 400 m 5 Mbps 160 m 10 Mbps 100 m
Count	Selectable from 1 station, 2 stations, 3 stations, or 4 stations
Cycle (Ver.2.00 only)	Selectable from 1x, 2x, 4x, and 8x

Connector Specifications



No.	Wire color	Signal name	Function
1, 6	Blue	DA	Communication wire "DA" for CC-Link. Connects to the master station or other slave stations (1 and 6 are shorted).
2, 7	White	DB	Communication wire "DB" for CC-Link. Connects to the master station or other slave stations (2 and 7 are shorted).
3, 8	Yellow	DG	Communication wire "DG" for CC-Link. Connects to the master station or other slave stations (3 and 8 are shorted).
4, 9	Bare wire	SLD	Shield. Connect the shielded wire from the CC-Link Ver.
5, 10	-	FG	Frame ground "FG" for CC-Link. Ground per Class D earth* (100 W or less) (5 and 10 are shorted).

* Use a cable with a cross-section area of at least 2 mm² as the grounding cable.

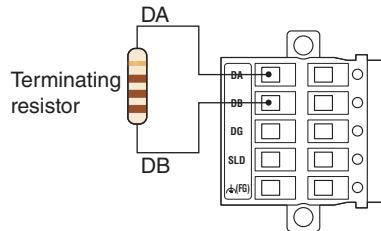
Connecting to the CC-Link Network

Precautions when wiring

Take note of the following when wiring the CA-NCL20E unit.

- When connecting the CA-NCL20E to a CC-Link network/device, always use a CC-Link Ver. 1.10 compatible cable or a cable approved by the CC-Link Partner Association. Correct operation cannot be assured when using another type of cable.
- When a CC-Link cable is used near a high voltage/current source or cable, electrical noise may cause operational errors. When using both a CC-Link cable and high voltage/current devices maintain at least 100 mm of separation between them.

CA-NCL20E terminating resistor installation

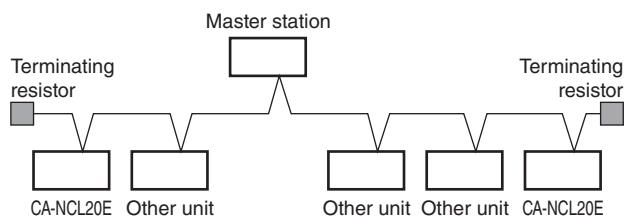


Reference

Because terminals 1 and 6, and terminals 2 and 7, are shorted, the terminating resistor can be installed either onto terminals 1 and 2, or onto terminals 6 and 7.

Terminating resistor

When connecting a CA-NCL20E unit to both ends of the CC-Link network, install a terminating resistor between CA-NCL20E terminals DA and DB. Make sure to install the terminating resistors, as they reduce signal noise and stabilize communications.



The terminating resistor will differ depending on the cable type

Two of each are shipped, one for terminating each end of the network with CA-NCL20E. Use the correct terminating resistor for the type of CC-Link cable being used.

Cable type	Terminating resistor
Ver. 1.10 compatible CC-Link cable FANC-110SBH, FA-CBL200PSBH, CS110 OP-79426, OP-79427	110Ω 1/2W
CC-Link cable	130Ω 1/2W
CC-Link high-performance cable	130Ω 1/2W

CC-Link Device Specifications and Reserved Address of the Controller

CC-Link Word Device Specifications

Word device address notation format

RWnnn

nnn: 3 digit decimal number



The same notation method is used for RWW.

Word device assignment to reserved address and user-definable address

RWr setting (example when the command area size is set to 128 words)

RWr	Worddevice name	Remarks
RWr000	Command Result	The command execution result is written (0: Success, <Error code>: Failure).
RWr001		
RWr002	Command Data1	The first command response data is written.
RWr003	Command Data1	
RWr004	Command Data2	The second command response data is written.
RWr005	Command Data2	
...	Command Datann	
RWr126	Command Data63	The 63rd command response data is written.
RWr127	Command Data63	

User-definable address range^{*1}

*1 To assign data output to a specific word device, specify an offset value in the unit of two words from RWr000 in the [RWr offset] field in the [Advance] tab of the data output unit which uses CC-Link as the output destination.



- Ensure that the same RWr address is not assigned to the command result and response of the command control or to the result data of the data output unit. If the address assignment overlaps, different data is written to the same address at different times, which may affect data reading.

Example of overlapped address assignment:

When the data output unit U0020 is set to output one piece of data using RWr offset "002" via the CC-Link, and the data output and command response (command area size: 6 words) are used at the same time.

RWr	Word device name	First cycle	Second cycle
RWr000	Command Result		
RWr001			
RWr002	Command Data1,U0020	First command	Result data
RWr003	Command Data1,U0020	response of U0020	data
RWr004	Command Data2	Second	
RWr005	Command Data2	command ←	response data

The first command response data in RWr002/003 is overwritten with the result data in the second cycle.

- To use command control and data output at the same time via the CC-Link, set the [RWr offset] for the data output unit taking the command area size into account.

RWw setting (example when the command area size is set to 34 words and the starting offset assignment of system variables is set to 34 words)

RWw address	Worddevice name	Remarks
RWw000	Command Number	The custom instruction No. is written.
RWw001		
RWw002	Command Parameter1	The custom instruction argument "*01" is written.
RWw003	Command Parameter1	
RWw004	Command Parameter2	The custom instruction argument "*02" is written.
RWw005	Command Parameter2	
...	Command Parameternn	
RWw032	Command Parameter16	The custom instruction argument "*16" is written.
RWw033	Command Parameter16	
RWw034	%InDataFieldbus[0]	A specified value is written as the system variable for variable synchronization [0].
RWw035	%InDataFieldbus[0]	
RWw036	%InDataFieldbus[1]	A specified value is written as the system variable for variable synchronization [1].
RWw037	%InDataFieldbus[1]	
...		
RWw0126	%InDataFieldbus[46]	A specified value is written as the system variable for variable synchronization [46].
RWw0127	%InDataFieldbus[46]	

User-definable address range

- Point**
- The number of word addresses which can actually be used varies depending on the setting. Word addresses which cannot be used are grayed out in the list.
 - Ensure that the same RWw address is not assigned to the command No. and parameter for the command control or to the special system variable for variable synchronization. If the address assignment overlaps, improper data may be read which can cause errors.
 - To use command control and variable synchronization at the same time via the CC-Link, set [Starting offset of assignment of system variables] in [RWw list] by taking the command area size into account.

CC-Link Bit Device Specifications

Bit Device Address Notation Format

RXnnnx

- nnn: 3 digit decimal number
- x: 1 digit hexadecimal number

Reference The same notation method is used for RY.

Example:

RX000, RX001, …, RX009, RX00A, RX00B, …, RX00F, RX010, …, RX01F, RX020, …, RX09F, RX010F, RX0110, …, RX055F

Bit Device Assignment to Reserved Address and User-definable Address

RX setting

User-definable address range	RX address	Bit device name	Remarks
	RX0000	Command complete flag	Turns on when command processing is complete.
	RX0001	Command error flag	Turns off when command processing is successful and turns on when it fails.
	RX0002	Command ready flag	Turns on when command processes can be received.
	RX0003	Result ready flag	Turns on when data transmission is complete.
	RX0004	Result OR flag	Linked to %JgAll.*
	RX0005	Assignable bit device	
...		Assignable bit device	
	RX(mmm-1)F	Assignable bit device	
	RXmmm0	(Reserved)	Reserved.
...		(Reserved)	Reserved.
	RXmmmA	Error status flag	Linked to %Error0.
	RXmmmB	Remote ready flag	Linked to %Run.
...		(Reserved)	Reserved.
	RXmmmF	(Reserved)	Reserved.



The high order 5 bits and low order 16 bits of the RX addresses are reserved and no variable can be assigned.

RY setting

User-definable address range	RY address	Bit device name	Remarks
	RY0000	Command request flag	Requests command execution when the signal switches from OFF to ON.
	RY0001	InDataFieldbus sync inhibit flag	When this bit is ON, reading data of %InDataFieldbus[] is not allowed.
	RY0002	(Reserved)	Reserved.
	RY0003	Result ack flag	Provides notification of data acquisition when the signal switches from OFF to ON.
	RY0004	Assignable bit device	
...		Assignable bit device	
	RY(mmm-1)F	Assignable bit device	
	RYmmm0	(Reserved)	Reserved.
...		(Reserved)	Reserved.
	RYmmmA	Error reset request flag	Clears Error0 when the signal switches from OFF to ON (works the same as %Error0Clear).
		(Reserved)	Reserved.
	RYmmmF	(Reserved)	Reserved.



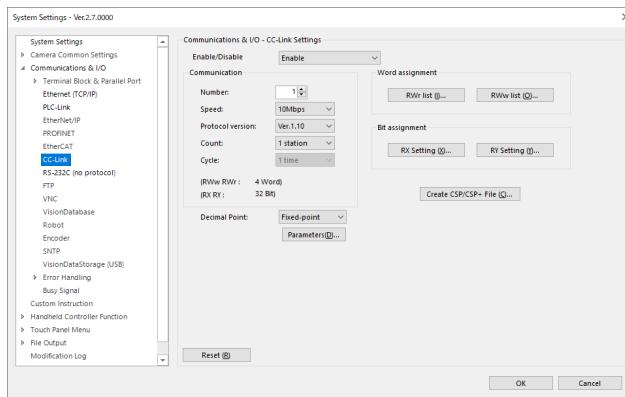
- The high order 4 bits and low order 16 bits of the RY addresses are reserved and no variable can be assigned.
- The number of bit addresses that can actually be used is "mmm × 16". The value mmm depends on the settings as follows:
mmm: First three numbers in the address (decimal notation). They depend on the number of exclusive stations and cycle setting, and are calculated with the following formula.
 - When the cycle is set to 1x:
mmm = (No. of exclusive stations) × 2 - 1
 - When the cycle is set to 2x or higher:
mmm = {(No. of exclusive stations) × 2 - 1} × (Cycle value) - 1

Changing the CC-Link Settings

Displaying CC-Link setting screen

Changing settings with XG-X VisionEditor

On the [CC-Link] menu in the XG-X VisionEditor System Setting, the settings for data input/output over the CC-Link can be changed when the controller is connected to the CC-Link unit CA-NCL20E.



Reference The controller communicates with the master station as a remote device station.

Point Since CC-Link performs communication through link scan, if the signal fluctuates at high speed, CC-Link may not be able to pick up these fluctuations. The scan cycle changes depending on the number of exclusive stations, cycles, and settings of other devices on the network. Keep this and the signal variation time in mind when using CC-Link.

1 Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

2 In the left pane of the [System Settings] menu, select [Communications & I/O] - [CC-Link].

The [CC-Link] menu appears.

3 Change the settings as required.

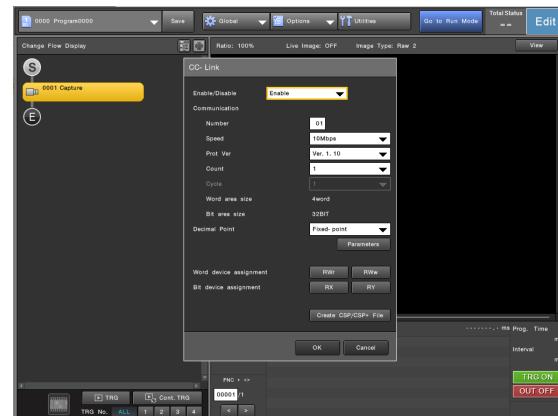
See "CC-Link Settings" (Page 1-121) for more details on each setting.

4 Click [OK].

Point To apply the change to the controller, you need to upload the system settings file to the controller and then restart the controller.

Changing settings with the controller

On the [CC-Link] menu of the Global settings, the settings for data input/output over the CC-Link can be changed when the controller is connected to the CC-Link unit CA-NCL20E.



Point

- If any settings other than the [Decimal Point] settings are changed, the controller must be restarted for changes to take effect.
- After restarting with the CC-Link set to [Enable], the controller will repeat the initialization process until a connection to the CC-Link unit is established. If there is no response from the connected CC-Link unit, the confirmation menu "CC-Link communication has failed" is displayed each time initialization fails.

1 On the [Global] menu at the top of the screen, select [Communications & I/O] - [CC-Link].

The [CC-Link] menu appears.

2 Specify [Enable] in the [Enable/Disable] field.

Point

If the input terminal assignment and coinciding system variable/bit is set to RY, the [OK] button will remain disabled, preventing changes to be confirmed even when selecting [Enable]. Change the input assignment or coinciding RY setting, then choose [Enable].

3 Change the settings as required.

See "CC-Link Settings" (Page 1-121) for more details on each setting.

4 Click [OK].

CC-Link Settings

Enable/Disable

Select whether to use CC-Link.

- Disable:** Disables CC-Link communication.
- Enable:** Enables CC-Link communication.

 Point
The CC-Link cannot be used while the PLC link (Page 1-71), EtherNet/IP (Page 1-148), PROFINET (Page 1-210), or EtherCAT (Page 1-252) is enabled.

Communication

Number

Select station number (1 to 64) of the CC-Link on the controller (Default: 1). With CC-Link, up to 64 stations can be connected to one master station (fixed to 0).

The controller has exclusive use of the number of stations set in [Count] starting from the number set in [Number].

For example, if the number is set to 10 and count is set to 4 stations, the controller will have exclusive use of station numbers 10, 11, 12, and 13.

 Point
Set the station numbers so that the same number is not used on multiple devices.

Communication speed

Select 156 Kbps, 625 Kbps, 2.5 Mbps, 5 Mbps, or 10 Mbps (default) for the communication speed.

Reference

- The speed should be set to the same setting as the master station.
- The maximum transmission distance changes depending on the selected speed.

Communication speed	156K bps	625K bps	2.5M bps	5 Mbps bps	10Mbps bps
Cable length between stations	20 cm or more				
Max. transmission distance*	1200 m	900 m	400 m	160 m	100 m

*When 110Ω type CC-Link cable is used.

Protocol Ver

Select the protocol version for the CC-Link.

- Ver.1.10** (default): Communication with Ver.1.10.
- Ver.2.00**: Communication with Ver.2.00. This can only be used when the master station is compatible. The cycle settings can be configured.

Count

Set the number of stations (1 to 4) used exclusively by the controller (default: Increasing the number of exclusive stations increases the amount of data that can be transmitted).

Cycle

When [Ver.2.00] is selected for [Protocol Ver], set the number of multiples (1 to 8) in the cycle settings (default: 1). Increasing the number of multiples increases the amount of data that can be sent or received with the same number of exclusive stations.

 Point

- Increasing the number of multiples slows down the response time.
- Reducing the number of stations may disable the previously configured word and bit device assignment settings and prevent output. After changing the number of stations and cycles, check the assignment status display to see if the necessary inputs and outputs are enabled.
- The number of data points allocated by setting the number of stations and cycles includes the data range used by the system inside the bit devices. The actual number of data points available to the user are listed below.

Cycle: 1x

Data type	Word device		Bit device	
	RWr	RWw	RX	RY
1 exclusive stations	4	4	11	12
2 exclusive stations	8	8	43	44
3 exclusive stations	12	12	75	76
4 exclusive stations	16	16	107	108

Cycle: 2x

Data type	Word device		Bit device	
	RWr	RWw	RX	RY
1 exclusive stations	8	8	11	12
2 exclusive stations	16	16	75	76
3 exclusive stations	24	24	139	140
4 exclusive stations	32	32	203	204

Point

Cycle: 4x				
Data type	Word device		Bit device	
	RWr	RWw	RX	RY
1 exclusive stations	16	16	43	44
2 exclusive stations	32	32	171	172
3 exclusive stations	48	48	299	300
4 exclusive stations	64	64	427	428

Cycle: 8x				
Data type	Word device		Bit device	
	RWr	RWw	RX	RY
1 exclusive stations	32	32	107	108
2 exclusive stations	64	64	363	364
3 exclusive stations	96	96	619	620
4 exclusive stations	128	128	875	876

Reference

The word device uses two words for each item, excluding the Command Result and Command Number items.

Decimal Point

Select the method for expressing data for each command parameter of the result output data and MW/MR/MS/MWX/MRX/MSX commands, and for the word device input/output used for command data outputs.

- **Fixed-point** (default): Use the data after multiplying it by 1000 as 32 bits of signed integer data in the word device input/output.

Select [Parameters] to specify the [Decimal Precision] (1/10, 1/100, 1/1000, or 1/10000; set to 1/1000 by default).

Point

Depending on the [Decimal Precision] setting: 1/10, 1/100, 1/1000, or 1/10000, the measurement result is multiplied by 10, 100, 1000, or 10000 (respectively) and is used as 32 bits of signed integer data.

- **Floating-point**: Use the data as single-precision floating point data (32 bits) in the word device output (RWrX: Low order 16 bits, RWrX+1: High order 16 bits).

Reference

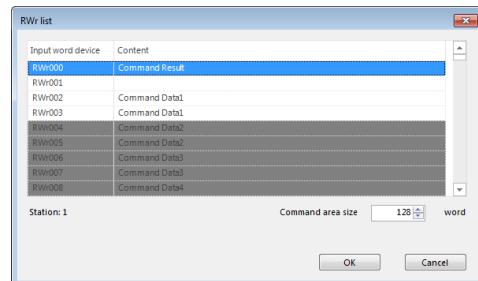
When a command requires the reading of integers, values are always rounded off to the nearest integer before being written regardless of this setting.

Word assignment (XG-X VisionEditor)

This function can be used to confirm the word device output and input assignments. This is useful because it allows unused device ranges to be seen easily.

RWr list

The list of assigned word device outputs is displayed in the [RWr list] menu.



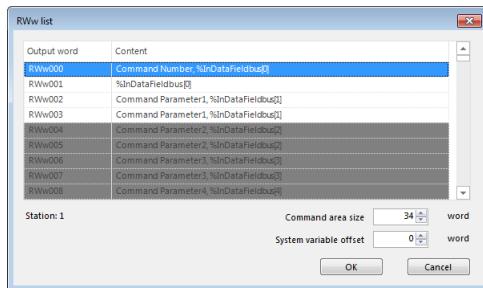
- Data output units in the flowchart that specify CC-Link as the destination are listed by their unit ID in the write data range.
- The items necessary for control by commands are written via CC-Link to a maximum continuous block of 128 words (by default), where the Command Result is written to RWr000, and Command Data1 to 63 are written to RWr002 to 127.
- Decreasing the Command area size reduces the command area in descending order in units of 2 words from RWr127.
- Any device ranges that cannot be used in the current settings are grayed out.
- The decimal data used for the result data and Command Data1 to 63 is expressed using the method set in [Decimal Point].

Reference

If data outputs and commands are used at the same time, their data ranges may overlap. Avoid this by reducing the command area size to the least amount of words required, and by changing the starting address for outputting results in the [Offset of RWr] setting for the data output unit. For more details, see the XG-X Series User's Manual.

RWw list

The list of assigned word device inputs is displayed in the [RWw list] dialog.



- By default, the system variables for variable synchronizing starting at %InDataFieldbus [0] are assigned to RWw000, 2 words for each item.
- Those items necessary for control by commands are written via CC-Link to the maximum continuous block of 34 words (by default), where the Command Number is written to RWw000, and Command Parameter1 to 16 are written to RWw002 to 034.
- Decreasing the Command area size reduces the command area in descending order in units of 2 words from RWw033.
- Any device ranges that cannot be used in the current settings are grayed out.
- Data that includes decimal points and is used in Command Parameter1 to 16 is registered using the method chosen in [Decimal Point].

Reference

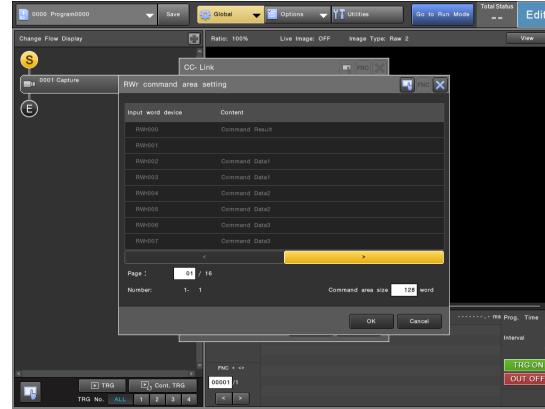
If command control and variable synchronization are used via CC-Link at the same time, their data ranges may overlap in the word devices used for RWw even when their default settings are used. Avoid this by reducing the command area size to the least amount of words required, and by changing the starting address for synchronizing variables in the [Starting offset of assignment of system variables] setting on the variable synchronization unit.

Word assignment (Controller)

This function can be used to confirm the word device output and input assignments. This is useful because it allows unused device ranges to be found as well.

RWr

A list of word outputs appear in the [RWr command area setting] menu.



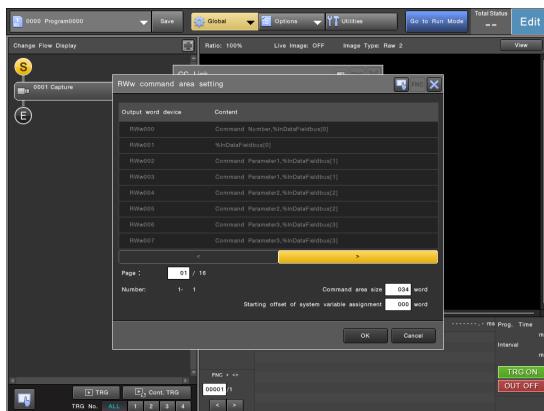
- Data output units in the flowchart that specify CC-Link as the destination are listed by their unit ID in the write data range.
- The items necessary for control by commands are written via CC-Link to a maximum continuous block of 128 words (by default), where the Command Result is written to RWr000, and Command Data1 to 63 are written to RWr002 to 127.
- Decreasing the Command area size reduces the command area in descending order in units of 2 words from RWr127.
- Any device ranges that cannot be used in the current settings are grayed out.
- The decimal data used for the result data and Command Data1 to 63 is expressed using the method set in [Decimal Point].

Reference

If data outputs and commands are used at the same time, their data ranges may overlap. Avoid this by reducing the command area size to the least amount of words required, and by changing the starting address for outputting results in the [Offset of RWr] setting for the data output unit. For more details, see the XG-X Series User's Manual.

RWw

A list of word inputs appear in the [RWw command area setting] menu.



- By default, the system variables for variable synchronizing starting at %InDataFieldbus [0] are assigned to RWw000, 2 words for each item.
- Those items necessary for control by commands are written via CC-Link to the maximum continuous block of 34 words (by default), where the Command Number is written to RWw000, and Command Parameter1 to 16 are written to RWw002 to 034.
- Decreasing the Command area size reduces the command area in descending order in units of 2 words from RWw033.
- Any device ranges that cannot be used in the current settings are grayed out.
- Data that includes decimal points and is used in Command Parameter1 to 16 is registered using the method chosen in [Decimal Point].

Point

Only custom commands can be executed using the CC-Link.

Reference

- If command control and variable synchronization are used via CC-Link at the same time, their data ranges may overlap in the word devices used for RWw even when their default settings are used. Avoid this by reducing the command area size to the least amount of words required, and by changing the starting address for synchronizing variables in the [Starting offset of assignment of system variables] setting on the variable synchronization unit.
- For more details on the commands available for the CC-Link, refer to "List of Custom Instructions" (Page 2-120).

Bit assignment (XG-X VisionEditor)

Any user-specified system variable related to parallel output control can be assigned to bit device outputs and inputs. Only devices available with the current settings are displayed.

Point

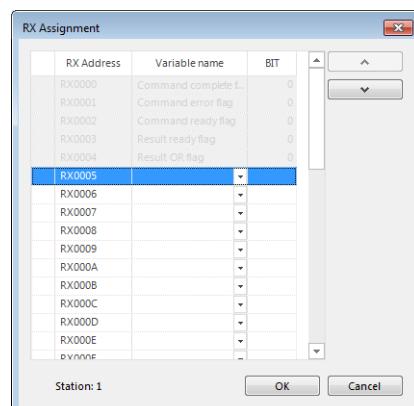
Since CC-Link performs communication through link scan, if the signal fluctuates at high speed, CC-Link may not be able to pick up these fluctuations. The scan cycle changes depending on the number of exclusive stations, cycles, and settings of other devices on the network. Keep this and the signal variation time in mind when using CC-Link.

Reference

The bits required for commands and data outputs are assigned to a reserved area and cannot be changed.

RX setting

The [RX Assignment] menu appears. This menu is used to assign system variables in the controller to a user-defined area in the bit device output RX range.



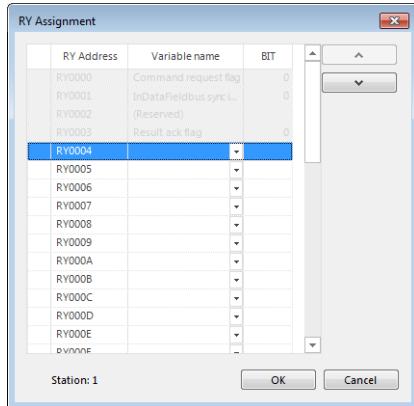
- Use the columns under [Variable name] and [bit] to assign the desired output-type system variable and its bit to an RX address. Only system variables related to parallel port control can be assigned.
- The assignment setting can be moved to another RX address by selecting the line and clicking [\wedge] or [\vee].
- Any device ranges that cannot be used in the current settings are not displayed.

Reference

For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).

RY setting

The [RY Assignment] menu appears. This menu is used to assign system variables in the controller to a user-defined area in the bit device input RY range.



- Use the columns under [Variable name] and [bit] to assign the desired input-type system variable and its bit to an RY address. Only system variables related to parallel port control can be assigned.
- The assignment setting can be moved to another RY address by selecting the line and clicking [\wedge] or [\vee].
- Any device ranges that cannot be used in the current settings are not displayed.

Reference

- For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).
- The system variables which have been assigned to the input terminals as external terminals cannot be used as another assignment for the CC-Link.
- Assignment of the same bit on the same system variable to multiple RY addresses and input terminals on the parallel port is not allowed.

Bit assignment (Controller)

Any user-specified system variable related to parallel output control can be assigned to bit device outputs and inputs. Only devices available with the current settings are displayed.



Point

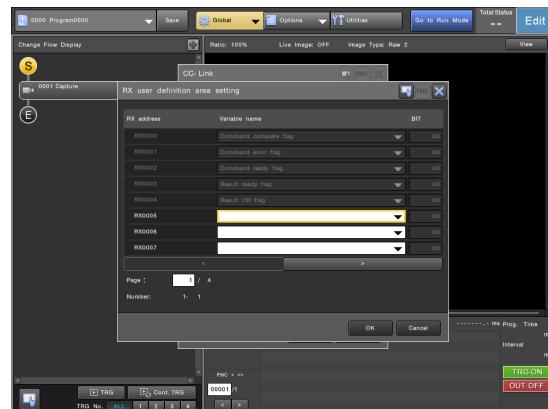
Since CC-Link performs communication through link scan, if the signal fluctuates at high speed, CC-Link may not be able to pick up these fluctuations. The scan cycle changes depending on the number of exclusive stations, cycles, and settings of other devices on the network. Keep this and the signal variation time in mind when using CC-Link.



The bits required for commands and data outputs are assigned to a reserved area and cannot be changed.

RX

The [RX user definition area setting] menu appears. This menu is used to assign system variables in the controller to a user-defined area in the bit device output RX range.



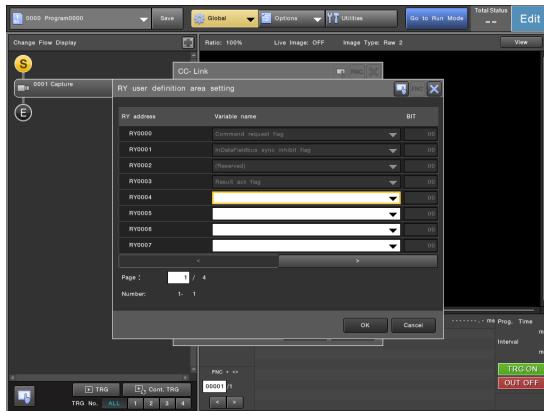
- Use the columns under [Variable name] and [bit] to assign the desired output-type system variable and its bit to an RX address. Only system variables related to parallel port control can be assigned.
- Any device ranges that cannot be used in the current settings are not displayed.

Reference

For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).

RY

The [RY user definition area setting] menu appears. This menu is used to assign system variables in the controller to a user-defined area in the bit device input RY range.



- Use the columns under [Variable name] and [bit] to assign the desired input-type system variable and its bit to an RY address. Only system variables related to parallel port control can be assigned.
- Any device ranges that cannot be used in the current settings are not displayed.

Reference

- For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).
- Assignment of the same bit on the same system variable to multiple RY addresses and input terminals on the parallel port is not allowed.

Create CSP/CSP+ File

This outputs a CSP/CSP+ file that is used when the master station references the controller CC-Link settings.

Naming rules of CSP file

- When Ver.1.10 is used: CA-NCL20E_[No. of exclusive stations].csp
- When Ver.2.00 is used: CA-NCL20E_[No. of exclusive stations]_V2-00_E[Cycle value].csp

About CSP+

- 0x0658_CA-NCL20E_1.0.0_ja.zip (Japanese)
 - 0x0658_CA-NCL20E_1.0.0_ja.cspp
 - CA-NCL20E.ico
 - CA-NCL20E.bmp
- 0x0658_CA-NCL20E_1.0.0_en.zip (Other Language)
 - 0x0658_CA-NCL20E_1.0.0_en.cspp
 - CA-NCL20E.ico
 - CA-NCL20E.bmp

Point

The file is not created if any of the parameter settings are incorrect. Confirm the settings and then try again.

Reference

- The file output path is SD2:/xg/CSP.
- As the changed information and settings configured on the controller and the XG-X VisionEditor system settings are not contained in the CSP+ file, the created CSP+ file will always contain the same content.
- If you connect to a Keyence KV Series device, a CSP/CSP+ file is not necessary.

Reset

Returns all settings of [CC-Link] to their initial values.

Outputting Measurement Data via CC-Link

(Data Output)

Change the settings so that a data output unit can output data via CC-Link.

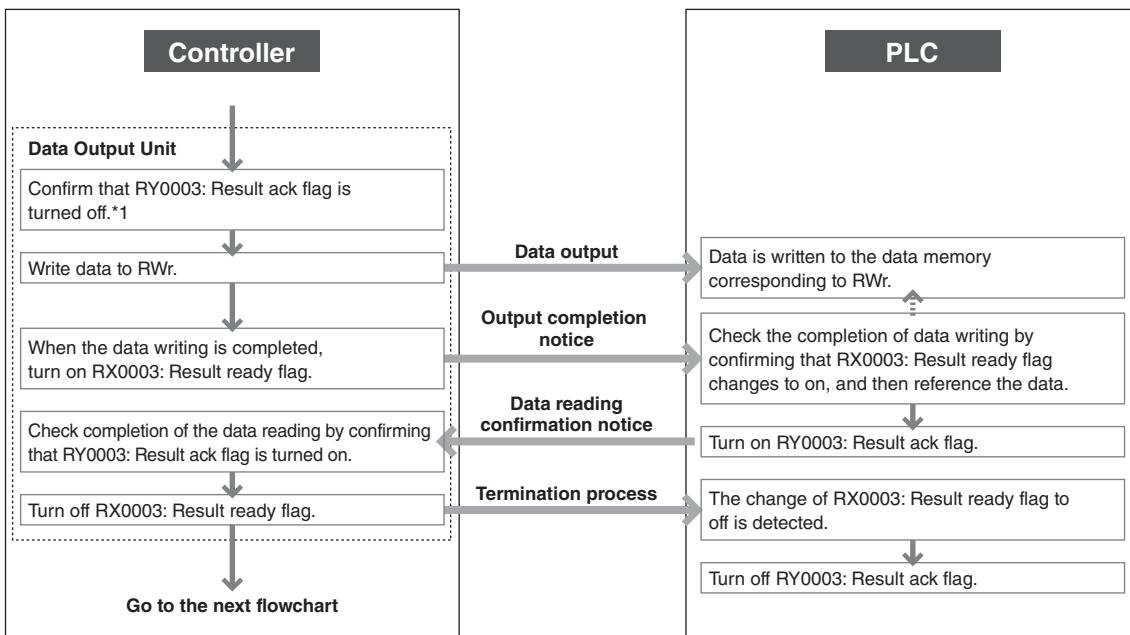
Point The CC-Link cannot be used while the PLC Link, EtherNet/IP, PROFINET, or EtherCAT is enabled.

Data Output Flow

Data is output from a data output unit. Set the output data and destination addresses for the data output unit.

Use the following procedures to output data from the controller by CC-Link.

- Reference**
- The data output via CC-Link is only performed while the controller is in run mode. Data cannot be output in setup mode.
 - With CC-Link, images and other binary data cannot be output.
 - No data is output unless all data output units in the flowchart have been executed. In this case, the Result ready flag is not changed.



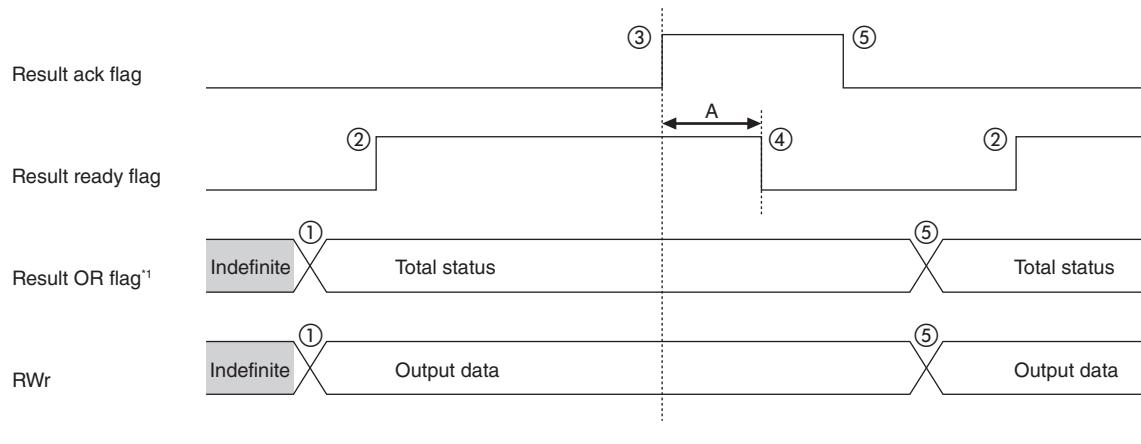
*1 This is the procedure when handshake is set to ON.

When handshake is set to OFF, the controller overwrites the data memory corresponding to RWr at the execution timing of the data output unit regardless of the RY0003: Result ack flag status. Then, the RX0003: Result ready flag remains ON. If it is necessary to check write completion for change from OFF to ON of RX0003: Result ready flag, turn ON RY0003: Result ack flag to turn OFF the Result ready flag.

Point Since the address of the word device output is shared between data output and the command control via CC-Link (Page 1-130), ensure that the data range used for the data output does not overlap with the range used for command response data.

Timing Chart (Data output by CC-link)

When handshake is ON



*1 If you use the Result OR flag, one or more item of data needs to be set to be output from the data output unit to the CC-Link.

(1) The data is updated.

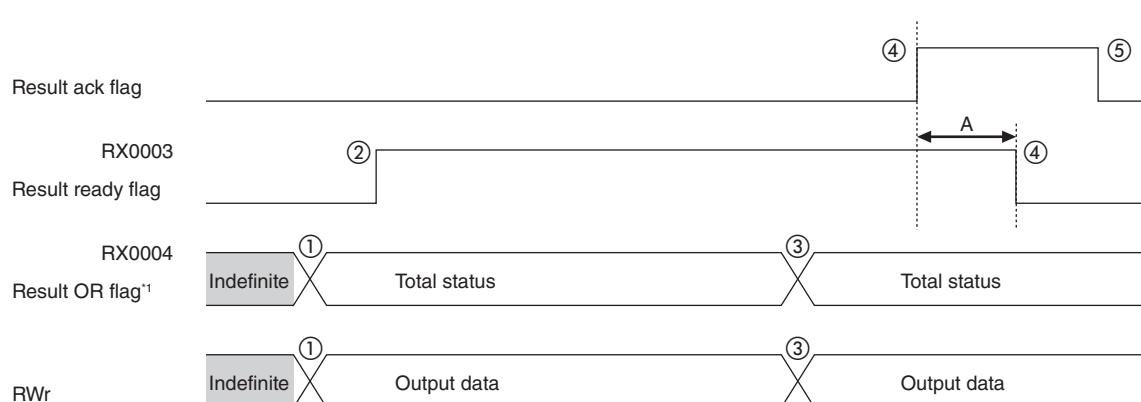
(2) The Result ready flag for the read synchronization signal of the output data turns ON and the data can be read.

(3) When data read is completed, the Result ack Flag turns ON as the signal for data read completion.

(4) Associated with (3), the Result ready flag turns OFF.

(5) Result ack flag turns OFF. This is received and output continues if data is updated.

When handshake is OFF



*1 If you use the Result OR flag, one or more item of data needs to be set to be output from the data output unit to the CC-Link.

(1) The data is updated.

(2) The Result ready flag for the read synchronization signal of the output data turns ON and the data can be read.

(3) If data is updated, the Result ready flag stays ON and output continues.

(4) If the Result ack flag turns ON, the Result ready flag turns OFF. This can be used when you want to find out the latest OK/NG status with as little delay as possible for such applications as when the line is to be stopped when the status is NG.

(5) Result ack flag turns OFF. Thus, you can find out the timing of the next data update.

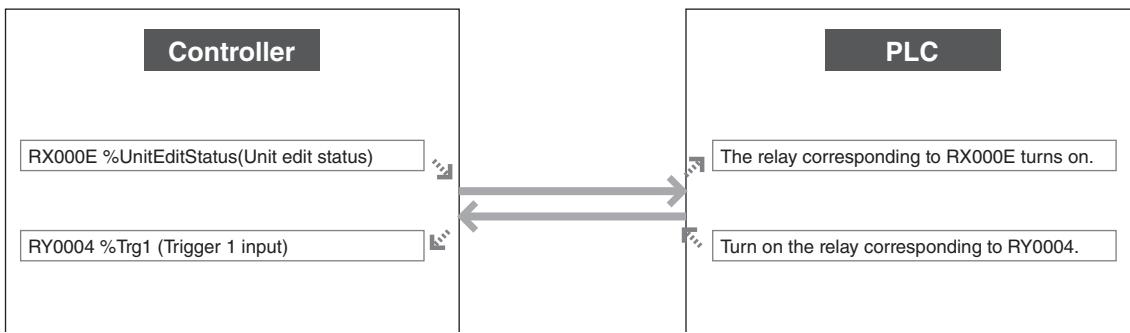
I/O Control via CC-Link

Change the settings to use CC-Link to control input/output in the same way as the terminal block interface or parallel I/O interface of the controller.

- The CC-Link cannot be used while the PLC-Link, EtherNet/IP, PROFINET, or EtherCAT is enabled.
- For more details on the system variables available for the CC-Link, refer to "List of System Variables" (Page 3-451).

I/O Control Operation (Example of Connection to PLC CC-Link Unit)

When system variables related to parallel output control are assigned to bit devices, multiple I/O signals can be transmitted through one CC-Link cable.



- Since the CC-Link performs communications through the link scan, if the signal fluctuates at high speed, the CC-Link may not be able to pick up these fluctuations.
- The scan cycle varies depending on the "Count," "Cycles," and "Settings of other devices on the network." Keep this and the signal variation time in mind when using the CC-Link.

- By assigning %OutDataAsync to the RX device, the measurement value or the judgment value can be output to the bit device.
- By assigning %CmdCode, %CmdParam, or %CmdStrobe to the RY device, the custom command may be executed from the bit device.

Controlling the System via CC-Link

(Command Control)

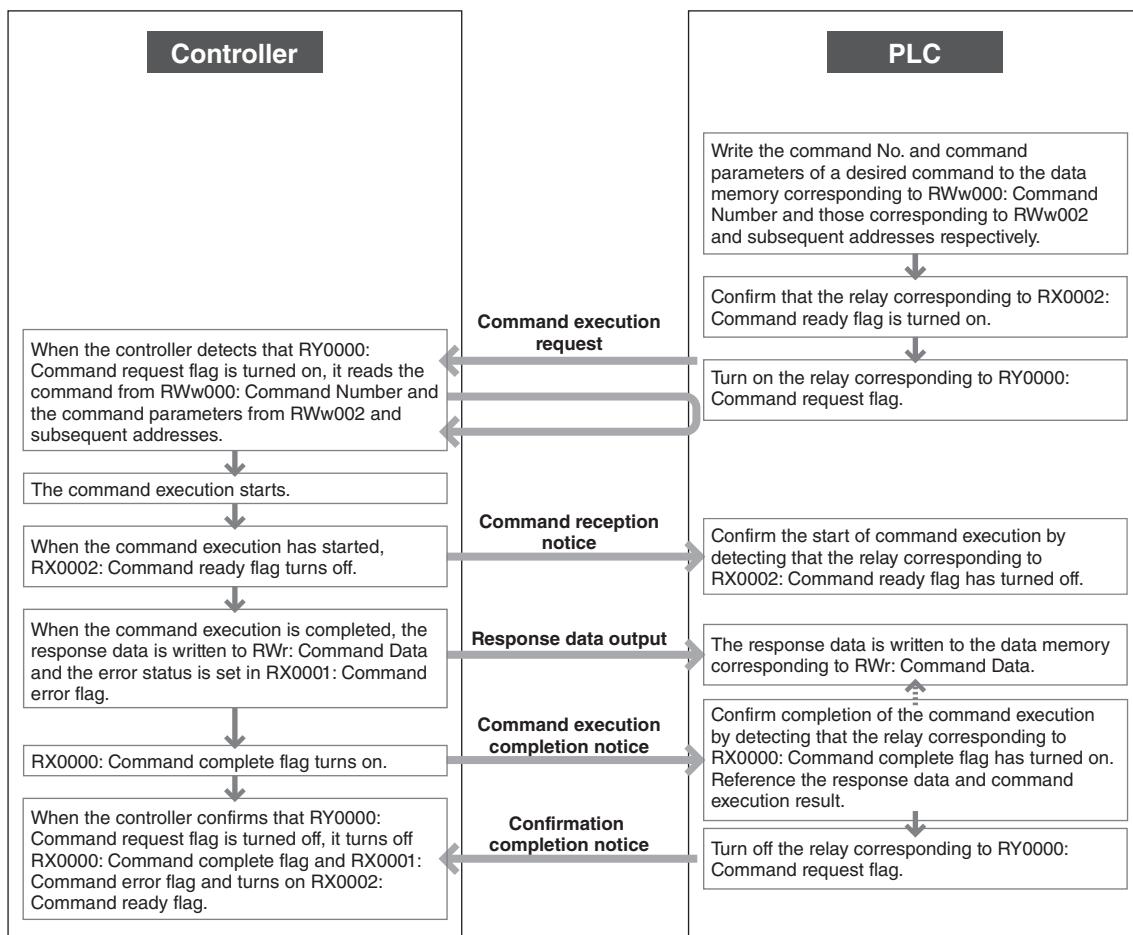
Predefined commands can be executed at any time.

Point

- The CC-Link cannot be used while the PLC-Link, EtherNet/IP, PROFINET, or EtherCAT is enabled.
- The commands which are to be executed as a custom instruction must be defined. See "Custom instruction" (Page 2-116) for more details.
- For more details on the commands available for the CC-Link, refer to "Command List (Available Operation vs. Situation)" (Page 2-9).

Command Processing Flow with CC-Link (Example of Connection to PLC CC-Link Unit)

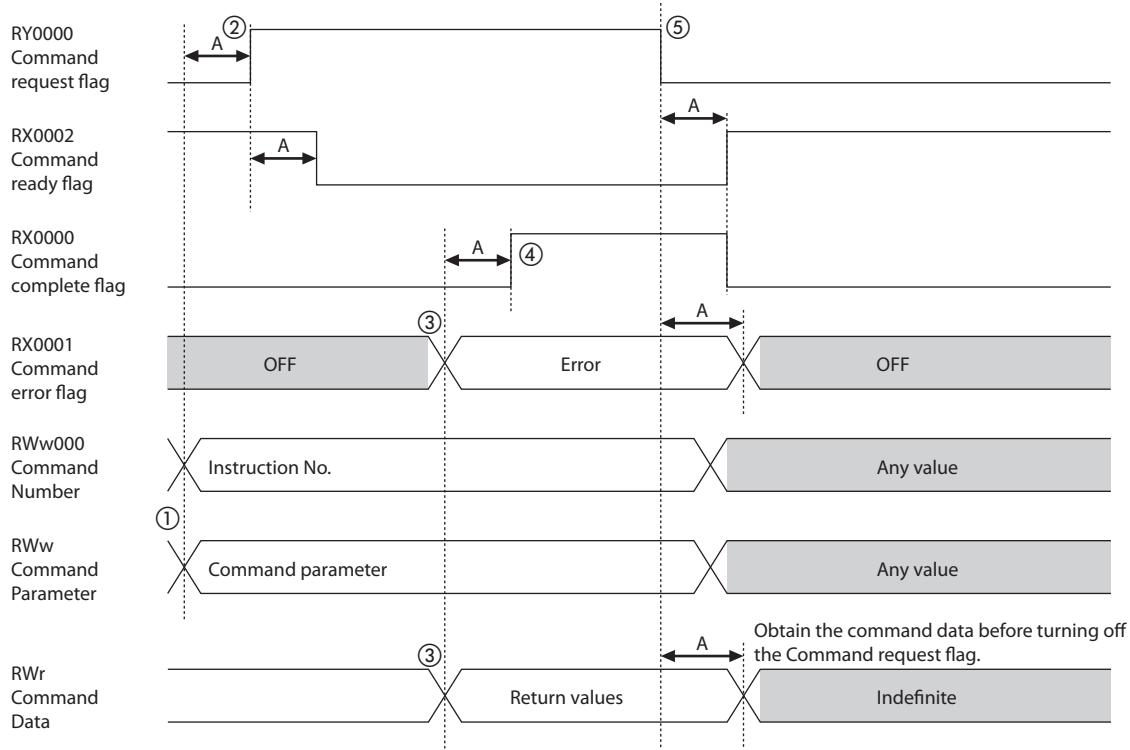
Use the following procedure to use commands to control the system with the CC-Link.



Reference

When a command error occurs, the command execution result data is written to RWr000: Command Result (0: Success, <Error code>: Failure). The error codes are described in "When an error occurs on command acceptance" (Page 2-6).

Timing Chart



A: 0 ms or more (depends on the link scan speed)

- (1) Store the command number in RWw000 and the starting command parameter in RWw002.
- (2) Turn ON RY0000 (Command request flag) and execute the command.
RX0002 (Command ready flag) turns OFF. (The Command ready flag will turn OFF according to the link scan speed)
- (3) When the time necessary for the command execution has passed, the return value is stored in Command Data and the error status in Command error flag. (Command error flag OFF: Command processing is a success, ON: Command processing is a failure.)
- (4) As a check signal for completion of the command execution, RX0000 (Command complete flag) is ON.
- (5) To issue the next command, the Command ready flag should be ON and the Command complete flag should be OFF.

Changing the Value of a Variable via CC-Link

(Variable Synchronization)

Change the settings to use CC-Link to change the value of a special system variable for variable synchronization (%InDataFieldbus[]) assigned to the word device.



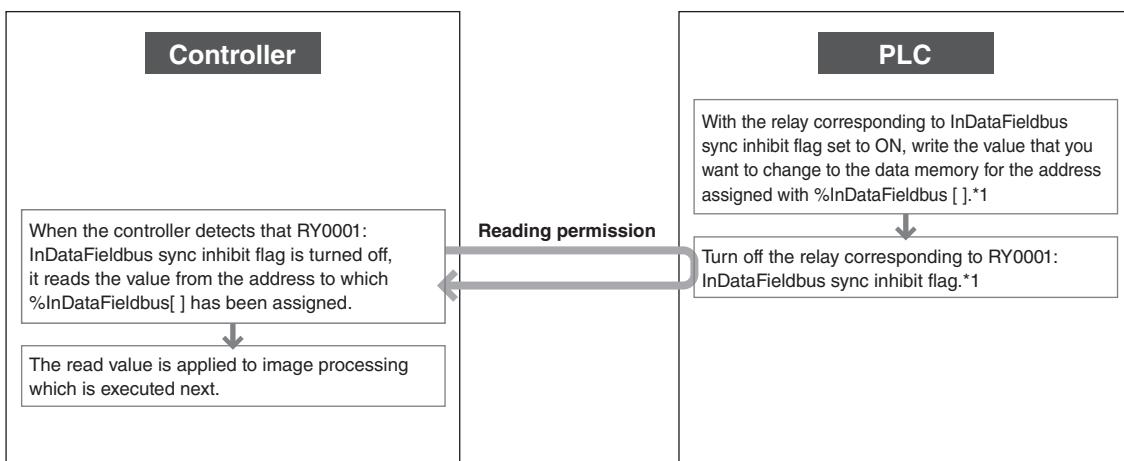
The CC-Link cannot be used while the PLC-Link, EtherNet/IP, PROFINET, or EtherCAT is enabled.



Refer to "List of System Variables" (Page 3-451) for more details on the system variable %InDataFieldbus[].

Variable Synchronization Flow with CC-Link (Example of Connection to PLC CC-Link Unit)

Use the following procedure for changing the system variable (%InDataFieldbus []) on the controller with CC-Link.



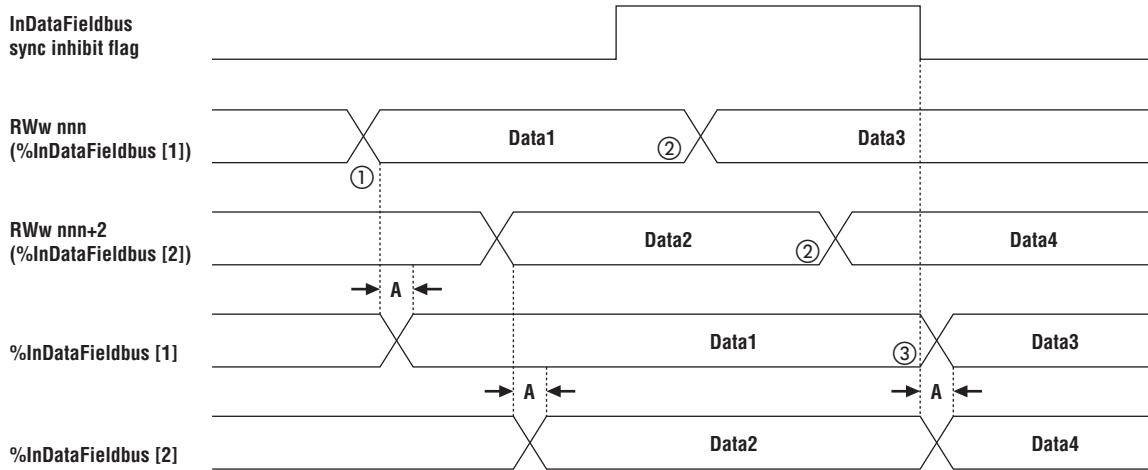
*1 This is the procedure for controlling the reading timing of one value. CC-Link reads a value for each normal link scan cycle. When the PLC is writing to multiple DM, a time lag may occur in the application timing. By turning on RY0001: InDataFieldbus sync inhibit flag in advance and writing to DM while reading is inhibited, multiple elements of an array variable can be changed simultaneously without being affected by the writing timing.



- The value of %InDataFieldbus[] is initialized to "0" immediately after the controller is started. If CC-Link communication is interrupted, the value of %InDataFieldbus[] which was last written is retained until the controller is restarted.
- The value is written to data memory as 32-bit signed integer data.

Timing Chart

Example when the values of %InDataFieldbus[1] and %InDataFieldbus[2] are changed



A: 0 ms or more (depends on the link scan speed)

- (1) Since the InDataFieldbus sync inhibit flag is OFF, if RWr corresponding to %InDataFieldbus [1] is rewritten, the value of %InDataFieldbus [1] is rewritten. (Since the value in RWr is not changed for %InDataFieldbus [2], the value remains the same.)
- (2) Although the RWw value corresponding to %InDataFieldbus [1]/%InDataFieldbus [2] is rewritten, InDataFieldbus sync inhibit flag is ON and the values of %InDataFieldbus [1] and %InDataFieldbus [2] remain the same. To rewrite multiple %InDataFieldbus values simultaneously, it is necessary to turn ON the InDataFieldbus sync inhibit flag and rewrite all corresponding RWw, and then to turn OFF the InDataFieldbus sync inhibit flag.
- (3) Since the InDataFieldbus sync inhibit flag is OFF, the values of %InDataFieldbus [1] and %InDataFieldbus [2] are rewritten. (At least the time for the link scan time is required until rewriting is completed.)

Typical CC-Link Setting Procedure

This section explains the operation example to connect the XG-X Series to the Keyence KV Series via CC-Link, output measured/judgment values and control the controller with the PW command using CC-Link.

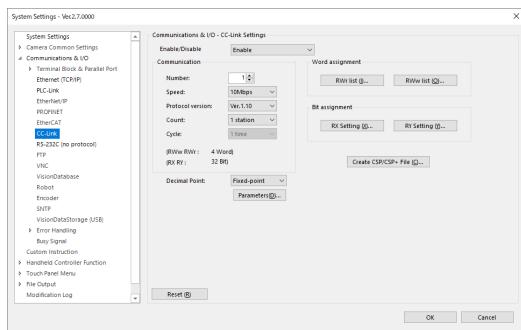
Connecting to the PLC



If the settings pertaining to the KV series CC-Link are not completed, first set the KV series side settings (Page 1-135).

1. Checking the system settings of the XG-X Series

- 1 Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.**
- 2 On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.**
- 3 In the [System Settings] screen, select [Communications & I/O] - [CC-Link].**
- 4 Change the CC-Link settings.**



The following setting values are used in this example
(Change them according to the device to be connected.).

[Communications & I/O - CC-Link Settings]

- **Enable/Disable:** Enable
- **Number:** 1
- **Speed:** 10Mbps
- **Protocol Version:** Ver.2.00
- **Count:** 4 stations
- **Cycle:** 8 times
- **Decimal Point:** Fixed-point (Decimal Precision: 1/1000)



- The number of word device and bit device points are determined by the [Count] and [Cycle] setting. In the above settings the word device is 128 points, and the bit device 896 points.
- In conjunction with the increase in [Cycle] multiples, the response times will slow down.

[Word assignment]

- **RWw list:** XG-X inputs, PLC write data assignments
- **RWr list:** XG-X outputs, PLC read data assignments



The representative data is assigned as the default value.

[Bit assignment]

- **RX Setting:** XG-X outputs, PLC read data assignments
- **RY Setting:** XG-X inputs, PLC write data assignments



- The representative data is assigned as the default value.
- Only the system variables are covered.

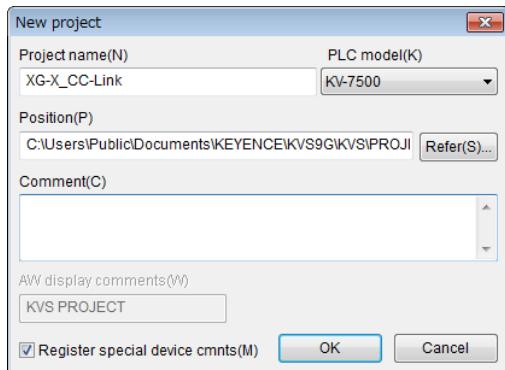
5 Select [OK].

The changes are saved.

6 Upload the system settings to the controller and then restart the controller.

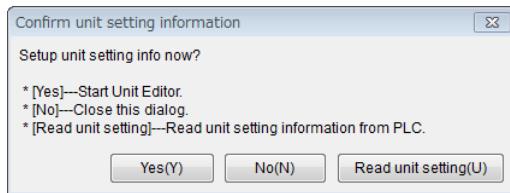
2. Changing the KV series settings

- 1 Start up the KV STUDIO with the computer and PLC connected, select [New project] from the [File] menu.**
- 2 After entering the [Project name], select the [PLC model], then click [OK].**

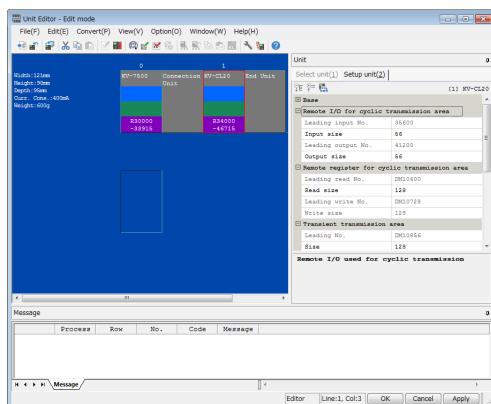


The [Confirm unit setting information] screen is displayed.

- 3 Click [Read unit setting].**



- 4 Select the XG-X series and the CC-Link unit (KV-CL20) inside the workspace, and after starting up the [Unit Editor], set the baud rate and remote input/output and remote register size settings via the [Setup unit(2)] tab.**



[Base]

- **Baud rate:** 10 Mbps (match with XG-X)



The other items fundamentally use the default values as they are (they can be changed to match needs).

[Remote I/O for cyclic transmission area]

Set the number of bit device points to 1/16 (896/16=56).

- **Input size:** 56
- **Output size:** 56

[Remote register for cyclic transmission area]

Set to the same number as the number of word device points.

- **Read size:** 128

- 5 Select [Convert] - [Auto-assign relay/DM] in the Unit Editor, then assign the devices.**

When doing automatic assigning, bit devices will be assigned as R, and word devices as DM.

- 6 Save the changes, then close the Unit Editor.**

- 7 Select [Transfer to PLC] from the KV STUDIO [Monitor/Simulator] menu, then forward the setting contents to the KV series.**

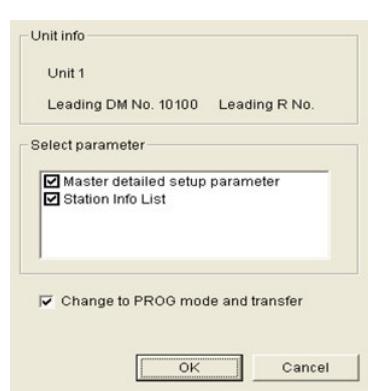
- 8 Select the [Setting KV-CL20] from the KV STUDIO [Tool] menu.**

The [KV-CL20 Settings] screen will appear.

- 9 Select [New] from the [File] menu via the [KV-CL20 Settings].**

- 10 Select the [Read from the Unit] from the [Comm setting] menu via the [KV-CL20 Settings].**

The [Read from the Unit] screen will appear.

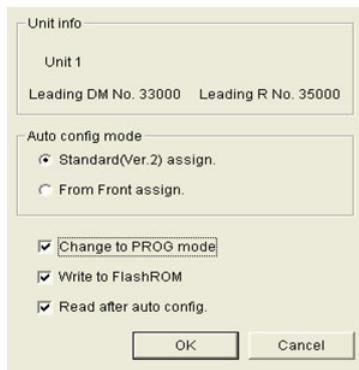


11 Click [OK].

The confirmation screen will appear.

12 Follow the onscreen instructions, and click in sequence [Yes] - [Yes] - [OK], then the parameter readouts are completed.**13 Select [Auto Configuration] from the [Comm setting] menu via the [KV-CL20 Settings].**

The [Auto Configuration] screen will appear.

**14 Click [OK].**

The confirmation screen will appear.

15 Follow the onscreen instructions, and click in sequence [Yes] - [Yes] - [Yes] - [OK], then the Auto Configurations are completed.**16 Select the [Station Information List Settings] from the KV STUDIO [CC-Link Settings] menu via the [KV-CL20 Settings].****17 After checking that the [Number of occupied stations] and [Advanced Settings], and [Remote stations count] are identical with the XG-X series system settings, then click [OK].**

- **Number of occupied stations:** 4 stations
- **Advanced Settings:** 8 times settings
- **Remote stations count:** 896 points

18 Select [Write to the unit] from the [Comm setting] menu via the [KV-CL20 Settings].

The [Write to the unit] screen will appear.

**19 Click [OK].****20 Follow the onscreen instructions, and click in sequence [Yes] - [Yes] - [Yes] - [OK], then the parameter writing is completed.****21 Close the [KV-CL20 Settings] screen.**

The setting file save confirmation screen will appear.

22 Click [Yes], to save the setting file.**23 Select [Transfer to PLC] from the [Monitor/Simulator] menu in KV STUDIO.****24 Restart both the XG-X series and the KV series.**

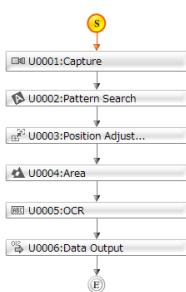
If the KV-CL20 ERR lamp (red) goes out, the CC-Link establishment is successful.

Outputting Measured/Judgment Values

1. Setting the output data (Data output unit)

To output various kinds of measured/judgment values, use the "Data output unit." This section describes how to assign the measured/judgment values of the following units to a data output unit as data to be output.

- Total status judgment of the flowchart (%JgAll)
- U0002: Pattern search (Position X)
- U0002: Pattern search (Position XY)
- U0004: Area (Area)
- U0005: OCR (Line 1 result string)
- Variable #a
- Variable #b
- U0002: Pattern search (Unit judgment value)
- U0004: Area (Unit judgment value)
- Processing time (%PrcTime)
- Processing start date (%PrcDay)

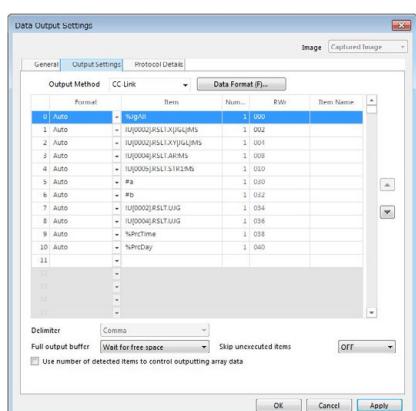


1 Add a "Data output unit" at the end of the flowchart.

The setting screen of the added "data output unit" is displayed.

2 Select [CC-Link] for [Output Method] on the [Output Settings] tab.

3 From the parts list, drag and drop measured/judgment values you want to output to assign them into the [Item] column.



Other than dragging and dropping from the parts list, you can enter values directly.

4 Check the RWr address used for the output.

- When you assign data in the [Item] column, the output destination RWr address is automatically displayed in the [RWr Address] column.
- The RWr address start position default value is [0], and it can be changed via the [Offset of RWr] in the [Protocol Details] tab.
- The correlation between the RWr address and the PLC DM address is set via the KV STUDIO.

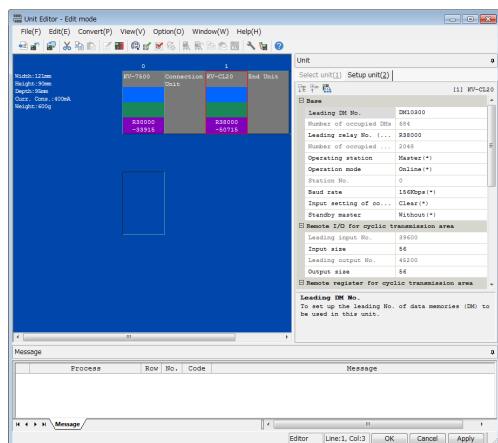
2. Check the DM correlation with the RW_r and output configuration to RW_r

1 Checking examples of storage of result data RW_r.

The data output unit in the flow is set to output the result data as per the following.

- Total status (OK=0 / NG=1)
- U0002: Pattern search position X (284.868)
- U0002: Pattern search position XY (X=284.868 / Y=196.223)
- U0004: Area (17839)
- U0005: OCR 1st row character string. (KEYENCE)
- Variable #a (95)
- Variable #b (348.267)
- U0002: Pattern search unit judgment value (OK=0 / NG=1)
- U0004: Area unit judgment value (OK=0 / NG=1)
- Processing time (67.477ms)
- Processing start date (%PrcDay) (11)

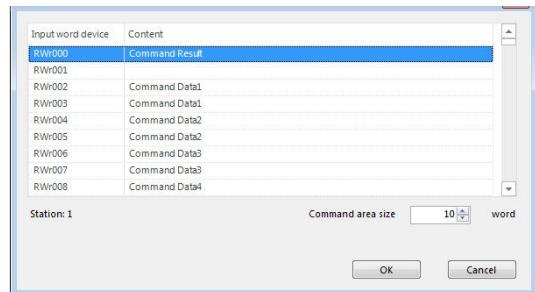
2 Check the DM address correlation with the RW_r address via the KV STUDIO.



- The [Leading Read No.] from the [Remote register for cyclic transmission area] is equivalent to the first address in the RW_r device.
 - Since the default value will be [DM10400] with the [Auto-assign relay/DM] operation, check that RW_r000=DM10400.
 - To change it, select [Leading DM No.] from the [Base] menu.
- For the first address in the RW_w device check the [Leading Write No.].

3 Select [Communications & I/O] - [CC-Link] via the XG-X VisionEditor [System Settings] screen, then click [RW_r list].

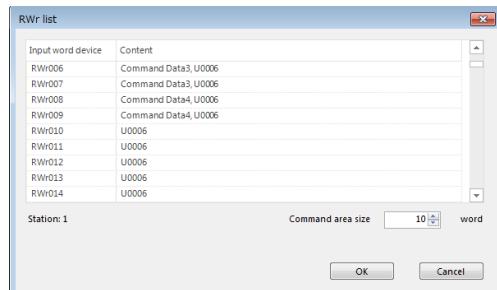
The contents which are assigned to the RW_r address can be confirmed.



In a default setting state, the [Command Result] and data output unit [U0006] are both assigned to RW_r000. Similarly, both are also assigned subsequent to RW_r001. In this state, since the command response and output data overlap, there is a need to change the data output storage location by performing the operations from step 4 and after.

4 Change the [Command area size] into the required amount.

Here the command area size (default value 128 words) is changed into 10 words.



- In the command area, the [CommandResult] is assigned to RW_r000, and 1 Command Data is assigned to 2 words from RW_r002.
- Change the size to match the command which is to be used.

5 Change the [Offset of RW_r] in the [Protocol Details] tab in the data output unit.

Change the [Offset of RW_r] to 10.

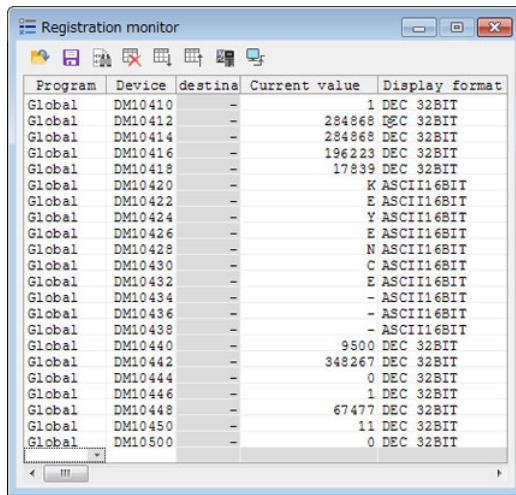
If it is changed, the first address will be 010.

6 Upload the program setting file and system setting file to the controller.

After restarting the controller, the output from CC-Link begins.

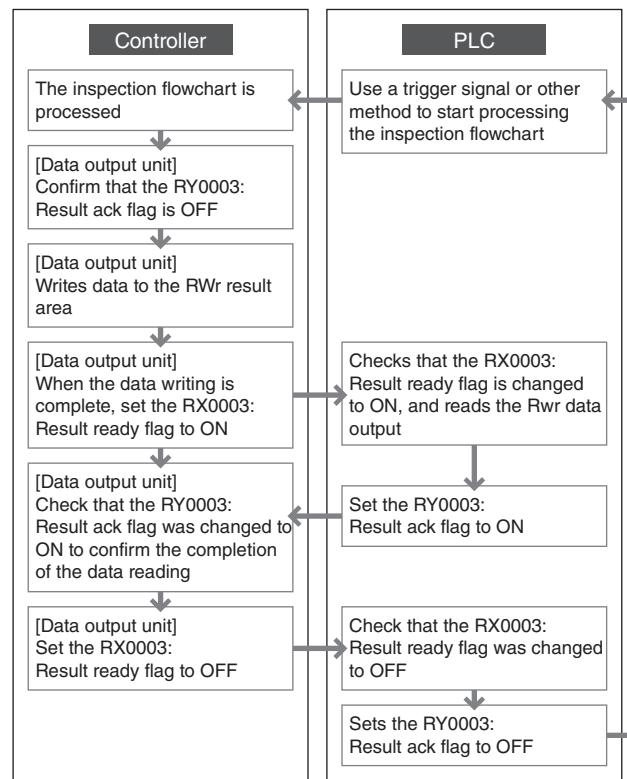
7 After entering the trigger to the XG-X series, check the output results via the KV STUDIO Registration monitor.

Check the current values with Device DM10410 as the beginning.

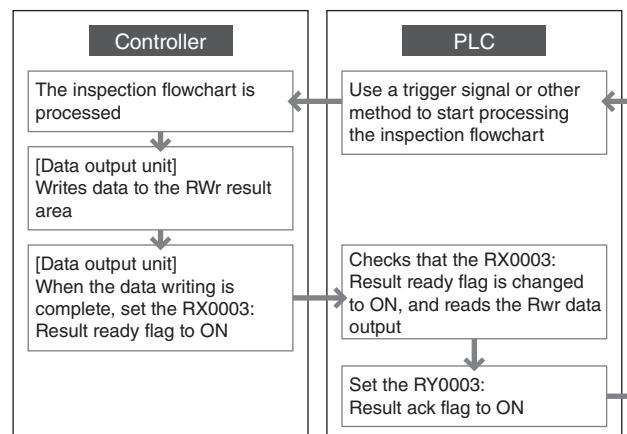


- Judgment values are stored by using two words to show 0 (OK) or 1 (NG).
- Decimal type data is multiplied by 1000 and stored by using two words: 284.868 to 284868
- When XY data is output, the data is stored in the order of X and Y by using two words for each.
- Integer type data is stored directly by using two words.
- Character data is stored as ASCII code by using two words for each character (Only in the case of OCR2 unit Trimmed String is one byte used for one character so that two words are used to store a unit of four characters.).
- When data is output as "string", the number of DM used varies depending on the specified number of characters. This example outputs the "number of characters on the first line" of the OCR unit and the string is seven characters of "KEYENCE". However, since [L1: Number of Characters] for [Block Setup] is set to 10, the range of 20 words (10 characters) from DM710 to DM729 are used.
- Changing the number of characters setting affects all the subsequent DM settings. It is recommended to set an item which may be changed at the end of the Data output unit.
- Variables are multiplied by 1000 and stored by using two words: 95 to 95000, 348.267 to 348267
- Judgment values are stored by using two words to show 0 (OK) or 1 (NG).
- For system variables, integer type data is stored as is while decimal type data is multiplied by 1000. They are stored by using 2 words.

Typical data output flow (Handshake: ON)



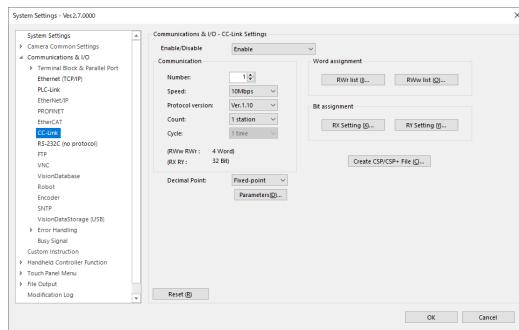
Typical data output flow (Handshake: OFF)



Controlling the Controller

1. Checking the system settings of the XG-X Series

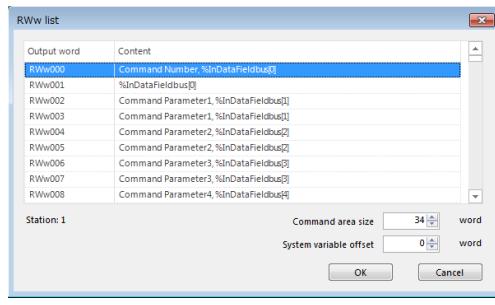
- 1 Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.
- 2 On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.
- 3 In the [System Settings] screen, select [Communications & I/O] - [CC-Link].



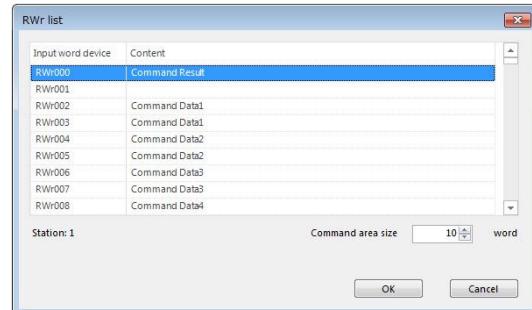
- 4 Check the word device assignment states required for controlling the controller via [Word assignment].

[Word assignment]

- **RWw list:** Inputs for the XG-X series, and assignments for the PLC writing data



- **RWw list:** Outputs for the XG-X series, and assignments for PLC reading data



Output data (PLC → XG-X: OUT)

- Command Number: Sets the command number which is to be executed (word)
- Command Parameter#: Sets the #th parameter of the command (presence or absence of parameters depends upon the command) (word)

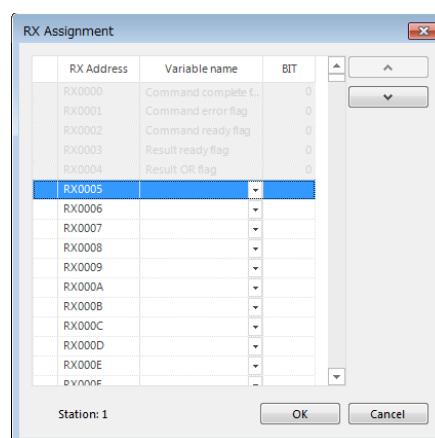
Input data (XG-X → PLC: IN)

- Command Result: The Command execution result will be set (0: Succeeded, <Error code>: Failed) (word)
- Command Data#: the #th response data for the command will be set (presence or absence of response data depends upon the command) (word)

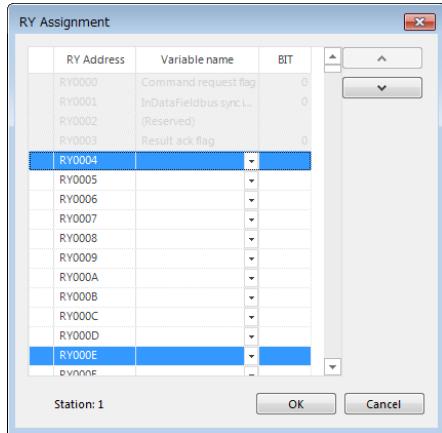
- 5 Check the bit device assignment states required for controlling the controller via [Bit assignment].

[Bit assignment]

- **RX setting:** Outputs for the XG-X series, and assignments for PLC reading data



- RY setting:** Inputs for the XG-X series, and assignments for the PLC writing data

**Point**

RX and RY addresses which already have assignments and which cannot be changed from the default values are grayed out.

Output data (PLC → XG-X: OUT)

- Command request flag: Turned from OFF to ON when executing commands (bit)

Input data (XG-X → PLC: IN)

- Command complete flag: When command processing completes, turns ON (bit)
- Command error flag: OFF when command processes succeeds, when it fails turns ON (bit)
- Command ready flag: When command processing can be received, turns ON (bit)

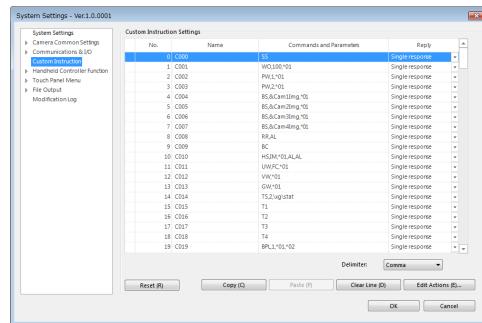
6 Select [OK].

Closes the [System Settings] screen.

7 Upload the system settings to the controller and then restart the controller.**2. Example of command execution procedure: Switch program No. (PW)**

The following is a typical example of the command execution procedure. This example uses the PW command (Change Program) which uses a command parameter.

- In the [System Settings] screen of the XG-X VisionEditor, select [Custom Instruction] and check the command details.



- With the default setting assignments, there are the PW commands, [PW, 1, *01] which switches to an SD1 setting number and the [PW, 2, *01] which switches to an SD2 setting number.
- Here the procedures for executing the [PW, 1, *01] that switches to an SD1 setting number are explained.
- The command No. is [2], and, since [*01] is written in the Commands and Parameters column, we know that a command parameter is used. Specify the program setting number that is to be switched to for [*01] (this time it is switched to program setting number 11).

- Input the PW command No. into the KV device to which RWw0000: Command Number is assigned, and input the program setting No. to switch to into the KV device to which RWw0002: Command Parameter1 is assigned.

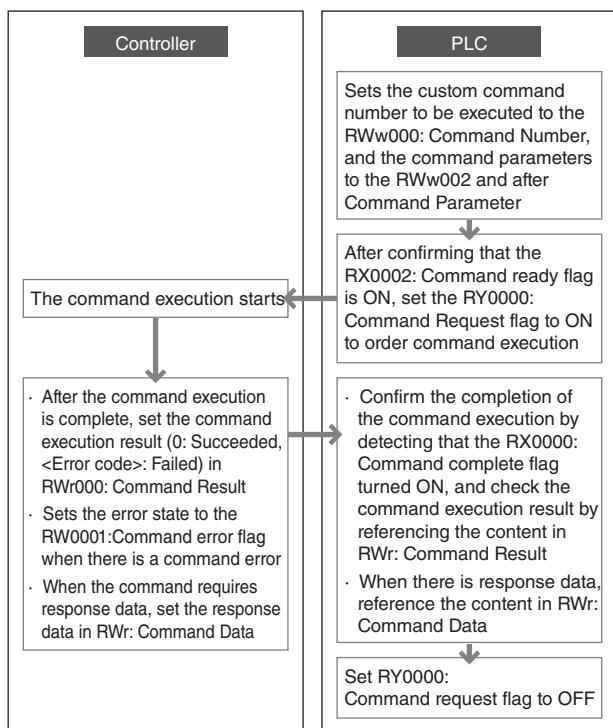
Here the PW command number, which is [2], is input into the KV device (DM10528) to which RWw0000: Command Number was assigned, and the program number [11] for the switching destination is input into the KV device (DM10530) to which RWw0002: Command Parameter1 was assigned. The DM which is used is 2 words per 1 item.

3 Turn on the KV device (here R39200) to which RY0000: Command request flag is assigned.

The PW command (the setting number is switched) is executed.

- Command instruction success: After the command execution is completed, the KV device (here R33600) to which the RX0000: Command complete flag was assigned turns on.
- Command instruction failure: the KV device (here R33601) to which the RX0001:Command error flag was assigned turns on, and the error code is written into the KV device (here DM10400) to which RWr0000: Command Result was assigned.

Typical command processing flow



Checking the CC-Link Communication Status (CC-Link Monitor & Diagnostics)

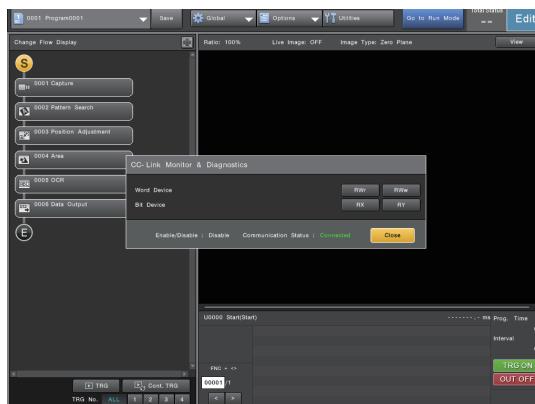
You can check the system's CC-Link I/O signal communication status with this function. This function is convenient because it allows you to check communications content when connected to an external device in situations such as when the appropriate data cannot be communicated between connected devices.



The monitor cannot be used when [Enable/Disable] for CC-Link is [Disable] or when CC-Link is not connected. First establish a CC-Link connection before using the monitor.

1 From the [Utilities] menu at the top of the screen, select [CC-Link Monitor & Diagnostics].

The [CC-Link Monitor & Diagnostics] screen is displayed.

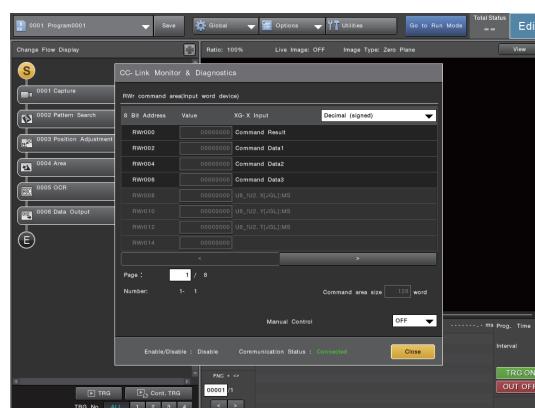


2 Select the item you wish to check.

Select Word Device (RWr/RWw) or Bit Device (RX/RY).

3 Now check the communication status.

RWr command area (Input word device) screen

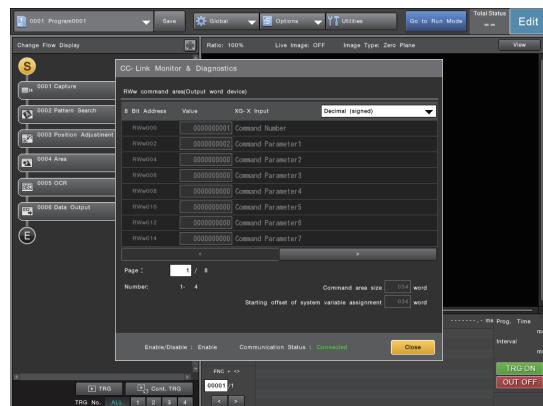


You can see that the result of Command Result was output as the value of RWr000 and the data specified to the unit 0002 was output as the value of RWr008, RWr010, and RWr012 from the controller.



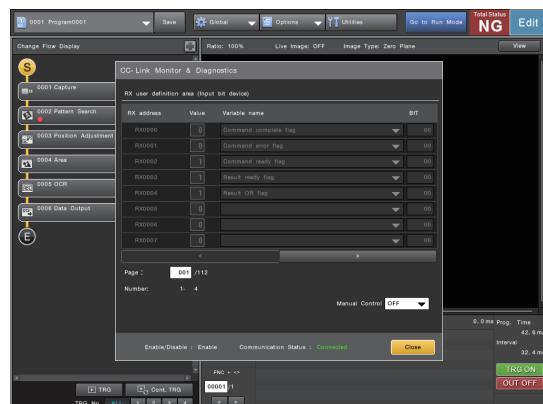
- Results data in this screen are displayed in a shortened form.
Example:
Normal notation!U[0002].RSLT.X[JGL]:MS
Shortened form!U2.X[JGL]:MS
- In setup mode, communication output other than response for external input commands is not performed. If you want to check the data output operation, switch to run mode.

RWw command area (Output word device) screen



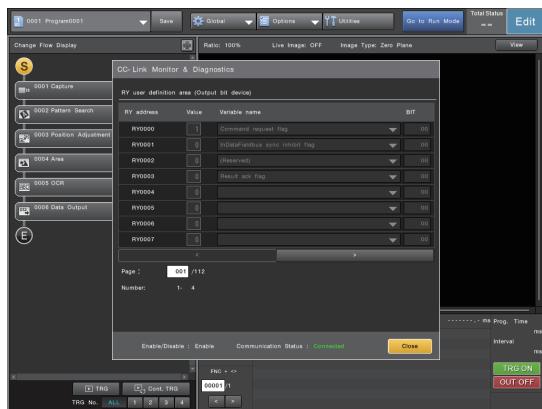
You can see that "1" as the Command Number is input as the value of RWw000 and "2" as the Command Parameter1 is input as the value of RWw002.

RX user definition area (Input bit device) screen



You can see that "1" as the Command ready flag, Result ready flag, and Result OR flag is output from the controller as the value of RX002, RX003, and RX004.

RY user definition area (Output bit device) screen



You can see that "1" as the value of the Command Request flag is input from the PLC side as the value of RY000.



With the input data (RWr and RX) monitor, you can manually change the value for the desired addresses and check those changes on the PLC by selecting ON for Manual Control during setup mode.

4 Select [Close].

Troubleshooting

If operation is not correct

Result OR flag is not output.

The Result OR flag is updated in association with execution of the data output unit which has CC-Link as the output destination. When the Result OR flag is used, it is necessary to output one or more data to CC-Link with the data output unit.

Result ready flag does not turn OFF

Control of the Result ack flag may not be correct. The Result ready flag is turned OFF when the Result ack flag is recognized (recieved by the controller). This is true whether the handshake is ON or OFF.

Data cannot be correctly retrieved due to change of the %Sto output at the leading edge from the external terminal.

Since %Sto is the data strobe signal of the parallel terminal output unit, it cannot be used as the strobe signal of data output.

For the data read timing with the CC-Link, refer to the Result ready flag.

Error Messages

Error Messages Assigned to System Variable %Error0.

The errors messages below are assigned to %Error0 by default.

The errors assigned to %Error0 can be removed or switched to %Error1 as desired.

Error Message	Cause	Corrective Action	Error Code
CC-Link communication has failed.	An error has occurred while starting communication or during communication, and communication cannot be performed correctly.	<ul style="list-style-type: none"> Check whether the CC-Link cable is connected correctly. Check whether the terminating resistor is attached properly. Make sure the cable complies with the specified standards. Check whether the baud rate is set correctly according to the cable length specifications. Make sure the settings on the master side have not been changed during the communication session. Check whether the controller and master were restarted after updating the communication settings. 	177
CC-Link unit (CA-NCL20E) disconnected.	The CC-Link unit is not recognized and the controller cannot use CC-Link communication.	<ul style="list-style-type: none"> Make sure the CC-Link unit is attached correctly. Make sure the CC-Link unit is not damaged. Do not disconnect the CC-Link unit while the controller and unit are powered on. 	181

Errors Messages not Assigned to System Variables %Error0 or %Error1

These errors by default are not assigned to %Error0 or %Error1 but can be assigned through the XG Vision Editor software.

Error Message	Cause	Corrective Action	Error Code
External command error has occurred.	An error occurred when executing a command from one of these devices:	<ul style="list-style-type: none"> PC Program PLC-Link Ethernet RS-232C CC-Link External terminals EtherNet/IP PROFINET EtherCAT 	128
Unable to write to CC-Link output buffer.	The controller output buffer for outputting via the CC-Link is full.	Reduce the amount of data to be output via CC-Link, so the buffer does not start filling up. Extend the time between triggers / processing to allow for data to be output. Note: Results data are not written when the buffer is full.	179

Error Message	Cause	Corrective Action	Error Code
CC-Link output buffer is full.	The controller output buffer for outputting via the CC-Link is full.	Reduce the amount of data to be output via CC-Link, so the data is output at a faster rate than it builds up. Or extend the time between triggers / processing to allow for data to be output. Note: Inspections processing can be put on hold until the buffer becomes free.	180

Control/Data Output via EtherNet/IP

Overview of System Control/ Data Output

Control/Data Output via
External Terminals

Control/Data Output via
PLC-Link

Control/Data Output via
CC-Link

► Control/Data Output via EtherNet/IP

Control/Data Output via
PROFINET

Control/Data Output via
EtherCAT

Control/Data Output via
No protocol communication

FTP Client/Server Function

Overview of Control/Data Output via EtherNet/IP

The XG-X Series supports communication via EtherNet/IP. EtherNet/IP is an open communications standard whose specifications are overseen by the ODVA (Open DeviceNet Vendor Association, Inc.). Communication is possible between all EtherNet/IP compatible devices regardless of vendor.

The EtherNet/IP functions supported by the controller are as follows:

Fixed-cycle Communication (Implicit)

High speed control can be performed using fixed-cycle communication at a specified interval (RPI: Request Packet Interval). Also, controls can be made by referencing and updating variables in the PLC, reducing the amount of PLC programming.

- **Controlling the system:** Commands can be assigned with fixed-cycle communication and used to control the vision system.
- **Outputting result data:** Inspection data results can be output to EtherNet/IP using fixed-cycle communication.
- **I/O control:** Using control system variables assigned to the fixed-cycle communication, the input/output functions of the I/O terminals of the XG-X can be controlled via the fixed-cycle communication.
- **Changing variable values:** When special system variables are assigned to %InDataFieldbus[], their values can be changed via the fixed-cycle communication (variable synchronization).

Point

- Settings for fixed-cycle communication, such as cycle (RPI), data size, timeout, and send trigger are performed on the PLC-side. When using cyclic communication with the XG-X controller, set the RPI to a value of 5 ms or more (1 ms or more when using a communication expansion unit). Also, when selecting COS (Change of State) using a PLC (Keyence KV-3000/5000/5500/7300/7500/8000, KV-Nano, etc.) where the send trigger can be selected, set the RPI to a value of 20 ms or more (4 ms or more when using the communication expansion unit) so that the Inhibit Time will be 5 ms or more (1 ms or more when using the communication expansion unit).
- Even when RPI has been set to 5 ms or more (1 ms or more when using a communication expansion unit), the XG-X controller may exhibit processing delays and communication may temporarily time out or disconnect when used with other communications such as system measurement setting, menu operations, commands, FTP or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Be sure to perform verification of the performance before actual operation.
- When there are multiple devices connected together on the network that includes EtherNet/IP devices, there can be a heavy load on the network which may result in constant/temporary communication delays or packet losses. Perform a thorough verification before operation.
- EtherNet/IP and PLC-Link, CC-Link, PROFINET or EtherCAT cannot be used at the same time (EtherNet/IP cannot be used when PLC-Link, CC-Link PROFINET or EtherCAT is enabled).

Explicit Message Communication

As with implicit fixed-cycle communication, this function can be used for communication applications that do not require fixed-times (Explicit message).

There is no functional difference between the explicit message communication function on the controller and the fixed-cycle communication function. Thus, in most cases there is no need to use the explicit message function. However, it can be used when performing EtherNet/IP communication with a PLC that does not support implicit fixed-cycle communication (such as the SLC5/05 series).

Operation Flow

Checking specifications (Page 1-150)

- Check if the PLC for connection is the model compliant with EtherNet/IP.
- Check the assignment status of input and output data.

Changing Ethernet/IP settings (Page 1-158)

- Make settings to connect the controller for EtherNet/IP connection.
Main items: IP address, PLC type, cyclic communication data size, input data/output data assignment of the controller

Establishing the Ethernet/IP link

- You can confirm whether a cyclic communications link has been established or not by checking [Communication Status] on the [EtherNet/IP] screen on the controller's Global settings.

Executing necessary processing

Data output (Page 1-166)

- The data from the data output unit is written on the data output area.
- Check data write completion with the Result ready flag.
- When the Result ack flag is ON, read completion is notified.

I/O control (Page 1-168)

- With assignment of the system variable related to the terminal control, the I/O control can be used.

Command control (Page 1-169)

- The custom command (Page 2-116) set in advance can be executed.
- Store the command code and the command parameter in the command input area and turn ON the command request flag to execute the command.
- When the command ready flag is ON, the command can be executed.
- Check execution of the command with the command complete flag.

Variable synchronization (Page 1-171)

- The value of a special system variable for variable synchronization (%InDataFieldbus[]) can be changed.

Preparing EtherNet/IP connection

Model compliant with EtherNet/IP connection

For details of each PLC setting method, refer to "Typical EtherNet/IP Setting Procedure" (Page 1-173) and the operation manual accompanying the PLC.

Keyence Corporation

KV Series

PLC type	EtherNet/IP Communication unit	Version of firmware
KV-3000	KV-EP21V	Ver.2 or later
KV-5000	KV-EP21V	Ver.2 or later
KV-5500	- (Built-in port in the unit or KV-EP21V)	Ver.2 or later
KV-7300	KV-XLE02, KV-EP21V	-
KV-7500	- (Built-in port in the unit or KV-XLE02, KV-EP21V)	-
KV-8000	- (Built-in port in the unit or KV-XLE02, KV-EP21V)	-
KV Nano	KV-NC1EP	Ver.1 or later

Rockwell Automation, Inc.

ControlLogix type PLC

PLC type	EtherNet/IP Communication unit	Version of firmware
1756 ControlLogix	1756-ENBT, 1756-EN2T	Ver.13 or later
	1756-L81E	Ver.32 or later
1769 CompactLogix	- (Built in the unit)	Ver.32 or later

SLC5/05 type PLC

PLC type	EtherNet/IP Communication unit	Version of firmware
1747 SLC5/05	- (Built in the unit)	OS firmware level Series C, FRN 10 or later
1763 MicroLogix 1100	- (Built in the unit)	16.000 or later

Omron Corporation

PLC type	EtherNet/IP Communication unit	Version of firmware
SYSMAC CJ2	- (Built-in port in the unit or CJ1W-EIP21)	V1.0 or later
SYSMAC CJ1	CJ1W-EIP21	V1.0 or later
SYSMAC CS1	CS1W-EIP21	V1.0 or later
SYSMAC NJ	- (Built-in port in the unit)	V1.3 or later

Preparing the EtherNet/IP Connection (When Using the CA-NEP20E)

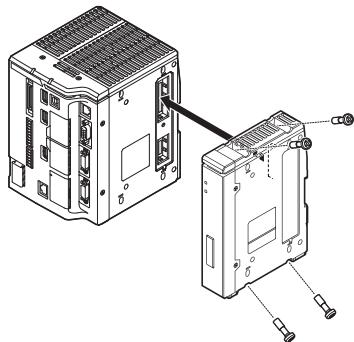
Installing the EtherNet/IP Unit

The optional EtherNet/IP unit CA-NEP20E is used when communicating over EtherNet/IP.

Remove the protective cover from the expansion unit connector on the right side of the controller and install the EtherNet/IP unit as shown below.

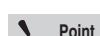
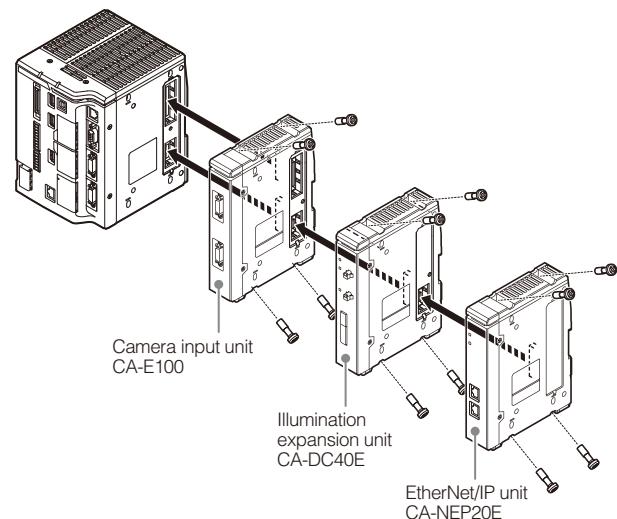


The controller must be turned off before connecting or disconnecting the CA-NEP20E.



When Using the Illumination Expansion Unit and EtherNet/IP Unit Together

Mount the camera input unit directly to the controller, then mount the illumination expansion unit and EtherNet/IP unit to the right side of the camera input unit.



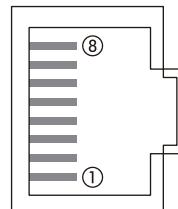
Illumination expansion units and EtherNet/IP units cannot be installed between camera input units and controllers.

CA-NEP20E EtherNet/IP Unit Specifications

Standard specifications

Item	
Compliant standard	IEEE802.3u (100BASE-TX)
Communication speed	100 Mbps (100BASE-TX)
Communication cycle	1 ms min.
Connection cable	Category 5e or greater shielded twisted pair (STP) cable
Node interval	100 m
Communication port	RJ45 connector × 2
Communication size	1436 bytes
Supported functions	Cyclic communication (Implicit message), Message communication (Explicit message) UCMM/Class3-compliant, DLR (Device Level Ring)-compliant
Conformance test version	Complying with Version.CT16

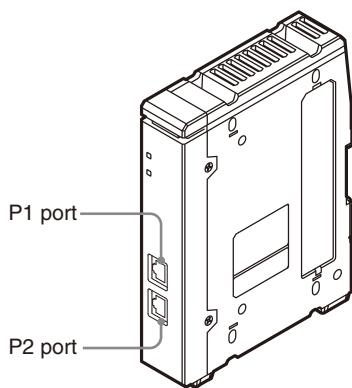
Wiring example (P1 port/P2 port)



No.	Signal name	Function
1	TX +	Transmission data (+)
2	TX -	Transmission data (-)
3	RX +	Reception data (+)
4	-	75 Ω terminating resistance connected
5	-	75 Ω terminating resistance connected
6	RX -	Reception data (-)
7	-	75 Ω terminating resistance connected
8	-	75 Ω terminating resistance connected

Connecting to an EtherNet/IP Network

Connect the EtherNet/IP network cable to the P1 port or the P2 port of the RJ connector. If an adapter is present downstream of this unit, connect a network cable to the unused port.



Point Use a category 5e or greater STP (shielded twisted pair) cable for the network cable. You can use either a straight cable or a crossover cable.

EtherNet/IP communication specifications

Standard specifications

	XG-X Ethernet port	Communication expansion unit (CA-NEP20E)	
Cyclic communication ^{*1} (Implicit communication)	No. of connections Communication size Transmission trigger	Maximum 32 Follow the PLC connection settings. To 248 bytes (Connection with Rockwell's SLC5/05) To 496 bytes (Connection with Rockwell's ControlLogix/CompactLogix) To 1436 bytes (Connection with Keyence's KV series and Omron's SYSMAC CJ2/CJ1/CS1/NJ) Follow the PLC connection settings. • Cyclic • COS ^{*2}	1 (Exclusive Owner) 4 (Input Only)
	Instance ID	• 100: Input data (transmission of controller) • 101: Output data (reception of controller) (254 for Input Only connection)	• 100: Input data (transmission of communication expansion unit) • 150: Output data (reception of communication expansion unit) (3 for Input Only)
Message communication (Explicit message)	No. of connections Compliant Explicit message method	Maximum 32 UCMM/Class3	Maximum 6
Conformance test	Complying with Version.CT15.	Complying with Version.CT16.	

*1 The conditions for the cyclic communication status to be "connected" are a bidirectional communication (Exclusive Owner) connection or an Input Only connection being established in the case of the XG-X Ethernet port and a bidirectional communication (Exclusive Owner) connection being established in the case of a communication expansion unit.

*2 Only the PLC compliant with COS (Keyence's KV-3000/5000/5500/7300/7500/8000, KV-Nano, etc.) can be specified. When the COS transmission trigger is selected, the controller sends the data at the timing when the transmission data is changed. (If the transmission data is not changed, it sends the data at specified RPI (communication frequency) intervals.) If the transmission data is continuously changed, the transmission is held during InhibitTime (minimum transmission interval). Also, the target used to check for changes to the transmission data is the "Result ready flag" and the "Command complete flag" in the case of the XG-X Ethernet port and is the entirety of the transmission data in the case of a communication expansion unit.

How to use explicit message communication and implicit fixed-cycle communication

Explicit message communication is used with PLC's like the Rockwell MicroLogix PLC. The setup procedure is different from the implicit fixed-cycle communication type PLC's like the ControlLogix, but the functionality is the same. Use explicit message communication for PLC's that do not have implicit communication.



- Since the explicit message communication performs TCP/IP communication, it is not suitable for a high speed control when compared to the implicit communication using UDP.
- Although the explicit message communication is a communication through TCP/IP, the data may not be delivered depending on a network status. Design the control (e.g. re-sending with time-out) at the PLC considering such a case.

Assignment status of cyclic communication data

Example of input data settings (XG-X series → Keyence KV-7500 series)

Example that one XG-X series is connected to the KV-7500 series and that the cyclic communication data size is set to 496 bytes (address 0000 to 0495), the command area size to 100 bytes (address 0020 to 0119), and the result area assignment start offset to 120 bytes (address 0120 -). (B****/W**** in the table is the assignment example of the KV-7500 link relay and link register address.)

Setting status	Address	7bit	6bit	5bit	4bit	3bit	2bit	1bit	0bit
		(byte)							
Bit area	0000	B007	Reserved	B006	Reserved	B005	Reserved	B004	Result OR
								B003	Result Ready
							B002	Cmd Ready	B001 Cmd Err
	0001	B00F	Reserved	B00E	Reserved	B00D	Reserved	B00C	Reserved
							B00B	Trg4 Ready	B00A Trg3 Ready
							B009	Trg2 Ready	B008 Trg1 Ready
	0002	B017	Reserved	B016	Reserved	B015	Reserved	B014	Reserved
							B013	Trg4 Ack	B012 Trg3 Ack
							B011	Trg2 Ack	B010 Trg1 Ack
	0003	B01F	Reserved	B01E	Reserved	B01D	Reserved	B01C	Reserved
							B01B	Remote Ready	B01A Err 1 Status
							B019	Err 0 Status	B018 Busy
	0004	B027	Assignable	B026	Assignable	B025	Assignable	B024	Assignable
							B023	Assignable	B022 Assignable
							B021	Assignable	B020 Assignable
	0005	B02F	Assignable	B02E	Assignable	B02D	Assignable	B02C	Assignable
							B02B	Assignable	B02A Assignable
							B029	Assignable	B028 Assignable
	0006	B037	Assignable	B036	Assignable	B035	Assignable	B034	Assignable
							B033	Assignable	B032 Assignable
							B031	Assignable	B030 Assignable
	0007	B03F	Assignable	B03E	Assignable	B03D	Assignable	B03C	Assignable
							B03B	Assignable	B03A Assignable
							B039	Assignable	B038 Assignable
Error code area	0008	W000	Error 0 Code						
	0009								
	0010	W001	Error 1 Code						
	0011								
	0012	W002	Reserved						
	0013		Reserved						
	0014	W003	Reserved						
	0015		Reserved						
Measurement count area	0016	W004	Total Count						
	0017								
	0018	W005							
	0019								
Command output area	0020	W006	Command	InData (0020)					
	0021		Result						
	0022	W007		InData (0022)					
	0023								
	0024	W008	Command	InData (0024)					
	0025		Data 1						
	0026	W009		InData (0026)					
	0027								
	0028	W00A	Command	InData (0028)					
	0029		Data 2						
	0030	W00B		InData (0030)					
	0031								
	0032	W00C		InData (0032)					
	:								
	0114	W035		InData (0114)					
	0115								
	0116	W036	Command	InData (0116)					
	0117		Data 24						
	0118	W037		InData (0118)					
	0119								

Setting status	Address	7bit (byte)	6bit	5bit	4bit	3bit	2bit	1bit	0bit
Result output area	0120	W038	Result Data	InData (0120)					
	0121		1						
	0122	W039		InData (0122)					
	0123								
	0124	W03A	Result Data	InData (0124)					
	0125	2							
	0126	W03B		InData (0126)					
	0127								
	0128	W03C		InData (0128)					
	0129								
	0130	W03D		InData (0130)					
	:								
	0490	W0F1		InData (0490)					
	0491								
	0492	W0F2	Result Data	InData (0492)					
	0493	94							
	0494	W0F3		InData (0494)					
	0495								

Names and operations of input signals

Assigned Region	Name	Remarks
Bit area	Cmd Complete	Turns ON when command processing is complete.
	Cmd Err	Turns OFF when command processing is successful and turns ON when it fails.
	Cmd Ready	Turns ON when command processes can be received.
	Result Ready	Turns ON when data transmission is complete.
	Result OR	Linked to %JgAll*.
	Trg1 Ready	Ready signal for Trigger 1
	Trg2 Ready	Ready signal for Trigger 2
	Trg3 Ready	Ready signal for Trigger 3
	Trg4 Ready	Ready signal for Trigger 4
	Trg1 Ack	Turns ON when Trigger 1 input is received. Turns OFF when Trigger 1 input is OFF.
	Trg2 Ack	Turns ON when Trigger 2 input is received. Turns OFF when Trigger 2 input is OFF.
	Trg3 Ack	Turns ON when Trigger 3 input is received. Turns OFF when Trigger 3 input is OFF.
	Trg4 Ack	Turns ON when Trigger 4 input is received. Turns OFF when Trigger 4 input is OFF.
	Busy	Linked to %Busy.
	Err 0 Status	Linked to %Error0.
	Err 1 Status	Linked to %Error1.
	Remote Ready	Linked to %Run.
Error code area	Error 0 Code	The error code for the cause of the error assigned to %Error0 that occurred last.
	Error 1 Code	The error code for the cause of the error assigned to %Error1 that occurred last.
Processing count area	Total Count	Displays the processing count.
Command output area	Command Result	Displays the command execution result.
	Command Data 1	Returns command execution result data 1.
	Command Data 2	Returns command execution result data 2.

	Command Data24	Returns command execution result data 24.
Data output area	Result Data 1	Returns measurement result data 1.
	Result Data 2	Returns measurement result data 2.

	Result Data 94	Returns measurement result data 94.

Example of output data settings (Keyence KV-7500 series → XG-X series)

Example that one XG-X series is connected to the KV-7500 series and that the cyclic communication data size is set to 496 bytes (address 0000 to 0495), the command area size to 68 bytes (address 0016 to 0083), and the system variable assignment start offset to 84 bytes (address 0084 -). (B****/W**** in the table is the assignment example of the KV-7500 link relay and link register address.)

Setting status	Address	7bit	6bit	5bit	4bit	3bit	2bit	1bit	0bit
Bit area	0000	B047	Reserved	B046	Reserved	B045	Err 1 reset request	B044	Err 0 reset request
	0001	B04F	Reserved	B04E	Reserved	B04D	Reserved	B04C	Reserved
	0002	B057	Reserved	B056	Reserved	B055	Reserved	B054	Reserved
	0003	B05F	Reserved	B05E	Reserved	B05D	Reserved	B05C	Reserved
	0004	B067	Assignable	B066	Assignable	B065	Assignable	B064	Assignable
	0005	B06F	Assignable	B06E	Assignable	B06D	Assignable	B06C	Assignable
	0006	B077	Assignable	B076	Assignable	B075	Assignable	B074	Assignable
	0007	B07F	Assignable	B07E	Assignable	B07D	Assignable	B07C	Assignable
Reserved area	0008		Reserved		Reserved		Reserved		Reserved
	0009		Reserved		Reserved		Reserved		Reserved
	0010		Reserved		Reserved		Reserved		Reserved
	0011		Reserved		Reserved		Reserved		Reserved
	0012		Reserved		Reserved		Reserved		Reserved
	0013		Reserved		Reserved		Reserved		Reserved
	0014		Reserved		Reserved		Reserved		Reserved
	0015		Reserved		Reserved		Reserved		Reserved
Command input area	0016	W0F8	Command number		OutDat (0016)				
	0017								
	0018	W0F9		OutDat (0018)					
	0019								
	0020	W0FA	Cmd Parameter1		OutDat (0020)				
	0021								
	0022	W0FB		OutDat (0022)					
	0023								
	0024	W0FC	Cmd Parameter2		OutDat (0024)				
	0025								
	0026	W0FD		OutDat (0026)					
	0027								
	0028	W0FE	Cmd Parameter3		OutDat (0028)				
	0029								
	0030	W0FF		OutDat (0030)					
	0031								
	0032	W100		OutDat (0032)					
	:								
	0079								
	0080	W118	Cmd Parameter		OutDat (0080)				
	0081								
	0082	W119	16		OutDat (0082)				
	0083								

Setting status	Address	7bit (byte)	6bit	5bit	4bit	3bit	2bit	1bit	0bit
System variable	0084	W011A	%InData	OutDat (0084)					
area special for variable	0085		Fieldbus						
synchronization	0086	W011B	[0]	OutDat (0086)					
	0087								
	0088	W011C	%InData	OutDat (0088)					
	0089		Fieldbus						
	0090	W011D	[1]	OutDat (0090)					
	0091								
	0092	W011E		OutDat (0092)					
	0093								
	:								
	0488	W01E4	%InData	OutDat (0488)					
	0489		Fieldbus						
	0490	W01E5	[101]	OutDat (0490)					
	0491								
	0492	W01E6	%InData	OutDat (0492)					
	0493		Fieldbus						
	0494	W01E7	[102]	OutDat (0494)					
	0495								

Names and operations of output signals

Assigned Region	Name	Remarks
Bit area	Cmd Request	Requests command execution when the signal changes from OFF to ON.
	InDataFB sync inhibit	When this is ON, reading of %InDataFieldbus[] data is not allowed.
	Result ack	Notifies of data acquisition when the signal changes from OFF to ON.
	Err 0 reset request	Clears Error0 when the signal changes from OFF to ON.
	Err 1 reset request	Clears Error1 when the signal changes from OFF to ON.
	Trg1	Trigger 1 input
	Trg2	Trigger 2 input
	Trg3	Trigger 3 input
	Trg4	Trigger 4 input
	Reset	Reset input: Resets the controller (rise cycle).
	Ext	Disable Trigger reception: During signal input, capturing for all cameras and capture unit operation will stop (level input).
	Test	Test run input: During signal input, data output for all ports, %JAHold, and %Sto will be forcibly stopped and the output buffer will also be cleared (level input).
Command input area	Command Number	Writes custom command numbers.
	Cmd Parameter1	Writes custom command argument "*01".
	Cmd Parameter2	Writes custom command argument "*02".
	Cmd Parameter3	Writes custom command argument "*03".

	Cmd Parameter16	Writes custom command argument "*16".
Variable synchronization specific	%InDataFieldbus[0]	Fieldbus-specific input data 1
System variable area	%InDataFieldbus[1]	Fieldbus-specific input data 2

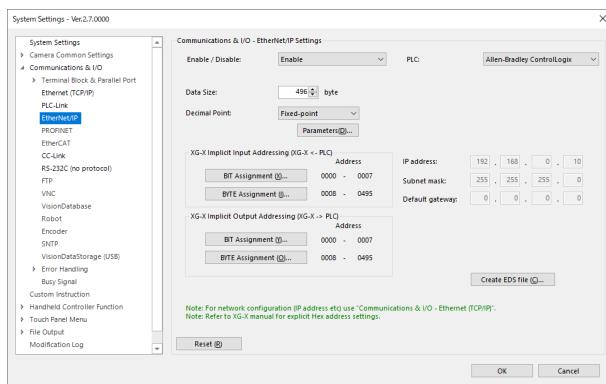
	%InDataFieldbus[101]	Fieldbus-specific input data 102
	%InDataFieldbus[102]	Fieldbus-specific input data 103

Changing EtherNet/IP settings

Displaying EtherNet/IP setting screen

Changing settings with XG-X VisionEditor

On the [EtherNet/IP] menu in the XG-X VisionEditor System Settings, the settings for controlling the input and output of data via EtherNet/IP through the Ethernet port of the controller or through an EtherNet/IP unit (CA-NEP20E: option) connected to the controller can be changed.



Reference

When using the XG-X Ethernet port, the controller Ethernet settings such as IP address and subnet mask are changed on the [Ethernet (TCP/IP)] screen (Page 1-295).

Point

- Implicit communication settings such as cycle (RPI), data size, time out, transmission trigger, etc. are specified at the PLC. When using cyclic communication with the XG-X controller, set the RPI to a value of 5 ms or more (1 ms or more when using a communication expansion unit). Also, when selecting COS (Change of State) using a PLC (Keyence KV-3000/5000/5500/7300/7500/8000, KV-Nano, etc.) where the send trigger can be selected, set the Inhibit Time to a value of 5 ms or more (1 ms or more when using a communication expansion unit).
- Even when RPI has been set to 5 ms or more (1 ms or more when using a communication expansion unit), the XG-X controller may exhibit processing delays and communication may temporarily time out or disconnect when used with other communications such as system measurement setting, menu operations, commands, FTP or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Furthermore, be sure to verify if the performance is acceptable before operation.
- Network traffic may affect the performance of communication between the EtherNet/IP device and the controller.
- The EtherNet/IP cannot be used while the PLC link (Page 1-71), CC-Link (Page 1-113), PROFINET (Page 1-210), or EtherCAT (Page 1-252) is enabled.

- Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

- In the left pane of the [System Settings] menu, select [Communications & I/O] - [EtherNet/IP].

The [EtherNet/IP] menu appears.

- Change the settings as required.

See "EtherNet/IP Settings" (Page 1-160) for more details on each setting.

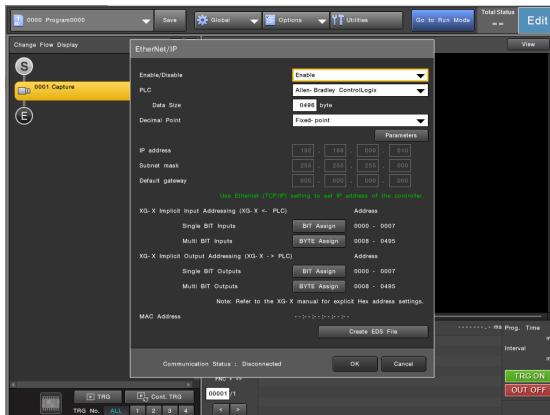
- Click [OK].



To apply changes to the controller, you need to upload the system settings file to the controller and then restart the controller.

Changing settings with the controller

On the [EtherNet/IP] menu in the global settings, the settings for controlling the input/output of data via EtherNet/IP through the Ethernet port of the controller or through an EtherNet/IP unit (CA-NEP20E: option) connected to the controller can be changed.



Reference

When using the XG-X Ethernet port, the controller Ethernet settings such as IP address and subnet mask are changed on the [Ethernet (TCP/IP)] screen (Page 1-295).

Point

- If any settings other than the [Decimal Point] and [Starting address of output data] inside the [XG-X Implicit Output Addressing (XG-X -> PLC): Multi BIT Output] settings are changed, the controller must be restarted for changes to take effect.
- Implicit communication settings such as cycle (RPI), data size, time out, transmission trigger, etc. are specified at the PLC. When using cyclic communication with the XG-X controller, set the RPI to a value of 5 ms or more (1 ms or more when using a communication expansion unit). Also, when selecting COS (Change of State) using a PLC (Keyence KV-3000/5000/5500/7300/7500/8000, KV-Nano, etc.) where the send trigger can be selected, set the Inhibit Time to a value of 5 ms or more (1 ms or more when using a communication expansion unit).
- Even when RPI has been set to 5 ms or more (1 ms or more when using a communication expansion unit), the XG-X controller may exhibit processing delays and communication may temporarily time out or disconnect when used with other communications such as system measurement setting, menu operations, commands, FTP or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Furthermore, be sure to verify if the performance is acceptable before operation.
- Network traffic may affect the performance of communication between the EtherNet/IP device and the controller.

- 1 On the [Global] menu at the top of the screen, select [Communications & I/O] - [EtherNet/IP].

The [EtherNet/IP] menu appears.

- 2 Select [Enable] in the [Enable/Disable] field.

- 3 Select the PLC type to be connected in [PLC].

The default settings for the selected PLC type will be set.

- 4 Change the settings as required.

See "EtherNet/IP Settings" (Page 1-160) for more details on each setting.

- 5 Click [OK].

EtherNet/IP Settings

Enable/Disable

Select whether to use EtherNet/IP.

- **Disable:** EtherNet/IP communication is disabled.
- **Enable:** EtherNet/IP communication through the XG-X Ethernet port is enabled.
- **Enable module:** EtherNet/IP communication through the communication expansion unit (CA-NEP20E: sold separately) connected to the controller is enabled.



EtherNet/IP cannot be used while the PLC link (Page 1-71), CC-Link (Page 1-113), PROFINET (Page 1-210) or EtherCAT (Page 1-252) is enabled. You must disable all of them.

PLC type

Select the type of connection.

The settings for the selected PLC type appear.



Changing the PLC types will initialize some of the EtherNet/IP settings.

Data Size

Specifies the data size assigned to EtherNet/IP fixed-cycle communication in 4 byte units. Various data areas whose size areas have been specified with this setting are assigned from the start address of fixed-cycle communication. The range that can be specified and the default settings will differ by the type of PLC that has been selected.

- **Allen-Bradley ControlLogix:** 16 to 496 bytes (Default value: 496 bytes)
- **Allen-Bradley SLC5/05:** 16 to 248 bytes (Default value: 248 bytes)
- **Keyence KV:** 16 to 1436 bytes (Default value: 496 bytes)
- **OMRON SYSMAC:** 16 to 1436 bytes (Default value: 496 bytes)
- **Other:** 16 to 1436 bytes (Default value: 496 bytes)



The data size that will actually be sent and received follows the PLC-side connection settings. It is recommended to set the same value for data size on the XG-X and the PLC.



The values set here are used as the data size when accessing Assembly Object input data (instance 100, attribute 3) and output data (instance 101 [when using the XG-X Ethernet port]/150 [when using a communication expansion unit], attribute 3) using explicit message communication.

Decimal Point

Select the data expression method for the input and outputs for the MW/MR/MS/MWX/MRX/MSX command parameters, command data outputs, and result outputs.

- **Fixed-point** (default): Outputs data after multiplying it by 1000 as a 32-bit signed integer.
Select [Parameters] to specify the [Decimal Precision] (1/10, 1/100, 1/1000, or 1/10000; set to 1/1000 by default).



Depending on the [Decimal Precision] setting: 1/10, 1/100, 1/1000, or 1/10000, the measurement result is multiplied by 10, 100, 1000, or 10000 (respectively) and is used as 32 bits of signed integer data.

- **Floating-point:** Outputs data as a single-precision floating point data (32 bit) (Low order byte is stored in the lowest address.).



For commands which handle integers, the command parameters are read as integers that have always rounded off the first decimal place regardless of the settings, and the command data outputs are written in integers.

Communication expansion unit network settings

- Point**
- If incorrect settings are used, the controller and other network equipment may not work properly. Consult your system administrator or network administrator about setting values.
 - For communication through the XG-X EtherNet/IP port, set the IP address, subnet mask, and default gateway on the [Ethernet] screen. For details, refer to "No protocol communication via Ethernet" (Page 1-295).

Reference When [Disable] or [Enable] is selected for [Enable/Disable], the setting details of the controller's XG-X Ethernet port are displayed.

- IP address:**
Enter the IP address (Default value: 192.168.0.20).
- Subnet mask:**
Enter a subnet mask (Default value: 255.255.255.0).
- Default gateway:**
Enter a default gateway IP address (Default value: 0.0.0.0).

Point The set value is common with the P1 port and P2 port of the communication expansion unit.

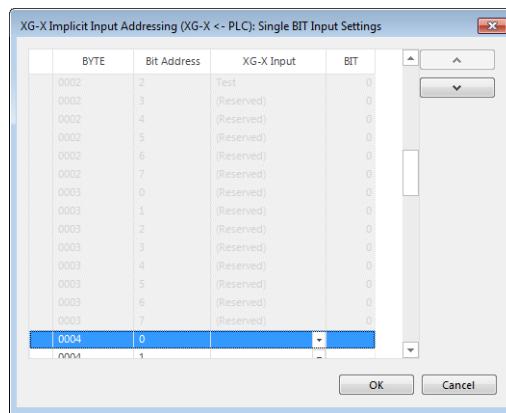
- Enable DHCP** (only when [Enable module] is selected)
Select this check box when the network setting information (IP address, subnet mask, and default gateway) is provided by a DHCP server when the controller starts. (Default: disabled)

- Point**
- When DHCP is enabled, the settings of the IP address, subnet mask, and default gateway cannot be changed on the [EtherNet/IP] menu.
 - If the DHCP server has not been started, the controller retries DHCP processing until there is a reply from the server. Clear this check box to change to manual assignment of the settings.

XG-X Implicit Input Addressing (XG-X ← PLC) (XG-X VisionEditor)

BIT Assignment

The [XG-X Implicit Input Addressing (XG-X ← PLC): Single BIT Input Settings] menu opens when the Bit Assignment button is pressed. It shows the predefined and customized assignment list of bit input data (data to the controller) used with EtherNet/IP.



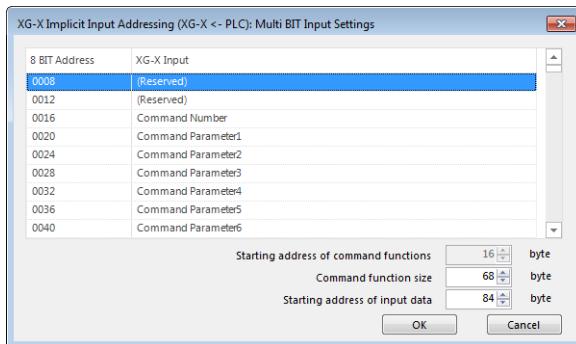
- Use the columns under [XG-X Input] and [BIT] to assign the desired input-type system variable and its bit to an address. Only system variables related to parallel port control can be assigned.
- The assignment setting can be moved to another address by selecting the line and clicking [\wedge] or [\vee].
- Any device ranges that cannot be used in the current settings are not displayed.

Reference For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).

- Point**
- The system variables which have been assigned to the input terminals on the parallel port cannot be used as another assignment for the EtherNet/IP.
 - Assignment of the same bit on the same system variable to multiple output data (reception of the controller) addresses and input terminals on the parallel port will result in an error.

BYTE Assignment

The [XG-X Implicit Input Addressing (XG-X ← PLC): Multi BIT Input Settings] menu opens when the Byte Assignment button is pressed. It shows the predefined and customized assignment list of byte input data (data to the controller) used with EtherNet/IP.



- Starting address of command functions:** Specifies the position to start assignment of items necessary for command control. In the controller, it is fixed to 16 bytes and cannot be changed.
- Command function size:** Items necessary for command control are assigned up to 68 bytes (default) which defines the area size upper limit. Command Numbers are assigned from 16 to 19 bytes, and Command Parameter 1 to 16 are assigned from 20 to 83 bytes.
- Starting address of input data:** Specifies the position to start assignment of %InDataFieldbus[]. By default, 4 bytes for each item from the 84th byte is assigned. When the command control and the variable synchronization are performed at the same time with EtherNet/IP, overlap of the data range used by the command and the variable synchronization may occur. Avoid this by reducing the command area size to the least amount of words required, and by changing the starting address for synchronizing variables in the [Starting address of input data] setting on the variable synchronization unit.

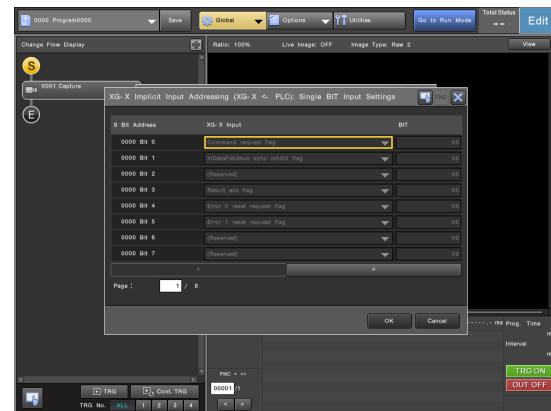
Reference

- Any device ranges that cannot be used in the current settings are grayed out.
- The decimal data written to Command Parameter is expressed using the method set in [Decimal Point].

XG-X Implicit Input Addressing (XG-X ← PLC) (Controller)

BIT Assign

The [XG-X Implicit Input Addressing (XG-X ← PLC): Single BIT Input Settings] menu shows the predefined and customized assignment list of bit input data (data to the controller) used with EtherNet/IP.



Use the columns under [XG-X Input] and [BIT] to assign the desired input-type system variable and its bit to an address. Only system variables related to parallel port control can be assigned.

Reference

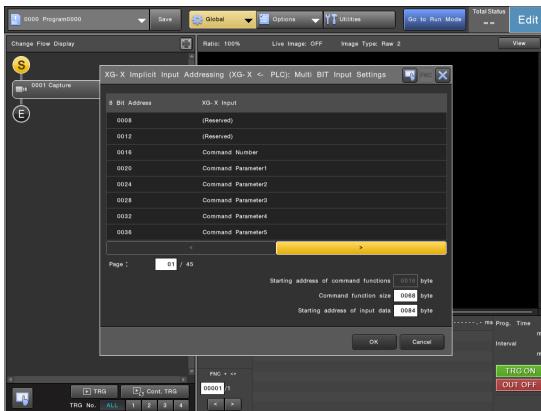
For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).

Point

- The system variables which have been assigned to the input terminals on the parallel port cannot be used as another assignment for the EtherNet/IP.
- Assignment of the same bit on the same system variable to multiple output data (reception of the controller) addresses and input terminals on the parallel port will result in an error.

BYTE Assign

The [XG-X Implicit Input Addressing (XG-X ← PLC): Multi BIT Input Settings] menu shows the predefined and customized assignment list of byte input data (data to the controller) used with EtherNet/IP.



- Starting address of command functions:** Specifies the position to start assignment of items necessary for command control. In the controller, it is fixed to 16 bytes and cannot be changed.
- Command function size:** Items necessary for command control are assigned up to 68 bytes (default) which are the area size upper limit. Command Numbers are assigned from 16 to 19 bytes and Command Parameter 1 to 16 are assigned from 20 to 83 bytes.
- Starting address of input data:** Specifies the position to start assignment of %InDataFieldbus[]. By default, 4 bytes for each item from the 84th byte is assigned.

Reference

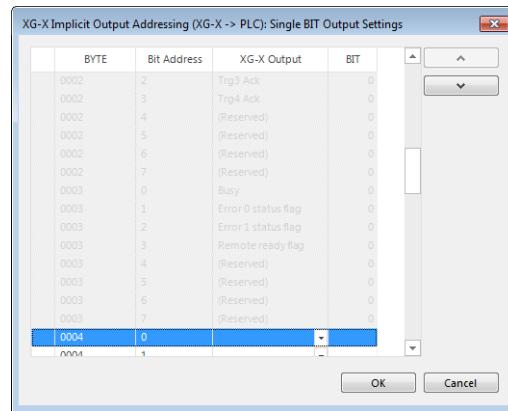
- Any device ranges that cannot be used in the current settings are grayed out.
- The decimal data written to Command Parameter is expressed using the method set in [Decimal Point].

Point Only custom commands can be executed using the EtherNet/IP.

XG-X Implicit Output Addressing (XG-X → PLC) (XG-X VisionEditor)

BIT Assignment

The [XG-X Implicit Output Addressing (XG-X → PLC): Single BIT Output Settings] menu opens when the Bit Assignment button is pressed. It shows the predefined and customized assignment list of bit output data (data from the controller) used with EtherNet/IP.



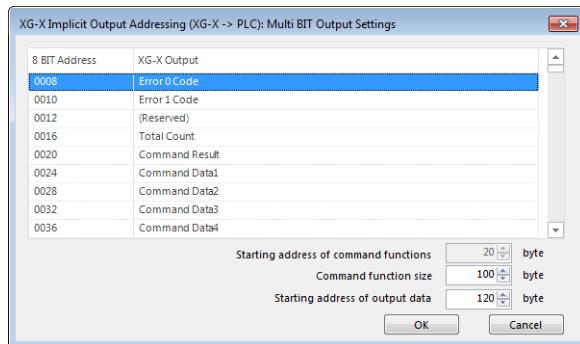
- Use the columns under [XG-X Output] and [BIT] to assign the desired output-type system variable and its bit to an address. Only system variables related to parallel port control can be assigned.
- The assignment setting can be moved to another address by selecting the line and clicking [\wedge] or [\vee].

Reference

For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).

BYTE Assignment

The [XG-X Implicit Output Addressing (XG-X → PLC): Multi BIT Output Settings] menu opens when the Byte Assignment button is pressed. It shows the predefined and customized assignment list of byte output data (data from the controller) used with EtherNet/IP.



- Starting address of command functions:** Specifies the position to start assignment of items necessary for command control. In the controller, it is fixed to 20 bytes and cannot be changed.
- Command function size:** Items necessary for command control are assigned to 100 bytes (default) of the area size. Command Results are assigned from 20 to 23 bytes and Command Data 1 to 24 are assigned from 24 to 119 bytes.
- Starting address of output data:** The data output unit which has EtherNet/IP as the output device can give the output after the assignment range set here in the area set by the fixed-cycle communication data size. If the data output size is not sufficient, reduce the command area size to the least amount required, and change the starting address position for outputting results in the [Starting address of output data] setting.

Reference

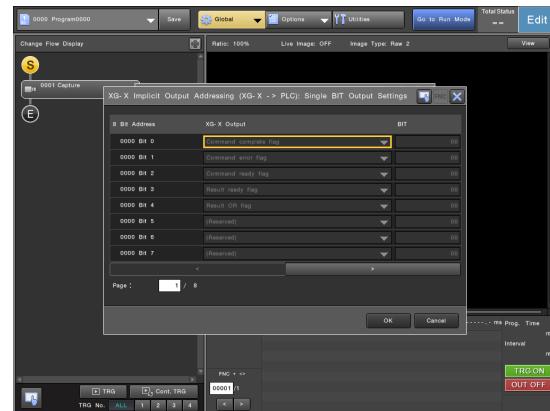
- Any address ranges that cannot be used in the current settings are grayed out.
- The decimal data in the Command Data is expressed using the method set in [Decimal Point].

Point
The data range, which is actually used for a command response, varies depending on the command. Be sure to provide a sufficient area for the command response of the command used.

XG-X Implicit Output Addressing (XG-X → PLC) (Controller)

BIT Assign

The [XG-X Implicit Output Addressing (XG-X → PLC): Single BIT Output Settings] menu shows the predefined and customized assignment list of bit output data (data from the controller) used with EtherNet/IP.



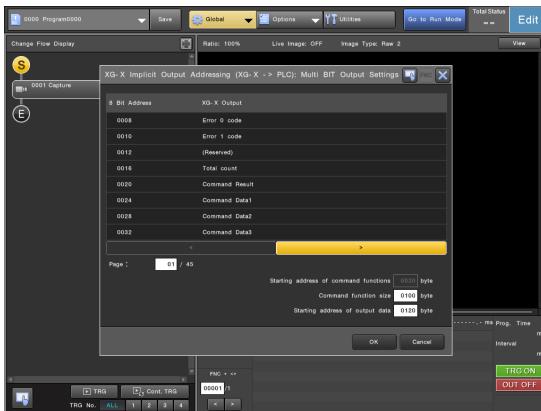
Use the columns under [XG-X Output] and [BIT] to assign the desired output-type system variable and its bit to an address. Only system variables related to parallel port control can be assigned.

Reference

For more details on system variables that can be assigned, refer to "List of System Variables" (Page 3-451).

BYTE Assign

The [XG-X Implicit Output Addressing (XG-X → PLC): Multi BIT Output Settings] menu shows the predefined and customized assignment list of byte output data (data from the controller) used with EtherNet/IP.



- Starting address of command functions:** Specifies the position to start assignment of items necessary for command control. In the controller, it is fixed to 20 bytes and cannot be changed.
- Command function size:** Items necessary for command control are assigned to 100 bytes (default) of the area size. Command Results are assigned from 20 to 23 bytes and Command Data 1 to 24 are assigned from 24 to 119 bytes.
- Starting address of output data:** The data output unit which has EtherNet/IP as the output device can give the output after the assignment range set here in the area set by the fixed-cycle communication data size. If the data output size is not sufficient, reduce the command area size to the least amount required, and change the starting address position for outputting results in the [Starting address of output data] setting.

Reference

- Any address ranges that cannot be used in the current settings are grayed out.
- The decimal data in the Command Data is expressed using the method set in [Decimal Point].

The data range, which is actually used for a command response, varies depending on the command. Be sure to provide a sufficient area for the command response of the command used.

Create EDS File

The EDS file including the information for the EtherNet/IP function of the controller is output. An EDS file is named based on the following naming rules.

- In the case of the XG-X2000 Series:
Keyence_5004_0101.eds
- In the case of the XG-X1000 Series:
Keyence_5006_0101.eds
- In the case of a communication expansion unit (CA-NEP20E):
Keyence_5008_0101.eds

Point
The file is not created if any of the parameter settings are incorrect. Confirm the settings and then try again.

Reference

- The output path of the file is SD2:/xg/EDS in the case of the controller and SD2:/xg/EDS_EX in the case of a communication expansion unit.
- Since the EDS file does not include the information set or changed by the controller or the XG-X VisionEditor system settings, the prepared EDS file always has the same content.
- The icon file for the controller is the *.ico file that is located in the "Doc" folder in the XG-X VisionEditor installation folder.
- If you connect to a Keyence KV Series device, an EDS file is not necessary.

Reset (XG-X VisionEditor)

Returns all settings of [EtherNet/IP] to their initial values.

Outputting measurement data via EtherNet/IP

(Data Output)

Change the settings so that a data output unit can output data via EtherNet/IP.



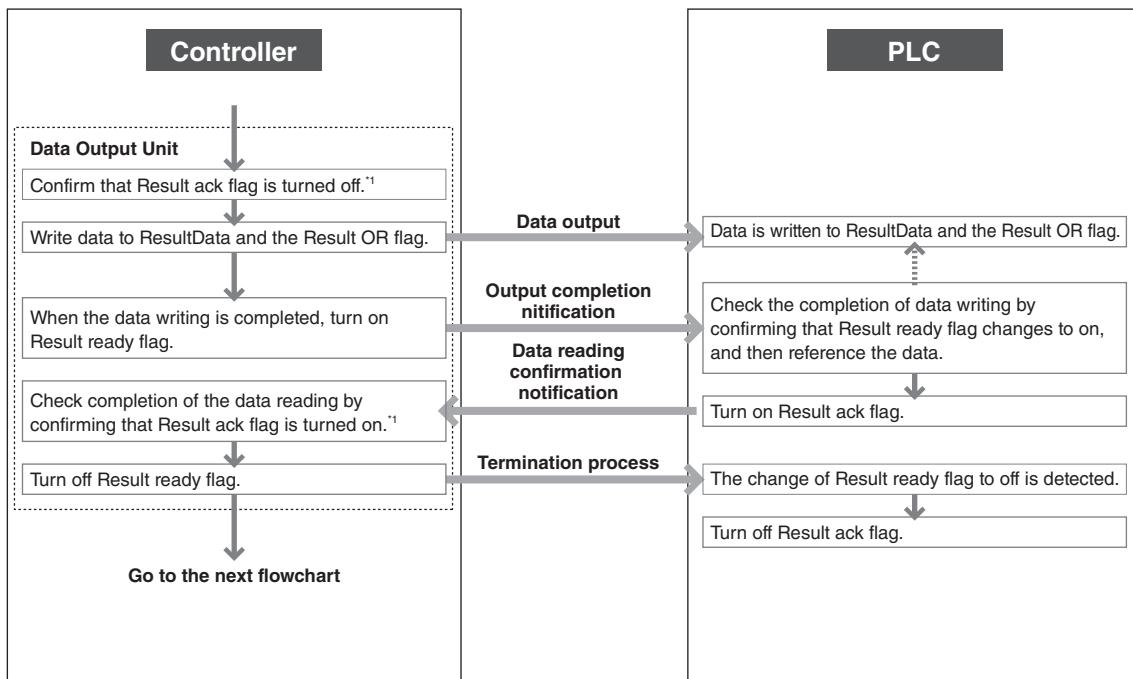
The EtherNet/IP cannot be used while the PLC-Link, CC-Link, PROFINET, or EtherCAT is enabled.

Data Output Flow

Data is output from a data output unit. Set the output data and destination addresses for the data output unit. Use the following procedures for outputting data from the controller by EtherNet/IP.



- The data output via the EtherNet/IP is performed only when the controller is in run mode. Data cannot be output in setup mode.
- With EtherNet/IP, images and other binary data cannot be output.
- No data is output unless all data output units in the flowchart have been executed. In this case, the Result ready flag is not changed.



¹ This is the procedure when handshake is set to ON.

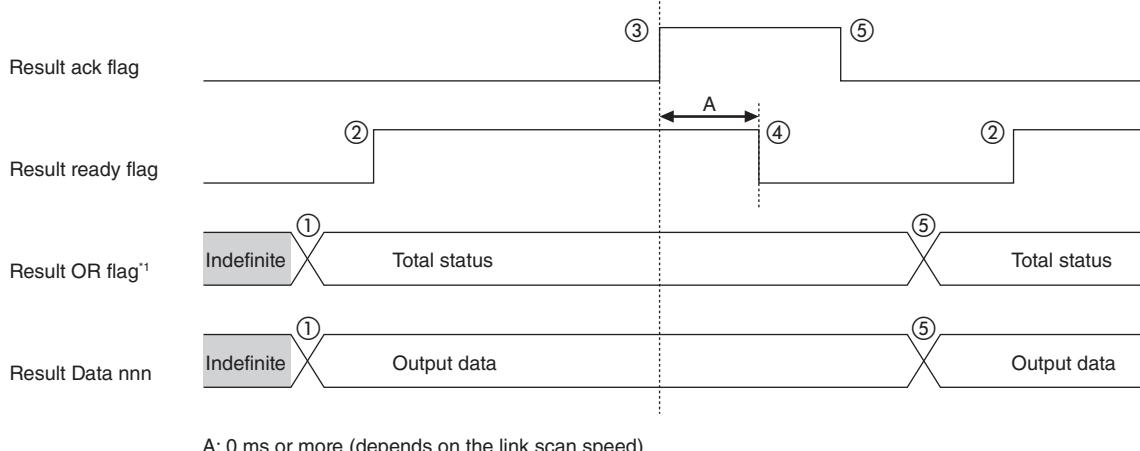
When handshake is set to OFF, regardless of the Result ack flag status, the controller overwrites the corresponding data memory when the data output unit is executed, and the Result ready flag remains ON. If the process requires writing completion confirmation by detecting the change of Result ready flag from OFF to ON, turn ON Result ack flag to turn OFF Result ready flag.



Be careful that the data range used for data output does not overlap the command response data.

Timing Chart

When handshake is ON



A: 0 ms or more (depends on the link scan speed)

*1 If you use the Result OR flag, one or more item of data needs to be set to be output from the data output unit to the EtherNet/IP.

(1) The data is updated.

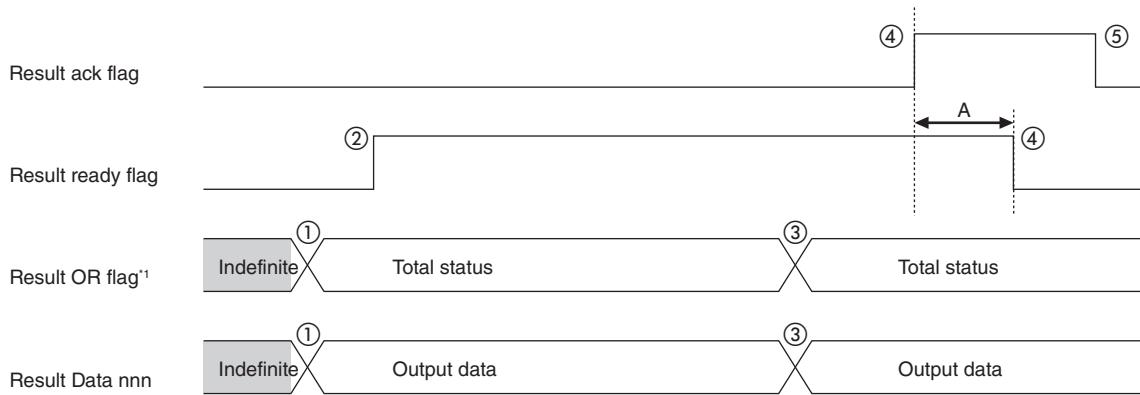
(2) The Result ready flag for the read synchronization signal of the output data turns ON and the data can be read.

(3) When data read is completed, the Result ack Flag turns ON as the signal for data read completion.

(4) Associated with (3), the Result ready flag turns OFF.

(5) Result ack flag turns OFF. This is received and output continues if data is updated.

When handshake is OFF



A: 0 ms or more (depends on the link scan speed)

*1 If you use the Result OR flag, one or more item of data needs to be set to be output from the data output unit to the EtherNet/IP.

(1) The data is updated.

(2) The Result ready flag for the read synchronization signal of the output data turns ON and the data can be read.

(3) If data is updated, the Result ready flag stays ON and output continues.

(4) If the Result ack flag turns ON, the Result ready flag turns OFF. This can be used when you want to find out the latest OK/NG status with as little delay as possible for such applications as when the line is to be stopped when the status is NG.

(5) Result ack flag turns OFF. Thus, you can find out the timing of the next data update.

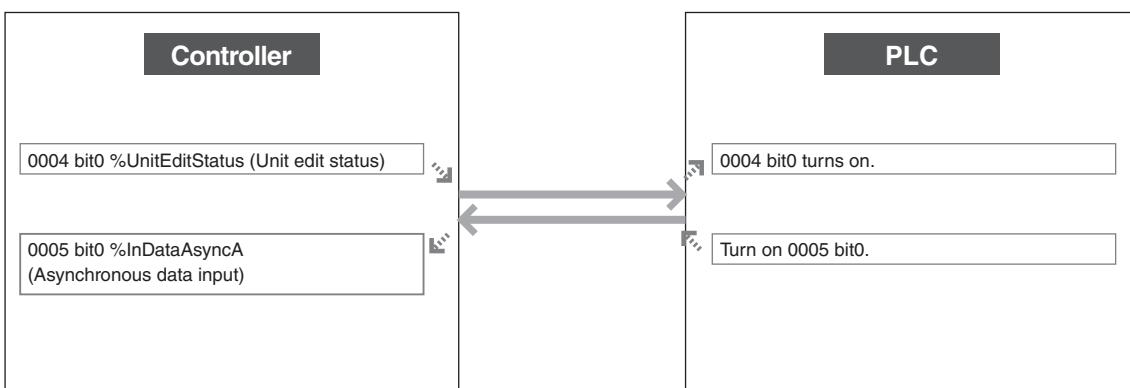
I/O Control via EtherNet/IP

Change the settings to use EtherNet/IP to control input/output in the same way as the terminal block interface or parallel I/O interface of the controller.

- The EtherNet/IP cannot be used while the PLC-Link, CC-Link, PROFINET, or EtherCAT is enabled.
- For more details on the system variables available for the EtherNet/IP, refer to "List of System Variables" (Page 3-451).

I/O Control Operation (Example of Connection to PLC EtherNet/IP Unit)

When system variables related to parallel output control are assigned to bit devices, multiple I/O signals can be transmitted through one LAN cable.



Point Although each I/O signal is interlocked with operation of the terminal block, the EtherNet/IP performs regular communications. If the signal fluctuates at high speed, the EtherNet/IP may not be able to pick up these fluctuations. Set the RPI value considering the signal change time used.

- Reference**
- It is also possible to output measured or judged values to bit devices by assigning %OutDataAsync to the bit address for the input data (data sent from the controller) and issuing a WP command from the process flow using the Command Execution unit.
 - By assigning %CmdCode, %CmdParam, and %CmdStrobe to the bit area of the output data (reception of the controller), the custom command may be executed from the bit device.

Controlling the System via EtherNet/IP

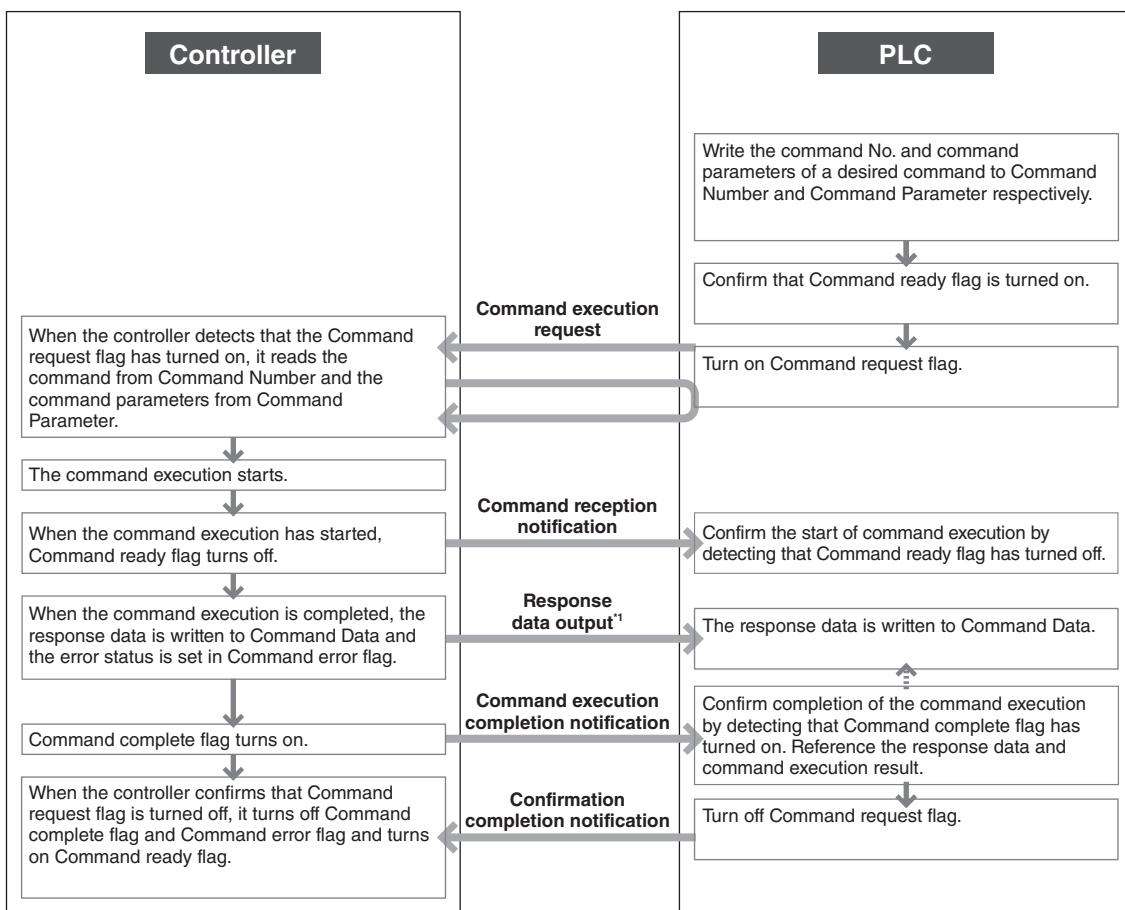
(Command Control)

Predefined commands can be executed at any time.

- The EtherNet/IP cannot be used while the PLC-Link, CC-Link, PROFINET, or EtherCAT is enabled.
- The commands which are to be executed as a custom instruction must be defined. See "Custom instruction" (Page 2-116) for more details.
- For more details on the commands available for the EtherNet/IP, refer to "Command List (Available Operation vs. Situation)" (Page 2-9).

Command Processing Flow with EtherNet/IP (Example of Connection to PLC EtherNet/IP Unit)

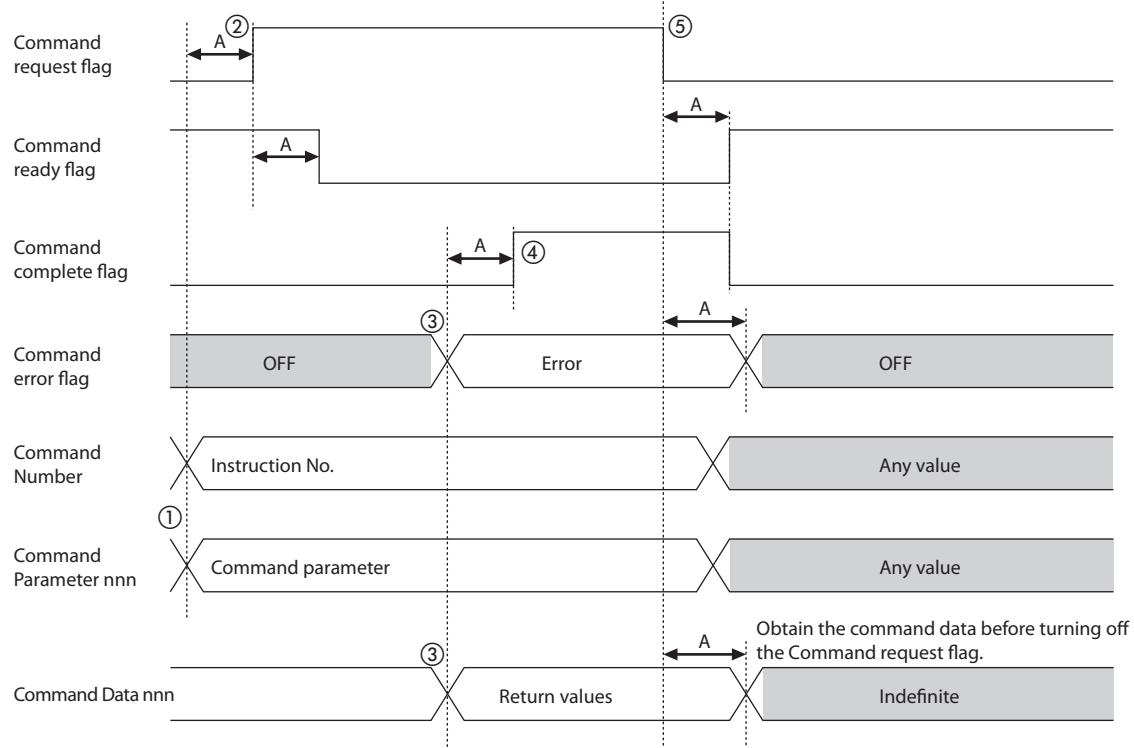
Use the following procedure for using commands to control the system with the EtherNet/IP.



*1 No response data will be output to the Command Data for commands without response data.

Reference When a command error occurs, the command execution result data is written to Command Result (0: Success, <Error code>: Failure). The error codes are described in "When an error occurs on command acceptance" (Page 2-6).

Timing Chart



A: 0 ms or more (depends on the link scan speed)

- (1) Store the command number in Command Number and the starting command parameter in Command Parameter.
- (2) Turn ON the Command request flag and execute the command.

The Command ready flag is also OFF. (To turn OFF the Command ready flag, at least the time for link scan is required.)

- (3) When the time necessary for the command execution has passed, the return value is stored in Command Data and the error status in Command error flag. (Command error flag is OFF: Command processing is a success, ON: Command processing is a failure.)
- (4) As a check signal for completion of the command execution, the Command complete flag is ON.
- (5) When the Command request flag is turned OFF to issue the next command, the Command ready flag is also ON and the Command complete flag is OFF.

Changing the Value of a Variable via EtherNet/IP (Variable Synchronization)

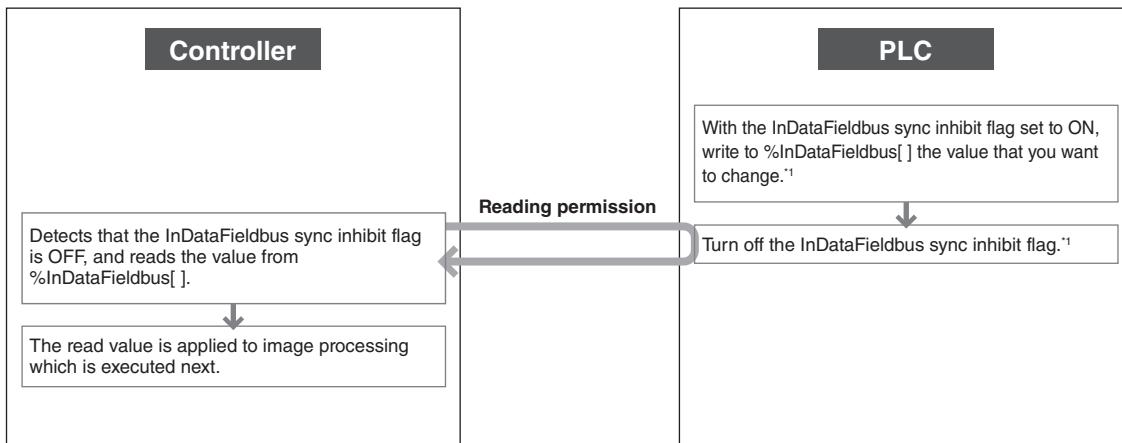
Change the settings to use Ethernet/IP to change the value of a special system variable for variable synchronization (%InDataFieldbus[]) assigned to input addressing (PLC to XG-X) for fixed-cycle communication.

Point The EtherNet/IP cannot be used while the PLC-Link, CC-Link, PROFINET, or EtherCAT is enabled.

Reference Refer to "List of System Variables" (Page 3-451) for more details on the system variable %InDataFieldbus[].

Variable Synchronization Flow with EtherNet/IP (Example of Connection to PLC EtherNet/IP Unit)

Use the following procedure for changing the value of %InDataFieldbus [] on the controller with the EtherNet/IP.



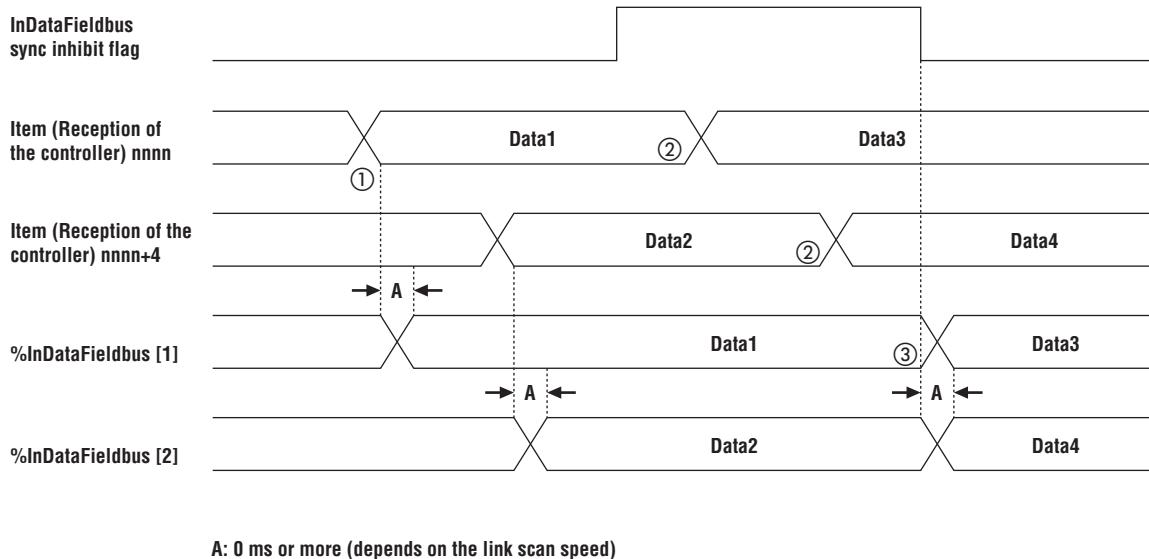
*1 This is the procedure for controlling the reading timing of one value. EtherNet/IP reads a value for each cycle specified by RPI. When the PLC is writing to multiple values of %InDataFieldbus[], a time lag may occur in the application timing of each memory. By turning on the InDataFieldbus sync inhibit flag in advance and rewriting the value while reading is inhibited, multiple values of %InDataFieldbus[] can be changed simultaneously without being affected by the writing timing.

Point

- The value of %InDataFieldbus[] is initialized to "0" immediately after the controller is started. If EtherNet/IP communication is interrupted, the value of %InDataFieldbus[] which was last written is retained until the controller is restarted.
- The value is written to data memory as 32-bit signed integer data.

Timing Chart

Example when the values of %InDataFieldbus[1] and %InDataFieldbus[2] are changed



- (1) Since the InDataFieldbus sync inhibit flag is OFF, if the byte area of the output data (reception of the controller) corresponding to %InDataFieldbus [1] is rewritten, the value of %InDataFieldbus [1] is rewritten at latest after the link scan time. (Since the byte area of the output data (data to the controller) is not changed for %InDataFieldbus [2], the value remains the same.)
- (2) Although the byte area of the output data (data to the controller) corresponding to %InDataFieldbus [1]/%InDataFieldbus [2] is rewritten, InDataFieldbus sync inhibit flag is ON and the values of %InDataFieldbus [1] and %InDataFieldbus [2] remain the same. To rewrite multiple %InDataFieldbus values simultaneously, it is necessary to turn ON the InDataFieldbus sync inhibit flag and rewrite all corresponding byte area of the output data (data to the controller), and then to turn OFF the InDataFieldbus sync inhibit flag.
- (3) Since the InDataFieldbus sync inhibit flag is OFF, the values of %InDataFieldbus [1] and %InDataFieldbus [2] are rewritten. (At minimum, the time for the link scan time is required until rewriting is completed.)

Typical EtherNet/IP Setting Procedure

This section explains the operation example to connect the XG-X series controller to the Keyence KV Series via EtherNet/IP, output measured/judgment values, and control the controller with the PW command.

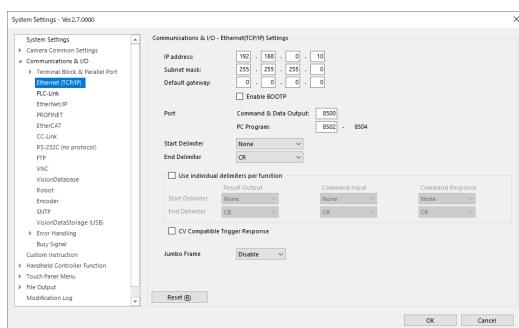
Connecting to the PLC



If the settings pertaining to the KV series, EtherNet/IP are not completed, first set the KV series side settings (Page 1-174).

1. Checking the system settings of the XG-X Series

- 1 Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.**
- 2 On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.**
- 3 In the [System Settings] screen, select [Communications & I/O] - [Ethernet (TCP/IP)].**
- 4 Change the EtherNet (TCP/IP) settings.**



The following setting values are used in this example
(Change them according to the device to be connected.).

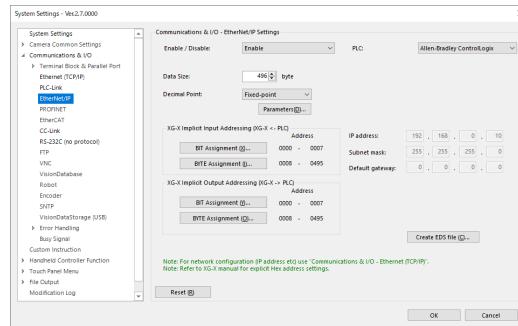
- **IP address:** 192.168.0.10
- **Subnet mask:** 255.255.255.0
- **Default gateway:** 0.0.0.0



When using a communication expansion unit (CA-NEP20E), the IP address and other such settings are configured on the [EtherNet/IP] screen in step 5.

- 5 In the [System Settings] screen, select [Communications & I/O] - [EtherNet/IP].**

- 6 Change the EtherNet/IP settings.**



The following setting values are used in this example
(Change them according to the device to be connected.).

[Communications & I/O - EtherNet/IP Settings]

- **Enable/Disable:** Enable
- **PLC:** Keyence KV Series
- **Data size:** 496 byte
- **Decimal Point:** Fixed-point (Decimal Precision: 1/1000)

[XG-X Implicit Input Addressing (XG-X <- PLC)][XG-X Implicit Output Addressing (XG-X -> PLC)]

Assign data to the bit/byte addresses and specify the starting address.

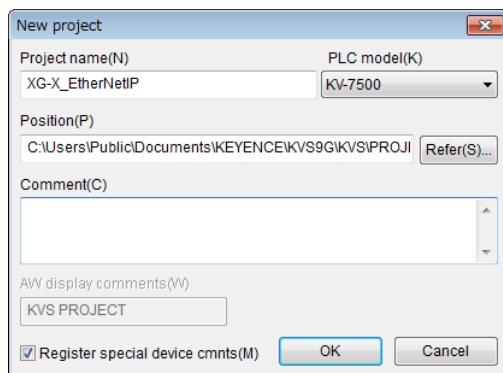
- 7 Select [OK].**

The changes are saved.

- 8 Upload the system settings to the controller and then restart the controller.**

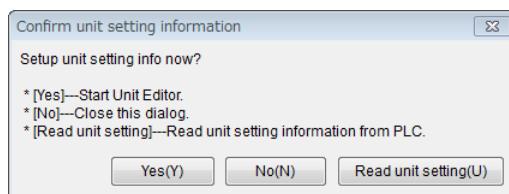
2. Changing the KV series settings

- 1 Start up the KV STUDIO with the computer and PLC connected, select [New project] from the [File] menu.**
- 2 After entering the [Project name], select the [PLC model], then click [OK].**

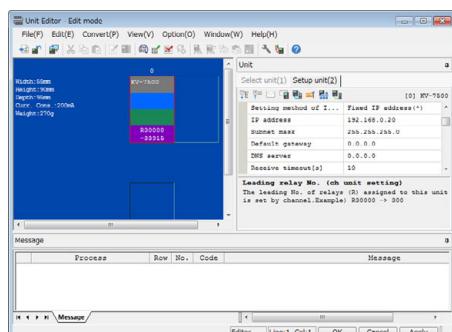


The [Confirm unit setting information] screen is displayed.

- 3 Click [Read unit setting].**



- 4 Select the EtherNet/IP Communication unit or CPU unit which are connected to the XG-X series inside the workspace, and after starting up the [Unit Editor], set the KV series IP address in the [Setup unit(2)] tab.**
- **IP address:** 192.168.0.20
 - **Subnet mask:** 255.255.255.0

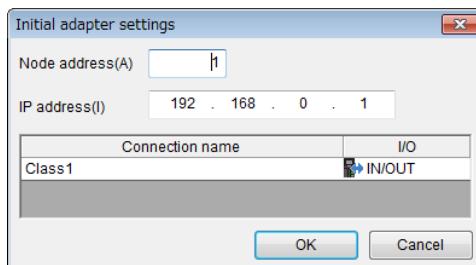


- 5 Select [Convert] - [Auto-assign relay/DM] in the Unit Editor, and assign the devices.**

For automatic assigning, bit devices are assigned to B (link relay), and byte devices to W (link register).

- 6 Click the icon in the [Setup unit(2)] tab, and set the settings for EtherNet/IP communication with the XG-X series via the [EtherNet/IP Settings] which starts up.**

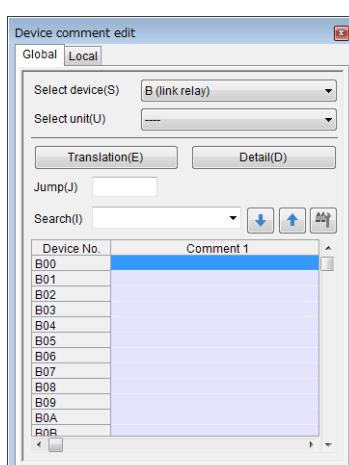
- Drag and drop the [XG-X1000 Series], [XG-X2000 Series], or [CA-NEP20E(XG-X)] from the [Model list(1)] tab in the [EtherNet/IP Settings], then add it to the scan list.
- In the [Initial adapter settings] that appears following the startup, enter the XG-X series IP address (192.168.0.10) which was set in the XG-X series' system settings.



- 7 Save the changes, and close the [EtherNet/IP Settings] and unit editor.**

- 8 Select the [Device cmnt edit window] from the KV STUDIO [View] menu.**

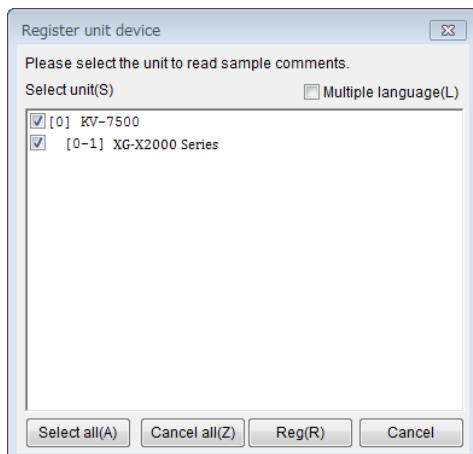
The [Device comment edit] screen will appear.



- 9 Click [Detail].**

The [Register unit device] screen will appear.

- 10** After checking that the [XG-X1000], [XG-X2000], or [CA-NEP20E(XG-X)] check box is selected in the [Select unit] field, click [Reg].



Device comments pertaining to XG-X1000 or XG-X2000 are automatically registered.

- 11** Select [Transfer to PLC] from the KV STUDIO [Monitor/Simulator] menu.

- 12** Restart both the XG-X series and the KV series.

Check that [EtherNet/IP] screen - [Communication Status] in the XG-X series [Global] - [Communications & I/O] is connected.

When the KV series Ethernet port LINK LED is constantly lit, or is constantly unlit

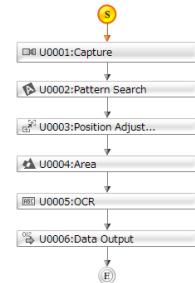
It may be that the EtherNet/IP is not properly set, the cable is not properly connected, or the XG-X series is not started up. Check the connection equipment (whether the HUB is operating, etc.).

Outputting Measured/Judgment Values

1. Setting the output data (Data output unit)

To output various kinds of measured/judgment values, use the "Data output unit." This section describes how to assign the measured/judgment values of the following units to a data output unit as data to be output.

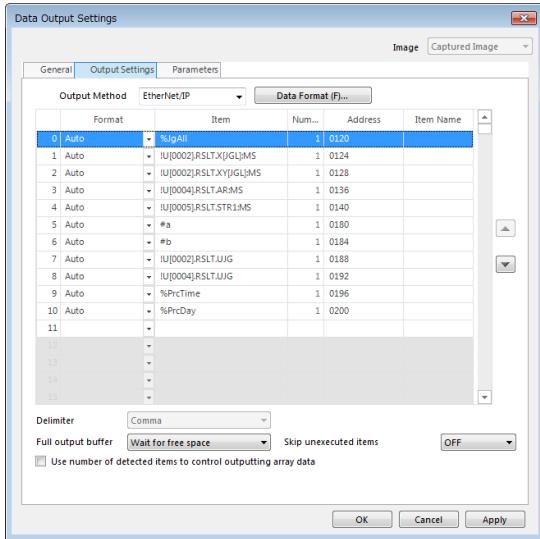
- Total status judgment of the flowchart (%JgAll)
- U0002: Pattern search (Position X)
- U0002: Pattern search (Position XY)
- U0004: Area (Area)
- U0005: OCR (Line 1 result string)
- Variable #a
- Variable #b
- U0002: Pattern search (Unit judgment value)
- U0004: Area (Unit judgment value)
- Processing time (%PrcTime)
- Processing start date (%PrcDay)



- 1** Add a "Data output unit" at the end of the flowchart.

The setting screen of the added "data output unit" is displayed.

- 2 Select [EtherNet/IP] for [Output Method].**
- 3 From the parts list, drag and drop measured/judgment values you want to output to assign them into the [Item] column.**



Other than dragging and dropping from the parts list, you can enter values directly.

- 4 Check the destination byte addresses used for the output.**

- When you assign data in the [Item] column, the output destination byte address is automatically displayed in the [Address] column. When there are several data output units in the flowchart and some byte addresses overlap, you can offset the output destination of the output data in [OutputOffset] on the [Parameters] tab.
- The starting address of the byte assignment is the address where [Result Data1] is assigned for [XG-X Implicit Output Addressing (XG-X->PLC)] of [Communications & I/O - Ethernet/IP Settings] in the [System Settings] screen of the XG-X VisionEditor (Byte address 0120 in the sample screen above).

2. Checking the output configuration to the byte address, and the correlation of the byte address and link register (W)

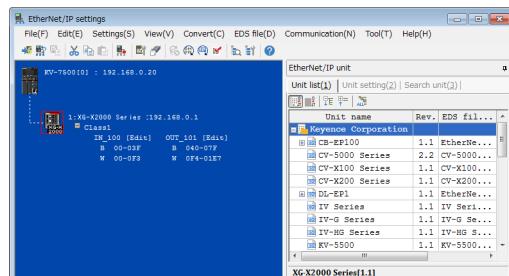
- 1 Check the example result data stored in the byte addresses.**

The data output unit in the flowchart is configured to output the following result data.

- Total status (0: OK, 1: NG)
- U0002: Pattern search position X (430.202)
- U0002: Pattern search position XY (X: 430.202, Y: 243.309)
- U0004: Area (26964)
- U0005: OCR Line 1 result string (KEYENCE)
- Variable #a (95)
- Variable #b (348.267)
- U0002: Pattern search unit judgment value (0: OK, 1: NG)
- U0004: Area unit judgment value (0: OK, 1: NG)
- Processing time (67.477 ms)
- Processing start date (8)

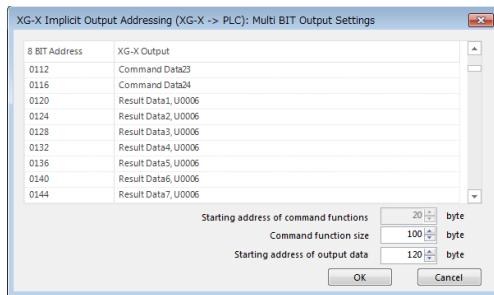
- 2 Check the correlation of the byte address and link register (W) via the KV STUDIO.**

Start up [EtherNet/IP Settings] via the [Setup unit(2)] tab in the KV STUDIO unit editor, click the [+] in the [Class1] for the registered XG-X series icon, then check the device assignments (in the above notation, the output from XG-X series is handled as [IN (Input)]).



- Check the link relay (B)/link register (W) range (hexadecimal notation) which is assigned to the registered XG-X series controller (click [Edit], then the range can be optionally changed).
- The byte addresses from 0000 – 0007 are assigned from the top via 2 byte addresses per 1 register from the link relay (B0000 -), and the byte address 0008 and following are assigned from the link register W0000.

3 In the [System Settings] screen of the XG-X VisionEditor, select [Communications & I/O] - [EtherNet/IP] and click [BYTE Assignment] under [XG-X Implicit Output Addressing (XG-X → PLC)]. You can check the items assigned to the byte addresses.



- By default, [Result Data1], which is the first data output, is assigned to byte address 0120 where the result data of the data output unit (U0006 in this example) is assigned.
- Since the result data is output in the unit of 32 bits, four byte addresses are used for one piece of result data (or one character when the result is characters). Also for OCR detected characters and match pattern strings of the 1D code reader unit and 2D code reader unit, four byte addresses are used for one character (Only in the case of OCR2 unit Trimmed String is one byte used for one character so that four-byte byte addresses are used for units of four characters.).

4 Upload the program data and system settings to the controller.

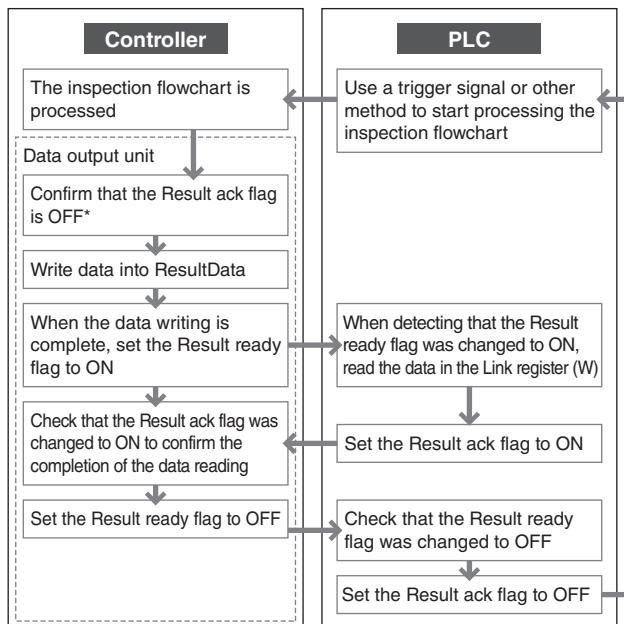
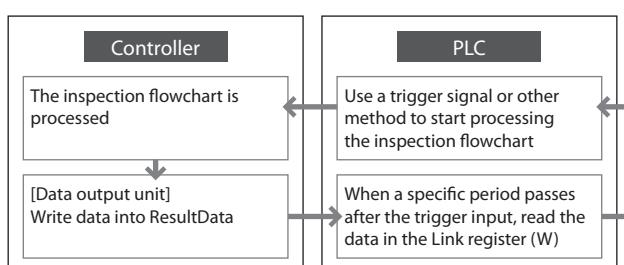
After the controller is restarted, the output through EtherNet/IP starts.

5 After entering the trigger to the XG-X series, check the output results via the KV STUDIO Registration monitor.

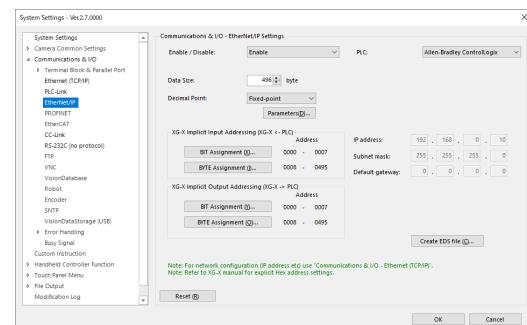
Check the current values starting from Device W038.

Device	Current value	Display format	Comments
W038	1	+/−DEC 32BIT	XG-K2000[1] InDat(0120)
W039	430202	+/−DEC 32BIT	XG-K2000[1] InDat(0124)
W03C	430202	+/−DEC 32BIT	XG-K2000[1] InDat(0128)
W03E	26364	+/−DEC 32BIT	XG-K2000[1] InDat(0132)
W040	26364	+/−DEC 32BIT	XG-K2000[1] InDat(0136)
W042	K ASCII16BIT	XG-K2000[1] InDat(0140)	
W044	E ASCII16BIT	XG-K2000[1] InDat(0144)	
W046	Y ASCII16BIT	XG-K2000[1] InDat(0148)	
W048	E ASCII16BIT	XG-K2000[1] InDat(0152)	
W04A	M ASCII16BIT	XG-K2000[1] InDat(0156)	
W04C	C ASCII16BIT	XG-K2000[1] InDat(0160)	
W04E	F ASCII16BIT	XG-K2000[1] InDat(0164)	
W052	.. ASCII16BIT	XG-K2000[1] InDat(0168)	
W054	.. ASCII16BIT	XG-K2000[1] InDat(0172)	
W056	95000	+/−DEC 32BIT	XG-K2000[1] InDat(0176)
W058	348267	+/−DEC 32BIT	XG-K2000[1] InDat(0180)
W05A	0	+/−DEC 32BIT	XG-K2000[1] InDat(0184)
W05C	1	+/−DEC 32BIT	XG-K2000[1] InDat(0188)
W05E	67477	+/−DEC 32BIT	XG-K2000[1] InDat(0192)
W060	8	+/−DEC 32BIT	XG-K2000[1] InDat(0200)

- Judgment values are stored by using two words to show 0 (OK) or 1 (NG).
- Decimal type data is multiplied by 1000 and stored by using two words: 124.121 to 124121
- When XY data is output, the data is stored in the order of X and Y by using two words for each.
- Integer type data is stored directly by using two words.
- Character data is stored as ASCII code by using two words for each character (Only in the case of OCR2 unit Trimmed String is one byte used for one character so that two words are used to store a unit of four characters.).
- When data is output as "string," the number of devices used varies depending on the specified number of characters. This example outputs the "number of characters on the first line" of the OCR unit and the string is seven characters of "KEYENCE." However, since [L1: Number of Characters] for [Block Setup] is set to 10, the range of 20 words (10 characters) from W042 to W054 are used.
- Changing the number of characters setting affects all the subsequent device settings. It is recommended to set an item which may be changed at the end of the data output unit.
- Variables are multiplied by 1000 and stored by using two words: 95 to 95000, 348.267 to 348267
- Judgment values are stored by using two words to show 0 (OK) or 1 (NG).
- System variables of integer type are stored directly by using two words. Those of decimal type are multiplied by 1000 and then stored by using two words.

Typical data output flow (Handshake: ON)**Typical data output flow (Handshake: OFF)****Controlling the Controller****1. Checking the system settings of the XG-X Series**

- 1 Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.**
- 2 On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.**
- 3 In the [System Settings] screen, select [Communications & I/O] - [EtherNet/IP].**



- 4 In [XG-X Implicit Input Addressing (XG-X ← PLC)] and [XG-X Implicit Output Addressing (XG-X → PLC)], check the assignment of bit and byte addresses for the various items required for controlling the controller.**

Output data (PLC → XG-X: OUT)

- Command request flag: Set this flag from OFF to ON to execute a command (bit).
- Command Number: Set the command No. to be executed (word).
- Command Parameter#: Set the #th argument of the command (word) (The presence/absence of the argument depends on the command.).

Input data (XG-X → PLC: IN)

- Command complete flag: This flag turns ON when the command processing finishes (bit).
 - Command error flag: This flag remains OFF when the command processing succeeds, and turns ON when the processing fails (bit).
 - Command ready flag: This flag is set to ON when the command processing can be accepted (bit).
 - Command Result: The command execution result is set (0: Succeeded, <Error code>: Failed) (word).
 - Command Data#: The #th response data of the command is set (The presence/absence of the response data depends on the command.)(word).

5 Select [OK].

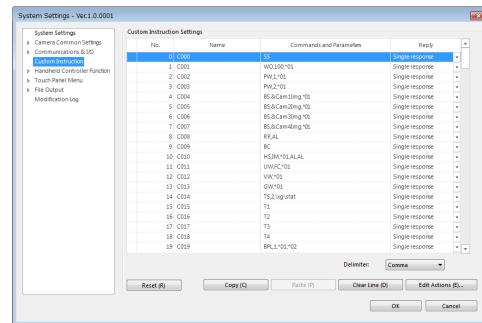
The changes are saved.

6 Upload the system settings to the controller and then restart the controller

2. Example of command execution procedure: Switch program No. (PW)

The following is a typical example of the command execution procedure. This example uses the PW command (Change Program) which uses a command parameter.

1 In the [System Settings] screen of the XG-X VisionEditor, select [Custom Instruction] and check the command details.



- With the default setting assignments, there are the PW commands, [PW, 1, *01] which switches to an SD1 setting number and the [PW, 2, *01] which switches to an SD2 setting number.
 - Here the procedures for executing the [PW, 1, *01] that switches to an SD1 setting number are explained.
 - The command No. is [2], and, since [*01] is written in the Commands and Parameters column, we know that a command parameter is used.
Specify the program setting number that is to be switched to for [*01] (this time it is switched to program setting number 11).

2 Input the command No. into the link register to which Command Number is assigned, and input the program setting No. to switch to into the link register to which Command Parameter1 is assigned.

Here the [2] which is the PW command No. is input into the link register W0F8, and the switching destination program number [11] is input into the link register W0FA to which Command Parameter1 was assigned.

The link register which is used is 2 words per 1 item.

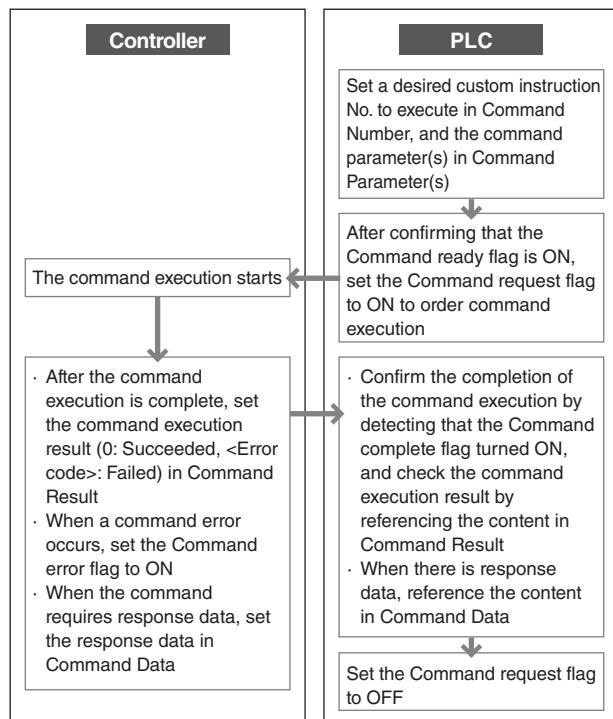
3 Turn on the link relay (here B040) to which the Command request flag is assigned.

The PW command (SD1 program number switching) will be executed

4 Check the change in the value of the link relay (here B00) to which the Command complete flag is assigned.

- Command instruction success: The link relay (here B00) is turned ON.
- Command instruction failure: The link relay (here B01) to which the Command error flag was assigned turns ON, and the error code is written into the link register (here W06) to which Command Result was assigned.

Typical command processing flow



Connecting with the Keyence KV Series

Use the following communication settings on the controller when connecting to a Keyence PLC.

- Fixed-cycle communication function Max. data size: 496 bytes
- Message communication function: UCMM

Supported devices

- EtherNet/IP port built-in CPU unit KV-5500/7500/8000
- EtherNet/IP Unit KV-EP21V, KV-NC1EP
- Ethernet Unit KV-XLE02

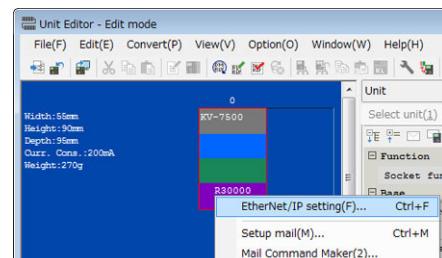
Reference When using the KV-EP21V with the KV-3000/5000/5500, connect the KV-EP21V to a CPU unit with CPU function version 2 or later.

Changing the settings for fixed-cycle communication

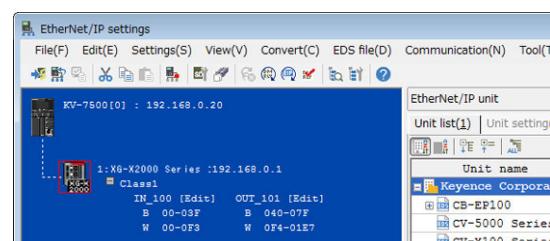
For more detailed information about PLC unit configuration and the required setting method within KV Series (software used to communicate with PLC to PC), refer to the KV STUDIO User's Manual and the KV Series EtherNet/IP Function User's Manual.

Here the setting methods for when the KV-7500 is used are explained.

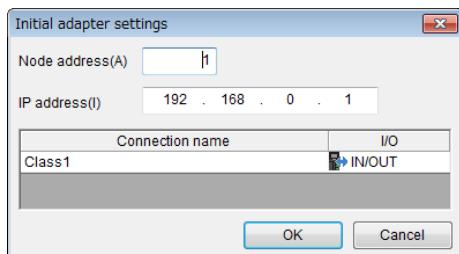
- 1 Right click KV-7500 in the KV STUDIO unit editor, then select [EtherNet/IP setting].



- 2 Drag and drop the [XG-X1000 Series], [XG-X2000 Series], or [CA-NEP20E(XG-X)] from the device list, then add it to the scan list.



3 Set the controller node address and the IP address via the [Initial adapter settings] screen.



If [OK] is clicked, the bi-directional connection settings will be completed automatically.

Reference When RPI is in its default setting, both directions for the inputs (transmitting from the controller) and the outputs (controller receiving) will be set to 10.0 ms.

4 Change the settings in accordance with requirements.

Click the scan list connection name, and the connection setting dialog box appears.



Confirm step 5 if changes are not required.

Send trigger

Set the input (transmitting from the controller) direction transmission trigger.

RPI

Set the communication cycle.

<IN (PLC ← Controller)>

- If the Send Trigger is [Cyclic]: Set the value to 5 ms or more (1 ms or more when using a communication expansion unit).
- If the Send Trigger is COS (Change Of State): Set the RPI to a value of 20 ms or more (4 ms or more when using the communication expansion unit) so that the Inhibit Time will be 5 ms or more (1 ms or more when using the communication expansion unit).

Reference When the Send Trigger is set to COS (Change Of State), even when the COS is successively generated, the span in the Inhibit Time will hold the data transmissions. The Inhibit Time is automatically set to the value of RPI×1/4.

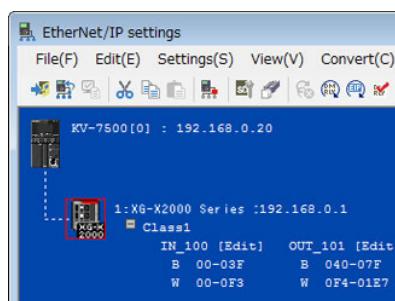
<OUT (PLC → Controller) (When selecting bi-directional connections)

Set the value to 5 ms or more (1 ms or more when using a communication expansion unit).

Reference

- When Send Trigger is set to COS (Change Of State), uncheck [Keep consistent with IN], then the outputs can be set to a different RPI (communication cycle).
- Depending upon the controller measurement settings, even if set to 5 ms or greater (20ms or greater when COS is selected), the image displays and external inputs/outputs, etc. might be affected. Be sure to implement an operations performance validation prior to operating.
- The setting values for RPI, etc. can also be changed from the settings list window.

5 Check the devices which are being used as the transmitting and receiving data for the controller and cyclic communications.



Connection name

Select bi-directional connections or input direction connections.

- Class1: Are bi-directional connection.
- Monitor data: Is an input (transmitting from the controller) direction connection

Reference

- The devices which are being used as transmitting and receiving data are automatically assigned. See the KV Series EtherNet/IP Function User's Manual for more details on how to make changes.
- If the KV STUDIO device comment registration functions are going to be used, the XG-X series comments will be automatically registered to the devices which will be used in transmitting and receiving data. After opening the [Device comment edit] screen, click [Detail] - [Register unit device], and after selecting [XG-X1000] or [XG-X2000] click [Reg].

6 Forward the settings to the PLC.

Transmit data to multiple PLCs (multicast)

If the connection type is set to multicast, the transmission data of the controller can be received by multiple PLCs. Set the PLC connection settings for each PLC as per the following.

	Bi-directional connection PLC (Max. 1 unit)	Input direction connection PLC
Connection name	Class1	Monitor data
IN (input from adapter)		
Connection type	Multicast	Multicast
Data size	optional value	
RPI (communication cycles)	optional value	
OUT (output to adapter)		
Connection type	Point-to-point	(no setting)
Data size	optional value	0
RPI (communication cycle)	optional value	RPI (inputs) times 16

Other precautions pertaining to settings

As for the decimal formatted data, the value formats change (MW/MR/MS/MWX/MRX/MSX command parameters, and result data decimal values are covered) as per the following depending upon the [Decimal Point] settings.

When [Fixed-point] is selected

The values which have been multiplied 1000 times are stored as \pm decimal numeral 32 bit values. (If Decimal Precision is set to 1/1000. The values can be multiplied by 10 or more if 1/10 is selected and by a number up to 10000 if 1/10000 is selected.)

When [Floating-point] is selected

Stored in FLOAT (single precision floating point number type real number) format.

Connecting with the ControlLogix PLC from Rockwell Automation, Inc.

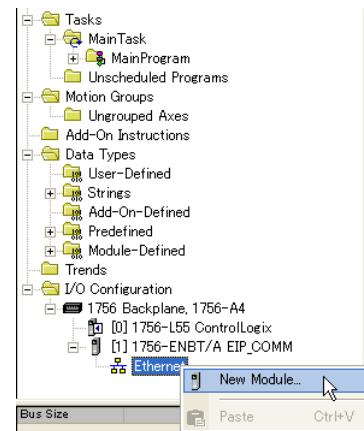
Use the following communication settings on the controller when connecting to a ControlLogix PLC from Rockwell Automation, Inc..

- Fixed-cycle communication function Max. data size: 496 bytes
- Message communication function: Class3/UCMM

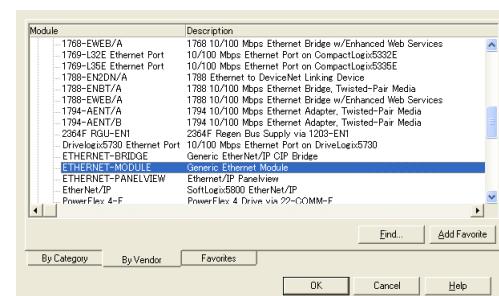
Changing the settings for fixed-cycle communication

For more detailed information about PLC unit configuration and the required setting method within RsLinx (software used to communicate with PLC to PC), refer to the PLC operation manual.

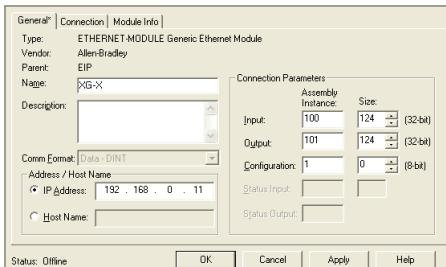
- Select the connected EIP communication unit (1756-ENBT) that is connected to the controller with the RsLogix5000 I/O configuration, right-click and select [New Module].



- [ETHERNET-MODULE (Generic Ethernet Module)] is added.



3 Change the settings as required.



Device name

Set any name. The following tags are created based on the name and used as the sending or receiving data for fixed-cycle communication.

- (Device name): I Information that is received from the controller.
- (Device name): O Information that is sent to the controller.
- (Device name): C Not used.

Comm Format

Set to [Data DINT].

IP Address

Sets the XG-X controller IP address.

Input (Sending data size for the controller)

- Instance number: 100 (decimal)
- Data size: Any value up to 124

Output (Receiving data size for the controller)

- Instance number 101 (decimal): When using the XG-X Ethernet port
150 (decimal): When using a communication expansion unit
- Data size: Any value up to 124

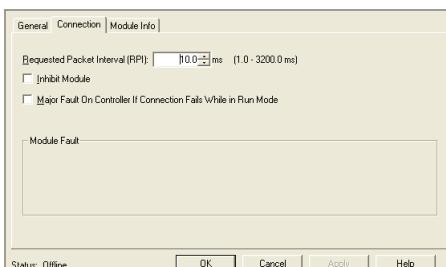
Configuration

- Instance number: 1 (decimal)
- Data size: 0

Reference When connecting to InputOnly, refer to "Sending data to multiple PLC units (InputOnly)" (Page 1-183).

RPI

Set the interval for fixed-cycle communication.



Set the value to 5 ms or more (1 ms or more when using a communication expansion unit).



Depending on the controller measurement settings, the display or external I/O can still be affected even if the value is set to 5 ms or more (1 ms or more when using a communication expansion unit). Be sure to verify the operating performance before starting operations.

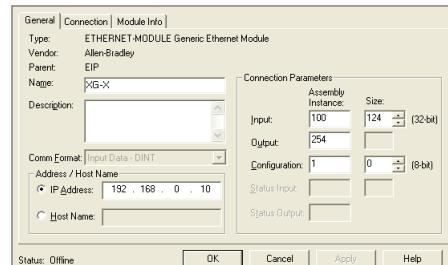
4 Download the settings to the PLC.

EtherNet/IP communications are enabled as long as the settings are downloaded before switching to online mode.

Sending data to multiple PLC units (InputOnly)

By connecting to multiple PLCs with a InputOnly connection configuration, the sending data on the controller can be received by multiple PLC units. When connecting with InputOnly, set each of the PLC units to the following settings.

	Bidirectional communication PLC	PLC connected with InputOnly (Max. 1 unit)
RPI value	Any value	Same value as left
InputAssembly Instance number	No. 100 (decimal)	Same value as left
InputAssembly data size	Any value	Same value as left
OutputAssembly Instance number	No. 101 (decimal): When using the XG-X Ethernet port No. 150 (decimal): When using a communication expansion unit	No. 254 (decimal): When using the XG-X Ethernet port No. 3 (decimal): When using a communication expansion unit
OutputAssembly data size	Any value	0 bytes
Comm Format	Data-DINT	Input Data-DINT



When using InputOnly connection with multiple PLC units while performing fixed-cycle communication, the controller input data must be sent with Multicast packets. When using ControlLogix, the controller sending is fixed to Multicast packets, so this is not a problem, but there are other devices using other connection systems such as KV or SYSMAC that allow the user to select between Multicast and Point to Point so be careful when using them.

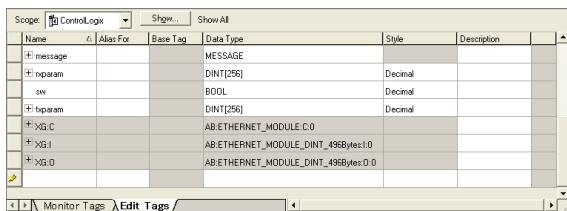
Changing the message communication settings

After performing "Changing the settings for fixed-cycle communication" (Page 1-182), use the MSG command in the ladder program to perform message communication.

Reference

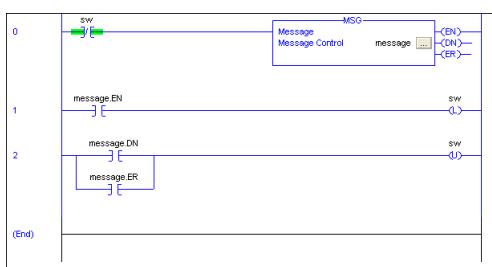
- For more detailed information about MSG command, refer to [Logix5000 Controllers General Instructions] (1756-RM003) or other applicable information.
- When fixed-cycle communication is not used, select Inhibit Module.

1 The following tags are defined in the RsLogix5000 [Controller Tags] field.

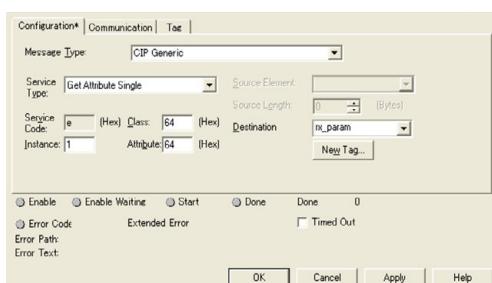


- Tag used for protecting MSG command administrative information (message - Message format)
- Tag that includes data sent and received with MSG command (tx_param, rx_param - DINT format)

2 Add MSG command to the RsLogix5000 ladder.



3 Open the [Configuration] tab in the message command setting dialog box and change the MSG command setting.



Message Type

Select [CIP Generic].

ServiceType, Class, Instance, Attribute

Set the value according to the sent message.

- Example 1: When writing to an attribute with the TRG bit set to 1 for the Vision System Object.

ServiceType	SetAttributeSingle
ServiceCode	- (Cannot be specified)
Class	64Hex
Instance	01Hex
Attribute	69Hex
SourceElement	Name of the tag where send data is stored
SourceLength	1 byte (because the attribute size is 1)
Destination	- (Cannot be specified)

- Example 2: When acquiring the value of READY1 bit of Vision System Object upon loading the attribute

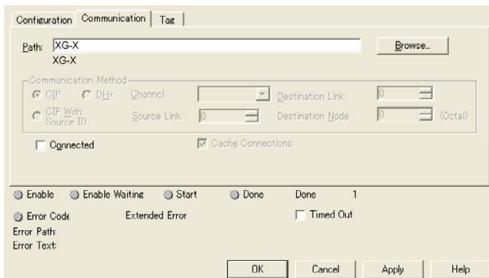
ServiceType	GetAttributeSingle
ServiceCode	- (Cannot be specified)
Class	64Hex
Instance	01Hex
Attribute	65Hex
SourceElement	- (Cannot be specified)
SourceLength	- (Cannot be specified)
Destination	Name of the tag where receive data will be stored

- Example 3: When using the result data acquisition service (4DHex) of Vision System Object upon service execution

ServiceType	Custom
ServiceCode	4DHex
Class	64Hex
Instance	01Hex
Attribute	01Hex
SourceElement	Name of the tag where send data is stored
SourceLength	4 bytes
Destination	Name of the tag where receive data will be stored

- Values for tags included in sent data:
0th element (DINT format) Size of the acquired result data (bytes)
1st element (DINT format) Head position of the acquired result data (bytes)
- Values for tags included in received data:
0th element (DINT format) 1st result data set with output settings on the controller
1st element (DINT format) 2nd result data set with output settings on the controller
2nd element (DINT format) 3rd result data set with output settings on the controller

4 Open the [Communication] tab and change the MSG communication settings.



Path

Set the set device name in [Settings for fixed-cycle communication]. (In the above example, the device is XG-X.)

Connected, Cache connection

- When connected to UCMM: Disable both sides (default).
- When connected to Class3: Enable both sides.

5 Describe the processing for the sending data settings and the receiving data acquisitions in the ladder program, and download it to the PLC.

Other points of note for settings

Data that contains decimal format changes in the following manner depending on the format set in [Decimal Point]. (This applies to MW/MR/MS/MWX/MRX/MSX command parameters, and result data fractional values.)

When [Fixed point] is selected

Stored as an integer that is 1000 times the actual value. (If Decimal Precision is set to 1/1000. The values can be multiplied by 10 or more if 1/10 is selected for Decimal Precision and by a number up to 10000 if 1/10000 is selected.)

When [Floating point] is selected

Stored as a value in single-precision floating point format.

When accessing data expressed in floating point format with ControlLogix

1). Uses REAL format tags.

2). Use the COP command to exchange floating point values with the controller.

- Acquiring floating point values:

Copy the data acquired by the message to the REAL format tag with COP command.



- Setting the floating point values:

After placing the floating point values into the REAL format tag, use the COP command to copy the values to data for sending with a message.



Connecting with the SLC5/05 PLC from Rockwell Automation, Inc.

When connected to an Rockwell SLC5/05, the following communications can be used with the controller.

- Message communication function: Class3

Reference

- The SLC5/05 Series is not compatible with the fixed-cycle communication function, but it can use messaging to access the Assembly Object in the controller and control the protocols and data formats in the same way as fixed-cycle communication.
- The maximum size for exchanging data with message communication on the SLC5/05 Series is 248 bytes.
 - When sending or receiving data with explicit message communication, do not exceed the set size.
 - The data size for the Assembly Object is the same as the data size from System Settings in the controller. When using SLC5/05, check that this value is 248 bytes.

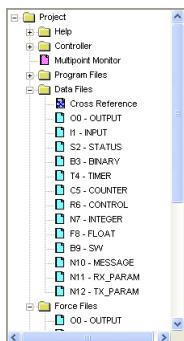
Changing the settings for message communication

Use EEM commands with the ladder program to perform message communication.

Reference

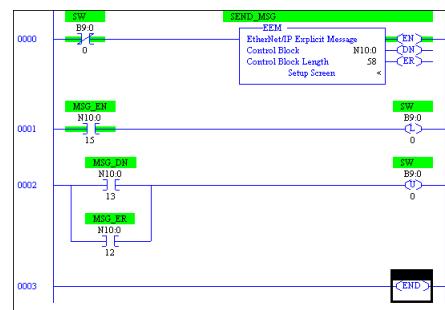
For more details about EEM command, refer to [SLC 500 Instruction Set Reference Manual] (1747-RM001) or other applicable information.

1 The following files are defined in the RsLogix5000 [Data Files] field.

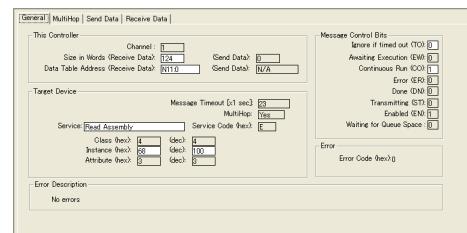


- File used for protecting EEM command administrative information (message - Integer format)
- File that includes data sent and received with EEM command (tx_param, rx_param - Integer format)

2 Add the EEM command to the RsLogix500 ladder.



3 Set the file to use in the EEM command defined in Step 1 in the EEM command control block and open the Setup Screen.



Service, Class, Instance, Attribute

Set the value according to the sent message.

- Example 1: When writing to an attribute with the TRG bit set to 1 for the Vision System Object.

Service	Generic Set Attribute Single
ServiceCode	- (Cannot be specified)
Class	68Hex
Instance	01Hex
Attribute	69Hex
Data Table Address (Send data)	Name of the file where send data will be stored
Size In Words (Send data)	1 word (because the attribute size is 1)
Data Table Address (Receive data)	- (Cannot be specified)
Size In Words (Receive data)	- (Cannot be specified)

- Example 2: When acquiring the READY bit value of Vision System Object upon loading the attribute

Service	Generic Get Attribute Single
ServiceCode	- (Cannot be specified)
Class	68Hex
Instance	01Hex
Attribute	65Hex
Data Table Address (Send data)	- (Cannot be specified)
Size In Words (Send data)	- (Cannot be specified)
Data Table Address (Receive data)	Name of the file where receive data will be stored
Size In Words (Receive data)	1 word (because the attribute size is 1)

- Example 3: When using the result data acquisition service (4DHex) of Vision System Object upon service execution

Service	Custom
ServiceCode	4DHex
Class	68Hex
Instance	01Hex
Attribute	01Hex
Data Table Address (Send data)	Name of the file where send data will be stored
Size In Words (Send data)	2 words
Data Table Address (Receive data)	Name of the file where receive data will be stored
Size In Words (Receive data)	Data size to acquire

- Value of the file where send data will be stored:
0th element (Integer format): Size of the acquired result data (bytes)
1st element (Integer format): -
2nd element (Integer format): Head position of the acquired result data (bytes)
3rd element (Integer format): -
 - Values for files included in received data:
0th element (Integer format): Lower word of the 1st result data set with output settings on the controller
1st element (Integer format): Upper word of the 1st result data set with output settings on the controller
2nd element (Integer format): Lower word of the 2nd result data set with output settings on the controller
3rd element (Integer format): Upper word of the 2nd result data set with output settings on the controller
4th element (Integer format): Lower word of the 3rd result data set with output settings on the controller
5th element (Integer format): Upper word of the 3rd result data set with output settings on the controller
-

- Example 4: When controlling with the same format and protocols as fixed-cycle data

Assembly Object attribute3: Accesses the data.

- Acquire input data for the controller

Service	ReadAssembly
ServiceCode	0EHex (Cannot be specified)
Class	04Hex (Cannot be specified)
Instance	64Hex
Attribute	03Hex (Cannot be specified)
Data Table Address (Send data)	(Cannot be specified)
Size In Words (Send data)	(Cannot be specified)
Data Table Address (Receive data)	Name of the file where receive data will be stored
Size In Words (Receive data)	124 words
Value of the File where receive data will be stored	The desired data format for fixed-cycle data communication allocation on the controller can be acquired.

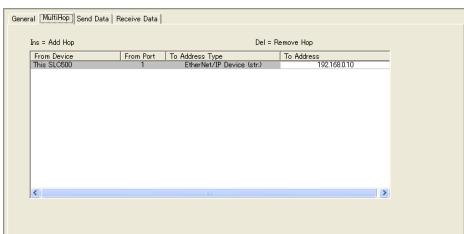
* The maximum message size that can be used for exchanging data with SLC5/05 is 124 words (248 bytes).

- Set the output data on the controller

Service	WriteAssembly
ServiceCode	10Hex (Cannot be specified)
Class	04Hex (Cannot be specified)
Instance	65Hex (When using the XG-X Ethernet port)
Attribute	03Hex (Cannot be specified)
Data Table Address (Send data)	Name of the file where send data will be stored
Size In Words (Send data)	124 words
Data Table Address (Receive data)	(Cannot be specified)
Size In Words (Receive data)	(Cannot be specified)
Value of the File where send data will be stored	Set the desired data format for fixed-cycle data communication allocation on the controller.

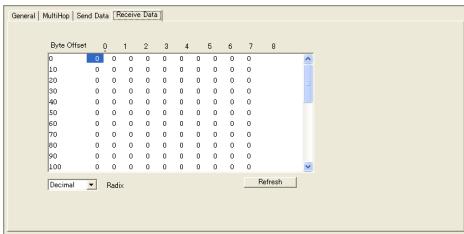
* The maximum message size that can be used for exchanging data with SLC5/05 is 124 words (248 bytes).

4 Open the [MultiHop] tab and set the IP address for the controller.



In the example used in the above figure, the IP address for the controller is 192.168.0.10.

5 Open the [Send Data] tab or [Receive Data] tab and confirm the information in the file that contains the data used for sending or receiving.



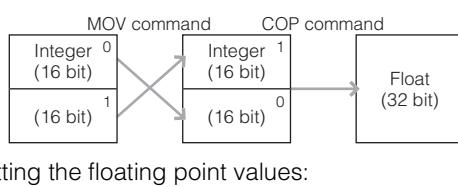
Example when locally accessing the data expressed in floating point format with the SLC5/05

- 1). Prepare a file that contains an array of the Float format and Integer format (2 elements).

- 2). Use the COP command and MOV command to exchange floating point values with the controller.

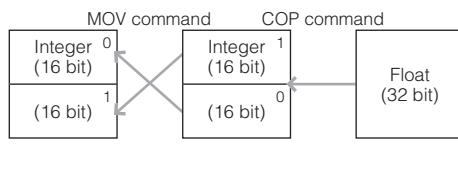
- Acquiring floating point values:

Take the upper word and the lower word from the two elements of data in Integer format acquired by the message, and switch the values into a previously designed Integer array. Copy the Integer array with the MOV command. Then, take the copied Integer array and use the COP command to copy it to the Float format file.



- Setting the floating point values:

After inserting floating point values in the file in Float format, use the COP command to copy two words into an Integer array, and switch the upper and lower words of the two elements of data in Integer format. Copy the Integer array with the MOV command.



6 Describe the processing for the sending data settings and the receiving data acquisitions in the ladder program, and download it to the PLC.

When [Fixed point] is selected

Stored as an integer that is 1000 times the actual value. (If Decimal Precision is set to 1/1000. The values can be multiplied by 10 or more if 1/10 is selected for Decimal Precision and by a number up to 10000 if 1/10000 is selected.)

When [Floating point] is selected

Stored as a value in single-precision floating point format.

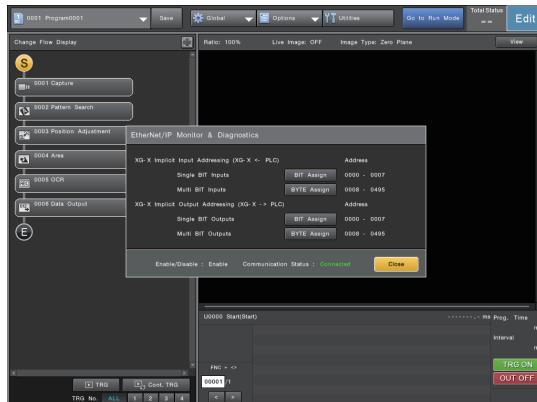
Checking the EtherNet/IP Communication Status (EtherNet/IP Monitor & Diagnostics)

You can check the system's EtherNet/IP I/O signal communication status with this function. This function is convenient because it allows you to check communications content when connected to an external device in situations such as when the appropriate data cannot be communicated between connected devices.

Point The monitor cannot be used when [Enable/Disable] for EtherNet/IP is [Disable] or when EtherNet/IP is not connected. First establish an EtherNet/IP connection before using the monitor.

1 From the [Utilities] menu at the top of the screen, select [EtherNet/IP Monitor & Diagnostics].

The [EtherNet/IP Monitor & Diagnostics] screen is displayed.

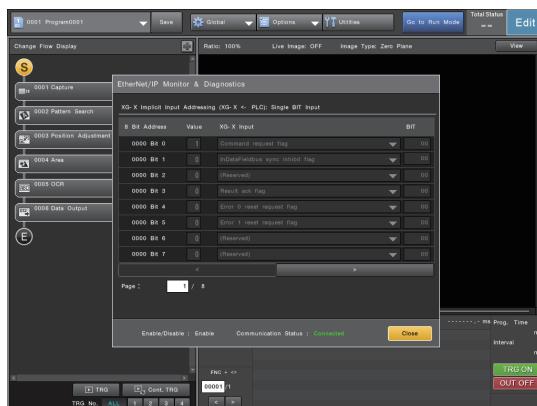


2 Select the item you wish to check.

Select the bit information or the byte information for the output data (received by the controller) or input data (sent by the controller).

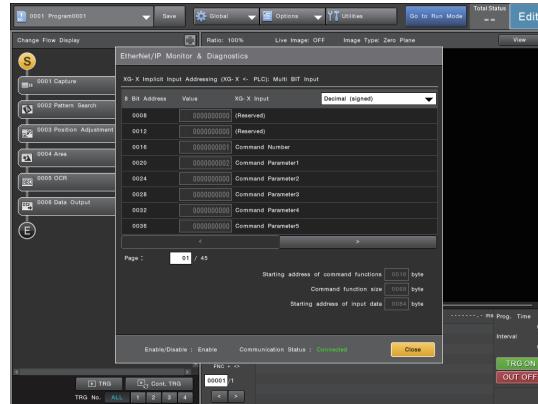
3 Now check the communication status.

Output data (received by the controller) bit information check screen



You can see that 1 was sent to Command request flag from the PLC.

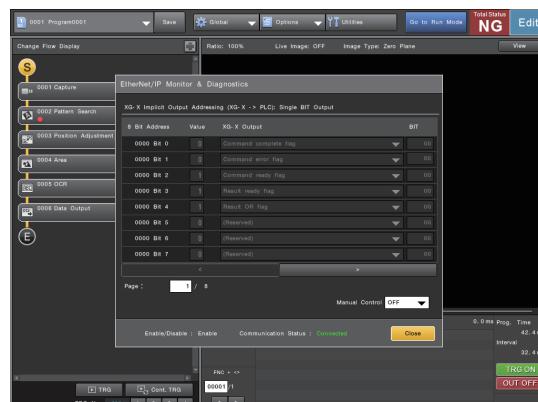
Output data (received by the controller) byte information check screen



You can see that 1 was input to Command Number and 2 was input to Command Parameter 1 (decimal, unsigned).

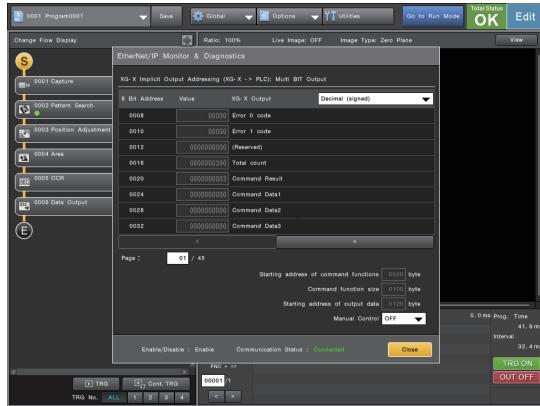
Using the down arrow at the upper right corner of the screen, you can select the value to monitor from Hexadecimal, Decimal (unsigned), or Decimal (signed).

Input data (sent by the controller) bit information check screen

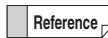


You can see that 1 was sent to Command ready flag, Result ready flag, and Result OR flag from the controller.

Input data (sent by the controller) byte information check screen



You can see that 390 was sent to Total count and 3 was sent to Command Result as a decimal (unsigned) from the controller.



With the input data (sent by the controller) monitor, you can manually change the value for the desired addresses and check those changes on the PLC by selecting ON for Manual Control during setup mode.

4 Select [Close].

Troubleshooting

If operation is not correct

Checking if the EtherNet/IP is correctly connected

On the controller, check [Utilities] - [EtherNet/IP Monitor & Diagnostics]. If "Disconnected" is displayed, the communication has failed. Check that the cable (cross cable for direct connection), IP address, communication settings at the PLC, etc. is correctly configured.



Point When the connection to Rockwell's SLC5/05 is made, the fixed-cycle communication is not performed. Even if the connection is correct, "Disconnected" is displayed.

The result data is output from byte address 0120, but the output destination at the PLC (KV series) is not known.

When automatic assignment is used for the 1st XG-X in the KV series, the XG-X result data is written in link register W0038 or later.

In automatic assignment of the KV series, byte addresses 0000 to 0007 are assigned to the link relay (B0000-) and byte addresses from 0008 are assigned to link register W0000 for 1 register per 2-byte address from the start.

When the byte address of the result data is 0120, (120-8)/2 = 56th → 38Hex. The result data is written in W0038 or later.

Result OR flag is not output.

The result OR flag is updated according to the total status (OK = 0, NG = 1). When the Result OR flag is used, it is necessary to output at least one data to the EtherNet/IP device using the data output unit.

Result ready flag is not changed from ON status.

Control of the Result ack flag may not be correct. The Result ready flag is turned OFF when start of the Result ack flag is sent to the controller. This is true whether the handshake is ON or OFF.

Data could not be correctly retrieved due to change of the %Sto output at the leading edge from the external terminal.

Since %Sto is the data ready signal for the parallel terminals, it cannot be used as the strobe signal for EtherNet/IP.

For read timing with EtherNet/IP, monitor the Result ready flag.

For the data read timing with the EtherNet/IP, refer to the Result ready flag.

Error Messages

Error Messages not Assigned to System Variables %Error0 or %Error1

These errors by default are not assigned to %Error0 or %Error1 but can be assigned through the XG-X Vision Editor software.

Error Message	Cause	Corrective Action	Error Code
External command error has occurred.	An error occurred when executing a command from one of these devices: <ul style="list-style-type: none">• PC Program• PLC-Link• Ethernet• RS-232C• CC-Link• External terminals• EtherNet/IP• PROFINET• EtherCAT	Review the command being sent, the program settings or the device status.	128
EtherNet/IP communication has failed.	Disconnection of the fixed-cycle communication has occurred.	<ul style="list-style-type: none">• Check whether the Ethernet cable is connected correctly.• Check whether the controller and master side were restarted after updating the communication settings.• Review the fixed-cycle communication cycle or time-out setting of the PLC.	241
Unable to write to EtherNet/IP output buffer.	The controller output buffer for outputting via the EtherNet/IP port is full.	Reset RPI to be output through EtherNet/IP, so the data is output faster than it accumulates. Alternatively, extend the time between triggers / processing to allow for data to be output. Note: Results data are not written when the buffer is full.	243
EtherNet/IP output buffer is full.	The controller output buffer for outputting via the EtherNet/IP port is full.	Reset RPI to be output through EtherNet/IP, so the data is output at a faster rate than it builds up. Alternatively, extend the time between triggers / processing to allow for data to be output. Note: Inspections processing can be put on hold until the buffer becomes free.	244

Communicating with the system in EtherNet/IP message communication

See "EtherNet/IP communication specifications" (Page 1-153) for more details on the basic specifications of the communication.

Object configuration

The controller's XG-X Ethernet port and the EtherNet/IP function provided by the communication expansion unit support the following objects. Access to these objects can be achieved through the message communication.

Class (Object name)	Class ID	Instance ID	XG-X Ethernet port	Communication expansion unit
Identity Object	1 (01Hex)	1 (01Hex)	○	○
Message Router Object	2 (02Hex)	1 (01Hex)	○	-
Assembly Object	4 (04Hex)	100 (64Hex): Input 101 (65Hex): Output 150 (95Hex): Output	○ ○ -	○ - ○
Connection Manager Object	6 (06Hex)	1 (01Hex)	○	○
Device Level Ring Object	71(47Hex)	1 (01Hex)	-	○
QoS Object	72(48Hex)	1 (01Hex)	-	○
Vision System Object	104 (68Hex)	1 (01Hex)	○	○
Port Object	244 (F4Hex)	1 (01Hex)	○	-
TCP/IP Interface Object	245 (F5Hex)	1 (01Hex)	○	○
EtherNet Link Object	246 (F6Hex)	1 (01Hex)	○	○

○: Supported, -: Not supported

- Reference**
- For detailed procedures for issuing the message with the PLC device in use, refer to the PLC operation manual.
 - This manual mainly describes the Vision System Object which is the object specific to the controller. For other objects, refer to the EtherNet/IP specifications (www.odva.org) issued by ODVA.

Notation for description

To explain the attribute and service of the object, the following terms are used.

Notation of data

- The bit position in the data is described by Bit n. (Bit0 represents LSB.)
- The array type data is shown by []. Example: DWORD[10] (DWORD type, number of elements 10 arrays)

Data type

The data type is specified by the EtherNet/IP specifications as follows:

Data type	Conditional expressions	Range	
		Minimum	Maximum
BOOL	Boolean	0: FALSE	1: TRUE
SINT	Short integer	-128	127
INT	Integer	-32768	32767
DINT	Double precision integer	-2^{31}	$2^{31}-1$
USINT	Unsigned short integer	0	255
UINT	Unsigned integer	0	65535
UDINT	Unsigned double precision integer	0	$2^{32}-1$
BYTE	Bit string: 8 bits	-	-
WORD	Bit string: 16 bits	-	-
DWORD	Bit string: 32 bits	-	-
REAL	No. of floating points	Range of single-precision floating point	

Reference All values are stored in little endian.

ClassID: 4 (04Hex) Assembly Object

Conditional expressions

The same data which is sent/received in the cyclic communication can be directly accessed/controlled in the message communication.

This is used when you want to control a model not compliant with the cyclic communication (e.g. Rockwell's SLC5/05) in the same data format as the cyclic communication.



Note that in the message communication, regular control in the cyclic communication cannot be performed.

Instance: 100 (64Hex)

It is the information for input assembly, and the information sent by the controller in the cyclic communication.

Attribute

Attribute ID	Access	Name	Data type	Parameters
3 (03Hex)	Get	data	BYTE array	It is the information specified by the input data of the cyclic communication data assignment in the global settings. It includes the controller status, command execution results, result data, etc.
4 (04Hex)	Get	size	UINT	Attribute3 size (for each byte) It is the size specified by the cyclic communication data size of the cyclic communication data assignment in the global settings.

Example of input assembly format

The input assembly configuration is in accordance with the fixed-cycle communication data assignment in the system settings.

As an example, the configuration below is used:

- Fixed-cycle communication data size: 496 bytes
- Command output area: Start address 0020 (fixed), end address 0119
- Result data area: Start address 0120, end address 0495

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Reserved	Reserved	Reserved	Result OR flag	Result ready flag	Command ready flag	Command error flag	Command complete flag
1	Reserved	Reserved	Reserved	Reserved	Trg4 Ready	Trg3 Ready	Trg2 Ready	Trg1 Ready
2	Reserved	Reserved	Reserved	Reserved	Trg4 Ack	Trg3 Ack	Trg2 Ack	Trg1 Ack
3	Reserved	Reserved	Reserved	Reserved	Remote ready flag	Error 1 status flag	Error 0 status flag	Busy
4	Assignable bit							
5								
6								
7								
8	Error0 code							
9								
10	Error1 code							
11								

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
12	Reserved							
13								
14								
15								
16	Total count							
17								
18								
19								
20	Command Result							
21								
22								
23								
24	Command Data1 (32-bit integer or floating point)*							
25								
26								
27								
28	Command Data2 (32-bit integer or floating point)*							
29								
30								
31								
32	Command Data3 (32-bit integer or floating point)*							
33								
34								
35								
36	Command Data4 (32-bit integer or floating point)*							
37								
38								
39								
120	ResultData1 (32-bit integer or floating point)*							
121								
122								
123								
124	ResultData2 (32-bit integer or floating point)*							
125								
126								
127								

* The decimal point format is in accordance with the setting of [Decimal Point] in the global settings. (Fixed point: Integer multiplying decimal value by 1,000 (If Decimal Precision is set to 1/1000. The values can be multiplied by 10 or more if 1/10 is selected for Decimal Precision and by a number up to 10000 if 1/10000 is selected.), Floating point: Single-precision floating point)

Service

Service code	Name	Parameters
14 (0EHx)	GetAttributeSingle	Retrieves the attribute value.

Instance: 101 (65Hex)/150 (95Hex)

This is the information for output assembly, and the information received by the controller in fixed-cycle communication. The value is 101 when using the XG-X Ethernet port and 150 when using a communication expansion unit.

Attribute

Attribute ID	Access	Name	Data type	Parameters
3 (03Hex)	Get/ Set	data	BYTE array	This is the information specified by the output data of the fixed-cycle communication data assignment in the system settings. System control, command input, %InDataFieldbus[] synchronous information, etc. can be written.
4 (04Hex)	Get	size	UINT	Attribute3 size (for each byte) This is the size specified by the fixed-cycle communication data size of the fixed-cycle communication data assignment in the system settings.

Example of output assembly format

The output assembly configuration is in accordance with the fixed-cycle communication data assignment in the system settings.

As an example, the configuration below is used:

- Fixed-cycle communication data size: 496 bytes
- Command input area: Start address 0016 (fixed), end address 0083
- %InDataFieldbus[] synchronous area: Start address 0084, end address 0495

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
0	Reserved	Reserved	Error 1 reset request flag	Error 0 reset request flag	Result ack flag	Reserved	InDataFieldbus sync inhibit flag	Command request flag
1	Reserved	Reserved	Reserved	Reserved	Trg4	Trg3	Trg2	Trg1
2	Reserved	Reserved	Reserved	Reserved	Reserved	Test	Ext	Reset
3	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
4	Assignable bit							
5								
6								
7								
8	Reserved							
9								
10								
11								
12								
13								
14								
15								
16	Command Number							
17								
18								
19								
20	Command Parameter1 (32-bit integer or floating point)*							
21								
22								
23								

Byte	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
24					Command Parameter2 (32-bit integer or floating point)*			
25								
26								
27								
28					Command Parameter3 (32-bit integer or floating point)*			
29								
30								
31								
32					Command Parameter4 (32-bit integer or floating point)*			
33								
34								
35								
84					%InDataFieldbus[0] (32-bit signed integer data)			
85								
86								
87								
88					%InDataFieldbus[1] (32-bit signed integer data)			
89								
90								
91								

* The decimal point format is set in the [Decimal Point] setting in the system settings. (Fixed point: Integer multiplying decimal value by 1,000 (If Decimal Precision is set to 1/1000. The values can be multiplied by 10 or more if 1/10 is selected for Decimal Precision and by a number up to 10000 if 1/10000 is selected.), Floating point: Single-precision floating point)

Service

Service code	Name	Parameters
14 (0EHex)	GetAttributeSingle	Retrieves the attribute value.
16 (10Hex)	SetAttributeSingle	Set a value to the attribute. Availability of setting is determined by the accessibility of the attribute.

ClassID: 104 (68Hex) Vision System Object

Conditional expressions

This is the object specific to the controller. It provides attributes and services necessary for control of the system in message communication.

For details of control with attributes, refer to the control sequence in the fixed-cycle communication.

Instance: 1 (01Hex)

Attribute

Attribute ID	Access	Name	Data type	Parameters
100 (64Hex)	Get	Vision System Object Status	BYTE	<p>Displays the status of the controller.</p> <ul style="list-style-type: none"> • Bit 0: Error 0 Status • Bit 1: Error 1 Status • Bit 2: Remote ready flag
101 (65Hex)	Get	Process Status	DWORD	<p>Displays the measurement status.</p> <ul style="list-style-type: none"> • Bit 0: Trg1 Ready • Bit 1: Trg2 Ready • Bit 2: Trg3 Ready • Bit 3: Trg4 Ready • Bit 4: Reserved • Bit 5: Reserved • Bit 6: Reserved • Bit 7: Reserved • Bit 8: Trg1 ack • Bit 9: Trg2 ack • Bit 10: Trg3 ack • Bit 11: Trg4 ack • Bit 12: Reserved • Bit 13: Reserved • Bit 14: Reserved • Bit 15: Reserved • Bit 16: Busy • Bit 17-31: Reserved
102 (66Hex)	Get/Set	RESET	BOOL	<p>Initializes the measurement processing.</p> <p>0->1: Measurement processing is initialized.</p>
103 (67Hex)	Get/Set	TEST	BOOL	<p>Controls the output.0->When 0 to 1, the output buffer is cleared.</p> <ul style="list-style-type: none"> • 1: Output control • 0: Enable outputs
104 (68Hex)	Get/Set	EXT	BOOL	<p>The trigger input is controlled.</p> <ul style="list-style-type: none"> • 1: Trigger input control • 0: Trigger input enabled
105 (69Hex)	Get/Set	TRG	BYTE	<p>Inputs the trigger.</p> <ul style="list-style-type: none"> • Bit 0: Trg1 • Bit 1: Trg2 • Bit 2: Trg3 • Bit 3: Trg4 • Bit 4: Reserved • Bit 5: Reserved • Bit 6: Reserved • Bit 7: Reserved

Attribute ID	Access	Name	Data type	Parameters						
106 (6AHex)	Get	Results Status	BYTE	Displays the result output status. <ul style="list-style-type: none">• Bit 0: Result ready flag• Bit 1: Result OR flag						
107 (6BHex)	Get/Set	Result ack flag	BOOL	Controls handshake of the result output.						
108 (6CHex)	Get	Inspection Result	DWORD[124]	Displays the result data. The data size is fixed to 248 bytes when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected. The size specified by the cyclic communication assignment from the starting address can be retrieved.						
109 (6DHex)	Get/Set	Command request flag	BOOL	Requests the custom command number. <ul style="list-style-type: none">• 1: Requesting command execution.• 0: Not requesting command execution.						
110 (6EHex)	Get/Set	Command	Structure	Specifies the custom command number and the parameter. <table border="1"><tr><td>Command Number</td><td>UINT</td></tr><tr><td>Reserved</td><td>UINT</td></tr><tr><td>Command Param</td><td>DWORD</td></tr></table> The data size is fixed to 248 bytes when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected. * In Set, only the size requiring update can be specified (integral multiple of 4 bytes).	Command Number	UINT	Reserved	UINT	Command Param	DWORD
Command Number	UINT									
Reserved	UINT									
Command Param	DWORD									
111 (6FHex)	Get	Command Status	BYTE	Displays the command execution status. <ul style="list-style-type: none">• Bit 0: Command complete flag• Bit 1: Command error flag• Bit 2: Command ready flag						
112 (70Hex)	Get	Command Result	Structure	Displays the command execution result. <table border="1"><tr><td>Command Result</td><td>UINT</td></tr><tr><td>Reserved</td><td>UINT</td></tr><tr><td>Command Data</td><td>DWORD</td></tr></table> The data size is fixed to 248 bytes when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected. The data size varies depending on the command execution result. The data size is fixed to 248 bytes maximum when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected.	Command Result	UINT	Reserved	UINT	Command Data	DWORD
Command Result	UINT									
Reserved	UINT									
Command Data	DWORD									
113 (71Hex)	Get	Total count	UDINT	Displays the number of measurements.						
114 (72Hex)	Get/Set	InDataFieldbus	DINT	Sets and refers to the value from %InDataFieldbus[0]. * In Set, only the size requiring update can be specified (integral multiple of 4 bytes). The data size in Get is fixed to 248 bytes when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected. There is no attribute equivalent to InDataFieldbus sync Inhibit flag which is present in the cyclic communication. It is immediately indicated.						
115 (73Hex)	Get	NGCount	UDINT	Displays the number of NG.						
116 (74Hex)	Get/Set	Program ID	Structure	Sets and refers to the setting number. <table border="1"><tr><td>SD No.</td><td>UINT</td></tr><tr><td>Program No.</td><td>UINT</td></tr></table> Specifies the SD card (1-2) that the setting number is stored on. Specifies the setting number (0-999).	SD No.	UINT	Program No.	UINT		
SD No.	UINT									
Program No.	UINT									
117 (75Hex)	Get/Set	Program Name	BYTE[61]	Sets and refers to the BYTE array (1 character per byte) for the setting name (60 characters maximum).						
118 (76Hex)	Get	Program Load Status	UINT	Displays the setting change status/result with attributes 116 and 117. <ul style="list-style-type: none">• 0: Setting change success• 1: Setting change failure• 2: Setting changing						

* In Get access, the GetAttributeSingle service (0EHex) is used. In Set, the SetAttributeSingle service (10Hex) is used.

Service

Service code	Name	Parameters
5 (05Hex)	Reset	Initializes the measurement processing.
14 (0EHex)	GetAttributeSingle	Retrieves the attribute value.
16 (10Hex)	SetAttributeSingle	Set a value to the attribute. Availability of setting is determined by the accessibility of the attribute.
75 (4BHex)	Capture	Executes image capture of the specified camera.
76 (4CHex)	Command execution	Issues the command request. Returns the command execution result with the message response.
77 (4DHex)	Retrieves results data.	Retrieves the measurement result.
78 (4EHex)	%InDataFieldbus[] rewrite	Rewrites the %InDataFieldbus[] value.
79 (4FHex)	Area assignment information retrieval	Retrieves the fixed-cycle communication assignment setting.
80 (50Hex)	Clear error	Clears the error status.

Service details

• Reset service (05Hex)

Initializes measurement processing. The execution is the same as resetting in I/O control.

- Transmission parameter: None
- Return data: None

• Image capture service (4BHex)

Input the trigger to capture image.

- Transmission parameter

Name	Data type	Parameters
TriggerBit	BYTE	Camera information indicating image capture <ul style="list-style-type: none"> • Bit 0: TRG1 • Bit 1: TRG2 • Bit 2: TRG3 • Bit 3: TRG4 • Bit 4: Reserved • Bit 5: Reserved • Bit 6: Reserved • Bit 7: Reserved

- Return error code

Error Code	Name	Parameters
09 (09Hex)	Parameter value error	A value other than 1 to 15 is specified as the parameter value.
21 (15Hex)	Parameter size too large	A parameter larger than 2 bytes is specified.
19 (13Hex)	Parameter size too small	If there is no parameter
16 (10Hex)	Status error	Ready corresponding to the specified trigger is OFF (not in run mode, image capture not accepted, etc.).

- Result data: None



In message communication, a processing delay may occur. If this delay is a problem, change the fixed-cycle communication or terminal input setting.

- **Custom command execution service (4CHex)**

Custom command is executed.

- Transmission parameter

Name	Data type	Parameters
Command Number	UINT	Specifies the custom command number.
Reserved	UINT	
Command Param	DWORD	Specifies the command parameter. Parameter can be specified to 492 bytes maximum (integral multiple of 4 bytes). See "Custom instruction" (Page 2-116) for more details on the command specification method.

- Return error code

Error Code	Sub-code	Name	Parameters
00 (00Hex)		Completion of command execution	Command execution is completed.
19 (13Hex)		Parameter too small error	The parameter is not specified in transmission data.
21 (15Hex)		Parameter too large error	A parameter larger than 496 bytes is specified.
31 (1FHex)	2	Command error	The requested command does not exist.
	3	Command operation inhibited	The received command cannot be performed.
	5	Command return error	Command result area is not sufficient.
	22	Parameter error	Either of the parameter count or range is incorrect.
	80	Incorrect password	The specified password does not match.
	81	Command ignored	Command is received from a device which inhibits input.

- Result data:

When the command execution with the command result is successful, the result data is returned in the following format:

Name	Data type	Parameters
Command Data	DWORD []	Returns the command execution result data. The data stored in this area is equivalent to the Command Data area. The maximum value of the returned data size is fixed to 248 bytes when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected.



In message communication, a processing delay may occur. If this delay is a problem, change the fixed-cycle communication or terminal input setting.

• Result data retrieval service (4DHEx)

Final measurement result is retrieved.

- Transmission parameter

Name	Data type	Parameters
Size	UINT	Specifies the result size to be retrieved in bytes. (The result data is the data in 4-byte. Be sure to specify the multiple value of 4.)
Offset	UINT	Specifies the result data offset in bytes. (The result data is the data in 4-byte. Be sure to specify the multiple value of 4.)

- Return error code

Error Code	Name	Parameters
09 (09Hex)	Parameter value error	Offset or size is an incorrect value.
21 (15Hex)	Parameter size too large	Parameter size is too large.
19 (13Hex)	Parameter size too small	Parameter size is too small.

- Result data

Name	Data type	Parameters
Result	BYTE []	Returns the result data of the specified offset or size. The maximum data size is fixed to 248 bytes when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected.

 In message communication, a processing delay may occur. If this delay is a problem, change the fixed-cycle communication or terminal input setting.

 Reference

- The retrievable result data is up to the size specified by the cyclic communication assignment.
- Use this command with the handshake OFF.

• %InDataFieldbus[] rewrite service (4EHEx)

%InDataFieldbus[] is updated. From a desired offset position, the %InDataFieldbus[] value of a desired consecutive size can be updated.

- Transmission parameter

Name	Data type	Parameters
Count	UINT	Number of %InDataFieldbus[] to be set (Specify the number.)
Offset	UINT	Offset number of %InDataFieldbus[] to be set (Example: To update from %InDataFieldbus[10], specify 10.)
Data	DINT []	Array of %InDataFieldbus[] value to be set. It is the data of specified size x 4 bytes.

- Return error code

Error Code	Name	Parameters
09 (09Hex)	Parameter value error	Offset or size is an incorrect value.
21 (15Hex)	Parameter size too large	The parameter size is too large or the value adding the size to the offset exceeds the %InDataFieldbus[] range.
19 (13Hex)	Parameter size too small	Parameter size is too small.

- Result data: None

 In message communication, a processing delay may occur. If this delay is a problem, change the fixed-cycle communication or terminal input setting.

 Reference

The offset and the size can be specified regardless of the fixed-cycle communication assignment offset setting.

- **Area assignment information retrieval service (4FHex)**

Address and size in each area assigned to the fixed-cycle communication are retrieved.

- Transmission parameter

Name	Data type	Parameters
Direction	UINT	Direction <ul style="list-style-type: none"> • 0: Reception side • 1: Transmission side
index	UINT	Direction is 0 (reception side). <ul style="list-style-type: none"> • 0: Bit area • 1: Fixed byte data area • 2: CommandParam area • 3: InDataFieldbus area Direction is 1 (transmission side). <ul style="list-style-type: none"> • 0: Bit area • 1: Fixed byte data area • 2: CommandData area • 3: ResultData area

- Return error code

Error Code	Name	Parameters
09 (09Hex)	Parameter value error	A value other than 0, 1, 2, and 3 is specified as the parameter value.
21 (15Hex)	Parameter size too large	A parameter larger than 2 bytes is specified.
19 (13Hex)	Parameter size too small	If there is no parameter

- Result data:

Name	Data type	Parameters
Size	UINT	Size of specified area
Offset	UINT	Starting address of specified area

- **Error clear service (50Hex)**

Error status is cleared.

- Transmission parameter

Name	Data type	Parameters
index	UINT	Error to be cleared <ul style="list-style-type: none"> • Bit 0: Error0 • Bit 1: Error1

- Return error code

Error Code	Name	Parameters
09 (09Hex)	Parameter value error	A value other than 1, 2, and 3 is specified as the parameter.
21 (15Hex)	Parameter size too large	A parameter larger than 2 bytes is specified.
19 (13Hex)	Parameter size too small	There is no parameter specified.

- Result data: None

 In message communication, a processing delay may occur. If this delay is a problem, change the fixed-cycle communication or terminal input setting.

Controlling the system with EtherNet/IP message communication

How to use message communication

The controller functions as the message communication server. The procedure for issuing the message communication varies depending on the device. For details, refer to "EtherNet/IP communication specifications" (Page 1-153) and manuals of each device.

IP address:

Specifies the controller IP address.

Class, instance:

Specifies the following class and instance equipped with the EtherNet/IP function of the controller.

Class name	Class ID	Instance ID
Identity Object	1 (01Hex)	1 (01Hex)
Message Router Object	2 (02Hex)	1 (01Hex)
Assembly Object	4 (04Hex)	100 (64Hex): Input 101 (65Hex): Output (when using the XG-X Ethernet port) 150 (95Hex): Output (when using a communication expansion unit)
Connection Manager Object	6 (06Hex)	1 (01Hex)
Vision System Object	104 (68Hex)	1 (01Hex)
Port Object	244 (F4Hex)	1 (01Hex)
TCP/IP Interface Object	245 (F5Hex)	1 (01Hex)
Ethernet Link Object	246 (F6Hex)	1 (01Hex)



The class mainly used in the message communication with the controller is as follows:

- Vision System Object: It is the object specific to the controller. This object is responsible for all controls as the image sensor.
- Assembly Object: The PLC not compliant with the cyclic communication can achieve control the same as the cyclic communication by directly reading/writing the data of this object.

Attribute

Attribute existing in the specified class or instance is specified. For details of attribute in each class, refer to "EtherNet/IP communication specifications" (Page 1-153) and specifications of the EtherNet/IP function issued by ODVA.



To obtain specifications issued by ODVA, refer to the following URL:
ODVA web site: www.odva.org/

Service

Execution details are specified. The major service used by the controller are as follows:

- Access to attribute:
GetAttributeSingle/SetAttributeSingle
- Service specific to object:
Service prepared for each object.

Control using the message communication

When the system is controlled in the message communication, gain access to the Vision System Object. The Vision System Object provides the following services.

Service name	Service ID	Description
Reset	5 (05Hex)	Resets the controller measurement items. It is the same as the reset command of the custom command.
GetAttribute Single	14 (0EHex)	Retrieves the specified attribute value.
SetAttribute Single	16 (10Hex)	Writes the value to the specified attribute.
Capture	75 (4BHex)	Inputs the specified trigger signal to capture the image.
Command execution	76 (4CHex)	This command executes a custom instruction.
Retrieves results data.	77 (4DHex)	Retrieves the measurement result.
%InDataField bus[] rewrite	78 (4EHex)	Rewrites the %InDataFieldbus[] value.
Area assignment information retrieval	79 (4FHex)	Retrieves the assignment information of each area (command area, system variable assignment area, result area, etc.) assigned as the cyclic communication data.
Clear error	80 (50Hex)	Clears the error status.



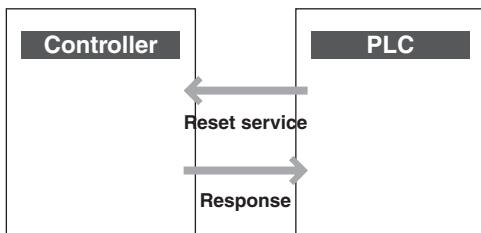
For details of each service, refer to "EtherNet/IP communication specifications" (Page 1-153). For details of the PLC settings, refer to "Typical EtherNet/IP Setting Procedure" (Page 1-173).

Resetting the controller with EtherNet/IP message communication

With message communication, the controller measurements can be reset using the reset service of the Vision System Object.

Control reset service (05Hex)

The measurement details are reset. Execution details are the same as resetting in I/O.



Data example

Transmission data

Class ID	68Hex	Vision System Object
Instance ID	01Hex	Fixed value
Service ID	05Hex	Reset service
Attribute ID	-	-
Data	-	-

Response

Execution result	Execution result
Additional code	None

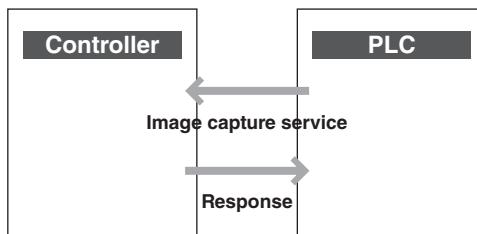
Execution result

0 (00Hex): Execution of the service is successful.

Controlling the image capture with EtherNet/IP message communication

Control image capture service (4BHex)

The specified trigger is input and the image is captured.



To use this service, the following conditions must be satisfied.

- The EtherNet/IP must be started in valid status.
- The EtherNet/IP must be valid in external trigger type settings.
- The EtherNet/IP must not be locked in the LK command.
- %Trg1Ready to %Trg4Ready corresponding to the specified trigger information is true (READY status).

Data example

When triggers 1 and 2 are input, the trigger information specifies 0x03 which is 1 for bit 0 and bit 1.

Transmission data

Class ID	68Hex	Vision System Object
Instance ID	01Hex	Fixed value
Service ID	4BHex	Image capture service
Attribute ID	-	-
Data	0th byte	03Hex bit0: Trg1 valid bit1: Trg2 valid bit2: Trg3 invalid bit3: Trg4 invalid bit4: Reserved bit5: Reserved bit6: Reserved bit7: Reserved

Response

Execution result	Execution result
Additional code	None

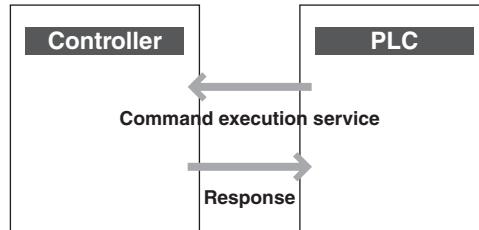
Execution result

- 0 (00Hex): Execution of the service is successful.
- 9 (09Hex): Data value is incorrect (invalid value).
- 16 (10Hex): The service is not accepted. (Any of the specified trigger is not Ready.)
- 19 (13Hex): The data size is incorrect (too small).
- 21 (15Hex): The data size is incorrect (too large).

Sending commands with EtherNet/IP message communication

Control command service (4CHex)

Command data is executed.



Point

To use this service, the following conditions must be satisfied.

- The EtherNet/IP must be started in valid status.
- The EtherNet/IP must not be locked in the LK command.
- The Command read flag must be true (ready for acceptance).

Reference

- The upper limit of the data which can be specified and retrieved in command input and command output is fixed to 248 bytes when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected. It is not related to the command area size assigned to the fixed-cycle communication area in the [System Settings] menu.
- The command output data returns the response for the result data size of the command executed.

Data example

The Switch program command (PW, 1, *1) in SD1 is registered to custom command number 2, and the program is changed to program 10 in the example below.

Transmission data

Class ID	68Hex	Vision System Object
Instance ID	01Hex	Fixed value
Service ID	4CHex	Command execution service
Attribute ID	–	–
Data	0th byte	02Hex
		Setting change to custom command number 2 in SD1
	1st byte	00Hex
	2nd byte	00Hex
	3rd byte	00Hex
	4th byte	0AHex
		Setting number 10 (0AHex)
	5th byte	00Hex
	6th byte	00Hex
	7th byte	00Hex

Response data

Execution result	Execution result								
Additional code	Refer to the following.								
Data	<table border="1"> <tr> <td>0th byte</td><td>0th byte of execution result</td></tr> <tr> <td>1st byte</td><td>00Hex</td></tr> <tr> <td>2nd byte</td><td>00Hex</td></tr> <tr> <td>3rd byte</td><td>00Hex</td></tr> </table>	0th byte	0th byte of execution result	1st byte	00Hex	2nd byte	00Hex	3rd byte	00Hex
0th byte	0th byte of execution result								
1st byte	00Hex								
2nd byte	00Hex								
3rd byte	00Hex								

Execution result

- 0 (00Hex): Execution of the service is successful.
- 19 (13Hex): The data size is incorrect (too small).
- 21 (15Hex): The data size is incorrect (too large).
- 31 (1FHex): Error specific to the vendor has occurred.
Detail reason is indicated by additional code.

Additional code

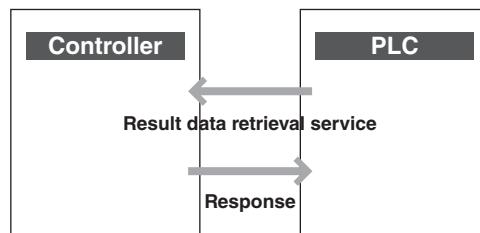
Error code of the binary command is stored.

2 (02Hex)	Command error	The requested command does not exist.
3 (03Hex)	Command operation inhibited	The received command cannot be performed.
22 (16Hex)	Parameter error	Either the parameter count or range is incorrect.
80 (50Hex)	Incorrect password	The specified password does not match.
81 (51Hex)	Command ignored	Command is received from a device which inhibits input.

Retrieving the measurement data with the EtherNet/IP message communication (data retrieval)

Control result data retrieval service (4DHex)

The offset and the size are specified in bytes with the result data assigned in output settings, and the result data is retrieved.



The upper limit size of the result data which can be retrieved is the result data area size assigned to the fixed-cycle communication area. The data size is limited to 248 bytes when Rockwell's SLC5/05 is selected as the PLC type, and to 496 bytes when other device is selected. If the size exceeding this value is specified, the data for the returnable size is returned.



To use this service, the following conditions must be satisfied.

- The EtherNet/IP must be started in valid status.
- The result data must be assigned to the fixed-cycle communication area.
- [EtherNet/IP] must be set as the output device in the data output unit.
- The measurement with the current settings must be completed (number of measurements is 1 or more).

Data example

Retrieving 20 bytes starting from the 12th byte of the result data

Transmission data

Class ID	68Hex	Vision System Object
Instance ID	01Hex	Fixed value
Service ID	4DHex	Result data retrieval service
Attribute ID	-	-
Data	0th byte	14Hex Retrieves 20 bytes.
	1st byte	00Hex
	2nd byte	0CHex Retrieves result data from the 12th byte
	3rd byte	00Hex

Response data

Execution result	Execution result
Additional code	OFF
Data	0th byte 12th byte of result data
	1st byte 13th byte of result data
	2nd byte 14th byte of result data
	3rd byte 15th byte of result data
	Snip
	16th byte 28th byte of result data
	17th byte 29th byte of result data
	18th byte 30th byte of result data
	19th byte 31st byte of result data

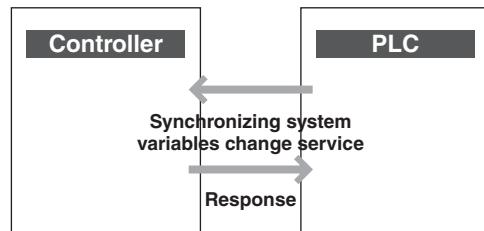
Execution result

- 0 (00Hex): Execution of the service is successful.
- 9 (09Hex): Data value is incorrect. (The offset or size is negative value or too large, and it is not appropriate.)
- 19 (13Hex): The data size is incorrect (too small).
- 21 (15Hex): The data size is incorrect (too large).

Changing %InDataFieldbus[] value with EtherNet/IP message communication (%InDataFieldbus[] rewrite)

Control %InDataFieldbus[] rewrite service (4EHex)

%InDataFieldBus[] values can be continuously rewritten.



%InDataFieldbus[] allows data to be specified from areas outside the fixed-cycle communication data assignment and offset setting range. (000 to 399)



- To use this service, the following conditions must be satisfied.
 - The EtherNet/IP must be started in valid status.
 - The EtherNet/IP must not be locked with the LK command.
- %InDataFieldbus[] assigned to the %InDataFieldbus[] synchronous area in the fixed-cycle communication assignment is overwritten during execution of the fixed-cycle communication. If %InDataFieldbus[] is updated in the message communication during execution of the fixed-cycle communication, specify %InDataFieldbus[] which is not assigned in the system variable synchronization.

Data example

12345678Hex is written in all five %InDataFieldbus[] from %InDataFieldbus[3] to %InDataFieldbus[7].

Transmission data

Class ID	68Hex	Vision System Object
Instance ID	01Hex	Fixed value
Service ID	4EHex	%InDataFieldbus[] rewrite service
Attribute ID	-	-
Data	0th byte	05Hex Rewrites five %InDataFieldbus[].
	1st byte	00Hex
	2nd byte	03Hex Rewrites from %InDataFieldbus[3].
	3rd byte	00Hex
	4th byte	78Hex Value written in
	5th byte	56Hex %InDataFieldbus[3].
	6th byte	34Hex
	7th byte	12Hex
	8th byte	78Hex Value written in
	9th byte	56Hex %InDataFieldbus[4].
	10th byte	34Hex
	11th byte	12Hex
	Snip	
	20th byte	78Hex Value written in
	21th byte	56Hex %InDataFieldbus[7].
	22th byte	34Hex
	23th byte	12Hex

Response data

Execution result	Execution result
Additional code	OFF

Execution result

- 0 (00Hex): Execution of the service is successful.
- 9 (09Hex): Data value is incorrect. (Not in valid %InDataFieldbus[] range.)
- 19 (13Hex): The data size is incorrect (too small).
- 21 (15Hex): The data size is incorrect (too large).

Control/Data Output via PROFINET

Overview of System Control/ Data Output

Control/Data Output via
External Terminals

Control/Data Output via
PLC-Link

Control/Data Output via
CC-Link

Control/Data Output via
EtherNet/IP

► Control/Data Output via PROFINET

Control/Data Output via
EtherCAT

Control/Data Output via
No protocol communication

FTP Client/Server Function

Overview of Control/Data Output Using PROFINET

The communication using PROFINET is supported. PROFINET is an open communication standard provided by PI (PROFIBUS & PROFINET International) to allow communication between supporting devices of any vendors. The XG-X Series belongs to Conformance Class A. The PROFINET connection provides the following functions:

Data I/O communication (cyclic communication)

Communicating at specified update time intervals allows high-speed control performed every several to several tens of microseconds. It is easier to writing PLC programs because you can control the controller by referencing and updating the variables and devices in the PLC without considering communication.

- Controller control: You can control the controller by issuing commands in the cyclic communication.
- Result data output: You can specify PROFINET as an output device for the data output unit and output data through the cyclic communication.
- I/O control: By assigning control-related system variables in the cyclic communication, you can control input/output in the same way as using the terminal block or parallel I/O interface of the controller.
- Changing variable values: By assigning a special system variable %InDataFieldbus[], you can externally change the value of a variable efficiently (variable synchronization).

Point

- Be sure to set the update time of the cyclic communication to 4 ms or more (1 ms or more when using a communication expansion unit).
- Even when the update time of the cyclic communication has been set to 4 ms or more (1 ms or more when using a communication expansion unit), the XG-X controller may exhibit processing delays and communication may temporarily time out or disconnect when used with other communications such as system measurement setting, menu operations, commands, FTP or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Be sure to check for these and other problems in the operating performance before entering production.
- In a network where many devices including a PROFINET device are connected, delay or packet loss may occur sometimes when a heavy load is applied to the network constantly or temporarily. Be sure to make thorough verification before entering production.
- PROFINET and PLC-Link, CC-Link, EtherNet/IP, or EtherCAT cannot be used at the same time (PROFINET cannot be used when PLC-Link, CC-Link, EtherNet/IP or EtherCAT is enabled).

Record data communication (non-cyclic communication)

This method can be used for communication which does not require regularity like the cyclic communication. This transmission method uses dedicated commands to read/write data records (1024 bytes/record) and can access the addresses exceeding the maximum size allowed to the cyclic communication (1408 bytes or 1248 bytes when using a communication expansion unit).

Operation Flow

Check the specifications (Page 1-212).

- Check whether the PLC to be connected supports the PROFINET connection.
- Check the input/output data assignments.

Change the PROFINET settings (Page 1-220).

- Configure the settings to use PROFINET to connect the controller.
Major setting items: IP address of the controller, PROFINET device name, and input/output data assignments

Establish the PROFINET communication.

- You can confirm whether PROFINET communications have been established or not by checking [Communication Status] on the [PROFINET Monitor & Diagnostics] screen or [Communication Status] on the [PROFINET] screen on the controller's Global settings.

Execute necessary processing.

Data output (Page 1-227)

- Data from the data output unit is written into the data output area.
- Check the Result ready flag to confirm the completion of the data writing.
- Set the Result ack flag to ON to notify that the reading has been completed.

I/O control (Page 1-229)

- Use I/O control by assigning system variables related to terminal control.

Command control (Page 1-230)

- Predefined custom instructions can be executed.
- To execute a command, write a command code and command parameters into the command input area and set the Command request flag to ON.
- A command can be executed when the Command ready flag is ON.
- Check the Command complete flag to confirm the completion of the command execution.

Variable synchronization (Page 1-232)

- Change the value of a system variable dedicated for variable synchronization (%InDataFieldbus[]).

Preparation for the PROFINET Connection

PROFINET Connection Supporting Models

For more details of the setting procedure of each PLC, refer to "Typical PROFINET Setting Procedure" (Page 1-234) and the instruction manual included with the PLC.

Siemens PLCs

PLC model	PROFINET communication unit	Firmware version
S7 300 Series Example: CPU315-2 PN/DP	- (included in the main unit)	V2.6 and later
S7 400 Series Example: CPU414-3 PN/DP	- (included in the main unit)	V5.3 and later
S7 1200 Series Example: CPU1212C	- (included in the main unit)	V2.0 and later
S7 1500 Series Example: CPU1511	- (included in the main unit)	V1.8.2

OMRON PLC

PLC model	PROFINET communication unit	Firmware version
SYSMAC CJ2/CJ1	CJ1W-PNT21	V1.04 and later

Preparing the PROFINET Connection (When Using the CA-NPN20E)

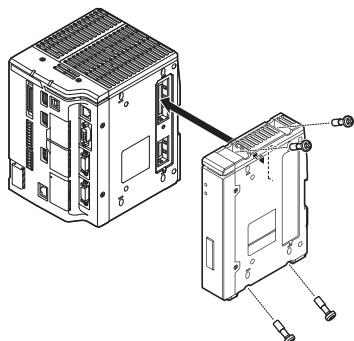
Installing the PROFINET Unit

The optional PROFINET unit CA-NPN20E is used when communicating over PROFINET.

Remove the protective cover from the expansion unit connector on the right side of the controller and install the PROFINET unit as shown below.

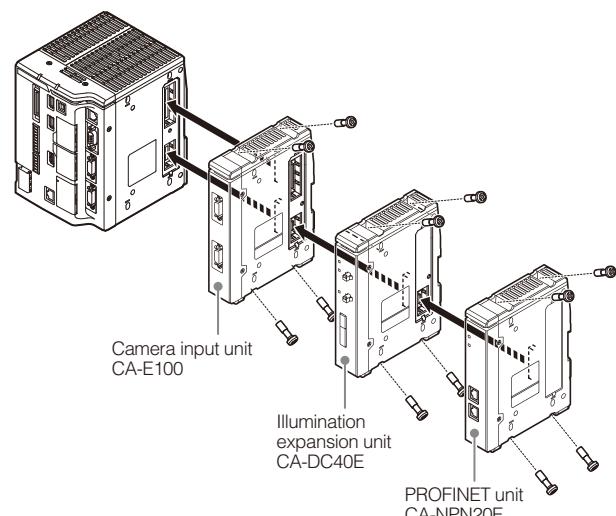


The controller must be turned off before connecting or disconnecting the CA-NPN20E.



When Using the Illumination Expansion Unit and PROFINET Unit Together

Mount the camera input unit directly to the controller, then mount the illumination expansion unit and PROFINET unit to the right side of the camera input unit.



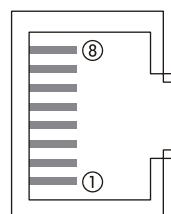
Illumination expansion units and PROFINET units cannot be installed between camera input units and controllers.

CA-NPN20E PROFINET Unit Specifications

Standard specifications

Item	
Compliant standard	IEEE802.3u (100BASE-TX)
Communication speed	100 Mbps (100BASE-TX)
Communication cycle	1 ms min.
Connection cable	Category 5e or greater shielded twisted pair (STP) cable
Node interval	100 m
Communication port	RJ45 connector × 2
Communication size	1248 bytes
Supported functions	Data I/O communication (cyclic communication) Record data communication (non-cyclic communication)
Applicable protocol	LLDP, DCP, MRP, SNMP
Conformance test version	Complying with Conformance Class C V2.34

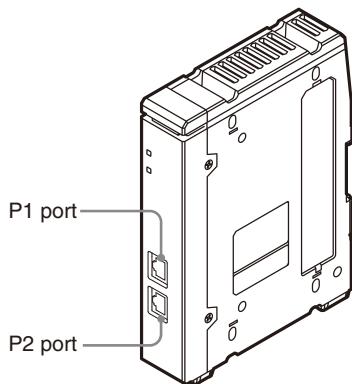
Wiring example (P1 port/P2 port)



No.	Signal name	Function
1	TX +	Transmission data (+)
2	TX -	Transmission data (-)
3	RX +	Reception data (+)
4	-	75 Ω terminating resistance connected
5	-	75 Ω terminating resistance connected
6	RX -	Reception data (-)
7	-	75 Ω terminating resistance connected
8	-	75 Ω terminating resistance connected

Connecting to an PROFINET Network

Connect the PROFINET network cable to the P1 port or the P2 port of the RJ connector. If a slave unit is present downstream of this unit, connect a network cable to the unused side.



Point Use a category 5e or greater STP (shielded twisted pair) cable for the network cable. You can use either a straight cable or a crossover cable.

PROFINET Communication Specifications of the Controller

Basic Specifications

The PROFINET communication of this system supports two types of communication: "data I/O communication (cyclic communication)" and "record data communication (non-cyclic communication)."

Data I/O communication (cyclic communication)

This is a function to make periodic communication at specified update time intervals and is suitable for real time control.

- The update time and communication size depend on the connection settings on the PLC (maximum communication size: 1408 bytes or 1248 bytes when using a communication expansion unit).
- See "Typical PROFINET Setting Procedure" (Page 1-234) for more details.

Record data communication (non-cyclic communication)

This is a communication method to use dedicated commands to access to a "record" which is a piece of byte information divided in the unit of 1024 bytes.

- Two types of commands, Read Record and Write Record are available. When these commands are executed, a response to the command is returned.
- This method can be used for communication which does not require real time processing.
- It is possible to access to the addresses exceeding the maximum size allowed to the cyclic communication (1408 bytes or 1248 bytes when using a communication expansion unit).
- Ensure that the writing size is specified in units of 4 bytes.
- Each record is assigned with an index. Data is accessed based on the specified index and size.

For the controller's XG-X Ethernet port and for communication expansion units, the accessible ranges for each piece of byte information are as follows:

Output data (received by the controller) - Read/write

Index	Accessible address	
	XG-X port	Expansion unit
1	0008 to 1031	0008 to 1007
2	1032 to 2055	1008 to 2007
3	(None)	2008 to 2055

Input data (sent from the controller) - Read only

Index	Accessible address	
	XG-X port	Expansion unit
10	0008 to 1031	0008 to 1007
11	1032 to 2055	1008 to 2007
12	2056 to 3079	2008 to 3007
13	3080 to 4103	3008 to 4007
14	(None)	4008 to 4103

- The Read Record and Write Record commands are issued from the PLC by using the "RDREC" (SFB 52) and "WRREC" (SFB 53) blocks respectively. See "Typical PROFINET Setting Procedure" (Page 1-234) for more details.



If the Write Record command is issued while the Parameter module is being written in the cyclic communication, memory area conflict may occur. Design the use of the Write Record command to avoid the memory area conflict with the cyclic communication.

Example of input data settings (from XG-X Series to Siemens SIMATIC S7-300 Series)

This is an example when one controller of the XG-X Series is connected to the Siemens SIMATIC S7-300 Series and [Command function size] is set to 100 bytes (addresses 0020 to 0119) and [Starting address of output data] is set to 120 bytes (from address 0120) (I***/PIB***/PID in the table show assignment examples of the I addresses of the SIMATIC S7-300.).

Setting	Address	Bit 7 status (Byte)	Bit 6		Bit 5		Bit 4		Bit 3		Bit 2		Bit 1		Bit 0		
Bit area	0000	I0.7	Reserved	I0.6	Reserved	I0.5	Reserved	I0.4	Result OR	I0.3	Result Ready	I0.2	Cmd Ready	I0.1	Cmd Err	I0.0	Cmd Complete
	0001	I1.7	Reserved	I1.6	Reserved	I1.5	Reserved	I1.4	Reserved	I1.3	Trg4 Ready	I1.2	Trg3 Ready	I1.1	Trg2 Ready	I1.0	Trg1 Ready
	0002	I2.7	Reserved	I2.6	Reserved	I2.5	Reserved	I2.4	Reserved	I2.3	Trg4 Ack	I2.2	Trg3 Ack	I2.1	Trg2 Ack	I2.0	Trg1 Ack
	0003	I3.7	Reserved	I3.6	Reserved	I3.5	Reserved	I3.4	Reserved	I3.3	Remote Ready	I3.2	Err 1 Status	I3.1	Err 0 Status	I3.0	Busy
	0004	Bit 7 of PIB256	Assignable	Bit 6 of PIB256	Assignable	Bit 5 of PIB256	Assignable	Bit 4 of PIB256	Assignable	Bit 3 of PIB256	Assignable	Bit 2 of PIB256	Assignable	Bit 1 of PIB256	Assignable	Bit 0 of PIB256	Assignable
	0005	Bit 7 of PIB257	Assignable	Bit 6 of PIB257	Assignable	Bit 5 of PIB257	Assignable	Bit 4 of PIB257	Assignable	Bit 3 of PIB257	Assignable	Bit 2 of PIB257	Assignable	Bit 1 of PIB257	Assignable	Bit 0 of PIB257	Assignable
	0006	Bit 7 of PIB258	Assignable	Bit 6 of PIB258	Assignable	Bit 5 of PIB258	Assignable	Bit 4 of PIB258	Assignable	Bit 3 of PIB258	Assignable	Bit 2 of PIB258	Assignable	Bit 1 of PIB258	Assignable	Bit 0 of PIB258	Assignable
	0007	Bit 7 of PIB259	Assignable	Bit 6 of PIB259	Assignable	Bit 5 of PIB259	Assignable	Bit 4 of PIB259	Assignable	Bit 3 of PIB259	Assignable	Bit 2 of PIB259	Assignable	Bit 1 of PIB259	Assignable	Bit 0 of PIB259	Assignable
Error code area	0008	PIW	Error 0 code														
	0009	420															
	0010	PIW	Error 1 code														
	0011	422															
Reserved area	0012	PID	Reserved														
	0013	424	Reserved														
	0014		Reserved														
	0015		Reserved														
Total count area	0016	PID	Total count														
	0017	428															
	0018																
	0019																
Command output area	0020	PID	Command Result														
	0021	432															
	0022																
	0023																
	0024	PID	Command Data 1														
	0025	436															
	0026																
	0027																
	0028	PID	Command Data 2														
	0029	440															
	0030																
	0031																
	:																
	0116	PID	Command Data 24														
	0117	528															
	0118																
	0119																

Setting	Address	Bit 7 (Byte)	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data output area	0120	PID	Result Data 1						
	0121	532							
	0122								
	0123								
	0124	PID	Result Data 2						
	0125	536							
	0126								
	0127								
	...								

Names and operations of input signals

Assigned Region	Name	Remarks
Bit area	Cmd Complete	Turns ON when command processing is complete.
	Cmd Err	Turns OFF when command processing is successful and turns ON when it fails.
	Cmd Ready	Turns ON when command processes can be received.
	Result Ready	Turns ON when data transmission is complete.
	Result OR	Linked to %JgAll*.
	Trg1 Ready	Ready signal for Trigger 1
	Trg2 Ready	Ready signal for Trigger 2
	Trg3 Ready	Ready signal for Trigger 3
	Trg4 Ready	Ready signal for Trigger 4
	Trg1 Ack	Turns ON when Trigger 1 input is received. Turns OFF when Trigger 1 input is OFF.
	Trg2 Ack	Turns ON when Trigger 2 input is received. Turns OFF when Trigger 2 input is OFF.
	Trg3 Ack	Turns ON when Trigger 3 input is received. Turns OFF when Trigger 3 input is OFF.
	Trg4 Ack	Turns ON when Trigger 4 input is received. Turns OFF when Trigger 4 input is OFF.
	Busy	Linked to %Busy.
	Err 0 Status	Linked to %Error0.
	Err 1 Status	Linked to %Error1.
	Remote Ready	Linked to %Run.
Error code area	Error 0 Code	The error code for the cause of the error assigned to %Error0 that occurred last.
	Error 1 Code	The error code for the cause of the error assigned to %Error1 that occurred last.
Processing count area	Total Count	Displays the processing count.
Command output area	Command Result	Displays the command execution result.
	Command Data 1	Returns command execution result data 1.
	Command Data 2	Returns command execution result data 2.

	Command Data24	Returns command execution result data 24.
Data output area	Result Data 1	Returns measurement result data 1.
	Result Data 2	Returns measurement result data 2.

Example of output data settings (from Siemens SIMATIC S7-300 Series to XG-X Series)

This is an example when one controller of the XG-X Series is connected to the Siemens SIMATIC S7-300 Series with [Command function size] set to 68 bytes (addresses 0016 to 0083) and [Starting address of input data] is set to 84 bytes (from address 0084) (Q***/PQB***/PQD*** in the table show assignment examples of the Q addresses of the SIMATIC S7-300 Series.).

Setting status	Address (Byte)	Bit 7	Bit 6		Bit 5		Bit 4		Bit 3		Bit 2		Bit 1		Bit 0	
Bit area	0000	Q0.7	Reserved	Q0.6	Reserved	Q0.5	Err 1 reset request	Q0.4	Err 0 reset request	Q0.3	Result ack	Q0.2	Reserved	Q0.1	InDataFB sync inhibit	Q0.0 Cmd Request
	0001	Q1.7	Reserved	Q1.6	Reserved	Q1.5	Reserved	Q1.4	Reserved	Q1.3	Trg4	Q1.2	Trg3	Q1.1	Trg2	Q1.0 Trg1
	0002	Q2.7	Reserved	Q2.6	Reserved	Q2.5	Reserved	Q2.4	Reserved	Q2.3	Reserved	Q2.2	Test	Q2.1	Ext	Q2.0 Reset
	0003	Q3.7	Reserved	Q3.6	Reserved	Q3.5	Reserved	Q3.4	Reserved	Q3.3	Reserved	Q3.2	Reserved	Q3.1	Reserved	Q3.0 Reserved
	0004	Bit 7 of PQB256	Assignable	Bit 6 of PQB256	Assignable	Bit 5 of PQB256	Assignable	Bit 4 of PQB256	Assignable	Bit 3 of PQB256	Assignable	Bit 2 of PQB256	Assignable	Bit 1 of PQB256	Assignable	Bit 0 of PQB256
	0005	Bit 7 of PQB257	Assignable	Bit 6 of PQB257	Assignable	Bit 5 of PQB257	Assignable	Bit 4 of PQB257	Assignable	Bit 3 of PQB257	Assignable	Bit 2 of PQB257	Assignable	Bit 1 of PQB257	Assignable	Bit 0 of PQB257
	0006	Bit 7 of PQB258	Assignable	Bit 6 of PQB258	Assignable	Bit 5 of PQB258	Assignable	Bit 4 of PQB258	Assignable	Bit 3 of PQB258	Assignable	Bit 2 of PQB258	Assignable	Bit 1 of PQB258	Assignable	Bit 0 of PQB258
	0007	Bit 7 of PQB259	Assignable	Bit 6 of PQB259	Assignable	Bit 5 of PQB259	Assignable	Bit 4 of PQB259	Assignable	Bit 3 of PQB259	Assignable	Bit 2 of PQB259	Assignable	Bit 1 of PQB259	Assignable	Bit 0 of PQB259
Reserved Region	0008	PQD420	Reserved													
	0009															
	0010															
	0011															
	0012	PQD424	Reserved													
	0013															
	0014															
	0015															
Command input area	0016	PQD42 Command Number														
	0017	8														
	0018															
	0019															
	0020	PQD43 Cmd Parameter1														
	0021	2														
	0022															
	0023															
	0024	PQD43 Cmd Parameter2														
	0025	6														
	0026															
	0027															
	0028	PQD44 Cmd Parameter3														
	0029	0														
	0030															
	0031															
	:															
	0080	PQD49 Cmd Parameter16														
	0081	2														
	0082															
	0083															

Setting status	Address (Byte)	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Variable	0084	PQD49	%InDataFieldbus[0]						
synchro-	0085	6							
nization-	0086								
specific	0087								
system	0088	PQD50	%InDataFieldbus[1]						
Variable	0088	PQD50	%InDataFieldbus[1]						
area	0089	0							
	0090								
	0091								
	...								

Names and operations of output signals

Assigned Region	Name	Remarks
Bit area	Cmd Request	Requests command execution when the signal changes from OFF to ON.
	InDataFB sync inhibit	When this is ON, reading of %InDataFieldbus[] data is not allowed.
	Result ack	Notifies of data acquisition when the signal changes from OFF to ON.
	Err 0 reset request	Clears Error0 when the signal changes from OFF to ON.
	Err 1 reset request	Clears Error1 when the signal changes from OFF to ON.
	Trg1	Trigger 1 input
	Trg2	Trigger 2 input
	Trg3	Trigger 3 input
	Trg4	Trigger 4 input
	Reset	Reset input: Resets the controller (rise cycle).
	Ext	Disable Trigger reception: During signal input, capturing for all cameras and capture unit operation will stop (level input).
	Test	Test run input: During signal input, data output for all ports, %JAHold, and %Sto will be forcibly stopped and the output buffer will also be cleared (level input).
Command input area	Command Number	Writes custom command numbers.
	Cmd Parameter1	Writes custom command argument **01".
	Cmd Parameter2	Writes custom command argument **02".
	Cmd Parameter3	Writes custom command argument **03".

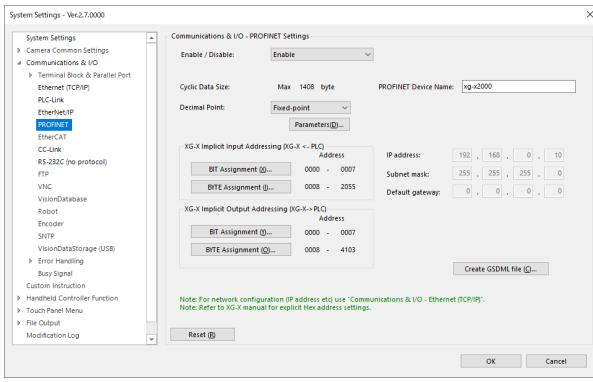
	Cmd Parameter16	Writes custom command argument **16".
Variable synchronization specific System variable area	%InDataFieldbus[0]	Fieldbus-specific input data 1
	%InDataFieldbus[1]	Fieldbus-specific input data 2

Changing the PROFINET Settings

Opening the PROFINET Setting Screen

To change the settings with the XG-X VisionEditor

In the [PROFINET] screen of [System Settings] of the XG-X VisionEditor, you can change various settings to use PROFINET to control the input/output of various data through the Ethernet port of the controller.



Reference

When using the XG-X Ethernet port, the controller Ethernet settings such as IP address and subnet mask are changed on the [Ethernet (TCP/IP)] screen.

Point

- The update time, data size, and timeout time are set on the PLC. Be sure to set an update time of 4 ms or more (1 ms or more when using a communication expansion unit).
- Even when the update time of the cyclic communication has been set to 4 ms or more (1 ms or more when using a communication expansion unit), the XG-X controller may exhibit processing delays and communication may temporarily time out or disconnect when used with other communications such as system measurement setting, menu operations, commands, FTP or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Be sure to check for these and other problems in the operating performance before entering production.
- In a network where many devices including a PROFINET device are connected, delay or packet loss may occur sometimes when a heavy load is applied to the network constantly or temporarily. Be sure to make thorough verification before entering production.
- PROFINET cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or EtherCAT is enabled.

- Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] screen is displayed.

- In the left pane of the [System Settings] screen, select [Communications & I/O] - [PROFINET].

The [PROFINET] screen is displayed.

- Change the settings as required.

See "PROFINET Setting Items Which can be Set with the System" (Page 1-222) for more details on the setting of each item.

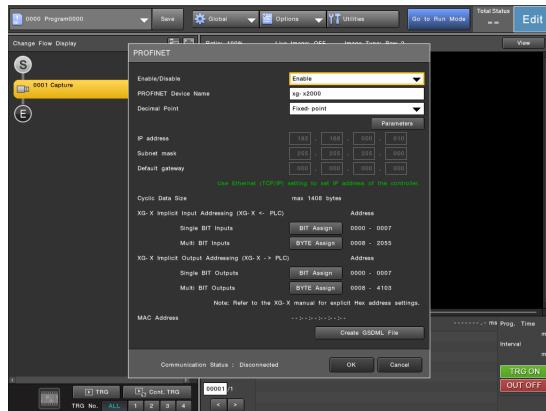
- Click [OK].

Point

To apply the change to the controller, you need to upload the system settings to the controller and then restart the controller.

To change the settings with the controller

In the [PROFINET] screen which can be opened from the Global settings, you can change various settings to use PROFINET to control the input/output of various data through the Ethernet port of the controller.



Reference

When using the XG-X Ethernet port, the controller Ethernet settings such as IP address and subnet mask are changed on the [Ethernet (TCP/IP)] screen.

Point

- If you change the setting items other than [Decimal Point] and [XG-X Implicit Output Addressing (XG-X → PLC): Multi BIT Output Settings] - [Starting address of output data], you need to restart the controller for the setting to take effect.
- The update time, data size, and timeout time are set on the PLC. Be sure to set an update time of 4 ms or more (1 ms or more when using a communication expansion unit).
- Even when the update time of the cyclic communication has been set to 4 ms or more (1 ms or more when using a communication expansion unit), the XG-X controller may exhibit processing delays and communication may temporarily time out or disconnect when used with other communications such as system measurement setting, menu operations, commands, FTP or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Be sure to check for these and other problems in the operating performance before entering production.
- In a network where many devices including a PROFINET device are connected, delay or packet loss may occur sometimes when a heavy load is applied to the network constantly or temporarily. Be sure to make thorough verification before entering production.

- On the [Global] menu at the top of the screen, select [Communications & I/O] - [PROFINET].

The [PROFINET] screen is displayed.

- Select [Enable] for [Enable/Disable].

- Specify the device name in [PROFINET Device Name].

- Change the settings as required.

See "PROFINET Setting Items Which can be Set with the System" (Page 1-222) for more details on the setting of each item.

- Click [OK].

PROFINET Setting Items Which can be Set with the System

Enable/Disable

Select whether to use PROFINET.

- **Disable:** Do not use the PROFINET communication.
- **Enable:** Use the PROFINET communication through the XG-X Ethernet port.
- **Enable module:** PROFINET communication through the communication expansion unit (CA-NPN20E: sold separately) connected to the controller is enabled.

 Point

PROFINET cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or EtherCAT is enabled. You must disable all of them.

PROFINET Device Name

Set the device name of the XG-X Series used for the PROFINET communication. This name must be the same as the name set on the PLC.

Decimal Point

Select a data representation format used for the parameters of MW/MR/MS/MWX/MRX/MSX commands, the output of command data, and the input/output of result output data.

- **Fixed-point** (default): Output data is multiplied by 1000 and is used as 32-bit signed integer data.

Select [Parameters] to specify the [Decimal Precision] (1/10, 1/100, 1/1000, or 1/10000; set to 1/1000 by default).

 Point

Depending on the [Decimal Precision] setting: 1/10, 1/100, 1/1000, or 1/10000, the measurement result is multiplied by 10, 100, 1000, or 10000 (respectively) and is used as 32 bits of signed integer data.

- **Floating-point:** Output data is used as single-precision floating point data (32-bit).

 Reference

For a command dealing with integers only, this setting is ignored and the system rounds off a value to the nearest integer and reads command parameters as integers or writes command data in integers.

Communication expansion unit network settings

 Point

- If incorrect settings are used, the controller and other network equipment may not work properly. Consult your system administrator or network administrator about setting values.
- For communication through the XG-X Ethernet port, set the IP address, subnet mask, and default gateway on the [Ethernet] screen. For details, refer to "No protocol communication via Ethernet" (Page 1-295).

 Reference

When [Disable] or [Enable] is selected for [Enable/Disable], the setting details of the controller's XG-X Ethernet port are displayed.

• **IP address:**

Enter the IP address (Default value: 192.168.0.20).

• **Subnet mask:**

Enter a subnet mask (Default value: 255.255.255.0).

• **Default gateway:**

Enter a default gateway IP address (Default value: 0.0.0.0).

 Point

The set value is common with the P1 port and P2 port of the communication expansion unit.

Cyclic Data Size

The maximum data size for the cyclic communication available with the XG-X Series is displayed (1408 bytes or 1248 bytes when using a communication expansion unit).

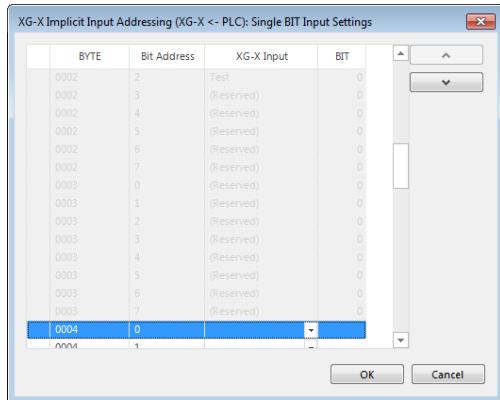
 Point

The actual data size to be sent or received will depend on the setting on the PLC.

XG-X Implicit Input Addressing (XG-X ← PLC) (XG-X VisionEditor)

BIT assignment

The [XG-X Implicit Input Addressing (XG-X ← PLC): Single BIT Input Settings] screen is displayed. This screen lists the bit address assignment of output data (received by the controller).

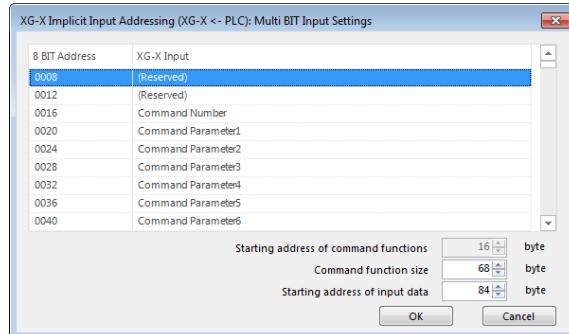


- In the [XG-X Input] and [BIT] columns, you can assign a desired input-type system variable related to terminal control and its bit to each address.
- You can also move the assignment setting to another address by selecting a line and clicking [\wedge] or [\vee].
- Device ranges that cannot be used in the current setting are not displayed.

- Point**
- The system variables which have already been assigned to the input terminals in the terminal block & parallel port cannot be assigned again for PROFINET.
 - The same bit of the same system variable cannot be assigned to multiple output data (received by the controller) addresses or be assigned again to the input terminal in the terminal block & parallel port.

BYTE assignment

The [XG-X Implicit Input Addressing (XG-X ← PLC): Multi BIT Input Settings] screen is displayed. This screen lists the byte address assignment of output data (received by the controller).



- Starting address of command functions:** Specify the position to start assignment of items necessary for command control. With the controller, this address is fixed to byte 16 and cannot be changed.

- Command function size:** Items necessary for command control are assigned up to 68 bytes (default) which is the area size upper limit. The custom instruction No. (Command Number) is assigned from bytes 16 to 19, and command parameters (Command Parameter1 to 16) are assigned from bytes 20 to 83.

- Starting address of input data:** Specify the position to start assignment of %InDataFieldbus[] for system variable synchronization. By default, the position has already been assigned from byte 84, four bytes for each item. When the command control and variable synchronization are performed simultaneously with PROFINET, some of the data range used by the command control and variable synchronization may overlap. When this occurs, minimize the command function size and change the starting address for the variable synchronization in the [Starting address of input data] setting of the variable synchronization.

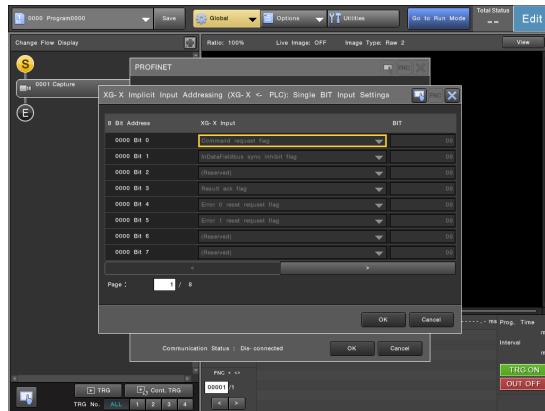
Reference

- Bytes 8 to 1408 (or 8 to 1248 when using a communication expansion unit) can be used for the cyclic communication. For the record data communication, all byte addresses can be used.
- The data representation format when decimal data is written as Command Parameter depends on the format specified at [Decimal Point].

XG-X Implicit Input Addressing (XG-X ← PLC) (Controller)

BIT assign

The [XG-X Implicit Input Addressing (XG-X ← PLC): Single BIT Input Settings] screen is displayed. This screen lists the bit address assignment of output data (received by the controller).



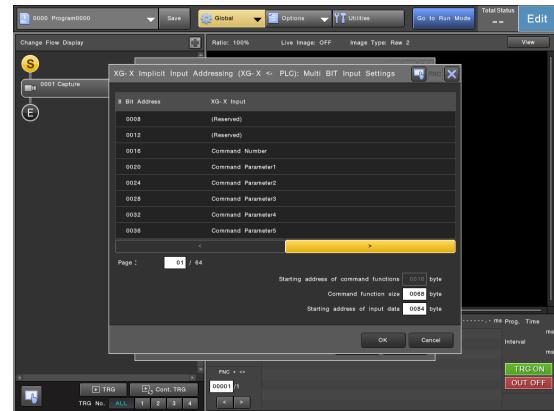
In the [XG-X Input] and [BIT] columns, you can assign a desired input-type system variable related to terminal control and its bit to each address.

Point

- The system variables which have already been assigned to the input terminals in the terminal block & parallel port cannot be assigned again for PROFINET.
- The same bit of the same system variable cannot be assigned to multiple output data (received by the controller) addresses or be assigned again to the input terminal in the terminal block & parallel port.

BYTE assign

The [XG-X Implicit Input Addressing (XG-X ← PLC): Multi BIT Input Settings] screen is displayed. This screen lists the byte address assignment of output data (received by the controller).



Starting address of command functions: Specify the position to start assignment of items necessary for command control. With the controller, this address is fixed to byte 16 and cannot be changed.

Command function size: Items necessary for command control are assigned up to 68 bytes (default) which is the area size upper limit. The custom instruction No. (Command Number) is assigned from bytes 16 to 19, and command parameters (Command Parameter1 to 16) are assigned from bytes 20 to 83.

Starting address of input data: Specify the position to start assignment of %InDataFieldbus[] for system variable synchronization. By default, the position has already been assigned from byte 84, four bytes for each item.

Reference

- Bytes 8 to 1408 (or 8 to 1248 when using a communication expansion unit) can be used for the cyclic communication. For the record data communication, all byte addresses can be used.
- The data representation format when decimal data is written as Command Parameter depends on the format specified at [Decimal Point].

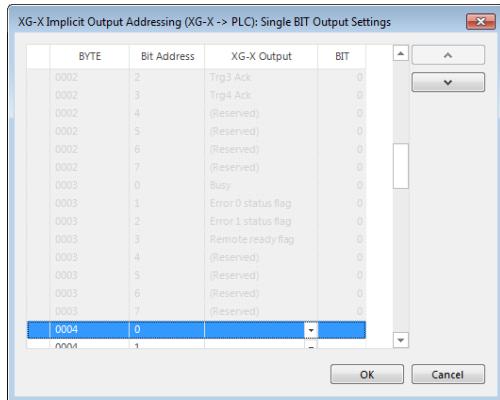
Point

Only custom instructions can be executed with PROFINET.

XG-X Implicit Output Addressing (XG-X → PLC) (XG-X VisionEditor)

BIT assignment

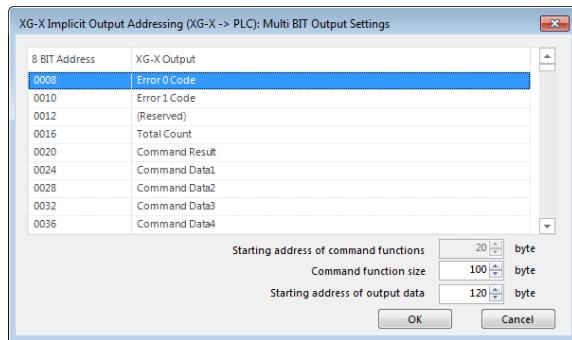
The [XG-X Implicit Output Addressing (XG-X → PLC): Single BIT Output Settings] screen is displayed. This screen lists the bit address assignment of input data (sent from the controller).



- In the [XG-X Output] and [BIT] columns, you can assign a desired output-type system variable related to terminal control and its bit to each address.
- You can also move the assignment setting to another address by selecting a line and clicking [\wedge] or [\vee].

BYTE assignment

The [XG-X Implicit Output Addressing (XG-X → PLC): Multi BIT Output Settings] screen is displayed. This screen lists the byte address assignment of input data (sent from the controller).



- Starting address of command functions:** Specify the position to start assignment of items necessary for command control. With the controller, this address is fixed to byte 20 and cannot be changed.
- Command function size:** Items necessary for command control are assigned up to 100 bytes (default) which is the area size. The command result (Command Result) is assigned from bytes 20 to 23, and command response data (Command Data1 to 24) are assigned from bytes 24 to 119.
- Starting address of output data:** The data output unit which uses PROFINET as an output device can output data to the assignment range starting from this address within the area set at [Cyclic Data Size]. If the data output size is insufficient, minimize the command function size to the least amount required, and change the starting address for the data output assignment in the [Starting address of output data] setting.

Reference

- Bytes 8 to 1408 (or 8 to 1248 when using a communication expansion unit) can be used for the cyclic communication. For the record data communication, all byte addresses can be used.
- The decimal data representation format in Command Data depends on the format specified at [Decimal Point].

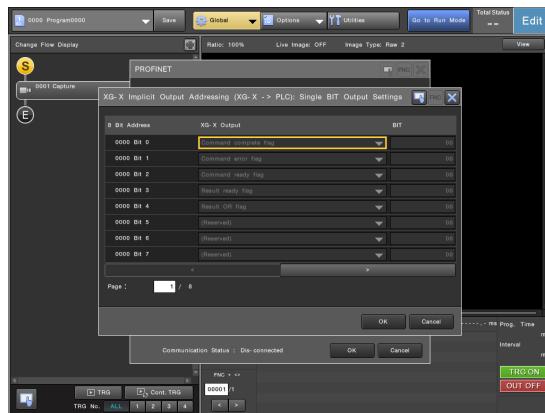
Point

The data range actually used for a command response varies depending on the command. Be sure to provide a sufficient area for the command response of the command to be used.

XG-X Implicit Output Addressing (XG-X → PLC) (Controller)

BIT assign

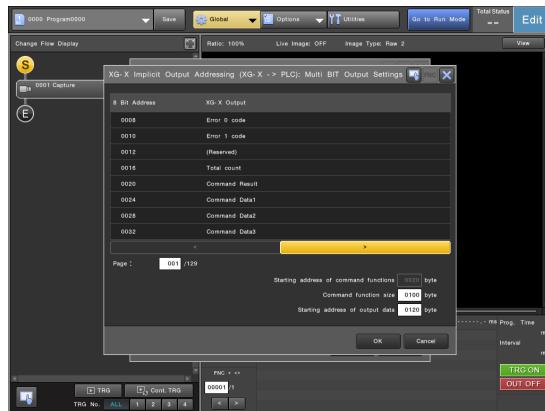
The [XG-X Implicit Output Addressing (XG-X → PLC): Single BIT Output Settings] screen is displayed. This screen lists the bit address assignment of input data (sent from the controller).



In the [XG-X Output] and [BIT] columns, you can assign a desired output-type system variable related to terminal control and its bit to each address.

BYTE assign

The [XG-X Implicit Output Addressing (XG-X → PLC): Multi BIT Output Settings] screen is displayed. This screen lists the byte address assignment of input data (sent from the controller).



- Starting address of command functions:** Specify the position to start assignment of items necessary for command control. With the controller, this address is fixed to byte 20 and cannot be changed.
- Command function size:** Items necessary for command control are assigned up to 100 bytes (default) which is the area size. The command result (Command Result) is assigned from bytes 20 to 23, and command response data (Command Data1 to 24) are assigned from bytes 24 to 119.

- Starting address of output data:** The data output unit which uses PROFINET as an output device can output data to the assignment range starting from this address within the area set at [Cyclic Data Size]. If the data output size is insufficient, minimize the command function size to the least amount required, and change the starting address for the data output assignment in the [Starting address of output data] setting.

Reference

- Bytes 8 to 1408 (or 8 to 1248 when using a communication expansion unit) can be used for the cyclic communication. For the record data communication, all byte addresses can be used.
- The decimal data representation format in Command Data depends on the format specified at [Decimal Point].

Point

The data range actually used for a command response varies depending on the command. Be sure to provide a sufficient area for the command response of the command to be used.

Create GSDML File

This option is used to output the GSDML and icon files which contain the information about the PROFINET functions of the controller. Each file name is as follows.

In the case of the XG-X2000 Series

- GSDML-V2.32-Keyence-XG-X2000-20180727.xml
- GSDML-01FD-XG-X2000.bmp

In the case of the XG-X1000 Series

- GSDML-V2.32-Keyence-XG-X1000-20180727.xml
- GSDML-01FD-XG-X1000.bmp

In the case of a communication expansion unit (CA-NPN20E)

- GSDML-V2.34-Keyence-XG-X1K2K-CA-NPN20E-20191031.xml
- GSDML-01FD-XG-X1K2K-CA-NPN20E.bmp

Point

These files are not created if any of the parameter settings are incorrect. Correct the incorrect settings and then try again.

Reference

- The output path of the file in the controller is SD2:/xg/GSDML in the case of the controller and SD2:/xg/GSDML_EX in the case of a communication expansion unit.
- Since the GSDML file does not contain the information set or changed in the system settings of the controller and the XG-X VisionEditor, the content of the created GSDML file is always the same.

Reset (XG-X VisionEditor)

Returns all settings on the [PROFINET] screen to their initial values.

Using the PROFINET Cyclic Communication to Output Measurement Data (Data Output)

Change the settings so that the data output unit outputs data through PROFINET.

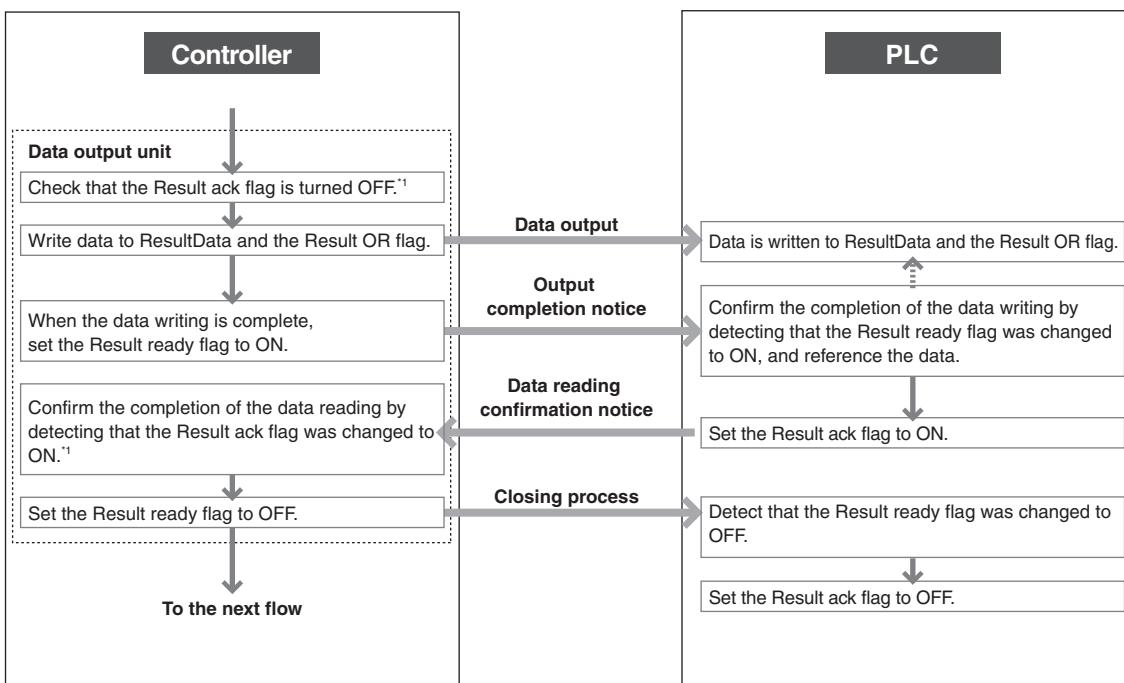
- Point** PROFINET cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or EtherCAT is enabled.

Data Output Flow

Data is output from the data output unit. The data and addresses for the output are set in the data output unit.

The controller outputs the data through PROFINET in the procedure shown below.

- Reference**
- The data output through PROFINET is possible only in run mode. Data will not be output in setup mode.
 - Binary data, such as images, cannot be output with PROFINET.
 - When none of the data output units in the flowchart is processed, no data will be output. In such a case, the Result ready flag does not change.



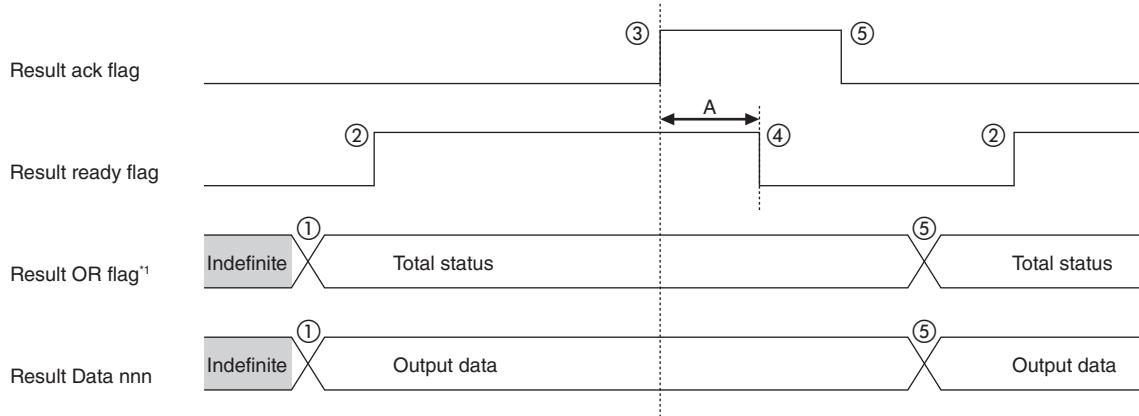
*1 This is a procedure for when handshake is set to ON.

If handshake is OFF, the controller overwrites when the data output unit is processed regardless of the status of the Result ack flag, and the Result ready flag remains ON. If you need to confirm the completion of writing based on the change of the Result ready flag from OFF to ON, set the Result ready flag to OFF by setting the Result ack flag to ON.

- Point** Confirm that the data range used for the data output does not overlap with the data range of the command response data.

Timing Chart

When handshake is ON

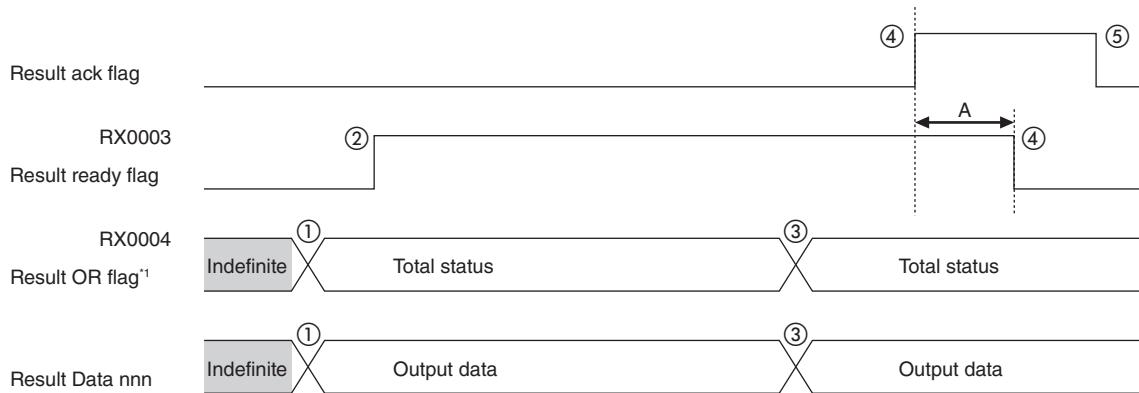


A: 0 ms or more (depending on the link scan speed)

*1 If you use the Result OR flag, one or more item of data needs to be set to be output from the data output unit to the PROFINET.

- (1) The data is updated.
- (2) The Result ready flag for the read synchronization signal of the output data turns ON and the data can be read.
- (3) When data read is completed, the Result ack Flag turns ON as the signal for data read completion.
- (4) Associated with (3), the Result ready flag turns OFF.
- (5) Result ack flag turns OFF. This is received and output continues if data is updated.

When handshake is OFF



A: 0 ms or more (depending on the link scan speed)

*1 If you use the Result OR flag, one or more item of data needs to be set to be output from the data output unit to the PROFINET.

- (1) The data is updated.
- (2) The Result ready flag for the read synchronization signal of the output data turns ON and the data can be read.
- (3) If data is updated, the Result ready flag stays ON and output continues.
- (4) If the Result ack flag turns ON, the Result ready flag turns OFF. This can be used when you want to find out the latest OK/NG status with as little delay as possible for such applications as when the line is to be stopped when the status is NG.
- (5) Result ack flag turns OFF. Thus, you can find out the timing of the next data update.

Using the PROFINET Cyclic Communication for I/O Control

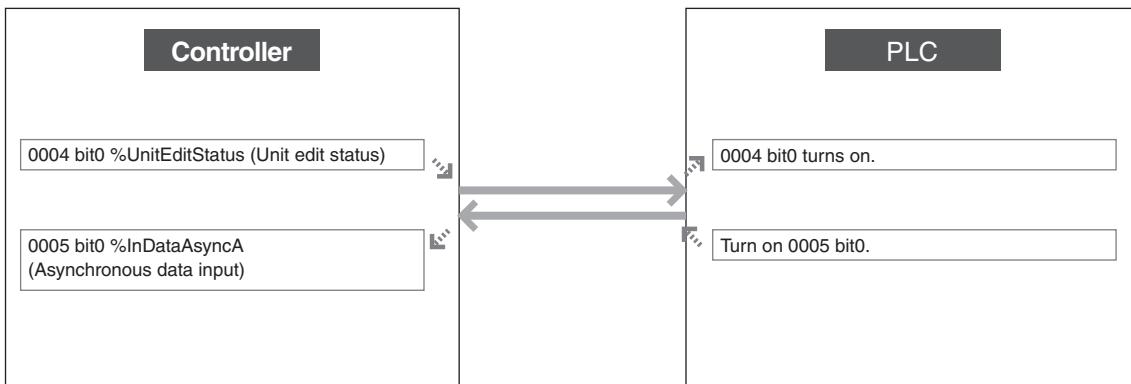
Change the settings to use PROFINET to control input/output in the same way as using the terminal block or parallel I/O interface of the controller.



PROFINET cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or EtherCAT is enabled.

Conceptual Diagram of I/O Control (Example Connection with the PROFINET Unit of a PLC)

By assigning the system variables related to terminal control to bit devices, you can use multiple I/O signals with a single LAN cable.



The PROFINET communication is based on periodic communication. As a result, although the I/O signals operate according to the terminal block operation, some instantaneous changes of the signals may not be detected. To avoid the problem, set the update time by considering the actual signal change time.



- It is also possible to output measured or judged values to bit devices by assigning %OutDataAsync to the bit address for the input data (data sent from the controller) and issuing a WP command from the process flow using the Command Execution unit.
- It is also possible to execute custom instructions from bit devices by assigning %CmdCode, %CmdParam, and %CmdStrobe to the bit address for the output data (received by the controller).

Using the PROFINET Cyclic Communication to Control the Controller (Command Control)

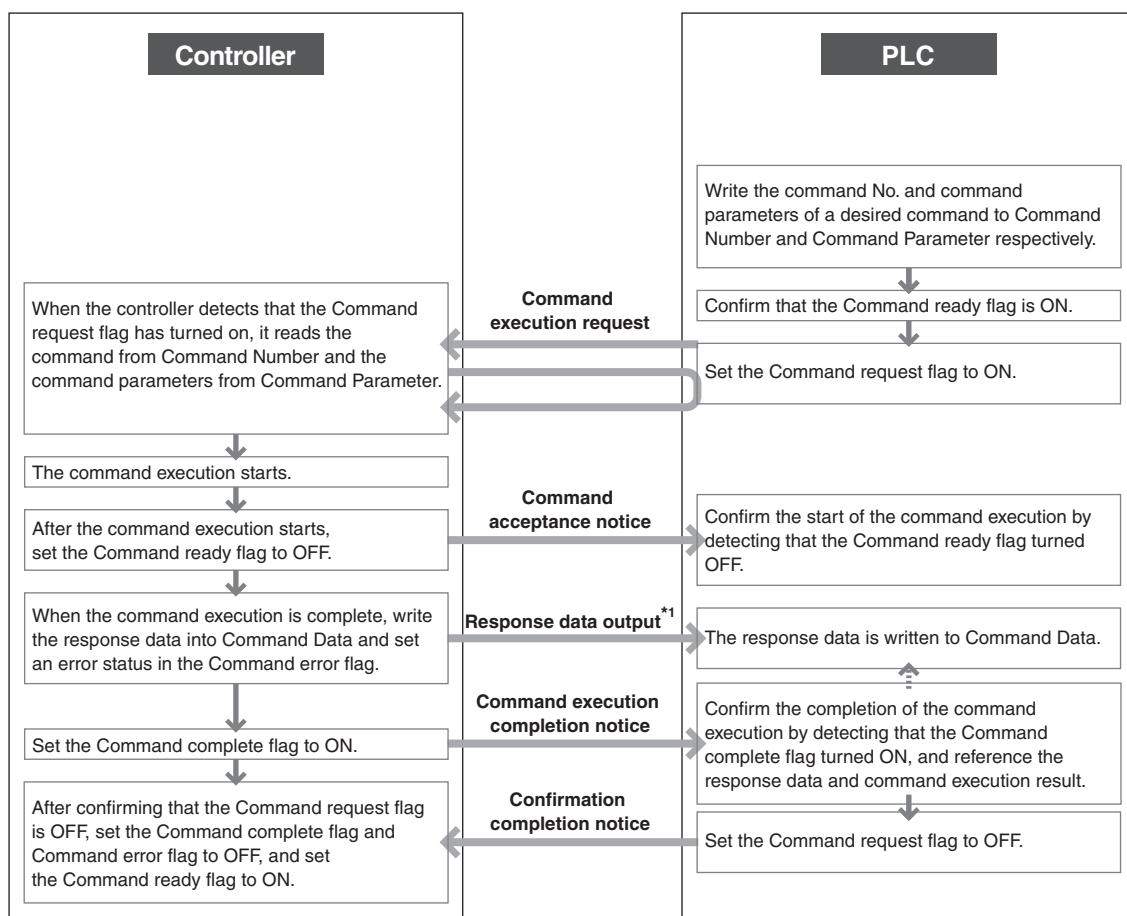
Predefined commands can be executed at a desired timing.



- PROFINET cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or EtherCAT is enabled.
- You need to set desired commands as custom instructions in advance.

Command Processing Flow Using PROFINET (Example Connection with the PROFINET Unit of a PLC)

The controller is controlled with the commands through PROFINET in the procedure shown below.

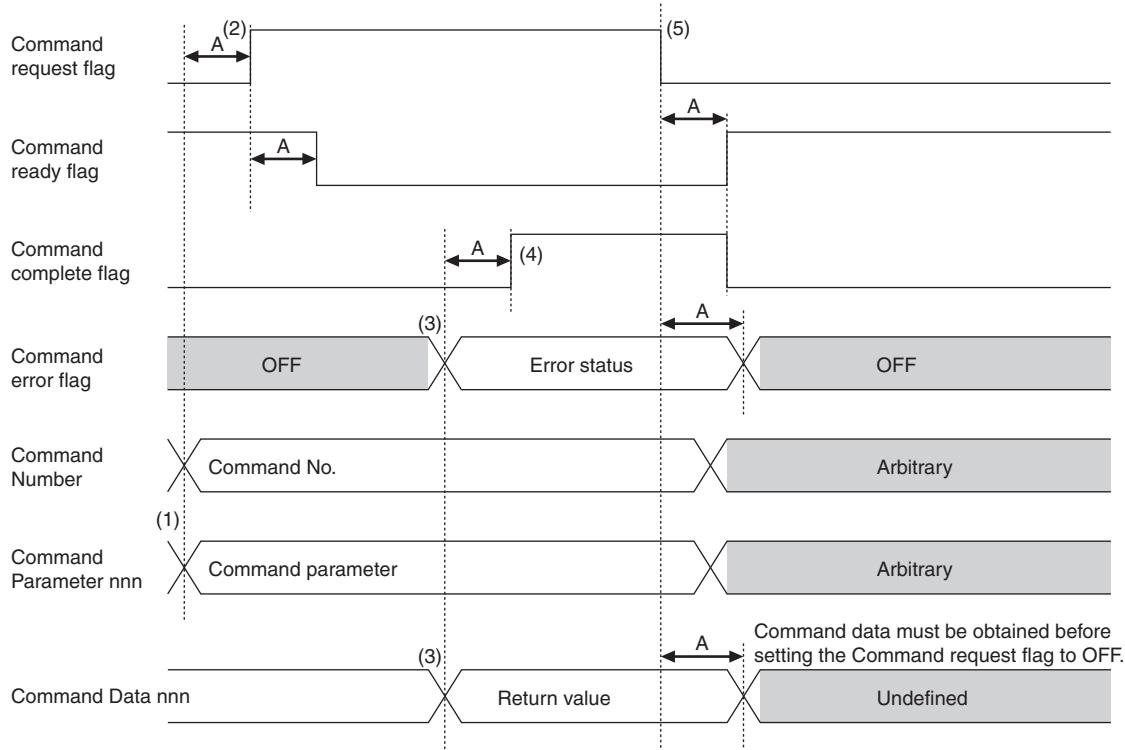


*1 For commands which produce no response data, no response data is output to Command Data.



When a command error occurs, the command execution result is written into Command Result (0: Succeeded, <Error code>: Failed).

Timing diagram



A: 0 ms or more (depending on the link scan speed)

- (1) The command No. is stored in Command Number and the first command parameter is stored in Command Parameter.
- (2) The Command request flag is set to ON to allow command execution.

The Command ready flag is also OFF. (To turn OFF the Command ready flag, at least the time for link scan is required.)

- (3) When the time required for the command execution elapses, the return value is stored in Command Data and an error status is stored in the Command error flag (When the Command error flag is OFF: Command execution succeeded, ON: Command execution failed).

- (4) The Command complete flag turns ON as a confirmation signal of command execution completion.
- (5) When the Command request flag is set to OFF to allow the next command to be issued, the Command ready flag turns ON and the Command complete flag turns OFF.

Using the PROFINET Cyclic Communication to Change Variable Value (Variable Synchronization)

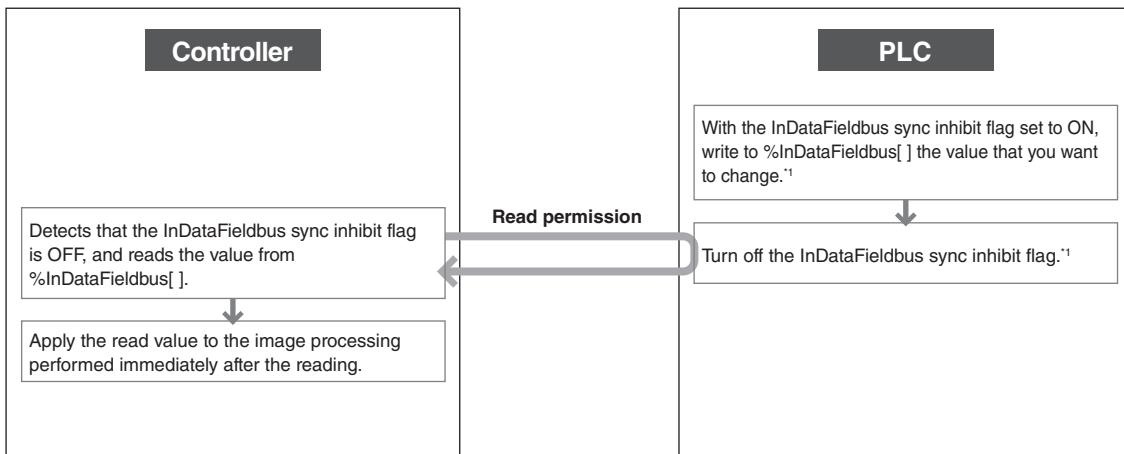
Change the settings to use PROFINET to change the value of a special system variable for variable synchronization (%InDataFieldbus[]) assigned to the output data (received by the controller) of the cyclic communication.



PROFINET cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or EtherCAT is enabled.

Variable Synchronization Flow Using PROFINET (Example Connection with the PROFINET Unit of a PLC)

When PROFINET is used, the value of %InDataFieldbus[] in the controller is changed in the following procedure.



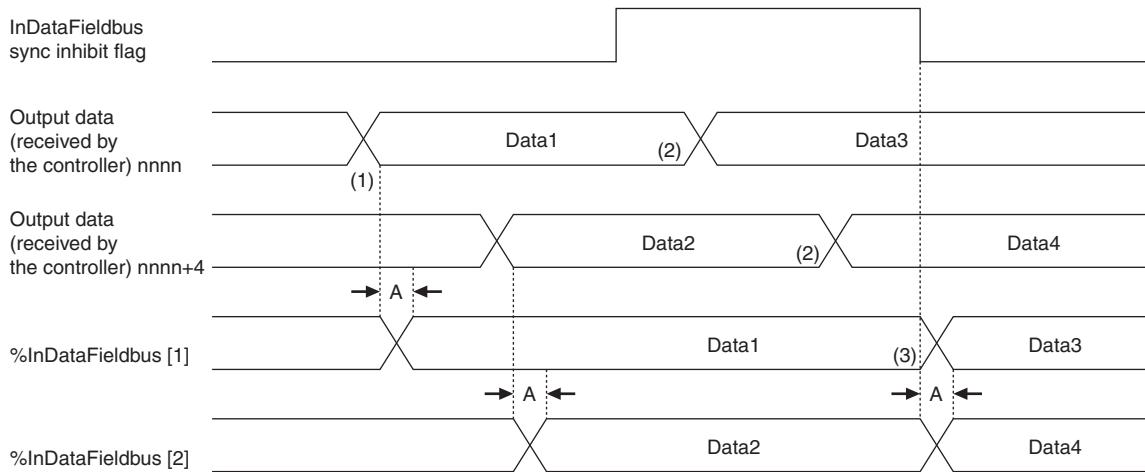
*1 This is the procedure for controlling the reading timing of one value. EtherNet/IP reads a value for each cycle specified by RPI. When the PLC is writing to multiple values of %InDataFieldbus[], a time lag may occur in the application timing of each memory. Setting the InDataFieldbus sync inhibit flag to ON beforehand to inhibit reading and then writing the values during the period ensure simultaneous change of multiple %InDataFieldbus[] values without being affected by the write timing.



- The value of %InDataFieldbus[] is initialized to "0" immediately after the startup of the controller. If the PROFINET communication is interrupted, the last value written into %InDataFieldbus[] is retained until the controller is restarted.
- The value is written into the data memory as 32-bit signed integer data.

Timing diagram

Example when the values of %InDataFieldbus[1] and %InDataFieldbus[2] are changed



A: 0 ms or more (depending on the link scan speed)

- (1) Since the InDataFieldbus sync inhibit flag is OFF, when a value is written into the byte address of the output data (received by the controller) corresponding to %InDataFieldbus[1], the value of %InDataFieldbus[1] is changed after the link scan time at the latest (The value of %InDataFieldbus[2] does not change because the value in the byte address of the output data (received by the controller) is not changed.).
- (2) Values are written into the byte addresses of the output data (received by the controller) corresponding to %InDataFieldbus[1] and %InDataFieldbus[2], however, the values of %InDataFieldbus[1] and %InDataFieldbus[2] do not change because the InDataFieldbus sync inhibit flag is ON. To change multiple %InDataFieldbus values simultaneously, you need to set the InDataFieldbus sync inhibit flag to ON, write and change the values in all of the corresponding byte addresses of the output data (received by the controller) , and then set the InDataFieldbus sync inhibit flag to OFF.
- (3) Since the InDataFieldbus sync inhibit flag turned OFF, the values of the %InDataFieldbus[1] and %InDataFieldbus[2] are changed (At least the time for a link scan is required before the change is complete.).

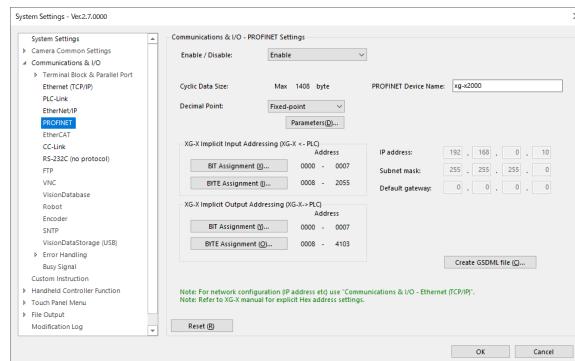
Typical PROFINET Setting Procedure

This section explains the operation example to connect the XG-X Series to the Siemens S7-300 Series via PROFINET, output measured/judgment values, and control the controller with the PW command.

Connecting to the CPU

1. Checking the system settings of the XG-X Series

- 1** Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.
- 2** On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.
- 3** In the [System Settings] screen, select [Communications & I/O] - [PROFINET].
- 4** Change the PROFINET settings.



The following setting values are used in this example
(Change them according to the device to be connected.).

[Communications & I/O - PROFINET Settings]

- Enable / Disable: Enable
- PROFINET Device Name: xg-x2000
- Decimal Point: Fixed-point (Decimal Precision: 1/1000)

[XG-X Implicit Input Addressing (XG-X ← PLC)]

[XG-X Implicit Output Addressing (XG-X → PLC)]

Assign data to the bit/byte addresses and specify the starting address.

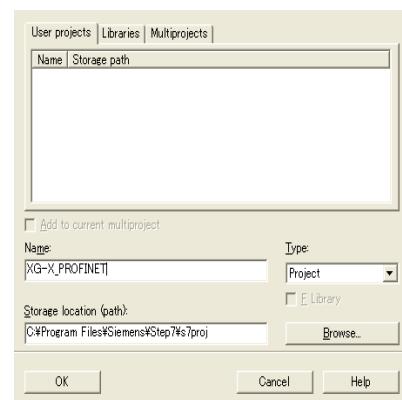
- 5** Select [OK].

The changes are saved.

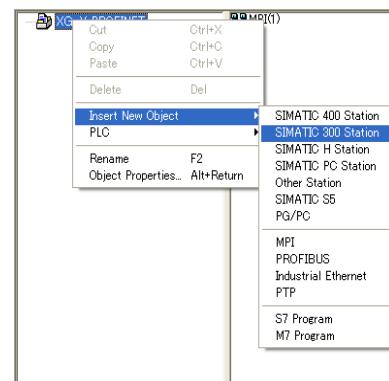
- 6** Upload the system settings to the controller and then restart the controller.

2. Changing the settings of the Siemens S7-300 Series

- 1** After connecting the PC and the CPU, start SIMATIC Manager and select [New] from the [File] menu.
- 2** Enter the project name in the [Name] field and click [OK].



- 3** Right-click the project name in the Object Hierarchy of SIMATIC Manager, and select [Insert New Object] - [SIMATIC 300 Station].



[SIMATIC 300] is added to the project.

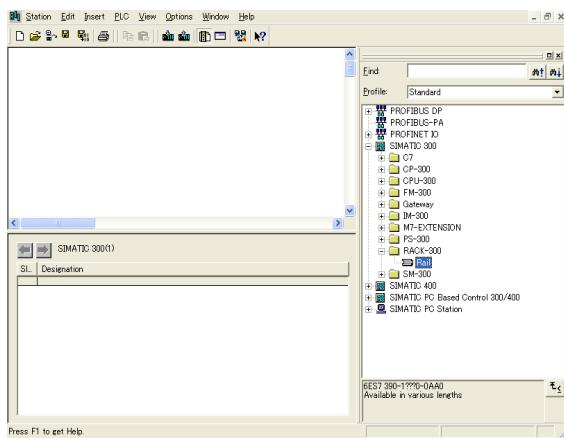


- 4** Expand the Object Hierarchy, select [SIMATIC 300], and then double-click [Hardware].



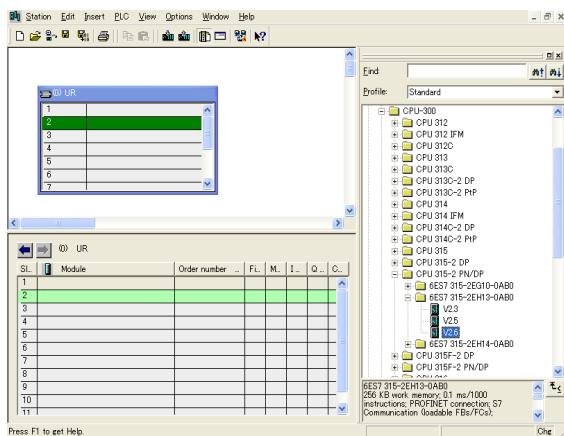
The [HW Config] screen is displayed.

- 5 In the Hardware Catalog, expand [SIMATIC 300] - [RACK-300], then drag and drop [Rail] into the Station Window.**

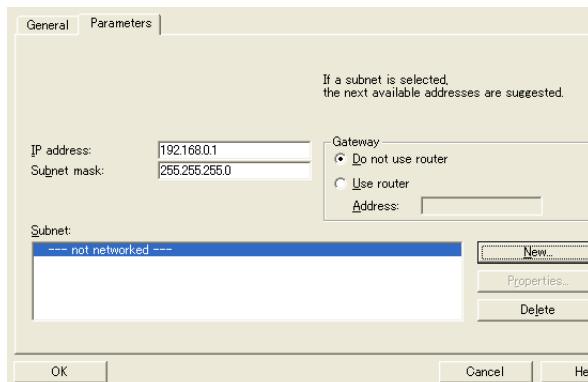


[Rail] is added to the Station Window.

- 6 Drag and drop the CPU to be connected from the Hardware Catalog and add it to the hardware configuration diagram.**

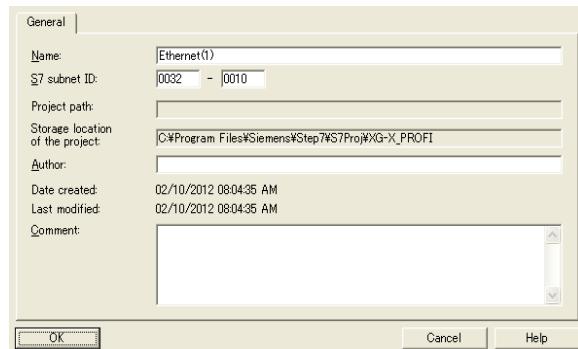


The [Properties - Ethernet interface PN-IO] screen is displayed.



- 7 Enter the IP address and subnet mask of the CPU and click [New].**

The [Properties - New subnet Industrial Ethernet] screen is displayed.



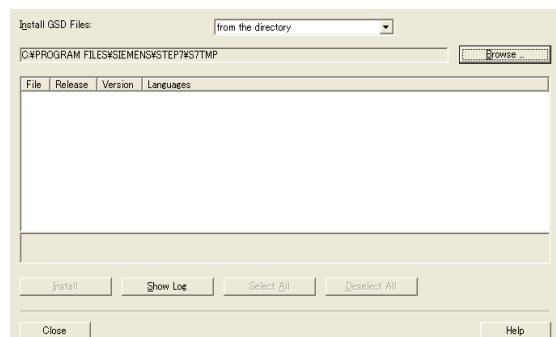
- 8 Click [OK].**

The screen returns to the [Properties - Ethernet interface PN-IO] screen.

- 9 Click [OK].**

- 10 When this is the first setting of the XG-X Series, you need to install the GSDML file.**

- In the [HW Config] screen, select [Install GSD File] from [Options].

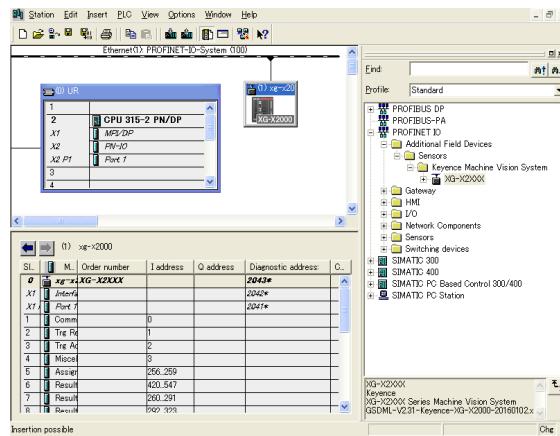


- In the [Install GSD Files] screen, click [Browse] and specify the folder containing the GSDML file.
- Specify the file you want to install and then click [Install] to install the GSDML file of the XG-X Series.

Reference

The GSDML file can be created by selecting [Create GSDML file] on the setting screen displayed by selecting [Communications & I/O] - [PROFINET] in the [System Settings] of the XG-X VisionEditor or by selecting [Communications & I/O] - [PROFINET] in the Global settings menu of the XG-X Series.

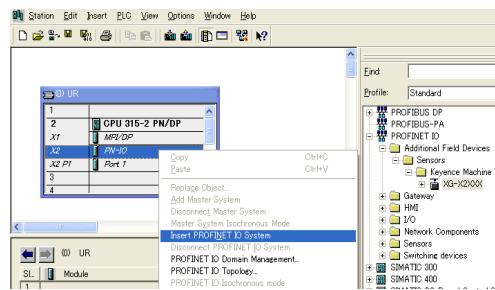
- 11** In the Hardware Catalog in the [HW Config] screen, expand [PROFINET IO] - [Additional Field Devices] - [Sensors] - [Keyence Machine Vision System], and drag and drop [XG-X1XXX], [XG-X2XXX], or [XG-X1K2K-CA-NPN20E] under [PROFINET-IO-System] in the Station Window.



The XG-X1XXX, XG-X2XXX, or XG-X1K2K-CA-NPN20E is added to the Station Window, and all modules that can be used with the XG-X Series are added automatically.



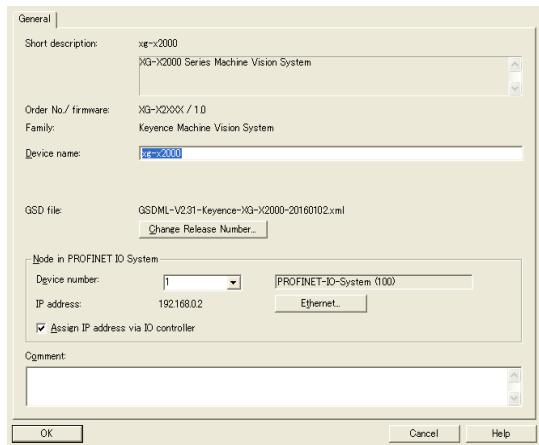
If [PROFINET-IO-System] is not shown in the Station Window, right-click [PN-IO] of the CPU and select [Insert PROFINET IO System].



- 12** Double-click the XG-X icon in the [HW Config] screen.

The [Properties - xg-x1000] screen, [Properties - xg-x2000] screen, or [Properties - XG-X1K2K-CA-NPN20E] screen is displayed.

- 13** Enter the same name as the PROFINET device name of the connected XG-X Series in the [Device name] field.

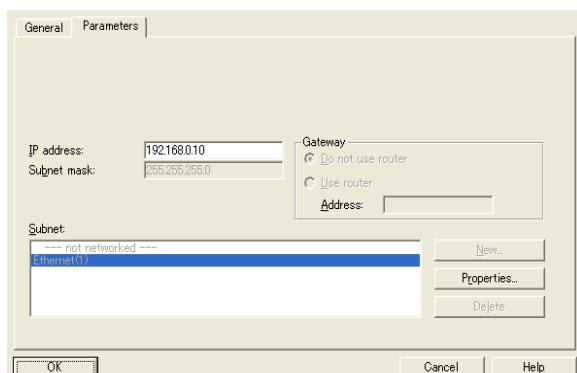


- PROFINET Device Name: xg-x1000 or xg-x2000, XG-X1K2K-CA-NPN20E

- 14** Click [Ethernet].

The [Properties - Ethernet interface xg-x1000] screen, [Properties - Ethernet interface xg-x2000] screen, or [Properties - Ethernet interface XG-X1K2K-CA-NPN20E] screen is displayed.

- 15** Enter the IP address for the connected XG-X Series in the [IP address] field.



- IP address: 192.168.0.10

- 16** Click [OK].

- 17** Click [OK].

- 18** In the [HW Config] screen, select [Station] - [Save and Compile] to save the setting.

- 19** In the [HW Config] screen, select [PLC] - [Download] to download the setting to the CPU.

20 Set the mode switch of the CPU to RUN.

When the connection succeeds, the RUN LED (green) of the CPU illuminates.



The connection can also be checked at [Communication Status] in the [PROFINET Monitor & Diagnostics] screen or [PROFINET] screen in Global settings.

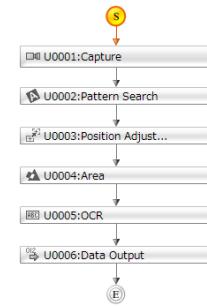
If the RUN LED does not illuminate,

- the PROFINET setting may be incorrect, the cable may not be connected properly, or the XG-X series may not be turned on.
- Once the communication becomes unconnected, the RUN LED goes off. In such a case, use the mode switch of the CPU to execute MRES, and then switch to the RUN mode again.

Outputting Measured/Judgment Values

1. Setting the output data (Data output unit)

To output various kinds of measured/judgment values, use the "data output unit." This section describes how to assign the measured/judgment values of the following units to a data output unit as data to be output.



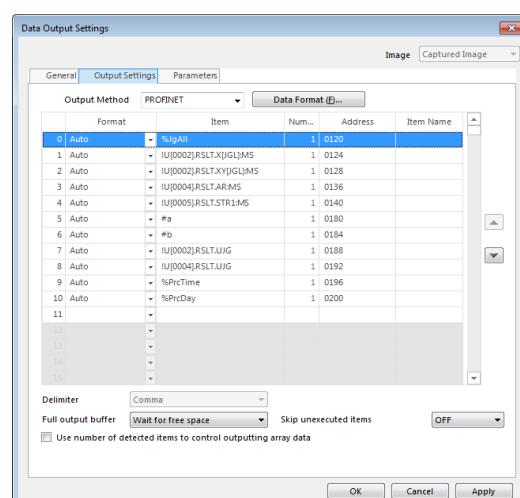
- Total status judgment of the flowchart (%JgAll)
- U0002: Pattern search (Position X)
- U0002: Pattern search (Position XY)
- U0004: Area (Area)
- U0005: OCR (Line 1 result string)
- Variable #a
- Variable #b
- U0002: Pattern search (Unit judgment value)
- U0004: Area (Unit judgment value)
- Processing time (%PrcTime)
- Processing start date (%PrcDay)

1 Add a "data output unit" at the end of the flowchart.

The setting screen of the added "data output unit" is displayed.

2 Select [PROFINET] for [Output Method].

3 From the parts list, drag and drop measured/judgment values you want to output to assign them into the [Item] column.



Other than dragging and dropping from the parts list, you can enter values directly.

4 Check the destination byte addresses used for the output.

- When you assign data in the [Item] column, the output destination byte address is automatically displayed in the [Address] column. When there are several data output units in the flowchart and some byte addresses overlap, you can offset the output destination of the output data in [Output Offset] on the [Parameters] tab.
- The starting address of the byte assignment is the address where [Result Data1] is assigned for [XG-X Implicit Output Addressing (XG-X → PLC)] of [Communications & I/O - PROFINET Settings] in the [System Settings] screen of the XG-X VisionEditor (Byte address 0120 in the sample screen above).

2. Checking the format of the output to the byte addresses and the relationship between the byte addresses and I addresses, and setting the Variable Table

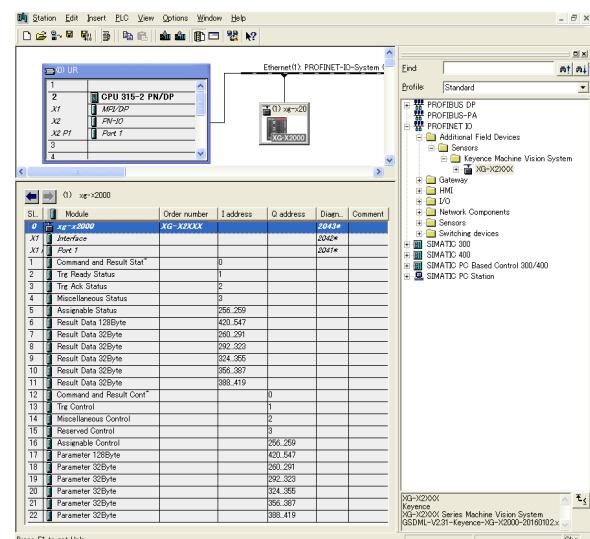
1 Check the example result data stored in the byte addresses.

The data output unit in the flowchart is configured to output the following result data.

- Total status (0: OK, 1: NG)
- U0002: Pattern search position X (430.202)
- U0002: Pattern search position XY (X: 430.202, Y: 243.309)
- U0004: Area (26964)
- U0005: OCR Line 1 result string (KEYENCE)
- Variable #a (95)
- Variable #b (348.267)
- U0002: Pattern search unit judgment value (0: OK, 1: NG)
- U0004: Area unit judgment value (0: OK, 1: NG)
- Processing time (67.477 ms)
- Processing start date (8)

2 In the [HW Config] screen of the SIMATIC Manager check the relationship between the byte addresses and I addresses.

Click the XG-X series icon in the [HW Config] screen and check the assignment of the input byte devices.

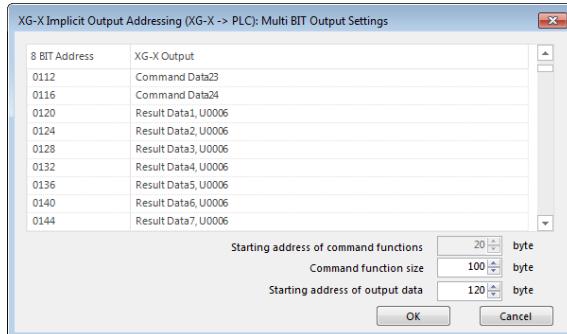


- Check the range of the input byte addresses of the XG-X Series.
- The input byte addresses 0008 to 0135 are assigned to I420 to 547, and input byte addresses 0136 to 0295 are assigned to I260 to 419.

Reference

The address assignment may vary depending on the setting.

- 3 In the [System Settings] screen of the XG-X VisionEditor, select [Communications & I/O] - [PROFINET] and click [BYTE Assignment] under [XG-X Implicit Output Addressing (XG-X → PLC)]. You can check the items assigned to the byte addresses.**

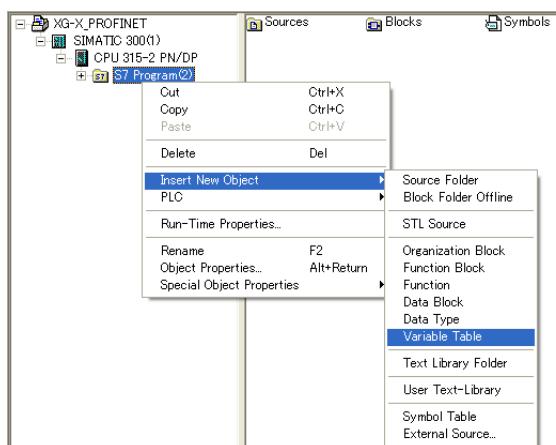


- By default, [Result Data1], which is the first data output, is assigned to byte address 0120 where the result data of the data output unit (U0006 in this example) is assigned.
- Since the result data is output in the unit of 32 bits, four byte addresses are used for one piece of result data (or one character when the result is characters) (Only in the case of OCR2 unit Trimmed String is one byte used for one character so that four byte addresses are used for units of four characters.).

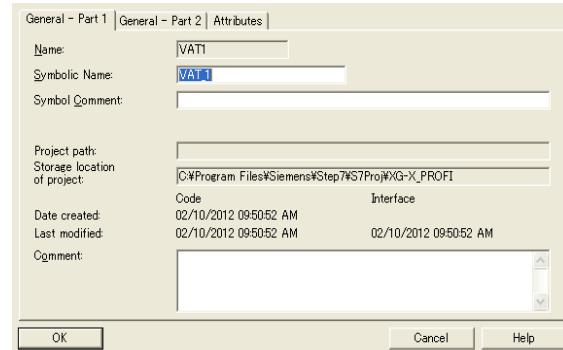
- 4 Upload the program data and system settings to the controller.**

After the controller is restarted, the output through PROFINET starts.

- 5 Right-click [S7 Program] in the Project Tree of SIMATIC Manager, and select [Insert New Object] - [Variable Table].**



The [Properties - Variable Table] screen is displayed.



- 6 Click [OK].**

A Variable Table is added to [Blocks] of SIMATIC Manager.

- 7 Select [Blocks] in the Object Hierarchy of the SIMATIC Manager, and double-click Variable Table "VAT_1" you added.**



The [Var - VAT_1] screen is displayed.

- 8 Add I addresses which correspond to input byte addresses 0120 to 0203 to the Variable Table in the unit of two words (four bytes).**

Enter the destination address in [Address] and specify the display format of the output data in [Display format].

#	Address	Symbol	Display format	Status value	Modify value
1	PID 532		DEC		
2	PID 536		DEC		
3	PID 540		DEC		
4	PID 544		DEC		
5	PID 260		DEC		
6	PID 264		CHARACTER		
7	PID 268		CHARACTER		
8	PID 272		CHARACTER		
9	PID 276		CHARACTER		
10	PID 280		CHARACTER		
11	PID 284		CHARACTER		
12	PID 288		CHARACTER		
13	PID 292		CHARACTER		
14	PID 296		CHARACTER		
15	PID 300		CHARACTER		
16	PID 304		DEC		
17	PID 308		DEC		
18	PID 312		DEC		
19	PID 316		DEC		
20	PID 320		DEC		
21	PID 324		DEC		
22					

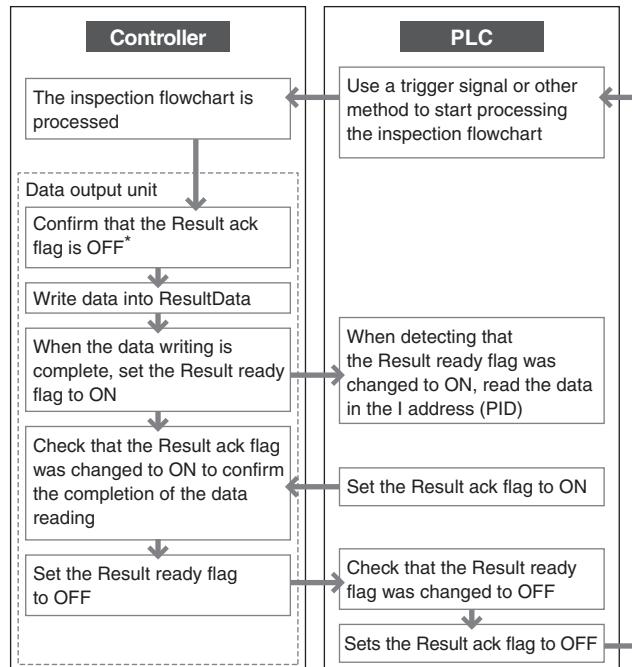
9 Select [Variable] - [Monitor] of the Variable Table to enter monitor mode, and then input a trigger to the XG-X Series and check the output result.

Check the current values starting from I address 532.

	Address	Symbol	Display format	Status value	Modify value
1	PID 532		DEC	L#1	
2	PID 536		DEC	L#430202	
3	PID 540		DEC	L#430202	
4	PID 544		DEC	L#243309	
5	PID 260		DEC	L#26964	
6	PID 264	CHARACTER	DW#16#0000004B		
7	PID 268	CHARACTER	DW#16#00000045		
8	PID 272	CHARACTER	DW#16#00000059		
9	PID 276	CHARACTER	DW#16#00000045		
10	PID 280	CHARACTER	DW#16#0000004E		
11	PID 284	CHARACTER	DW#16#00000043		
12	PID 288	CHARACTER	DW#16#00000045		
13	PID 292	CHARACTER	DW#16#00000000		
14	PID 296	CHARACTER	DW#16#00000000		
15	PID 300	CHARACTER	DW#16#00000000		
16	PID 304		DEC	L#9500	
17	PID 308		DEC	L#348267	
18	PID 312		DEC	L#0	
19	PID 316		DEC	L#1	
20	PID 320		DEC	L#67477	
21	PID 324		DEC	L#8	
22					

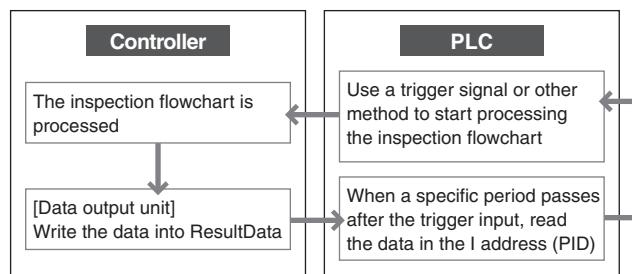
- Judgment values are stored by using two words to show 0 (OK) or 1 (NG).
- Decimal type data is multiplied by 1000 and stored by using two words:
124.121 to 124121
- When XY data is output, the data is stored in the order of X and Y by using two words for each.
- Integer type data is stored directly by using two words.
- Character data is stored as ASCII code by using two words for each character (Only in the case of OCR2 unit Trimmed String is one byte used for one character so that two words are used to store a unit of four characters.).
- When data is output as "string," the number of devices used varies depending on the specified number of characters. This example outputs the "number of characters on the first line" of the OCR unit and the string is seven characters of "KEYENCE."However, since [L1: Number of Characters] for [Block Setup] is set to 10, the range of 20 words (10 characters) from PID264 to PID300 are used.
- Changing the number of characters setting affects all the subsequent device settings. It is recommended to set an item which may be changed at the end of the data output unit.
- Variables are multiplied by 1000 and stored by using two words:
9.5 to 9500, 348.267 to 348267
- Judgment values are stored by using two words to show 0 (OK) or 1 (NG).
- System variables of integer type are stored directly by using two words. Those of decimal type are multiplied by 1000 and then stored by using two words.

Typical data output flow (Handshake: ON)



- If the data output unit is processed while the Result ack flag is ON, the data is stored only in the output buffer and is not written into ResultData. The data stored in the buffer will be written when the Result ack flag is set to OFF. Be careful that if the processing of the inspection flowchart continues while the Result ack flag is ON, the output buffer will overflow and a trigger input will be disabled.

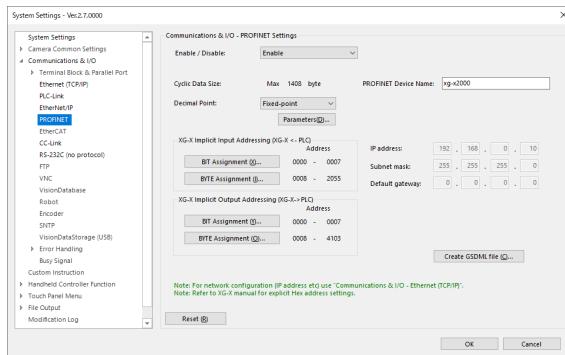
Typical data output flow (Handshake: OFF)



Controlling the Controller

1. Checking the system settings of the XG-X Series

- 1 Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.**
- 2 On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.**
- 3 In the [System Settings] screen, select [Communications & I/O] - [PROFINET].**
- 4 In [XG-X Implicit Input Addressing (XG-X ← PLC)] and [XG-X Implicit Output Addressing (XG-X → PLC)], check the assignment of the bit and byte addresses required for controlling the controller.**



Output data (PLC → XG-X: OUT)

- Command request flag: Set this flag from OFF to ON to execute a command (bit).
- Command Number: Set the command No. to be executed (word).
- Command Parameter#: Set the #th argument of the command (double word) (The presence/absence of the argument depends on the command.).

Input data (XG-X → PLC: IN)

- Command complete flag: This flag turns ON when the command processing finishes (bit).
- Command error flag: This flag remains OFF when the command processing succeeds, and turns ON when the processing fails (bit).
- Command ready flag: This flag is set to ON when the command processing can be accepted (bit).
- Command Result: The command execution result is set (0: Succeeded, <Error code>: Failed) (word).
- Command Data#: The #th response data of the command is set (The presence/absence of the response data depends on the command.)(double word).

5 Select [OK].

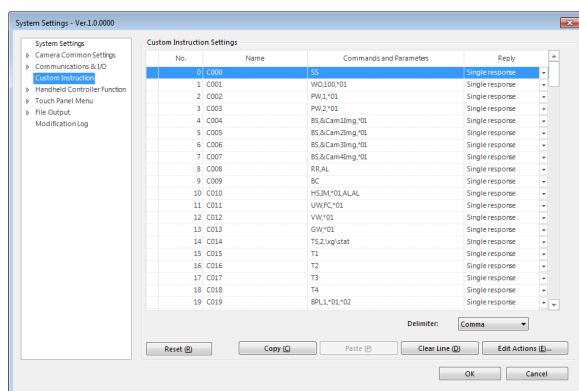
The changes are saved.

6 Upload the system settings to the controller and then restart the controller.

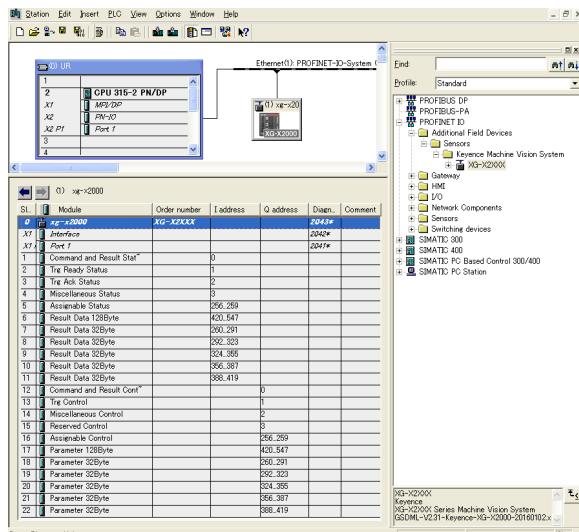
2. Example of command execution procedure: Switch program No. (PW)

The following is a typical example of the command execution procedure. This example uses the PW command (Change Program) which uses a command parameter.

1 In the [System Settings] screen of the XG-X VisionEditor, select [Custom Instruction] and check the command details.



2 In the [HW Config] screen of the SIMATIC Manager check the relationship between the addresses used by the command and I addresses/Q addresses.



Click the XG-X1000 icon or the XG-X2000 icon in the [HW Config] screen and check the assignment of the following addresses.

The relationships between the items required for the command control are as follows:

- Command Number (Output address 0016 of XG-X Series): PQD428
- Command Parameter1 (Output address 0020 of XG-X Series): PQD432
- Command request flag (Output address 0000 bit 0 of XG-X Series): Q0.0
- Command complete flag (Input address 0000 bit 0 of XG-X Series): I0.0
- Command error flag (Input address 0000 bit 1 of XG-X Series): I0.1
- Command Result (Input address 0020 of XG-X Series): PID432

[Reference] The address assignment may vary depending on the setting.

3 In the Object Hierarchy of the SIMATIC Manager select [S7 Program] and then double-click [Symbols].



The [Symbol Editor] screen is displayed.

4 Define the symbols as follows.

Status	Symbol /	Address	Data type	Comment
1	Command complete flag	I 0.0	BOOL	
2	Command error flag	I 0.1	BOOL	
3	Command Number	PDO 428	DWORD	
4	Command Parameter1	PDO 432	DWORD	
5	Command ready	I 0.2	BOOL	
6	Command request flag	Q 0.0	BOOL	
7	Command Result	PID 432	DWORD	

Press F1 to get Help.

5 Open the Variable Table of the SIMATIC Manager and enter the following I addresses/Q addresses in the [Address] column.

Address	Symbol /	Display format	Status value	Modify value
1	Q 0.0 "Command request flag"	BOOL		
2	PQD 428 "Command Number"	DEC		
3	PQD 432 "Command Parameter1"	DEC		
4	I 0.0 "Command complete flag"	BOOL		
5	I 0.1 "Command error flag"	BOOL		
6	I 0.2 "Command ready"	BOOL		
7	PID 432 "Command Result"	DEC		
8				

Press F1 for help.

For Command Number, Command Parameter1, and Command Result, change the values in the [Display format] column to [DEC] so that the values are displayed in decimal notation.

6 Enter the command No. into the Q address where Command Number was assigned, and enter the command parameter in the Q address where Command Parameter1 was assigned.

The screenshot shows the SIMATIC Manager Variable Table. Row 2 has 'PQD 428 "Command Number"' in Address and 'DEC' in Symbol. In the Modify value column, 'L#2' is entered. Row 3 has 'PQD 432 "Command Parameter1"' in Address and 'DEC' in Symbol. In the Modify value column, 'L#11' is entered.

Address	Symbol	Display format	Status value	Modify value
1 Q 0.0 "Command request flag"	BOOL			
2 PQD 428 "Command Number"	DEC			L#2
3 PQD 432 "Command Parameter1"	DEC			L#11
4 I 0.0 "Command complete flag"	BOOL			
5 I 0.1 "Command error flag"	BOOL			
6 I 0.2 "Command ready"	BOOL			
7 PID 432 "Command Result"	DEC			
8				

In this example, enter "2" as the command No. and "11" as the command parameter in order to execute "PW,1,*01" to switch to the program No. 11.

7 Select [Variable] - [Monitor] in the Variable Table to enter monitor mode.

8 Select [Variable] - [Activate Modify Values] in the Variable Table to apply the entered values.

9 Enter 1 (true) in the Q address where the Command request flag was assigned (Q0.0 in this example).

The screenshot shows the SIMATIC Manager Variable Table. Row 1 has 'Q 0.0 "Command request flag"' in Address and 'BOOL' in Symbol. In the Modify value column, 'true' is entered. Row 4 has 'I 0.0 "Command complete flag"' in Address and 'BOOL' in Symbol. In the Status value column, 'false' is shown. Row 6 has 'I 0.2 "Command ready"' in Address and 'BOOL' in Symbol. In the Status value column, 'true' is shown.

Address	Symbol	Display format	Status value	Modify value
1 Q 0.0 "Command request flag"	BOOL	false		true
2 PQD 428 "Command Number"	DEC			L#2
3 PQD 432 "Command Parameter1"	DEC			L#11
4 I 0.0 "Command complete flag"	BOOL	false		
5 I 0.1 "Command error flag"	BOOL			
6 I 0.2 "Command ready"	BOOL	true		
7 PID 432 "Command Result"	DEC			
8				

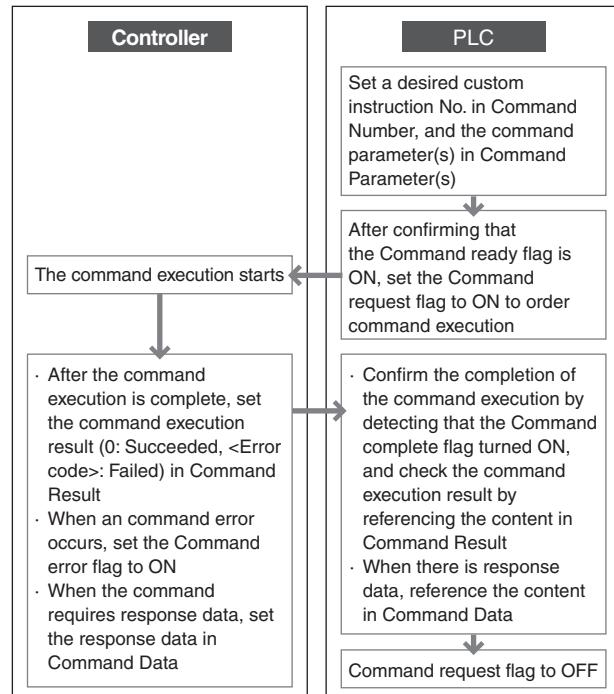
10 Select [Variable] - [Activate Modify Values] in the Variable Table to apply the entered value.

The PW command (Change Program of SD1) is executed.

11 Check the change of the value in the I address where the Command complete flag was assigned.

- When the command execution succeeded: I address where the Command complete flag was assigned (I0.0 in this example) contains 1 (true).
- When the command execution failed: I address where the Command error flag was assigned (I0.1 in this example) contains 1 (true) and an error code is written into the I address where the Command Result was assigned (PID432).

Typical command processing flow



Connecting with the Siemens SIMATIC S7-300 Series

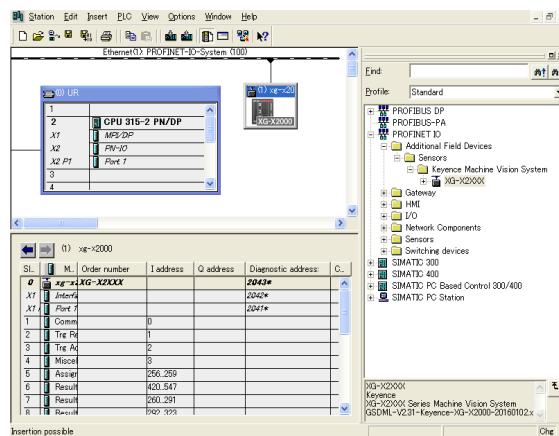
When connected with the Siemens CPU, the controller can use the following types of communication:

- Cyclic communication using the maximum data size of 1408 bytes (1248 bytes when using a communication expansion unit)
- Record data communication (non-cyclic communication) for reading input/output byte data up to 1024 bytes by using "RDREC" (SFB 52)
- Writing output byte data up to 1024 bytes by using "WRREC" (SFB 53)

Changing the settings for the cyclic communication

For more details of the CPU unit configuration and settings required for the communication with the CPU, refer to the instruction manual of the CPU.

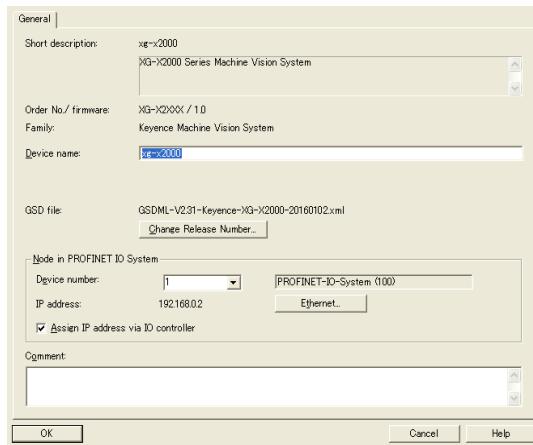
- 1 In the [HW Config] screen of the SIMATIC Manager, select [XG-X1XXX], [XG-X2XXX], or [XG-X1K2K-CA-NPN20E] from the Hardware Catalog and drag and drop it under [PROFINET-IO-System] in the Station Window.



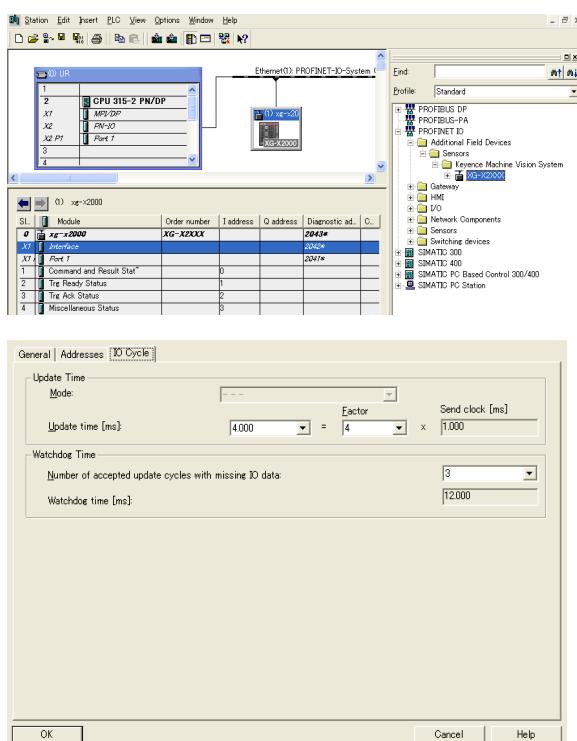
Point

If the GSDML file of the XG-X Series has not been installed yet, [XG-X1XXX], [XG-X2XXX], or [XG-X1K2K-CA-NPN20E] is not shown in the Hardware Catalog. When this is the first setting of the XG-X Series, select [Options] - [Install GSD File] and install the GSDML file.

- 2 Double-click the XG-X1000, XG-X2000, or XG-X icon in the [HW Config] screen and set [Device name] and [IP address].



- 3 To change the update time of the cyclic communication, click the XG-X1000, XG-X2000, or XG-X icon in the [HW Config] screen, double-click [Interface], and change the value of [Update time] in the [Properties - Interface] screen.

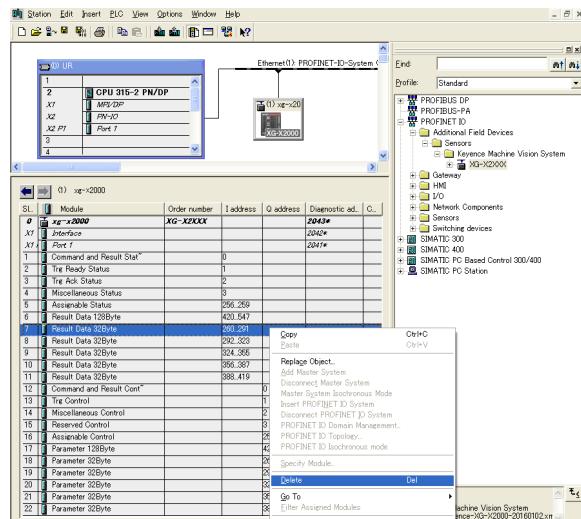


Point

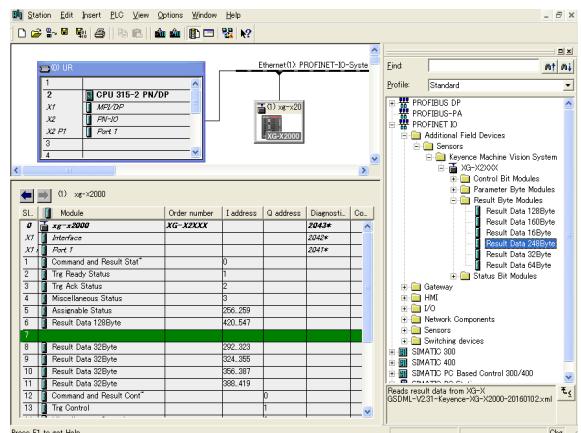
Even when a value of 4 ms or more (1 ms or more when using a communication expansion unit) is set, the screen display or external input/output may be affected depending on the measurement setting of the XG-X Series. Be sure to verify the operating performance before entering production.

4 Change the sizes of [Parameter Byte Modules] and [Result Byte Modules].

To change the value from the default, right-click the module and select [Delete] to delete it.



Then drag and drop a module of a desired size from [Parameter Byte Modules] or [Result Byte Modules] in the Hardware Catalog.



Point
The CPU will not operate properly when even one of the Bit Modules (Slots 1 to 5, Slots 12 to 16) is deleted. Do not delete Bit Modules.

5 In order to apply the settings to the CPU, select [Station] - [Save and Compile] in the [HW Config] screen and then select [PLC] - [Download] to download the settings to the CPU.

After the settings have been downloaded, switch the CPU to RUN mode and the PROFINET communication is enabled.

Changing the settings for the record data communication

After completing the procedure of "Changing the settings for the cyclic communication" (Page 1-244), use the "RDREC" (SFB 52) block in the ladder program to enable the record data communication.

The XG-X Series supports the following Record commands:

Index	Content	Attribute
1	Parameter (Output addresses 0008 to 1031 of XG-X)	Read/write
2	Parameter (Output addresses 1032 to 2055 of XG-X)	Read/write
10	Result Data (Input addresses 0008 to 1031 of XG-X)	Read only
11	Result Data (Input addresses 1032 to 2055 of XG-X)	Read only
12	Result Data (Input addresses 2056 to 3079 of XG-X)	Read only
13	Result Data (Input addresses 3080 to 4103 of XG-X)	Read only

In this example, specify 10 for Index and use "RDREC" (SFB 52) to read the data of 1024 bytes stored in the input addresses 0008 to 1031 of the XG-X.

1 In the Object Hierarchy of the SIMATIC Manager, select [S7 Program] and then double-click [Symbols].

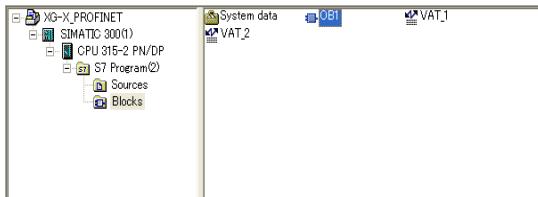


The [Symbol Editor] screen is displayed.

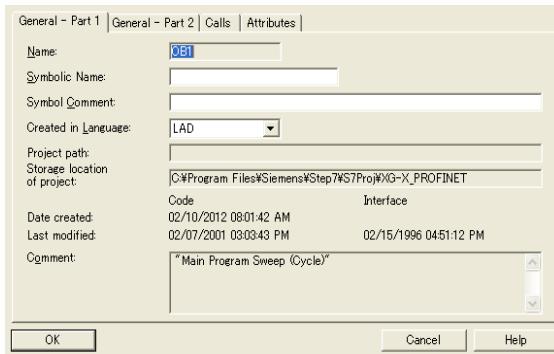
2 Define the symbols as follows.

Status	Symbol /	Address	Data type	Comment
	ReadData	M 200.0	BOOL	
	ReadDataBusy	M 200.1	BOOL	
	ReadDataError	M 200.2	BOOL	
	VALID	M 200.3	BOOL	
	ReadDataStatus	MD 250	DWORD	
	LEN	MW 220	INT	
	Error 0 code	MW 1000	WORD	
	Error 1 code	MW 1002	WORD	
	Total Count	MD 1008	DWORD	
	Command Result	MD 1012	DWORD	
	Command Data1	MD 1016	DWORD	
	Result Data1	MD 1112	DWORD	
	Result Data2	MD 1116	DWORD	

3 In the Object Hierarchy of the SIMATIC Manager select [Blocks] and then double-click [OB1].

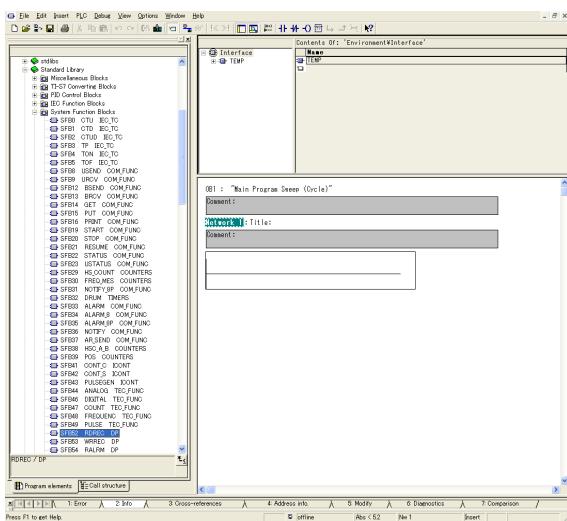


The [Properties - Organization Block] screen is displayed.

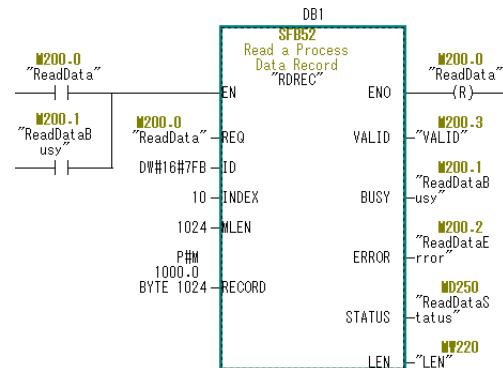


4 Select [LAD] for [Created in Language] and click [OK].

5 Under [Overview] in the [LAD/STL/FBD - OB1] screen, select [Libraries] - [Standard Library] - [System Function Blocks] and drag and drop [SFB52 RDREC DP] into [Network] of the ladder to add it.



6 Create the following ladder.



Reference

- ID needs to be a hexadecimal value corresponding to [Diagnostic address] in the XG-X Series to which the command will be sent.
- The [Diagnostic address] can be seen in the [HW Config] screen of the SIMATIC Manager in this example, the diagnostic address is 2043 (0x7FB in hexadecimal notation).

7 Download the setting file to the CPU and set the CPU to RUN mode.

Point

Even when you select download in the [LAD/STL/FBD] screen, sometimes the changes in the setting may not be applied to the CPU. In such a case, select download in the [SIMATIC Manager] screen.

8 Open the Variable Table of the SIMATIC Manager and add the following variables.

Address	Symbol	Display format	Status value	Modify value
1 M 200.0	"ReadData"	BOOL	false	
2 M 200.3	"VALID"	BOOL	false	
3 M 200.2	"ReadDataError"	BOOL	false	
4 MD 250	"ReadDataStatus"	HEX	DW#16#00000000	
5 MW 1000	"Error 0 code"	HEX	W#16#0000	
6 MW 1002	"Error 1 code"	HEX	W#16#0000	
7 MD 1008	"Total Count"	HEX	DW#16#00000000	
8 MD 1012	"Command Result"	HEX	DW#16#00000000	
9 MD 1016	"Command Data1"	HEX	DW#16#00000000	
10 MD 1112	"Result Data1"	HEX	DW#16#00000000	
11 MD 1116	"Result Data2"	HEX	DW#16#00000000	
12				

9 Select [Variable] - [Monitor] in the Variable Table to start monitoring.

10 In the Variable Table, enter 1 (true) in the [Modify value] column for [Read Data] (M200.0).

11 Select [Variable] - [Activate Modify Values] in the Variable Table to apply the entered value to the memory of the CPU.

"RDREC" (SFB 52) is executed and the values in the input byte addresses 0008 to 1031 are read into MD1000 to 2020.

Checking the PROFINET Communication Status

(PROFINET Monitor & Diagnostics)

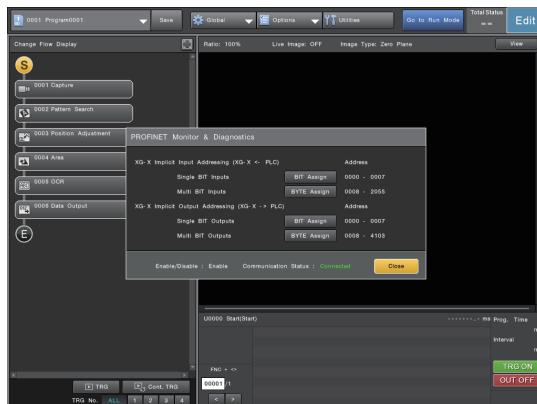
You can check the system's PROFINET I/O signal communication status with this function. This function is convenient because it allows you to check communications content when connected to an external device in situations such as when the appropriate data cannot be communicated between connected devices.



The monitor cannot be used when [Enable/Disable] for PROFINET is [Disable] or when PROFINET is not connected. First establish a PROFINET connection before using the monitor.

- From the [Utilities] menu at the top of the screen, select [PROFINET Monitor & Diagnostics].

The [PROFINET Monitor & Diagnostics] screen is displayed.

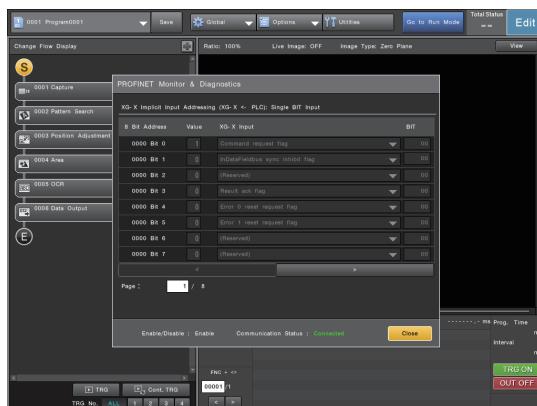


- Select the item you wish to check.

Select the bit information or the byte information for the output data (received by the controller) or input data (sent by the controller).

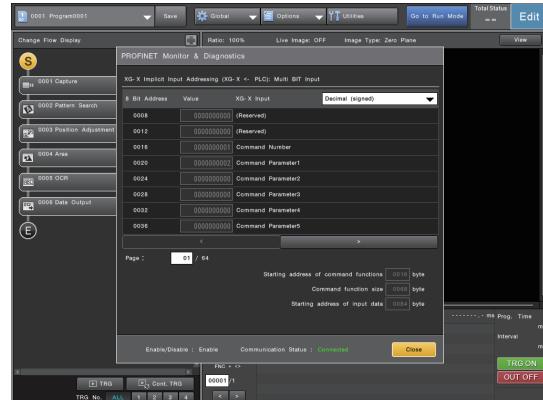
- Now check the communication status.

Output data (received by the controller) bit information check screen



You can see that 1 was sent to Command request flag from the PLC.

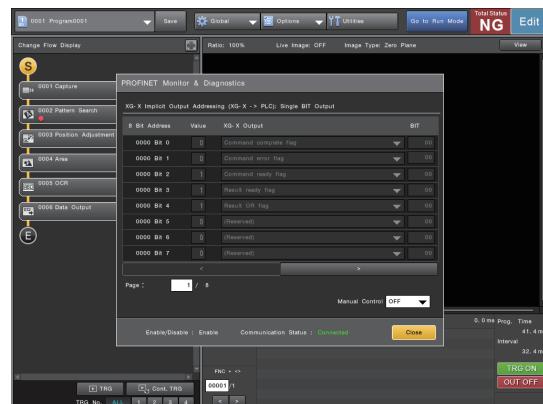
Output data (received by the controller) byte information check screen



You can see that 1 was input to Command Number and 2 was input to Command Parameter 1 (decimal, unsigned).

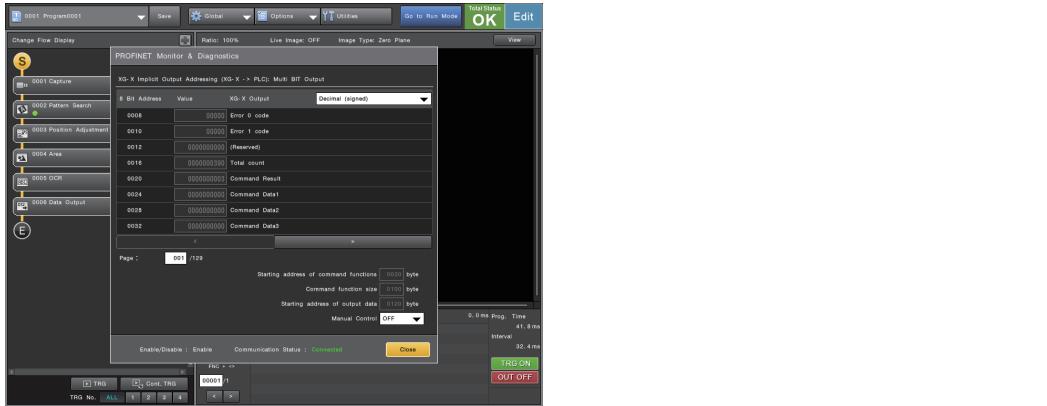
Using the down arrow at the upper right corner of the screen, you can select the value to monitor from Hexadecimal, Decimal (unsigned), or Decimal (signed).

Input data (sent by the controller) bit information check screen



You can see that 1 was sent to Command ready flag, Result ready flag, and Result OR flag from the controller.

Input data (sent by the controller) byte information check screen



You can see that 390 was sent to Total count and 3 was sent to Command Result as a decimal (unsigned) from the controller.

Reference With the input data (sent by the controller) monitor, you can manually change the value for the desired addresses and check those changes on the PLC by selecting ON for Manual Control during setup mode.

4 Select [Close].

Troubleshooting

Problems and Countermeasures

I want to check whether the PROFINET connection has been established successfully.

On the controller, check [Utilities] - [PROFINET Monitor & Diagnostics]. When [Disconnected] is shown here, the communication has failed. Check again the cable connection, IP address, and the communication settings on the PLC.

The Result OR flag is not output.

The Result OR flag is updated when the data output unit which uses PROFINET as an output device is processed. At least one piece of data must be output via the data output unit from PROFINET before the Result OR flag can be used.

The Result ready flag remains ON and does not change.

The Result ack flag may not be controlled properly. The Result ready flag turns off when the rise of the Result ack flag is recognized during sending (received by the controller). This is true whether the handshake is ON or OFF.

I tried to read data when the %Sto output from the terminal block changes to rise, but could not obtain the data properly.

The %Sto is a strobe signal dedicated to the data for the parallel terminal output unit. It cannot be used as a strobe signal for other data output.

For the data read timing through PROFINET, reference the Result ready flag.

Ethernet settings, such as the IP address, were changed unexpectedly.

In PROFINET, the IP address of the controller specified on the PLC overwrites the Ethernet settings (such as the IP address) specified on the controller at the beginning of the communication. You need to set the correct Ethernet settings of the controller on the PLC.

The behavior is different from that specified with the module address setting assigned on the PLC.

When any of the bit modules are deleted, the behavior may become different from that specified with the module address setting assigned on the PLC.
Do not delete the bit modules.

Error Messages

Error messages which are not assigned to either system variable %Error0 or %Error1

By default, the following error messages are not assigned to either %Error0 or %Error1, so that no output is provided even when the error occurs. You can assign them to %Error0 or %Error1 as necessary.

Message	Cause	Countermeasure	Error factor No.
External command error has occurred.	A command error has occurred during the processing of a command input from the following devices: <ul style="list-style-type: none">• PC application• PLC-Link• Ethernet• RS-232C• CC-Link• Terminal block & parallel port• EtherNet/IP• PROFINET• EtherCAT	Review the command or program data.	128
PROFINET communication has failed.	The communication was disconnected (It is automatically recovered when possible.).	<ul style="list-style-type: none">• Check that the Ethernet cable is connected properly.• Confirm that both of the XG-X Series and master unit have been restarted after the communication settings were updated.• Review the settings on the PLC including the communication cycle and timeout time.	257
Unable to write to PROFINET output buffer.	The output buffer for PROFINET is full.	Change the update time on the PLC so that the rate of data output to PROFINET exceeds the rate of data output from the flowchart, or set the trigger interval longer (The result output is disabled while the output buffer is full.).	259
PROFINET output buffer is full.	The output buffer for PROFINET is full.	Change the update time on the PLC so that the rate of data output to PROFINET exceeds the rate of data output from the flowchart, or set the trigger interval longer (When the output buffer is full, measurement is suspended until the buffer becomes available.).	260

Control/Data Output via EtherCAT

Overview of System Control/ Data Output

Control/Data Output via External Terminals

Control/Data Output via PLC-Link

Control/Data Output via CC-Link

Control/Data Output via EtherNet/IP

Control/Data Output via PROFINET

► Control/Data Output via EtherCAT

Control/Data Output via No protocol communication

FTP Client/Server Function

Overview of Control/Data Output Using EtherCAT

The communication using EtherCAT is supported.

EtherCAT is the open real-time Ethernet network originally developed by Beckhoff. This system operates as an EtherCAT slave, and the functions shown below can be realized by way of EtherCAT communication.

Process data object communication (Cyclic communication)

Communicating at specified update time intervals allows high-speed control performed every several to several tens of microseconds. Also, writing programs on the PLC becomes easier because you can control the controller by referencing and updating the variables and devices in the PLC without considering communication.

- Controller control: You can control the controller by issuing commands in the cyclic communication.
- Result data output: You can specify EtherCAT as an output device for the data output unit and output data through the cyclic communication.
- I/O control: By assigning control-related system variables in the cyclic communication, you can control input/output in the same way as using the terminal block or parallel I/O interface of the controller.
- Changing variable values: By assigning a special system variable %InDataFieldbus[], you can externally change the value of a variable efficiently (variable synchronization).



- Be sure to set the update time of the cyclic communication to 500 µs or longer.

- Even if you specify the update time of the cyclic communication to 500 µs or longer, the processing may be delayed or the communication may be disconnected by temporary timeout due to the excessive load applied to the controller temporarily or continuously when there are other communication functions being used in the controller such as measurement settings, dialog operations, commands, FTP, or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Be sure to check for these and other problems in the operating performance before entering production.

- In a network where many devices, including EtherCAT devices, are connected, delay or packet loss may occur sometimes when a heavy load is applied to the network constantly or temporarily. Be sure to make thorough verification before entering production.
- EtherCAT and PLC-Link, CC-Link, EtherNet/IP, or PROFINET cannot be used at the same time (EtherCAT cannot be used when PLC-Link, CC-Link, EtherNet/IP or PROFINET is enabled).

Mailbox communication (non-cyclic communication)

This method can be used for communication which does not require regularity like the cyclic communication. This communication method uses dedicated commands to read/write data records and can access addresses exceeding the maximum size allowed to cyclic communication (536 bytes for input and 532 bytes for output).

Operation Flow

Check the specifications (Page 1-255)

- Check whether the PLC to be connected is a model that supports EtherCAT connection.
- Check the input/output data assignments.

Change the EtherCAT settings (Page 1-262)

- Configure the settings to use EtherCAT to connect the controller.
Major setting items: Device ID and input/output data assignments

Establish the EtherCAT communication

- You can confirm whether EtherCAT communications have been established or not by checking [Communication Status] on the [EtherCAT Monitor & Diagnostics] screen or [Communication Status] on the [EtherCAT] screen on the controller's Global settings.

Execute necessary processing.

Data output (Page 1-269)

- Data from the data output unit is written into the data output area.
- Check the Result ready flag to confirm the completion of the data writing.
- Set the Result ack flag to ON to notify that the reading has been completed.

I/O control (Page 1-271)

- Use I/O control by assigning system variables related to terminal control.

Command control (Page 1-272)

- Predefined custom instructions can be executed.
- To execute a command, write the command code and command parameters into the command input area and set the Command request flag to ON.
- A command can be executed when the Command ready flag is ON.
- Check the Command complete flag to confirm the completion of the command execution.

Variable synchronization (Page 1-274)

- Change the value of the system variable dedicated for variable synchronization (%InDataFieldbus[]).

Preparing the EtherCAT connection

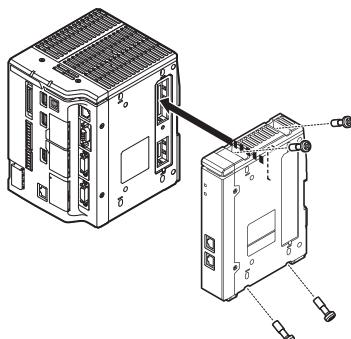
Installing the EtherCAT Unit

The optional EtherCAT unit CA-NEC20E is used when communicating over EtherCAT.

Remove the protective cover from the expansion unit connector on the right side of the controller and install the EtherCAT unit as shown below.

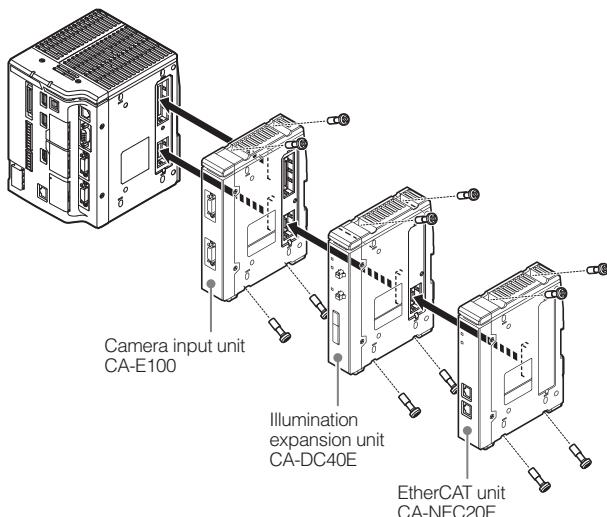


- The controller must be turned off before connecting or disconnecting the CA-NEC20E.
- Restart the controller and master station after changing the EtherCAT settings.



When Using the Illumination Expansion Unit and EtherCAT Unit Together

Mount the camera input unit directly to the controller, then mount the illumination expansion unit and EtherCAT unit to the right side of the camera input unit.



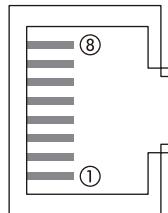
- Illumination expansion units and EtherCAT units cannot be installed between camera input units and controllers.

CA-NEC20E EtherCAT Unit Specifications

Standard specifications

Item	
Compliant standard	IEEE802.3u (100BASE-TX)
Communication speed	100 Mbps (100BASE-TX)
Communication cycle	500 µs min.
Connection cable	Category 5e or greater shielded twisted pair (STP) cable
Node interval	100 m
Communication port	RJ45 connector × 2
Communication size	536 bytes (input), 532 bytes (output)
Supported functions	Process data object communication (cyclic communication) Mailbox communication (non-cyclic communication) Supports CoE Explicit Device Identification
Conformance test version	Complying with Version.2.1.0.2.

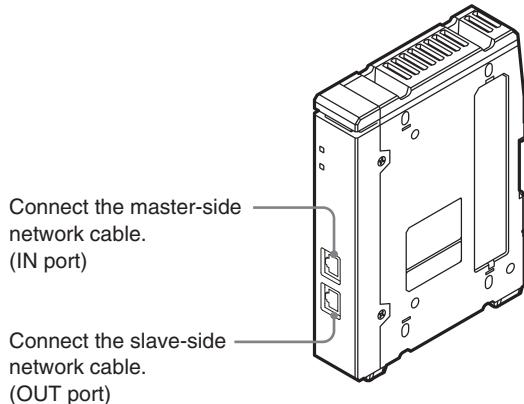
Wiring example (IN port/OUT port)



No.	Signal name	Function
1	TX +	Transmission data (+)
2	TX -	Transmission data (-)
3	RX +	Reception data (+)
4	-	75 Ω terminating resistance connected
5	-	75 Ω terminating resistance connected
6	RX -	Reception data (-)
7	-	75 Ω terminating resistance connected
8	-	75 Ω terminating resistance connected

Connecting to an EtherCAT Network

Connect the master-side network cable to the IN port of the RJ connector. If a slave unit is present downstream of this unit, connect a network cable to the OUT port of the RJ connector.



Point

Use a category 5e or greater STP (shielded twisted pair) cable for the network cable. You can use either a straight cable or a crossover cable.

EtherCAT Connection Supporting Models

For details of each PLC setting method, refer to "Typical EtherCAT Setting Procedure" (Page 1-276) and the operation manual accompanying the PLC.

Beckhoff PLC

PLC model	EtherCAT Communication unit	Version of firmware	Software used	Version of software used
C6920-0050 (TwinCAT)	- (Built in the unit)	Windows7 Ultimate Service Pack1	TwinCAT3	v3.1.4020(Build4020)

OMRON PLC

PLC model	EtherCAT Communication unit	Version of firmware	Software used	Version of software used
NJ101-9000	- (Built in the unit)	1.1.521	Sysmac Studio	Ver.1.15
NJ301-1100	- (Built in the unit)	1.1.521	Sysmac Studio	Ver.1.15

EtherCAT communication specifications of the controller

Standard specifications

This system supports two types of EtherCAT communication: "process data object communication (cyclic communication)" and "mailbox communication (non-cyclic communication)."

Process Data Object Communication (Cyclic Communication)

This is a function that performs periodic communication at specified update time intervals and is suitable for real-time control.

- The update time and communication size depend on the connection settings on the PLC (the maximum size for cyclic communication is 536 bytes for input and 532 bytes for output).
- See "Typical EtherCAT Setting Procedure" (Page 1-276) for more details.

Mailbox Communication (non-cyclic communication)

This is a communication method in which dedicated commands are used to access "objects" in which byte information is divided into units of 1000 bytes.

- Commands such as reading (SDO Upload) and writing (SDO Download) are available. When these commands are executed, a response to the command is returned.
- This method can be used for communication which does not require real time processing.
- It is possible to access to the addresses exceeding the maximum size allowed to the cyclic communication (input: 536 bytes, output: 532 bytes).
- Each record is assigned with an index. Data is accessed based on the specified index and size.

The accessible ranges for each byte information are as follows:

Output data (received by the controller) - Read/write

Index	Accessible address
2019H	0020 to 1019
201AH	1020 to 2019
201BH	2020 to 2055

Input data (sent from the controller) - Read only

Index	Accessible address
200CH	0024 to 1023
200DH	1024 to 2023
200EH	2024 to 3023
200FH	3024 to 4023
2010H	4024 to 4103



If the SDO Download command is issued while the Parameter module is being written in the cyclic communication, memory area conflict may occur. Design the use of the SDO Download command in such a way as to avoid the memory area conflict with the cyclic communication.

Process Data Object Map

The data that can be assigned as process data objects are shown below.

Use the configuration software to select the indexes to assign as process data objects.

Index (Hex)	Initial Assignment	Size (Bytes)	Name	Assignable Data Index (Hex)	
1600H	O	4	ControlBit	2011: 01 to 20	This is without exception assigned as PDO.
1601H	O	4	OutBit	2012: 01 to 20	This is without exception assigned as PDO.
1602H	O	4	Command Number	2013	This is without exception assigned as PDO.
1603H		32	Parameter 32Byte	2014: 01 to 08	Objects from 1603H to 1607H cannot be assigned at the same time. Select and assign one object at a time.
1604H		64	Parameter 64Byte	2015: 01 to 10	Select and assign one object at a time.
1605H	O	128	Parameter 128Byte	2016: 01 to 20	
1606H		256	Parameter 256Byte	2017: 01 to 40	
1607H		512	Parameter 512Byte	2018: 01 to 80	
1A00H	O	4	StatusBit	2001: 01 to 20	This is without exception assigned as PDO.
1A01H	O	4	InBit	2002: 01 to 20	This is without exception assigned as PDO.
1A02H	O	2	Error 0 code	2003	This is without exception assigned as PDO.
1A03H	O	2	Error 1 code	2004	This is without exception assigned as PDO.
1A04H	O	4	Total count	2005	This is without exception assigned as PDO.
1A05H	O	4	Command Result	2006	This is without exception assigned as PDO.
1A06H		32	Result Data 32Byte	2007: 01 to 08	Objects from 1A06H to 1A0AH cannot be assigned at the same time. Select and assign one object at a time.
1A07H		64	Result Data 64Byte	2008: 01 to 10	Select and assign one object at a time.
1A08H	O	128	Result Data 128Byte	2009: 01 to 20	
1A09H		256	Result Data 256Byte	200A: 01 to 40	
1A0AH		512	Result Data 512Byte	200B: 01 to 80	

Example of input data settings (from XG-X Series to Beckhoff C6920-0050)

This is an example when one controller of the XG-X Series is connected to the Beckhoff C6920-0050 and [Command function size] is set to 100 bytes (addresses 0020 to 0119) and [Starting address of output data] is set to 120 bytes (BIT **.*/**.* in the table is the assignment example of Address(Input) for the C6920-0050. The leading address varies depending on the settings.)

Setting	Address	Bit 7 status (Byte)	Bit 6		Bit 5		Bit 4		Bit 3		Bit 2		Bit 1		Bit 0		
Bit area	0000	BIT 39.7	Reserved	BIT 39.6	Reserved	BIT 39.5	Reserved	BIT 39.4	Result OR	BIT 39.3	Result Ready	BIT 39.2	Cmd Ready	BIT 39.1	Cmd Err 39.0	Cmd Complete	
	0001	BIT 40.7	Reserved	BIT 40.6	Reserved	BIT 40.5	Reserved	BIT 40.4	Reserved	BIT 40.3	Trg4 Ready	BIT 40.2	Trg3 Ready	BIT 40.1	Trg2 Ready	BIT 40.0	Trg1 Ready
	0002	BIT 41.7	Reserved	BIT 41.6	Reserved	BIT 41.5	Reserved	BIT 41.4	Reserved	BIT 41.3	Trg4 Ack	BIT 41.2	Trg3 Ack	BIT 41.1	Trg2 Ack	BIT 41.0	Trg1 Ack
	0003	BIT 42.7	Reserved	BIT 42.6	Reserved	BIT 42.5	Reserved	BIT 42.4	Reserved	BIT 42.3	Remote Ready	BIT 42.2	Err 1 Status	BIT 42.1	Err 0 Status	BIT 42.0	Busy
	0004	BIT 43.7	Assignable	BIT 43.6	Assignable	BIT 43.5	Assignable	BIT 43.4	Assignable	BIT 43.3	Assignable	BIT 43.2	Assignable	BIT 43.1	Assignable	BIT 43.0	Assignable
	0005	BIT 44.7	Assignable	BIT 44.6	Assignable	BIT 44.5	Assignable	BIT 44.4	Assignable	BIT 44.3	Assignable	BIT 44.2	Assignable	BIT 44.1	Assignable	BIT 44.0	Assignable
	0006	BIT 45.7	Assignable	BIT 45.6	Assignable	BIT 45.5	Assignable	BIT 45.4	Assignable	BIT 45.3	Assignable	BIT 45.2	Assignable	BIT 45.1	Assignable	BIT 45.0	Assignable
	0007	BIT 46.7	Assignable	BIT 46.6	Assignable	BIT 46.5	Assignable	BIT 46.4	Assignable	BIT 46.3	Assignable	BIT 46.2	Assignable	BIT 46.1	Assignable	BIT 46.0	Assignable
Error code area	0008	47.0	Error 0 code														
	0009																
	0010	49.0	Error 1 code														
	0011																
Total count area	0016	51.0	Total count														
	0017																
	0018																
	0019																
Command output area	0020	55.0	Command Result														
	0021																
	0022																
	0023																
	0024	59.0	Command Data 1														
	0025																
	0026																
	0027																
	0028	63.0	Command Data 2														
	0029																
	0030																
	0031																
	:																
	0116	151.0	Command Data 24														
	0117																
	0118																
	0119																

Setting	Address	Bit 7 (Byte)	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Command output area	0120	155.0	Result Data 1						
	0121								
	0122								
	0123								
	0124	159.0	Result Data 2						
	0125								
	0126								
	0127								
	...								

Names and operations of input signals

Assigned Region	Name	Remarks
Bit area	Cmd Complete	Turns ON when command processing is complete.
	Cmd Err	Turns OFF when command processing is successful and turns ON when it fails.
	Cmd Ready	Turns ON when command processes can be received.
	Result Ready	Turns ON when data transmission is complete.
	Result OR	Linked to %JgAll*.
	Trg1 Ready	Ready signal for Trigger 1
	Trg2 Ready	Ready signal for Trigger 2
	Trg3 Ready	Ready signal for Trigger 3
	Trg4 Ready	Ready signal for Trigger 4
	Trg1 Ack	Turns ON when Trigger 1 input is received. Turns OFF when Trigger 1 input is OFF.
	Trg2 Ack	Turns ON when Trigger 2 input is received. Turns OFF when Trigger 2 input is OFF.
	Trg3 Ack	Turns ON when Trigger 3 input is received. Turns OFF when Trigger 3 input is OFF.
	Trg4 Ack	Turns ON when Trigger 4 input is received. Turns OFF when Trigger 4 input is OFF.
	Busy	Linked to %Busy.
	Err 0 Status	Linked to %Error0.
	Err 1 Status	Linked to %Error1.
	Remote Ready	Linked to %Run.
Error code area	Error 0 Code	The error code for the cause of the error assigned to %Error0 that occurred last.
	Error 1 Code	The error code for the cause of the error assigned to %Error1 that occurred last.
Processing count area	Total Count	Displays the processing count.
Command output area	Command Result	Displays the command execution result.
	Command Data 1	Returns command execution result data 1.
	Command Data 2	Returns command execution result data 2.

	Command Data24	Returns command execution result data 24.
Data output area	Result Data 1	Returns measurement result data 1.
	Result Data 2	Returns measurement result data 2.

	Result Data 94	Returns measurement result data 94.

Example of output data settings (from Beckhoff C6920-0050 to XG-X Series)

This is an example when one controller of the XG-X Series is connected to the Beckhoff C6920-0050 with [Command function size] set to 68 bytes (addresses 0016 to 0083) and [Starting address of input data] is set to 84 bytes (from address 0084) (BIT **.*/**.* in the table is the assignment example of Address(Output) for the C6920-0050. The leading address varies depending on the settings.)

Setting	Address	Bit 7	Bit 6		Bit 5		Bit 4		Bit 3		Bit 2		Bit 1		Bit 0		
Bit area	0000	BIT 39.7	Reserved	BIT 39.6	Reserved	BIT 39.5	Err 1 reset request	BIT 39.4	Err 0 reset request	BIT 39.3	Result ack	BIT 39.2	Reserved	BIT 39.1	InDataFB sync inhibit	BIT 39.0	Cmd Request
	0001	BIT 40.7	Reserved	BIT 40.6	Reserved	BIT 40.5	Reserved	BIT 40.4	Reserved	BIT 40.3	Trg4	BIT 40.2	Trg3	BIT 40.1	Trg2	BIT 40.0	Trg1
	0002	BIT 41.7	Reserved	BIT 41.6	Reserved	BIT 41.5	Reserved	BIT 41.4	Reserved	BIT 41.3	Test	BIT 41.2	Ext	BIT 41.1	Reset	BIT 41.0	
	0003	BIT 42.7	Reserved	BIT 42.6	Reserved	BIT 42.5	Reserved	BIT 42.4	Reserved	BIT 42.3	Reserved	BIT 42.2	Reserved	BIT 42.1	Reserved	BIT 42.0	Reserved
	0004	BIT 43.7	Assignable	BIT 43.6	Assignable	BIT 43.5	Assignable	BIT 43.4	Assignable	BIT 43.3	Assignable	BIT 43.2	Assignable	BIT 43.1	Assignable	BIT 43.0	Assignable
	0005	BIT 44.7	Assignable	BIT 44.6	Assignable	BIT 44.5	Assignable	BIT 44.4	Assignable	BIT 44.3	Assignable	BIT 44.2	Assignable	BIT 44.1	Assignable	BIT 44.0	Assignable
	0006	BIT 45.7	Assignable	BIT 45.6	Assignable	BIT 45.5	Assignable	BIT 45.4	Assignable	BIT 45.3	Assignable	BIT 45.2	Assignable	BIT 45.1	Assignable	BIT 45.0	Assignable
	0007	BIT 46.7	Assignable	BIT 46.6	Assignable	BIT 46.5	Assignable	BIT 46.4	Assignable	BIT 46.3	Assignable	BIT 46.2	Assignable	BIT 46.1	Assignable	BIT 46.0	Assignable
Command	0016	47.0	Command Number														
input area	0017																
	0018																
	0019																
	0020	51.0	Cmd Parameter1														
	0021																
	0022																
	0023																
	0024	55.0	Cmd Parameter2														
	0025																
	0026																
	0027																
	0028	59.0	Cmd Parameter3														
	0029																
	0030																
	0031																
	:																
	0080	111.0	Cmd Parameter16														
	0081																
	0082																
	0083																

Setting status (Byte)	Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Variable synchronization specific system	0084	115.0	%InDataFieldbus[0]						
Variable area	0085								
	0086								
	0087								
	0088	119.0	%InDataFieldbus[1]						
	0089								
	0090								
	0091								
	...								

Names and operations of output signals

Assigned Region	Name	Remarks
Bit area	Cmd Request	Requests command execution when the signal changes from OFF to ON.
	InDataFB sync inhibit	When this is ON, reading of %InDataFieldbus[] data is not allowed.
	Result ack	Notifies of data acquisition when the signal changes from OFF to ON.
	Err 0 reset request	Clears Error0 when the signal changes from OFF to ON.
	Err 1 reset request	Clears Error1 when the signal changes from OFF to ON.
	Trg1	Trigger 1 input
	Trg2	Trigger 2 input
	Trg3	Trigger 3 input
	Trg4	Trigger 4 input
	Reset	Reset input: Resets the controller (rise cycle).
	Ext	Disable Trigger reception: During signal input, capturing for all cameras and capture unit operation will stop (level input).
	Test	Test run input: During signal input, data output for all ports, %JAHold, and %Sto will be forcibly stopped and the output buffer will also be cleared (level input).
Command input area	Command Number	Writes custom command numbers.
	Cmd Parameter1	Writes custom command argument **01".
	Cmd Parameter2	Writes custom command argument **02".
	Cmd Parameter3	Writes custom command argument **03".

	Cmd Parameter16	Writes custom command argument **16".

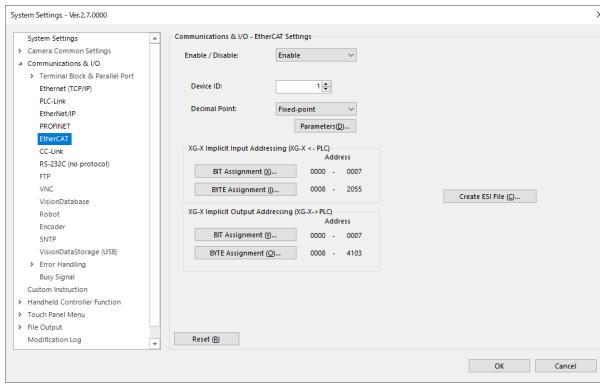
Variable synchronization specific System variable area	%InDataFieldbus[0]	Fieldbus-specific input data 1
	%InDataFieldbus[1]	Fieldbus-specific input data 2

Changing the EtherCAT Settings

Opening the EtherCAT Setting Screen

To change the settings with the XG-X VisionEditor

On the [EtherCAT] screen in the XG-X VisionEditor System Settings, the settings for data input/output using EtherCAT with a CA-NEC20E connected to the controller can be changed.



Point

- The update time, data size, and timeout time are set on the PLC. Be sure to set the update time of 500 µs or longer for the cyclic communication with the controller.
- Even if you specify the update time of the cyclic communication to 500 µs or longer, the processing may be delayed or the communication may be disconnected by temporary timeout due to the excessive load applied to the controller temporarily or continuously when there are other communication functions being used in the controller, such as measurement settings, dialog operations, commands, FTP, or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Be sure to check for these and other problems in the operating performance before entering production.
- In a network where many devices, including EtherCAT devices, are connected, delay or packet loss may occur sometimes when a heavy load is applied to the network constantly or temporarily. Be sure to make thorough verification before entering production.
- EtherCAT cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or PROFINET is enabled.

- Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] screen is displayed.

- In the left pane of the [System Settings] screen, select [Communications & I/O] - [EtherCAT].

The [EtherCAT] screen is displayed.

- Change the settings as required.

See "EtherCAT Setting Items Which can be Set with the System" (Page 1-264) for more details on the setting of each item.

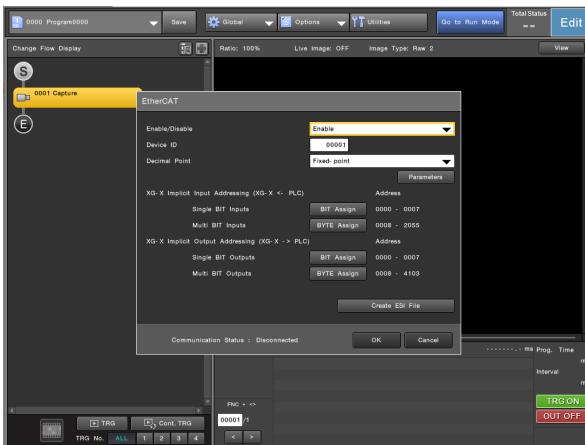
- Click [OK].

Point

To apply the change to the controller, you need to upload the system settings to the controller and then restart the controller.

To change the settings with the controller

In the [EtherCAT] screen, which can be opened from the Global settings, you can change various settings to use EtherCAT for the input/output of various data when an EtherCAT unit CA-NEC20E is connected to the controller.



- Point
- If you change the setting items other than [Decimal Point] and [XG-X Implicit Output Addressing (XG-X → PLC): Multi BIT Output Settings] - [Starting address of output data], you need to restart the controller for the setting to take effect.
- The update time, data size, and timeout time are set on the PLC. Be sure to set the update time of 500 μs or longer for the cyclic communication with the controller.
- Even if you specify the update time of the cyclic communication to 500 μs or longer, the processing may be delayed or the communication may be disconnected by temporary timeout due to the excessive load applied to the controller temporarily or continuously when there are other communication functions being used in the controller, such as measurement settings, dialog operations, commands, FTP, or remote desktop. When this occurs, review the cyclic communication settings and conditions used. Be sure to check for these and other problems in the operating performance before entering production.
- In a network where many devices, including EtherCAT devices, are connected, delay or packet loss may occur sometimes when a heavy load is applied to the network constantly or temporarily. Be sure to make thorough verification before entering production.

- 1 On the [Global] menu at the top of the screen, select [Communications & I/O] - [EtherCAT].

The [EtherCAT] screen is displayed.

- 2 Select [Enable] for [Enable/Disable].

- 3 Specify the device ID in [Device ID].

- 4 Change the settings as required.

See "EtherCAT Setting Items Which can be Set with the System" (Page 1-264) for more details on the setting of each item.

- 5 Click [OK].

EtherCAT Setting Items Which can be Set with the System

Enable/Disable

Select whether to use EtherCAT.

- Disable:** Do not use the EtherCAT communication.
- Enable:** Use the EtherCAT communication.



EtherCAT cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or PROFINET is enabled. You must disable all of them.

Device ID

Set the device ID of the controller used for the EtherCAT communication. This ID must be the same as the ID set on the PLC.

Decimal Point

Select a data representation format used for the parameters of MW/MR/MS/MWX/MRX/MSX commands, the output of command data, and the input/output of result output data.

- Fixed-point** (default): Output data is multiplied by 1000 and is used as 32-bit signed integer data.
Select [Parameters] to specify the [Decimal Precision] (1/10, 1/100, 1/1000, or 1/10000; set to 1/1000 by default).



Depending on the [Decimal Precision] setting: 1/10, 1/100, 1/1000, or 1/10000, the measurement result is multiplied by 10, 100, 1000, or 10000 (respectively) and is used as 32 bits of signed integer data.

- Floating-point:** Output data is used as single-precision floating point data (32-bit).

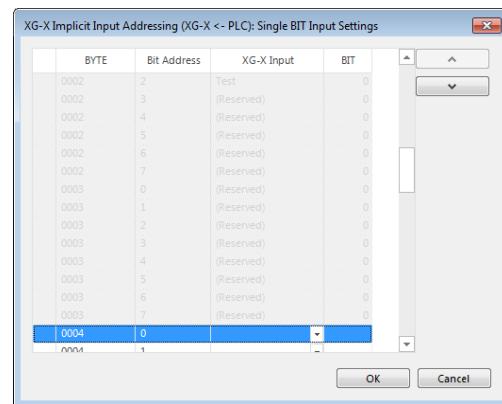


For a command dealing with integers only, this setting is ignored and the system rounds off a value to the nearest integer and reads command parameters as integers and writes command data in integers.

XG-X Implicit Input Addressing (XG-X ← PLC) (XG-X VisionEditor)

BIT Assignment

The [XG-X Implicit Input Addressing (XG-X ← PLC): Single BIT Input Settings] screen is displayed. This screen lists the bit address assignment of output data (received by the controller).



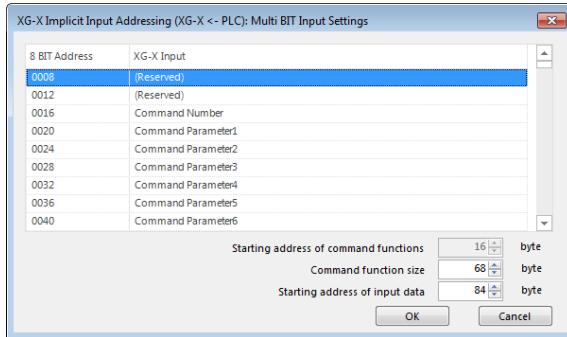
- In the [XG-X Input] and [BIT] columns, you can assign a desired input-type system variable related to terminal control and its bit to each address.
- You can also move the assignment setting to another address by selecting a line and clicking [\wedge] or [\vee].
- Device ranges that cannot be used in the current setting are not displayed.



- The system variables which have already been assigned to the input terminals in the terminal block & parallel port cannot be assigned again for EtherCAT.
- The same bit of the same system variable cannot be assigned to multiple output data (received by the controller) addresses or be assigned again to the input terminal in the terminal block & parallel port.

BYTE Assignment

The [XG-X Implicit Input Addressing (XG-X ← PLC): Multi BIT Input Settings] screen is displayed. This screen lists the byte address assignment of output data (received by the controller).



- Starting address of command functions:** Specify the position to start assignment of items necessary for command control. With the controller, this address is fixed to byte 16 and cannot be changed.
- Command function size:** Items necessary for command control are assigned up to 68 bytes (default) which is the area size upper limit. The custom instruction No. (Command Number) is assigned from bytes 16 to 19, and command parameters (Command Parameter1 to 16) are assigned from bytes 20 to 83.
- Starting address of input data:** Specify the position to start assignment of %InDataFieldbus[] for system variable synchronization. By default, the position has already been assigned from byte 84, four bytes for each item. When the command control and variable synchronization are performed simultaneously with EtherCAT, some of the data range used by the command control and variable synchronization may overlap. When this occurs, minimize the command function size and change the assignment starting address for the variable synchronization in the [Starting address of input data] setting of the variable synchronization.

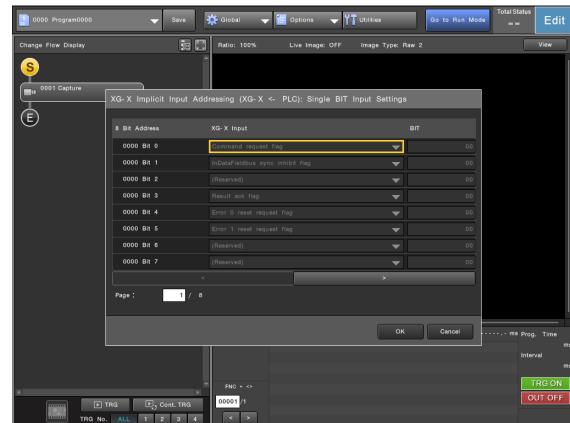
Reference

- Up to 536 bytes for input and 532 bytes for output can be used in cyclic communication. In non-cyclic communication, the entire byte area can be used.
- The data representation format when decimal data is written to Command Parameter follows the format specified at [Decimal Point].

XG-X Implicit Input Addressing (XG-X ← PLC) (Controller)

BIT Assign

The [XG-X Implicit Input Addressing (XG-X ← PLC): Single BIT Input Settings] screen is displayed. This screen lists the bit address assignment of output data (received by the controller).



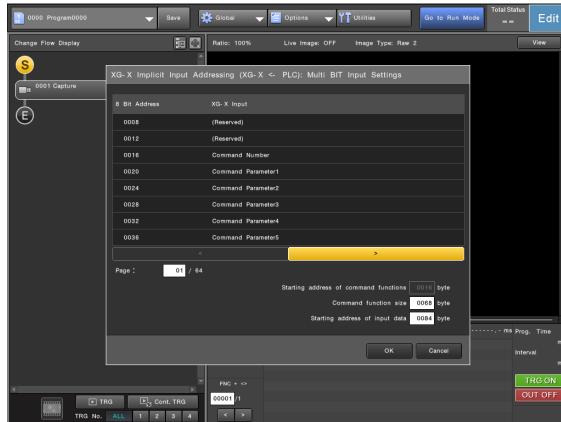
In the [XG-X Input] and [BIT] columns, you can assign a desired input-type system variable related to terminal control and its bit to each address.

Point

- The system variables which have already been assigned to the input terminals in the terminal block & parallel port cannot be assigned again for EtherCAT.
- The same bit of the same system variable cannot be assigned to multiple output data (received by the controller) addresses or be assigned again to the input terminal in the terminal block & parallel port.

BYTE Assign

The [XG-X Implicit Input Addressing (XG-X ← PLC): Multi BIT Input Settings] screen is displayed. This screen lists the byte address assignment of output data (received by the controller).



- Starting address of command functions:** Specify the position to start assignment of items necessary for command control. With the controller, this address is fixed to byte 16 and cannot be changed.
- Command function size:** Items necessary for command control are assigned up to 68 bytes (default) which is the area size upper limit. The custom instruction No. (Command Number) is assigned from bytes 16 to 19, and command parameters (Command Parameter1 to 16) are assigned from bytes 20 to 83.
- Starting address of input data:** Specify the position to start assignment of %InDataFieldbus[] for system variable synchronization. By default, the position has already been assigned from byte 84, four bytes for each item.

Reference

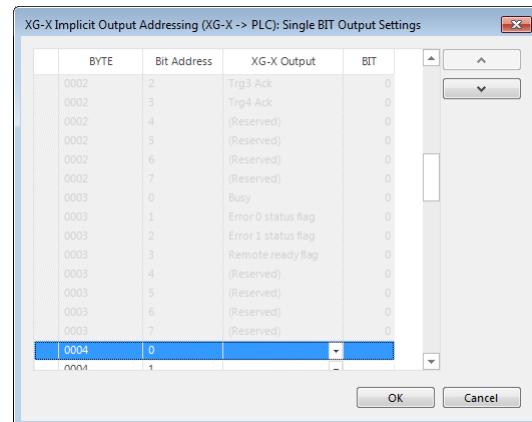
- Up to 536 bytes for input and 532 bytes for output can be used in cyclic communication. In non-cyclic communication, the entire byte area can be used.
- The data representation format when decimal data is written to Command Parameter follows the format specified at [Decimal Point].

Point Only custom instructions can be executed with EtherCAT.

XG-X Implicit Output Addressing (XG-X → PLC) (XG-X VisionEditor)

BIT Assignment

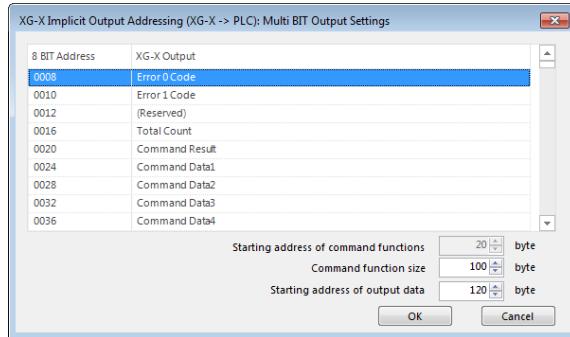
The [XG-X Implicit Output Addressing (XG-X → PLC): Single BIT Output Settings] screen is displayed. This screen lists the bit address assignment of input data (sent from the controller).



- In the [XG-X Output] and [BIT] columns, you can assign a desired output-type system variable related to terminal control and its bit to each address.
- You can also move the assignment setting to another address by selecting a line and clicking [\wedge] or [\vee].

BYTE Assignment

The [XG-X Implicit Output Addressing (XG-X → PLC): Multi BIT Output Settings] screen is displayed. This screen lists the byte address assignment of input data (sent from the controller).



- Starting address of command functions:** Specify the position to start assignment of items necessary for command control. With the controller, this address is fixed to byte 20 and cannot be changed.
- Command function size:** Items necessary for command control are assigned an area size of 100 bytes (default). The command result (Command Result) is assigned from bytes 20 to 23, and command response data (Command Data1 to 24) are assigned from bytes 24 to 119.
- Starting address of output data:** The data output unit which uses EtherCAT as an output device can output data to the assignment range starting from this address within the area set at [Cyclic Data Size]. If the data output size is insufficient, minimize the command function size to the least amount required, and change the starting address for the data output assignment in the [Starting address of output data] setting.

Reference

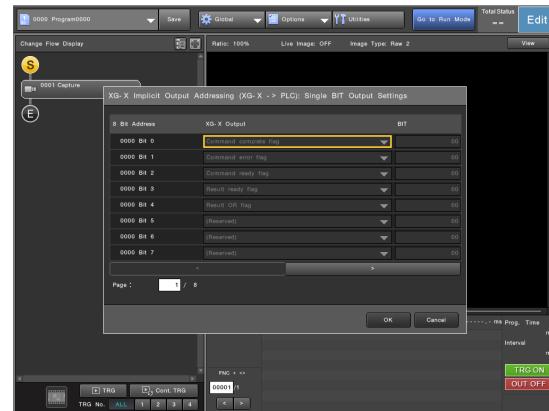
- Up to 536 bytes for input and 532 bytes for output can be used in cyclic communication. In non-cyclic communication, the entire byte area can be used.
- The decimal data representation format in Command Data follows the format specified at [Decimal Point].

The data range actually used for a command response varies depending on the command. Be sure to provide a sufficient area for the command response of the command to be used.

XG-X Implicit Output Addressing (XG-X → PLC) (Controller)

BIT Assign

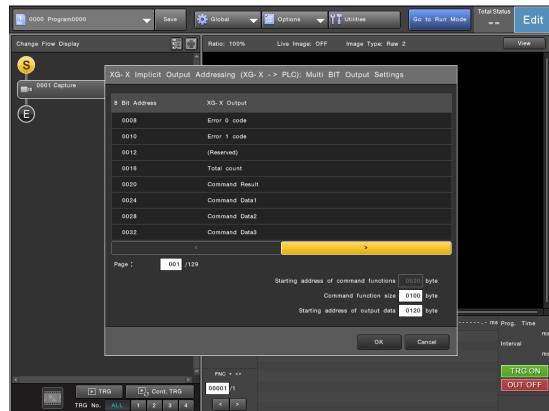
The [XG-X Implicit Output Addressing (XG-X → PLC): Single BIT Output Settings] screen is displayed. This screen lists the bit address assignment of input data (sent from the controller).



In the [XG-X Output] and [BIT] columns, you can assign a desired output-type system variable related to terminal control and its bit to each address.

BYTE Assign

The [XG-X Implicit Output Addressing (XG-X → PLC): Multi BIT Output Settings] screen is displayed. This screen lists the byte address assignment of input data (sent from the controller).



- Starting address of command functions:** Specify the position to start assignment of items necessary for command control. With the controller, this address is fixed to byte 20 and cannot be changed.

- Command function size:** Items necessary for command control are assigned an area size of 100 bytes (default). The command result (Command Result) is assigned from bytes 20 to 23, and command response data (Command Data1 to 24) are assigned from bytes 24 to 119.

- **Starting address of output data:** The data output unit which uses EtherCAT as an output device can output data to the assignment range starting from this address within the area set at [Cyclic Data Size]. If the data output size is insufficient, minimize the command function size to the least amount required, and change the starting address for the data output assignment in the [Starting address of output data] setting.

 Reference

- Up to 536 bytes for input and 532 bytes for output can be used in cyclic communication. In non-cyclic communication, the entire byte area can be used.
- The decimal data representation format in Command Data follows the format specified at [Decimal Point].

 Point

The data range actually used for a command response varies depending on the command. Be sure to provide a sufficient area for the command response of the command to be used.

Create ESI File

Outputs the ESI file shown below, which includes information related to the controller's EtherCAT function.

- In the case of the XG-X2000 Series:
Keyence XG-X2xxx_CA-NEC20E.xml
- In the case of the XG-X1000 Series:
Keyence XG-X1xxx_CA-NEC20E.xml

 Point

This file is not created if any of the parameter settings are incorrect. Correct the incorrect settings and then try again.

 Reference

- The output path of the file in the controller is:
SD2:/xg/ESI.
- Since the ESI file does not contain information set or changed in the system settings of the controller and the XG-X VisionEditor, the content of the created ESI file is always the same.

Reset

Returns all settings on the [EtherCAT] screen to their initial values.

Using the EtherCAT Cyclic Communication to Output Measurement Data (Data Output)

Change the settings so that the data output unit outputs data through EtherCAT.



EtherCAT cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or PROFINET is enabled.

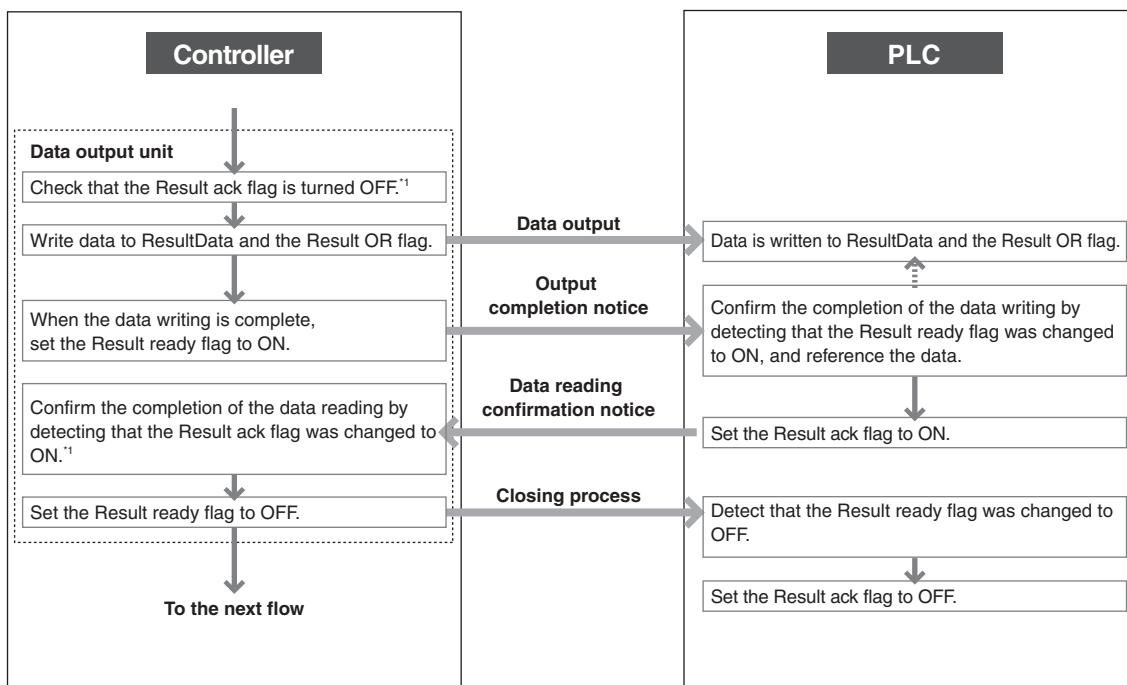
Data Output Flow

Data is output from the data output unit. The data and addresses for the output are set in the data output unit.

The controller outputs the data through EtherCAT in the procedure shown below.

Reference

- The data output through EtherCAT is possible only in run mode. Data will not be output in setup mode.
- Binary data, such as images, cannot be output with EtherCAT.
- When none of the data output units in the flowchart is processed, no data will be output. In such a case, the Result ready flag does not change.



¹ This is a procedure for when handshake is set to ON.

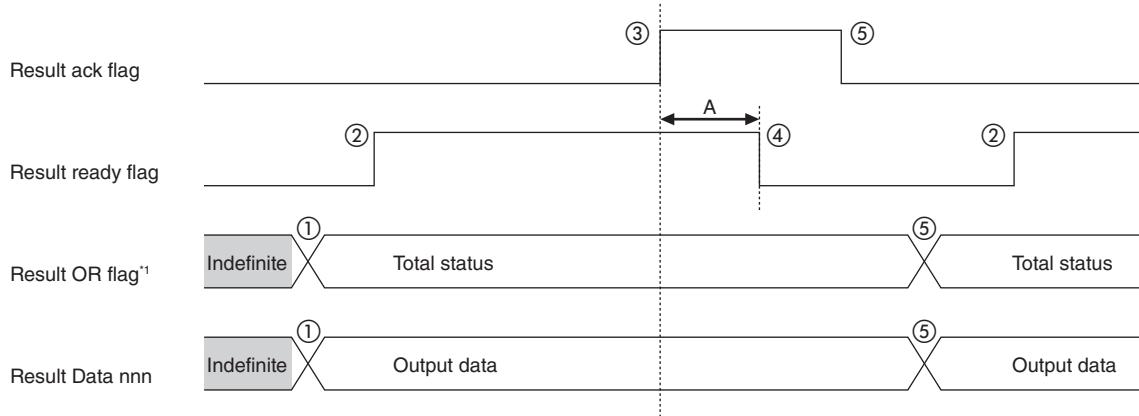
If handshake is OFF, the controller overwrites when the data output unit is processed regardless of the status of the Result ack flag, and the Result ready flag remains ON. If you need to confirm the completion of writing based on the change of the Result ready flag from OFF to ON, set the Result ready flag to OFF by setting the Result ack flag to ON.



Confirm that the data range used for the data output does not overlap with the data range of the command response data.

Timing Chart

When handshake is ON

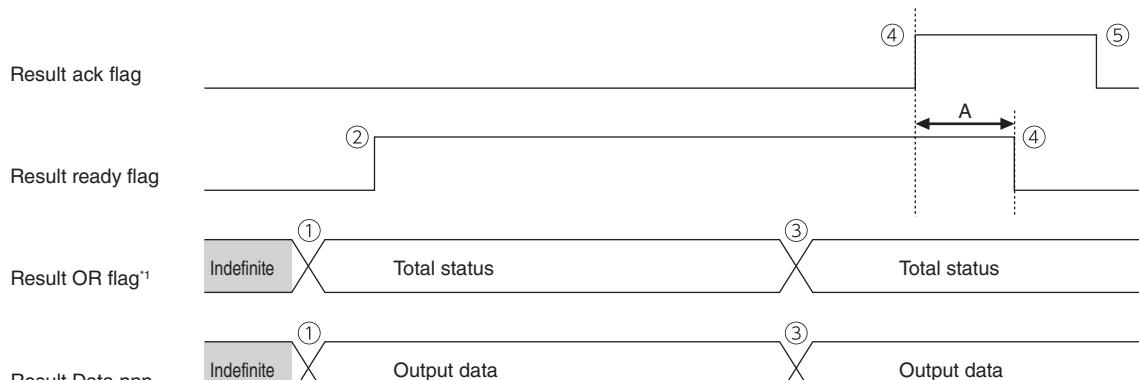


A: 0 ms or more (depending on the link scan speed)

*¹ If you use the Result OR flag, one or more item of data needs to be set to be output from the data output unit to the EtherCAT.

- (1) The data is updated.
- (2) The Result ready flag (the read synchronization signal of the output data) turns ON and the data can be read.
- (3) When data reading is completed, the Result ack flag turns ON as the signal for data reading completion.
- (4) Associated with (3), the Result ready flag turns OFF.
- (5) The result ack flag turns OFF. This is received and output continues if data is updated.

When handshake is OFF



A: 0 ms or more (depending on the link scan speed)

*¹ If you use the Result OR flag, one or more item of data needs to be set to be output from the data output unit to the EtherCAT.

- (1) The data is updated.
- (2) The Result ready flag (the read synchronization signal of the output data) turns ON and reading becomes possible.
- (3) If data is updated, the Result ready flag stays ON and output continues.
- (4) If the Result ack flag turns ON, the Result ready flag turns OFF. This can be used when you want to find out the latest OK/NG status with as little delay as possible for such applications as when the line is to be stopped when the status is NG.
- (5) The result ack flag turns OFF. Thus, you can find out the timing of the next data update.

Using the EtherCAT Cyclic Communication for I/O Control

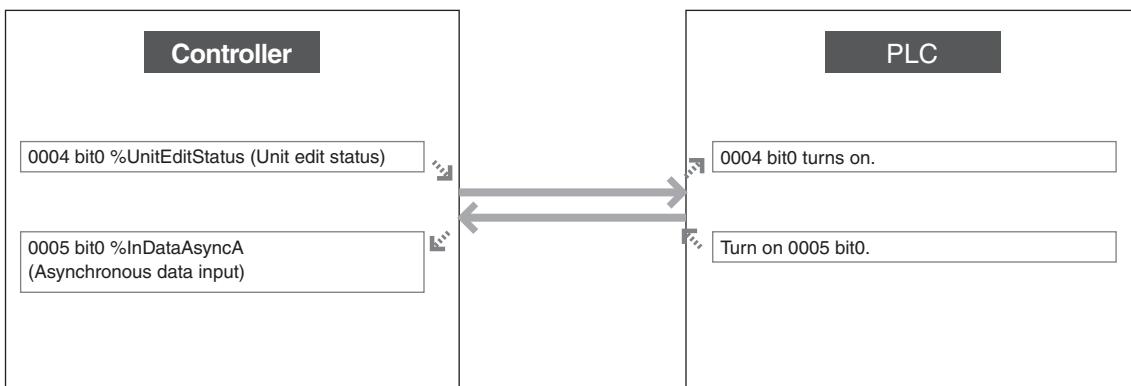
Change the settings to use EtherCAT to control input/output in the same way as using the terminal block or parallel I/O interface of the controller.



EtherCAT cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or PROFINET is enabled.

Conceptual Diagram of I/O Control (Example Connection with the EtherCAT Unit of a PLC)

By assigning the desired system variables related to terminal control to bit devices, you can use multiple I/O signals with a single LAN cable.



The EtherCAT communication is based on periodic communication. As a result, although the I/O signals operate according to the terminal block operation, some instantaneous changes of the signals may not be detected. To avoid the problem, set the update time by considering the actual signal change time.



- It is also possible to output measured or judgment values to bit devices by assigning %OutDataAsync to the bit address for the input data (data sent from the controller) and issuing a WP command from the process flow using the Command Execution unit.
- It is also possible to execute custom instructions from bit devices by assigning %CmdCode, %CmdParam, and %CmdStrobe to the bit address for the output data (received by the controller).

Using the EtherCAT Cyclic Communication to Control the Controller (Command Control)

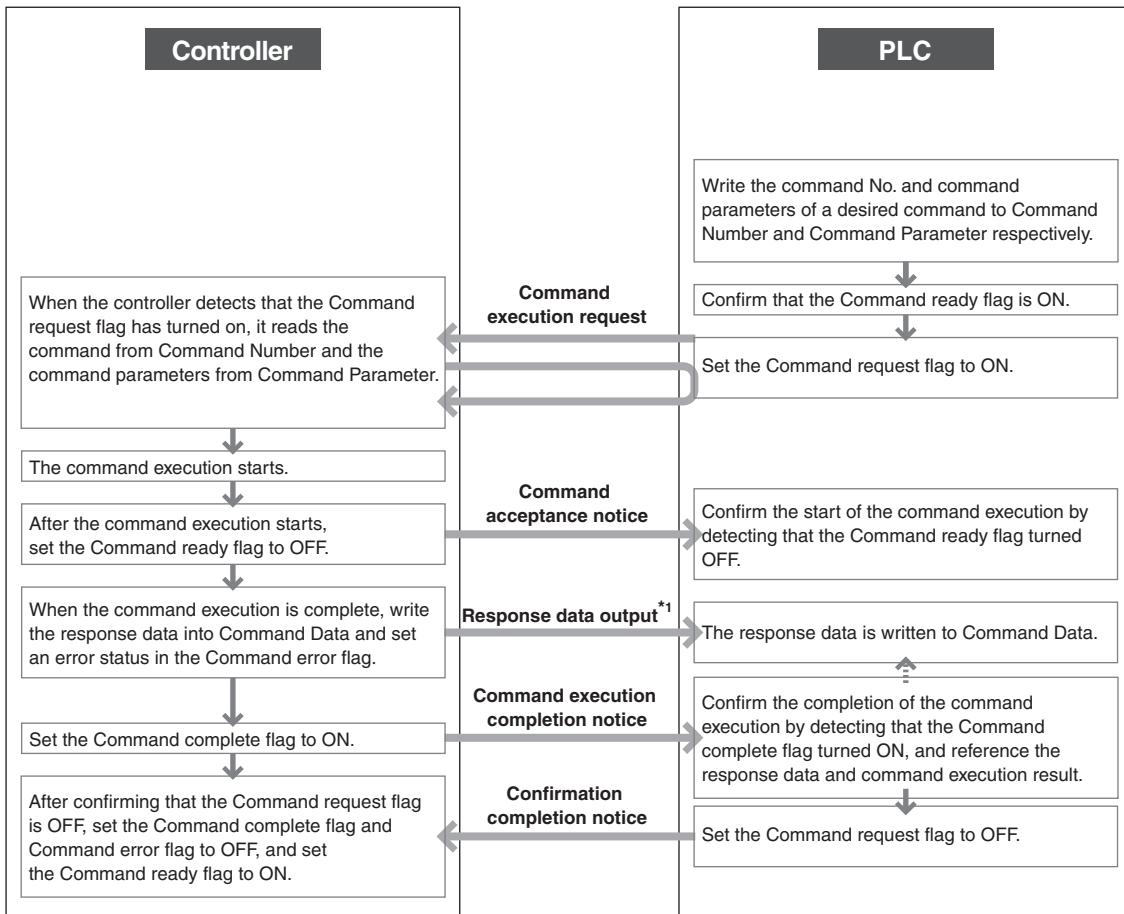
Predefined commands can be executed at the desired timing.



- EtherCAT cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or PROFINET is enabled.
- You need to set the desired commands to execute as custom instructions in advance.

Command Processing Flow Using EtherCAT (Example Connection with the EtherCAT Unit of a PLC)

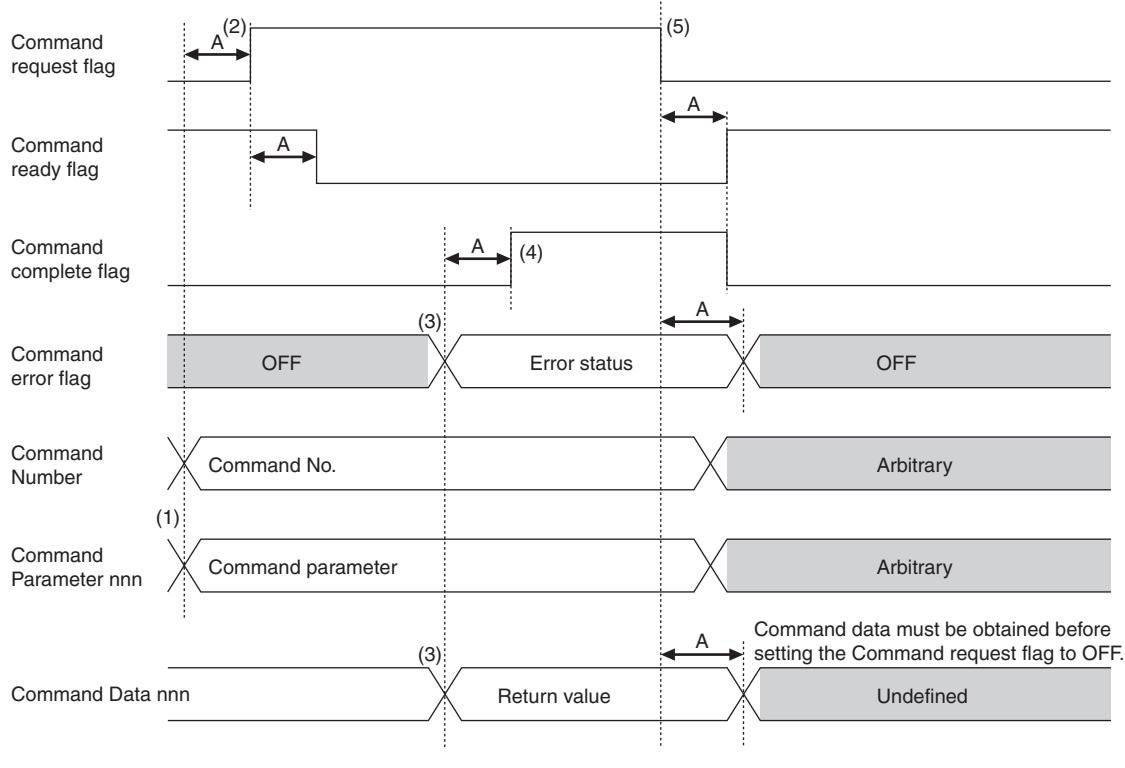
The controller is controlled with the commands through EtherCAT in the procedure shown below.



*1 For commands which produce no response data, no response data is output to Command Data.

Reference When a command error occurs, the command execution result is written into Command Result (0: Succeeded, <Error code>: Failed).

Timing diagram



- (1) The command No. is stored in Command Number and the first command parameter is stored in Command Parameter.
- (2) The Command request flag is set to ON to order command execution.

The Command ready flag is also set to OFF. (To turn OFF the Command ready flag, at least the time for link scan is required.)

- (3) When the time required for the command execution elapses, the return value is stored in Command Data and an error status is stored in the Command error flag (When the Command error flag is OFF: Command processing succeeded, ON: Command processing failed).

- (4) The Command complete flag turns ON as a confirmation signal of command execution completion.

- (5) When the Command request flag is set to OFF to allow the next command to be issued, the Command ready flag turns ON and the Command complete flag turns OFF.

Using the EtherCAT Cyclic Communication to Change Variable Value (Variable Synchronization)

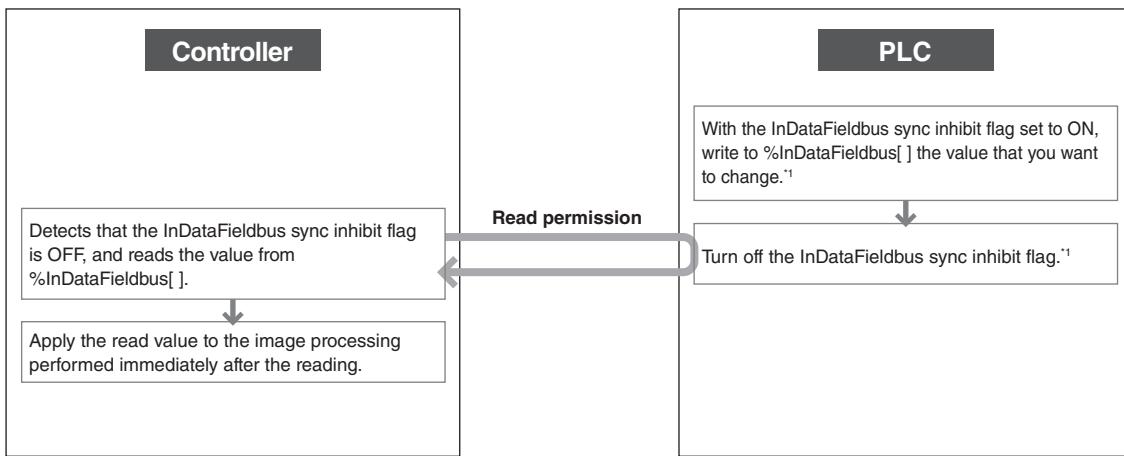
Change the settings to use EtherCAT to change the value of a special system variable for variable synchronization (%InDataFieldbus[]) assigned to the output data (received by the controller) of the cyclic communication.



EtherCAT cannot be used when the PLC-Link, CC-Link, EtherNet/IP, or PROFINET is enabled.

Variable Synchronization Flow Using EtherCAT (Example Connection with the EtherCAT Unit of a PLC)

When EtherCAT is used, the value of %InDataFieldbus[] in the controller is changed in the following procedure.



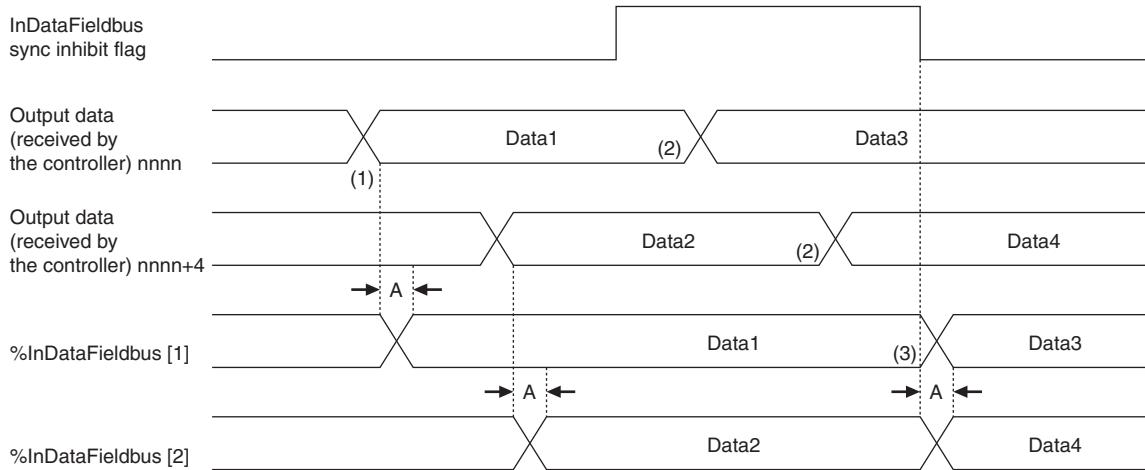
*1 This is the procedure for controlling the reading timing of one value. EtherCAT reads a value for each cycle specified by RPI. When the PLC is writing to multiple values of %InDataFieldbus[], a time lag may occur in the application timing of each memory. Setting the InDataFieldbus sync inhibit flag to ON beforehand to inhibit reading and then writing the values during the period ensure simultaneous change of multiple %InDataFieldbus[] values without being affected by the write timing.



- The value of %InDataFieldbus[] is initialized to "0" immediately after the startup of the controller. If the EtherCAT communication is interrupted, the last value written into %InDataFieldbus[] is retained until the controller is restarted.
- The value is written into the data memory as 32-bit signed integer data.

Timing diagram

Example when the values of %InDataFieldbus[1] and %InDataFieldbus[2] are changed



A: 0 ms or more (depending on the link scan speed)

- (1) Since the InDataFieldbus sync inhibit flag is OFF, when a value is written into the byte address of the output data (received by the controller) corresponding to %InDataFieldbus[1], the value of %InDataFieldbus[1] is changed after the link scan time at the latest (The value of %InDataFieldbus[2] does not change because the value in the byte address of the output data (received by the controller) is not changed.).
- (2) Values are written into the byte addresses of the output data (received by the controller) corresponding to %InDataFieldbus[1] and %InDataFieldbus[2]. However, the values of %InDataFieldbus[1] and %InDataFieldbus[2] do not change because the InDataFieldbus sync inhibit flag is ON. To change multiple %InDataFieldbus values simultaneously, you need to set the InDataFieldbus sync inhibit flag to ON, write and change the values in all of the corresponding byte addresses of the output data (received by the controller) , and then set the InDataFieldbus sync inhibit flag to OFF.
- (3) Since the InDataFieldbus sync inhibit flag turned OFF, the values of the %InDataFieldbus[1] and %InDataFieldbus[2] are changed (At least the time for a link scan is required before the change is complete.).

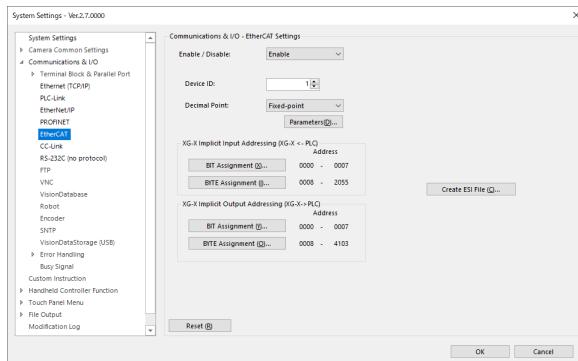
Typical EtherCAT Setting Procedure

This section explains an operation example that shows how to connect the XG-X Series to a C6920-0050 made by Beckhoff via EtherCAT and to establish communication.

Connecting to the CPU

1. Changing the system settings of the XG-X Series

- 1** Start the XG-X VisionEditor and select the program setting of the workspace which is the target of setting.
- 2** On the XG-X VisionEditor [Program Setting] tab, select [System Settings] from the [Various Settings] menu.
- 3** In the [System Settings] screen, select [Communications & I/O] - [EtherCAT].
- 4** Change the EtherCAT settings.



The following setting values are used in this example
(Change them according to the device to be connected.).

[Communications & I/O - EtherCAT Settings]

- Enable / Disable: Enable
- Device ID: 00001
- Decimal Point: Fixed-point (Decimal Precision: 1/1000)

[XG-X Implicit Input Addressing (XG-X ← PLC)]

[XG-X Implicit Output Addressing (XG-X → PLC)]

Assign data to the bit/byte addresses and specify the starting address.

- 5** Select [OK].

The changes are saved.

- 6** Upload the system settings to the controller and then restart the controller.

2. Changing the C6920-0050 settings

- 1** Start the C6920-0050, and then copy the ESI file for the XG-X Series "Keyence XG-X1xxx_CA-NEC20E.xml" or "Keyence XG-X2xxx_CA-NEC20E.xml" to the folder shown below.

(In the following path, the "x" part of the "3.x" folder varies depending on the version of TwinCAT3 that you are using. Change this part to match your environment.)

C:\TwinCAT\3.x\Config\Io\EtherCAT

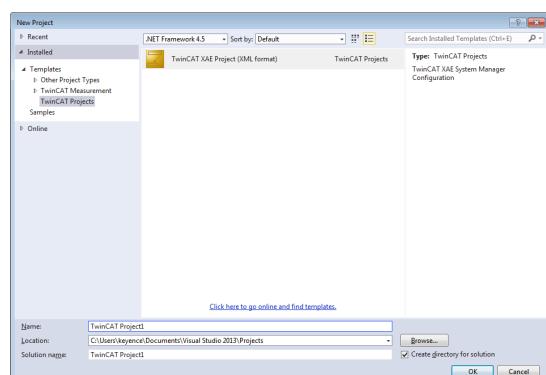


To create the ESI file, on the XG-X Series [Global] menu, select [Communications & I/O] - [EtherCAT] to display the settings screen, and then select [Create ESI File].

- 2** Start TwinCAT3. On the [File] menu, select [New] - [Project].

- 3** Check that [Installed] - [Templates] - [TwinCAT Projects] has been selected, and then enter the project name in the [Name] field and click [OK].

In this example, we have entered "TwinCAT Project1".



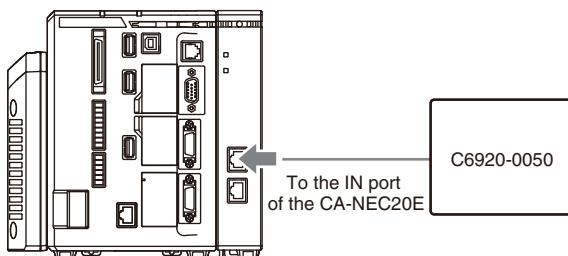
- 4** On the [TwinCAT] menu, select [Restart TwinCAT (Config Mode)]. Alternatively, click [Restart TwinCAT (Config Mode)].

The [Restart TwinCAT System in Config Mode] screen is displayed.

- 5** Click [OK].

6 Use an Ethernet cable to connect the C6920-0050 and the XG-X Series.

In this example, we have connected the network cable from the C6920-0050 to the IN port of the CA-NEC20E, as shown below.



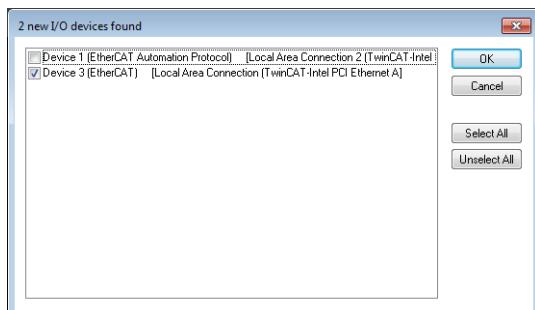
7 In [Solution Explorer], right-click [TwinCAT Project1] - [I/O] - [Devices], and then select [Scan] on the shortcut menu that is displayed.

The [HINT: Not all types of devices can be found automatically] screen is displayed.

8 Select [OK].

The [2 new I/O devices found] screen is displayed.

9 Check that the check box for the same device as the network interface name of the port of the C6920-0050 connected to the XG-X Series is selected, and then click [OK].



The [Scan for boxes] screen is displayed.

10 Click [Yes].

The [Activate Free Run] screen is displayed.

11 Click [Yes].

3. Checking the status of the cyclic communication

Checking from the XG-X Series (CA-NEC20E)

If the indicator (RUN) on the XG-X Series (CA-NEC20E) is lit, the connection has been established and cyclic communication is being performed.

Checking from TwinCAT3

1 In [Solution Explorer], double-click [TwinCAT Project1] - [I/O] - [Devices] - [Device3 (EtherCAT)] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)], and then open the [Online] tab on the displayed screen.

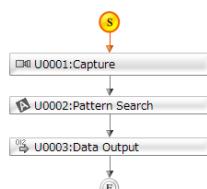
2 Check the display of the [Current State] field. If [OP] is displayed, cyclic communication is being performed.

Outputting Measured/Judgment Values

1. Setting the output data (Data output unit)

To output various kinds of measured/judgment values, use the "data output unit." This section describes as an example how to assign the measured/judgment values of the following units to a data output unit as data to be output.

- Total status judgment of the flowchart (%JgAll)
- U0002: Pattern search (Position X)
- U0002: Pattern search (Position XY)
- Variable #a
- Variable #b
- U0002: Pattern search (Unit judgment value)
- Processing time (%PrcTime)
- Processing start date (%PrcDay)



4 Check the destination byte addresses used for the output.

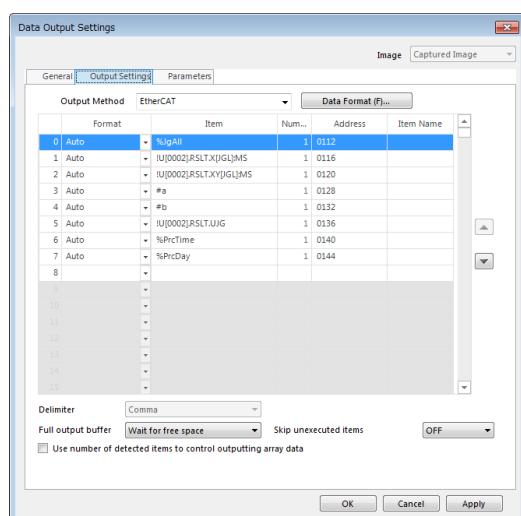
- When you assign data in the [Item] column, the output destination byte address is automatically displayed in the [Address] column. When there are several data output units in the flowchart and some byte addresses overlap, you can offset the output destination of the output data by means of [Output Offset] on the [Parameters] tab.
- The starting address of the byte assignment is the address where [Result Data1] is assigned for [XG-X Implicit Output Addressing (XG-X → PLC)] of [Communications & I/O - EtherCAT Settings] in the [System Settings] screen of the XG-X VisionEditor.
- In this example, we have configured the settings as shown below.
 - Command function size: 92 bytes
 - Starting address of output data: 112 byte

1 Add a "data output unit" at the end of the flowchart.

The setting screen of the added "data output unit" is displayed.

2 Select [EtherCAT] for [Output Method].

3 From the parts list, drag and drop measured/judgment values you want to output to assign them into the [Item] column.

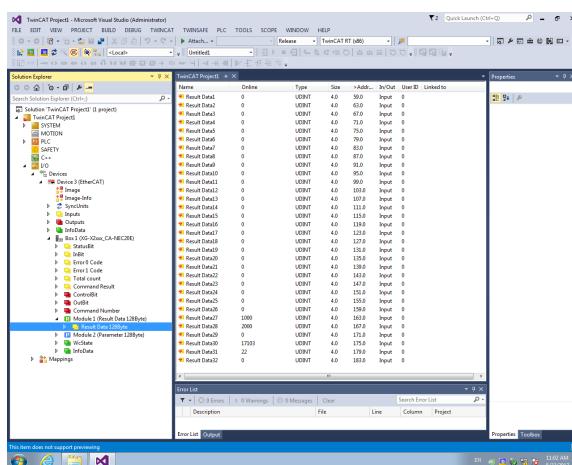


Other than dragging and dropping from the parts list, you can enter the items directly.

2. Using TwinCAT to check the data output by the XG-X Series.

In [Solution Explorer], open [TwinCAT Project1] - [I/O] - [Devices] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)] - [Module1 (Result Data 128Byte)], and then double-click [Result Data 128Byte].

A list of the byte data output by the XG-X Series is displayed.



- In the [Result Data 128Byte] field, the data output by the XG-X Series is displayed starting with Command Data1.
- In this example, the command area size has been set to 92 bytes. So, with the 4 bytes of the Command Result part subtracted, 88 bytes (Command Data1 to Command Data21) are displayed in Result Data1 to Result Data22.
- The data to be output set with the data output unit is displayed starting with Result Data23.

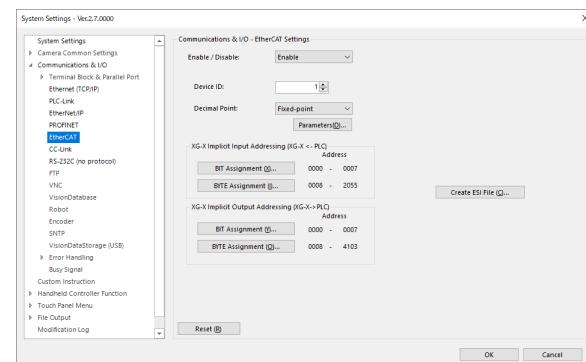
Reference

You can check the XG-X Series output data other than the above data by double-clicking ([Status Bit] to [Command Result]) under [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)].

Controlling the Controller

1. Checking the system settings of the XG-X Series

- In XG-X VisionEditor, select [Communications & I/O] - [EtherCAT] from the [System Settings] menu.
- In [XG-X Implicit Input Addressing (XG-X → PLC)] and [XG-X Implicit Output Addressing (XG-X → PLC)], check the assignment of the bit and byte addresses for the various items required for controlling the controller.



Output data (PLC → XG-X: OUT)

- Command request flag: Set this flag from OFF to ON to execute a command (bit).
- Command Number: Set the command No. to be executed (word).
- Command Parameter#: Set the #th parameter of the command (double word) (The presence/absence of parameters and the number of parameters depends on the command.)

Input data (XG-X → PLC: IN)

- Command complete flag: This flag turns ON when the command processing finishes (bit).
- Command error flag: This flag remains OFF when the command processing succeeds, and turns ON when the processing fails (bit).
- Command ready flag: This flag is set to ON when command processing can be accepted (bit).
- Command Result: The command execution result is set (0: Succeeded, <Error code>: Failed) (word).
- Command Data#: The #th response data of the command is set (The presence/absence of the response data depends on the command.)(double word).

In this example, we have configured the settings as shown below.

- XG-X Implicit Input Addressing (XG-X <- PLC): Multi BIT Input Settings
 - Command function size: 68 bytes
 - Starting address of input data: 84 byte
- XG-X Implicit Output Addressing (XG-X -> PLC): Multi BIT Output Settings
 - Command function size: 92 bytes
 - Starting address of output data: 112 byte

3 Select [OK].

The changes are saved.

4 Upload the system settings to the controller and then restart the controller.**2. Example of command execution procedure: Switch program No. (PW)**

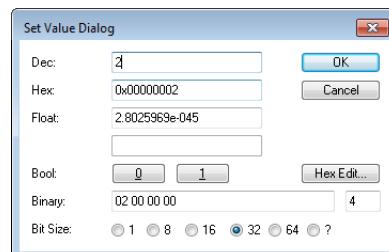
The following is a typical example of the command execution procedure. This example uses the PW command (Switch program No.) which uses a command parameter.



If the program setting to switch to does not exist in the SD1 of the XG-X Series that is executing the command, a command execution error will occur. Check for this data in advance on the XG-X Series.

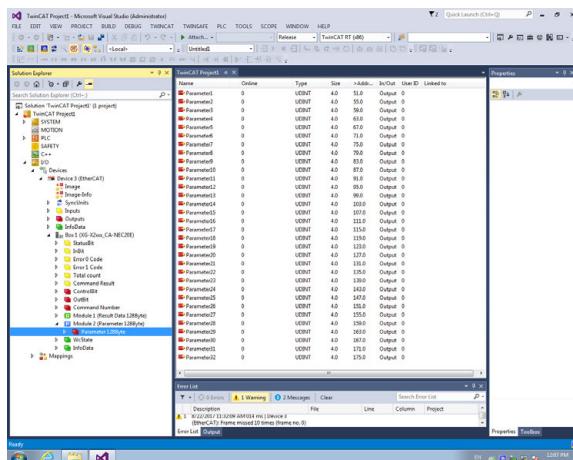
1 In XG-X VisionEditor, select [Custom Instruction] from the [System Settings] menu, and then check the number of the command to execute (for the PW command, the default setting is [2]).**2 In [Solution Explorer], open [TwinCAT Project1] - [I/O] - [Devices] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)], and then double-click [Command Number].**

If the [TwinCAT Project1] tab is already open, switch to the [Command Number] screen not by double-clicking it but by clicking it.

3 Right-click [Command Number] displayed on the [TwinCAT Project1] tab, and then select [Online Write] on the shortcut menu that is displayed.**4 In the [Set Value Dialog] dialog box that is displayed, enter [2] (the PW command number) in the [Dec] field, and then click [OK].**

5 In [Solution Explorer], open [TwinCAT Project1] - [I/O] - [Devices] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)] - [Module2 (Parameter 128Byte)], and then click [Parameter 128Byte].

A list of the byte data to input into the XG-X Series is displayed.



- Starting with Command Parameter1, the data to input into the XG-X Series is stored in [Parameter 128Byte].
- In this example, the command area size has been set to 68 bytes. So, with the 4 bytes of the Command Number part subtracted, 64 bytes (Command Parameter1 to Command Parameter16) are stored in Parameter1 to Parameter16.
- %InDataFieldbus is stored starting from Parameter17.

6 Right-click [Parameter1] displayed on the [TwinCAT Project1] tab, and then select [Online Write] on the shortcut menu that is displayed.

7 In the [Set Value Dialog] dialog box that is displayed, enter [1] in the [Dec] field as the first parameter (the number of the program setting to switch to) of the PW command, and then click [OK].

8 In [Solution Explorer], open [TwinCAT Project1] - [I/O] - [Devices] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)], and then click [StatusBit].

A list of the bit data output by the XG-X Series is displayed.

9 Check that the [Command ready flag] displayed on the [TwinCAT Project1] tab is [1] and that the XG-X Series is in a state in which commands can be executed.

10 In [Solution Explorer], open [TwinCAT Project1] - [I/O] - [Devices] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)], and then click [ControlBit].

A list of the bit data to input into the XG-X Series is displayed.

11 Right-click [Command request flag] displayed on the [TwinCAT Project1] tab, and then select [Online Write '1'] on the shortcut menu that is displayed.

After detecting that the [Command request flag] value has changed from 0 to 1, the XG-X Series executes the PW command (switches the number of the SD1 program setting).

12 In [Solution Explorer], open [TwinCAT Project1] - [I/O] - [Devices] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)], and then click [StatusBit].

- When the command was executed successfully, the [Command complete flag] is set to 1, and the [Command error flag] is set to 0.
- When the command execution failed, the [Command error flag] is set to 1, and the error code is written to [Command Result].
- After the command is executed, the [Command ready flag] is set to 0.
- Returning the [Command request flag] from 1 to 0 causes the [Command ready flag] to be set to 1, which switches the state to one in which the next command can be executed.

Using Mailbox Communication

Using TwinCAT3 Functions to Check the Values of Mailbox Communication Data

- 1** In [Solution Explorer], double-click [TwinCAT Project1] - [I/O] - [Devices] - [Device3 (EtherCAT)] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)], and then open the [CoE - Online] tab on the displayed screen.

The list of data that can be read with mailbox communication is displayed.



When you click the [CoE - Online] tab, all the data within the XG-X Series that can be read are read automatically (this operation may take some time).

- 2** Click the data to read in order to check it.
 - Data for which a [+] mark is displayed to the left of [Index] is array type data. You can click the [+] mark to check the value of each data within the array.
 - The value displayed in the [Value] field for data that has a [+] mark indicates the number of elements in the array.
 - You can select [Update List] to manually update the data.
 - When the [Auto Update] check box is selected, the data is updated automatically.

Using TwinCAT3 Functions to Change the Mailbox Communication Data

- 1** Double-click the data to change. The [Set Value Dialog] screen is displayed.
- 2** Enter a value in the [Dec], [Hex], [Float], [Bool], or [Binary] field, and then click [OK].

Accessing the Byte Data Area through Mailbox Communication

Mailbox communication is used to access "objects" in which byte information is divided into units of 1000 bytes.

- This method can be used for communication which does not require real time processing.
- It is possible to access addresses exceeding the maximum size allowed to cyclic communication (536 bytes for input and 532 bytes for output).
- Each object is assigned an index and a sub-index, which are then specified in order to access the data.

Accessible Ranges for Each Piece of Byte Information

Output data (received by the controller)

Index (Hexadecimal)	Accessible address
2019H	0020 to 1019
201AH	1020 to 2019
201BH	2020 to 2055

Input data (sent from the controller)

Index (Hexadecimal)	Accessible address
200CH	0024 to 1023
200DH	1024 to 2023
200EH	2024 to 3023
200FH	3024 to 4023
2010H	4024 to 4103

1. Using TwinCAT3 Functions to Check the Byte Information Values

- In [Solution Explorer], double-click [TwinCAT Project1] - [I/O] - [Devices] - [Device3 (EtherCAT)] - [Box1 (XG-X1xxx_CA-NEC20E)] or [Box1 (XG-X2xxx_CA-NEC20E)], and then open the [CoE - Online] tab on the displayed screen.

The list of data that can be read with mailbox communication is displayed.

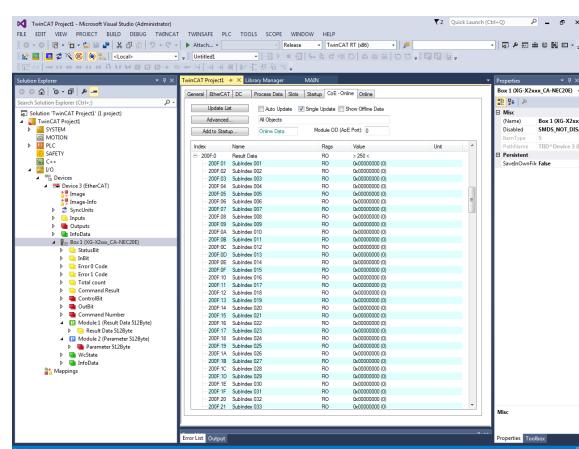
Reference When you click the [CoE - Online] tab, all the data within the XG-X Series that can be read are read automatically (this operation may take some time).

- Click the data to read in order to check it.

In this example, 1000 bytes from input address 3024 to input address 4023 on the XG-X Series are checked.

- Click the [+] next to index 200FH to expand the list.

The value of each address is displayed under [Value].



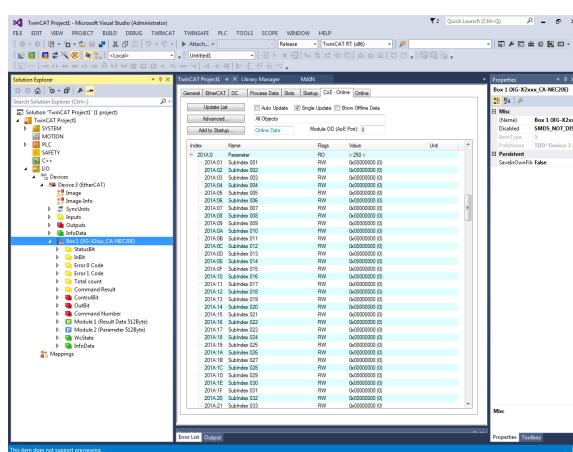
2. Using TwinCAT3 Functions to Change the Byte Information Values

In this example, output address 1020 on the XG-X Series is changed.



Before using mailbox communication to change an output address value, check that the address is not assigned to cyclic communication. If you use this method to change the value of an output address assigned to cyclic communication, a memory area conflict will occur.

- 1 Click the [+] next to index 201AH to expand the list.**
- The value of each address is displayed under [Value].



- 2 Double-click [201A:01 (sub-index 01H of index 201AH)].**
- The [Set Value Dialog] screen is displayed.
- 3 Enter a value in the [Dec], [Hex], [Float], [Bool], or [Binary] field, and then click [OK].**
 - 4 Check the value of [201A:01] under [Value].**

Checking the EtherCAT Communication Status

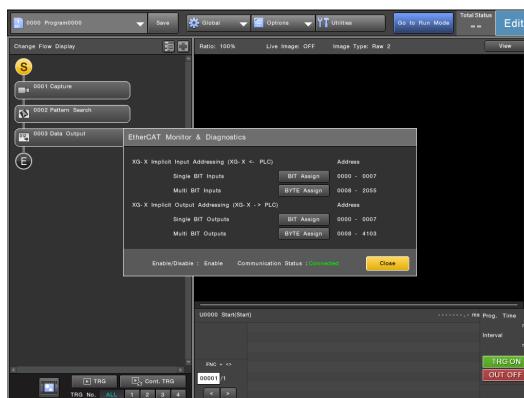
(EtherCAT Monitor & Diagnostics)

You can check the system's EtherCAT I/O signal communication status with this function. This function is convenient because it allows you to check communications content when connected to an external device in situations such as when the appropriate data cannot be communicated between connected devices.

Point The monitor cannot be used when [Enable/Disable] for EtherCAT is [Disable] or when EtherCAT is not connected. First establish an EtherCAT connection before using the monitor.

1 From the [Utilities] menu at the top of the screen, select [EtherCAT Monitor & Diagnostics].

The [EtherCAT Monitor & Diagnostics] screen is displayed.

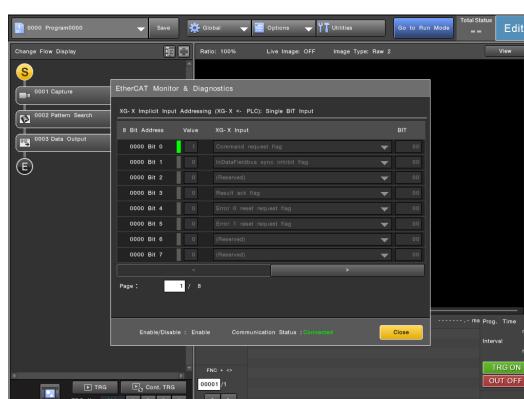


2 Select the item you wish to check.

Select the BIT Assign or the BYTE Assign of the XG-X Implicit Input Addressing (XG-X <- PLC) or the XG-X Implicit Output Addressing (XG-X -> PLC).

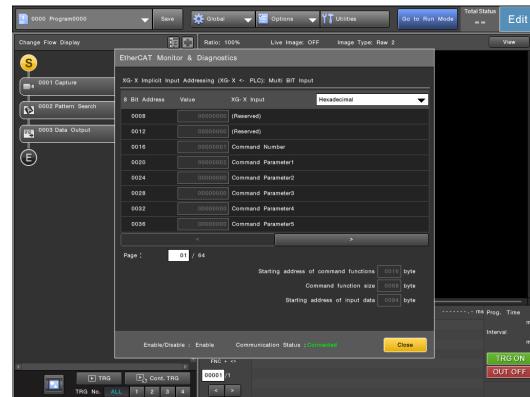
3 Now check the communication status.

Output data (received by the controller) byte information check screen



You can see that 1 was sent to Command request flag from the PLC.

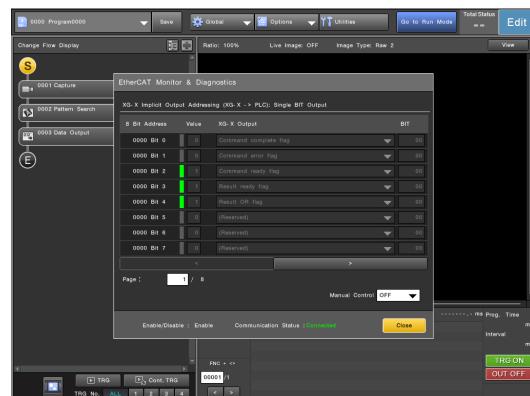
Output data (received by the controller) byte information check screen



You can see that 1 was input to Command Number and 2 was input to Command Parameter1 (decimal, unsigned).

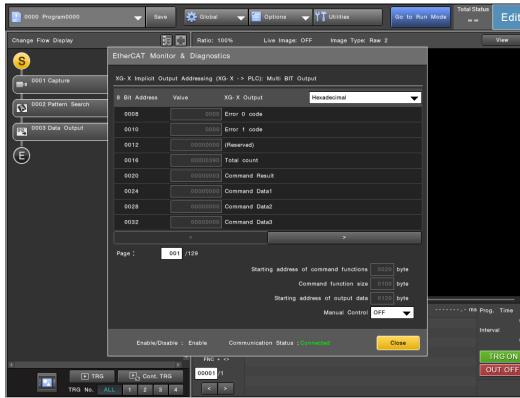
Using the down arrow at the upper right corner of the screen, you can also select the value to monitor from Hexadecimal, Decimal (unsigned), or Decimal (signed).

Input data (sent by the controller) bit information check screen



You can see that 1 was sent to Command ready flag, Result ready flag, and Result OR flag from the controller.

Input data (sent by the controller) byte information check screen



You can see that 390 was sent to Total count and 3 was sent to Command Result as a decimal (unsigned) from the controller.



With the input data (sent by the controller) monitor, you can forcibly change the value for the desired addresses and check those changes on the PLC by selecting ON for Manual Control during setup mode.

4 Select [Close].

Troubleshooting

Problems and Countermeasures

I want to check whether the EtherCAT connection has been established successfully.

On the controller, check [Utilities] - [EtherCAT Monitor & Diagnostics]. When [Disconnected] is shown here, the communication has failed. Check again the cable connection, Device ID, and the communication settings on the PLC.

The Result OR flag is not output.

The Result OR flag is updated when the data output unit which uses EtherCAT as an output device is processed. At least one piece of data must be output via the data output unit from EtherCAT before the Result OR flag can be used.

The Result ready flag remains ON and does not change.

The Result ack flag may not be controlled properly. The Result ready flag turns off when the rise of the Result ack flag is recognized during sending (received by the controller). This is true whether the handshake is ON or OFF.

I tried to read data when the %Sto output from the terminal block changes to rise, but could not obtain the data properly.

The %Sto is a strobe signal dedicated to the data for the parallel terminal output unit. It cannot be used as a strobe signal for other data output.

For the data read timing through EtherCAT, reference the Result ready flag.

Error Messages

Error messages assigned to system variable %Error0

By default, these error messages are assigned to %Error0.

If necessary, you can change the assignments to %Error1 and you can clear the assignments to the system variable.

Message	Cause	Countermeasure	Error factor No.
EtherCAT communication has failed.	An error has occurred while starting communication or during communication, and communication cannot be performed correctly.	<ul style="list-style-type: none"> Check whether the Ethernet cable is connected correctly. Check whether the controller and master were restarted after updating the communication settings. Review settings such as the communication cycle and the timeout time on the PLC. 	353
EtherCAT module disconnected.	The EtherCAT unit is not recognized and the controller cannot use EtherCAT communication.	<ul style="list-style-type: none"> Make sure the EtherCAT unit is attached correctly. Make sure the EtherCAT unit is not damaged. Do not connect or disconnect the EtherCAT unit while the controller and unit are powered on. 	357

Error messages which are not assigned to either system variable %Error0 or %Error1

By default, the following error messages are not assigned to either %Error0 or %Error1, so that no output is provided even when the error occurs. You can assign them to %Error0 or %Error1 as necessary.

Message	Cause	Countermeasure	Error factor No.
External command error has occurred.	A command error has occurred during the processing of a command input from the following devices: <ul style="list-style-type: none"> PC application PLC-Link Ethernet RS-232C CC-Link Terminal block & parallel port EtherNet/IP PROFINET EtherCAT 	Review the command or program data.	128
Unable to write to EtherCAT output buffer.	The output buffer for EtherCAT is full.	Change the update time on the PLC so that the rate of data output to EtherCAT exceeds the rate of data output from the flowchart, or set the trigger interval longer (The result output is disabled while the output buffer is full.).	355
EtherCAT output buffer is full.	The output buffer for EtherCAT is full.	Change the update time on the PLC so that the rate of data output to EtherCAT exceeds the rate of data output from the flowchart, or set the trigger interval longer (When the output buffer is full, measurement is suspended until the buffer becomes available.).	356

Control/Data Output via No protocol communication

Overview of System Control/ Data Output

Control/Data Output via
External Terminals

Control/Data Output via
PLC-Link

Control/Data Output via
CC-Link

Control/Data Output via
EtherNet/IP

Control/Data Output via
PROFINET

Control/Data Output via
EtherCAT

► **Control/Data Output via No protocol communication**

FTP Client/Server Function

Overview of Control/Data Output via No protocol communication

Control and data output can be executed through no protocol mode using the RS-232C and Ethernet communication ports.

- RS-232C interface (Page 1-290)
- Ethernet Interface (Page 1-295)

No protocol communication via RS-232C

Getting Started

The system connects with a computer via an RS-232C cable, and measured values and judgment results can be output, and the system can be controlled via the RS-232C. Refer to, "Control via commands" (Page 2-2) for more details on controlling.

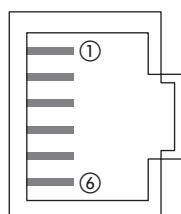
Standard specifications

- Connector: RJ-11 (port 1)
- Standards: The connected device must comply with EIA (Electronic Industries Association) RS-232C standards.

Item	Compatibility
Communication System	Full-duplex
Synchronous system	Asynchronous
Transmission Code	ASCII (Part binary code)
Data Length	8-bit
Stop-bit	1-bit/2-bit
Parity-bit	None/odd/even
Communication speed	9600/19200/38400/57600/115200/230400 bps
Start Delimiter	STX/ENQ/ASCII Code/None
End Delimiter	CR/CR + LF/LF/EXT/ASCII Code
Flow Control	None, CTS/RTS
Maximum cable length	15 m

Connector specifications (RS-232C port)

The specifications of the RS-232C port on the controller are as follows:



No.	Signal	Signal Description	Signal direction
1	CS (CTS)	Data Transmission Permission	Output
2	Not used	—	—
3	SD (TXD)	Data Transmission	Input
4	SG (GND)	GND	—
5	RD (RXD)	Data Reception	Output
6	RS (RTS)	Data Transmission Request	Input

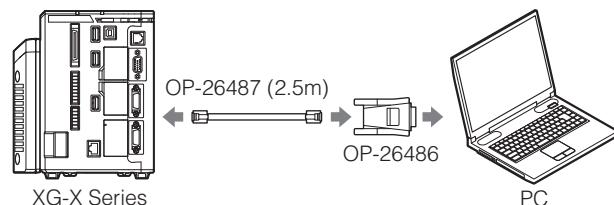
Reference

Since the controller uses the RS-232C modem definition, SD is assigned to input and RD is assigned to output.

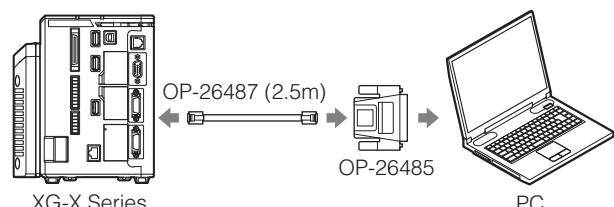
Connecting to a PC

The controller can be connected to your computer using a dedicated serial cable (optional).

When the PC has a D-sub 9-pin connector



When the PC has a D-sub 25-pin connector



Point

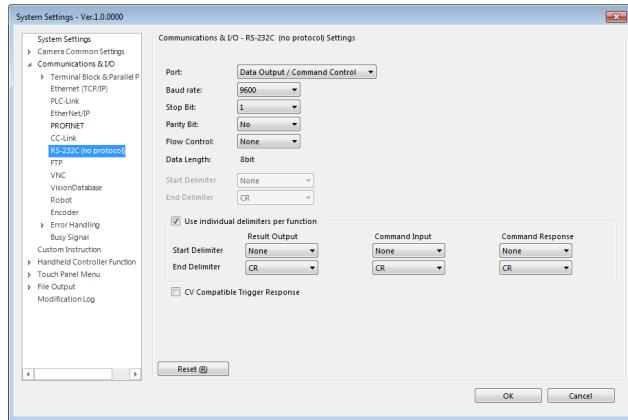
- In the connection examples above, flow control is not possible.
- Use the system setting details to select the system's communications settings and communications modes. Refer to, "Changing the settings" (Page 1-291) for more details. In addition, the No protocol mode baud rate and parity bits can be checked and changed via the [RS-232C (no protocol)] in the System settings.

Changing the settings

Displaying the RS-232C setting screen

Changing settings with XG-X VisionEditor

In the [RS-232C] menu in the XG-X VisionEditor System Settings, various settings for data input/output via no protocol can be changed and then uploaded to the controller.



- 1 Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

- 2 In the left pane of the [System Settings] menu, select [Communications & I/O] - [RS-232C (no protocol)].

The [RS-232C (no protocol)] menu appears.

- 3 Change the settings as required.

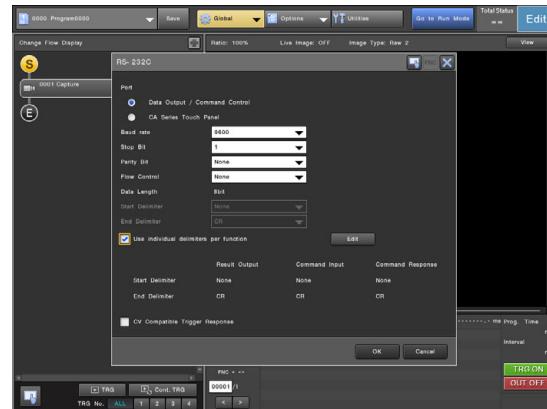
See "RS-232C Settings" (Page 1-292) for more details on each setting.

- 4 Click [OK].

Point To apply the changes to the controller, upload the global settings file to the controller and then restart the controller.

Changing settings with the controller

On the [RS-232C] menu in the Global settings, various settings for data input/output in no protocol can be changed.



- 1 On the [Global] menu at the top of the screen, select [Communications & I/O] - [RS-232C].

The [RS-232C] menu appears.

- 2 Change the settings as required.

See "RS-232C Settings" (Page 1-292) for more details on each setting.

- 3 To apply settings, click [OK].

RS-232C Settings

Port

Select the assignment of function to the RS-232C port from between [Data Output / Command Control] (default setting) or [CA Series Touch Panel].

 Point

If [Port] is changed using the touch panel, the touch panel can not be used after change is set. To restore it, you need a USB handheld controller (OP-87983) or a special mouse (OP-87506).

Baud rate

Select 9600 (default), 19200, 38400, 57600, 115200, or 230400 (bps) for the baud rate.

Stop Bit

Select [1] (default) or [2] for the stop bit.

Parity Bit

Select [None] (default), [Odd], or [Even] for the parity bit.

Flow Control

Select [None] (default) or [CTS/RTS] for the flow control.

Start Delimiter

The specified delimiter is output at the head of the output data.

- **STX:** STX (=0x02) is output as the start delimiter.
- **ENQ:** ENQ (=0x05) is output as the start delimiter.
- **ASCII Code:** The desired ASCII code value is output as the start delimiter.
- **None** (default): The start delimiter is not output.

End Delimiter

The specified delimiter is output at the end of the output data.

- **CR**(default): CR (=0x0D) is output as the end delimiter.
- **CR + LF:** CR (=0x0D) + LF (=0x0A) is output as the end delimiter.
- **LF:** LF (=0x0A) is output as the end delimiter.
- **ETX:** ETX (=0x03) is output as the end delimiter.
- **ASCII Code:** The desired ASCII code value is output as the end delimiter.

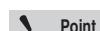
Use individual delimiters per function

When this option is checked, for each of the result data output, command reception, and command response, the start/end delimiters can be specified for each function.

- For the controller, select [Edit] to specify a desired value.
- The values which can be specified as the start/end delimiters are the same as those which can be specified with normal [Start Delimiter] and [End Delimiter] settings.

 Reference

When the [Use individual delimiters per function] option is checked, normal [Start Delimiter] and [End Delimiter] settings are not operated.

 Point

When the system settings are uploaded, the delimiter settings in the Ethernet settings are always uploaded to the controller regardless of whether or not [Include controller name and Ethernet settings.] is selected.

CV Compatible Trigger Response

If you select this check box, you can make trigger command responses compatible with the CV-5000 Series. For details, refer to "Detailed Setting of Non-protocol Communication" (Page 1-303).

An example of communicating with the controller using terminal software and no protocol mode

You can use terminal software to communicate with the controller. In this example, the operation process using Tera Term (free software) is described.

Reference See the following URL for details on Tera Term (as of January 2019).
ja.osdn.net/projects/ttssh2/releases/

1 Prepare terminal software.

Install terminal software such as Tera Term (freeware).

2 Start terminal software on your PC and configure settings for the host.

- Host: Select [Serial].
- Port: Select the port used for RS-232C communication of the PC.

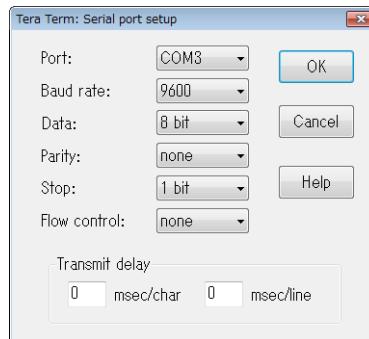
Example of host settings in using Tera Term



3 Set the communication speed.

Change settings according to the settings of the controller.

Example of host settings in using Tera Term



4 Connect the host.

If Tera Term is used, click [OK] after configuring the host computer connections.

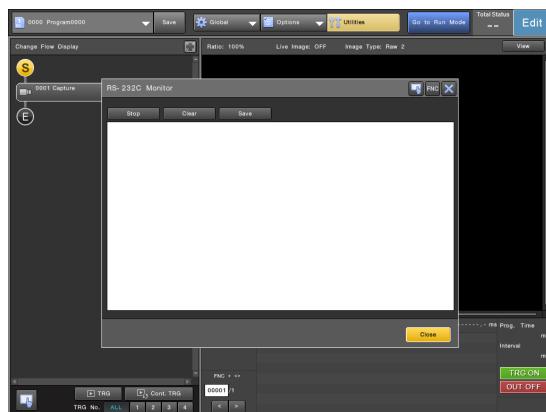
See "Standard instruction" (Page 2-9) for more details on issuing commands.

Verifying the Status of RS-232C Communication

The RS-232C Diagnostic tool allows for the checking of the status of incoming and outgoing signals via the RS-232 port of the controller. This feature is very useful for verifying the communication status and content between the controller and external equipment. The most recent communication content (up to 10 KB) can also be saved for later review.

1 From the [Utilities] menu at the top of the screen, select [RS-232C Monitor].

The [RS-232C Monitor] menu appears.



2 Verify the communication status.

The communication data is updated in response to incoming and outgoing RS-232C commands.

- A "<" appears at the beginning of the data when output from the controller, and a ">" appears at the beginning of the data when received by the controller.
- Characters other than ASCII code are displayed as hexadecimal.



In Offline mode, the only RS-232 communication output that occurs are responses to commands sent from external devices. To check whether data output from the program is functioning correctly, switch to Run mode.

3 Use the following operations as required.

- **To stop data being displayed on screen:** Click [Stop].
- **To clear the log:** Click [Clear].
- **To save the log to the SD card:** Click [Save] to save the log as text data. The log is saved in the "`xg\rs_log`" folder on the specified SD card with the name "File creation date YYMMDD_HHMMSS_SD No._ProgramNo.log".



The SD card slot can be specified in [System Settings] - [File Output] - [RS-232C / Ethernet (TCP/IP) Log] - [Save to] in the XG-X VisionEditor (default: SD2).

4 Click [Close].

No protocol communication via Ethernet

Getting Started

When the controller is connected to a PC through the Ethernet cable, the measurement values or judgment results can be output through Ethernet or the system can be controlled. See "Control via commands" (Page 2-2) for more details on control.

- Consult your system administrator or network administrator when connecting to an existing LAN. If any incorrect settings are made, the controller as well as other network equipment may not work properly.
- The controller may truncate parts of the output data, depending on the network conditions. (The controller does not resend data with packet loss)
- Some delays may occur during data transmission between the network and the controller, depending on the network conditions. If a response is required, such as a trigger input, communicating via the I/O interface is recommended.
- If a firewall is present on the FTP server or the network of the FTP server, the connection may fail. In this case, you need to disable the firewall or take other measures.
For details, consult the network administrator or manufacturer of the PC.
- Use equipment that is intended for use in a factory environment (such as hubs and LAN cables) for the network. Using commercial equipment meant for office applications may cause unstable operation.

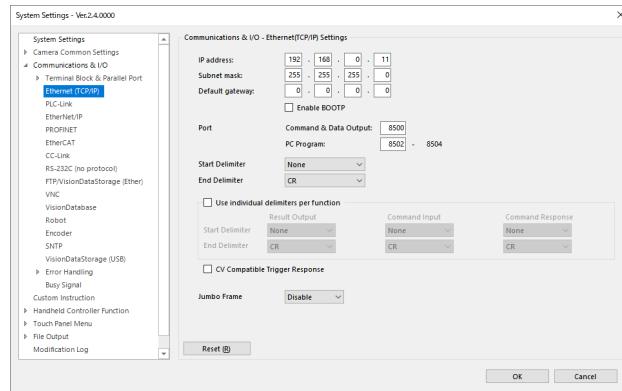
Point

Changing the settings

Displaying Ethernet setting screen

Changing settings with XG-X VisionEditor

In the [Ethernet] menu in the XG-X VisionEditor system settings, various settings for data input/output via no protocol can be changed and can then be uploaded to the controller.



- 1 Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

- 2 In the left pane of the [System Settings] menu, select [Communications & I/O] - [Ethernet (TCP/IP)].

The [Ethernet (TCP/IP)] menu appears.

- 3 Change the settings as required.

See "Ethernet settings" (Page 1-296) for more details on each setting.

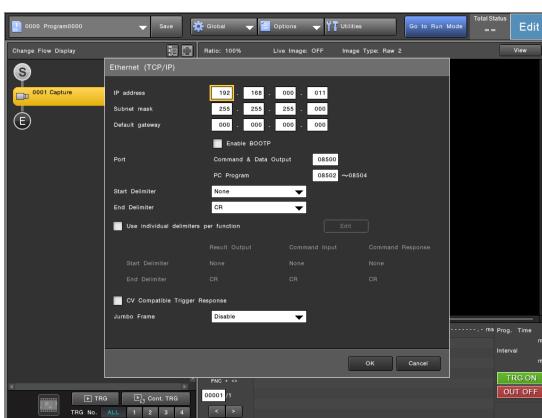
- 4 Click [OK].

Point

To apply the changes to the controller, upload the global settings file to the controller and then restart the controller.

Changing settings with the controller

On the [Ethernet] menu in the global settings, various settings for data input/output via no protocol can be changed.



- 1 On the [Global] menu at the top of the screen, select [Communications & I/O] - [Ethernet (TCP/IP)].

The [Ethernet (TCP/IP)] menu appears.

- 2 Change the settings as required.

See "Ethernet settings" (Page 1-296) for more details on each setting.

- 3 To apply settings, click [OK].

Ethernet settings



If incorrect settings are used, the controller and other network equipment may not work properly. Consult your system administrator or network administrator about setting values.

IP address

Enter the IP address of the controller (Default value: 192.168.0.10).

Subnet mask

Enter a subnet mask (Default value: 255.255.255.0).

Default gateway

Enter a default gateway IP address (Default value: 0.0.0.0).



- The IP address specified as the destination for archive data using FTP must be unique.
- If the PLC-Link (Ethernet) is enabled, the IP address must not be the same as the IP address on the other end of the PLC link.
- If PLC-Link (Ethernet) or EtherNet/IP is enabled and the settings are changed, the controller must be restarted for changes to take effect.

Enable BOOTP

Select this option when the network setting information (IP address, subnet mask, and default gateway) is provided by a BOOTP server when the controller starts up. (Default: Invalid). The provided network information is used in the global settings. If retrieval of information from the BOOTP server fails at the next startup, the system will start with the saved settings.



- When BOOTP is enabled, the settings of the IP address, sub-net mask, and default gateway cannot be changed on the [Ethernet] menu.
- If the BOOTP server is not started, the controller retries BOOTP processing for about 3 minutes at startup. To interrupt the BOOTP processing, press the ESC key on the console.
- If a retry times out, the system starts operation with the network setting saved in the global settings.



The verified BOOTP servers are:

- IP Setting Tool by Keyence
- BOOTP-DHCP server by Rockwell Automation, Inc.
- BootP server by WAGO

Port

Enter the port number used for data I/O on the controller.

- **Command & Data Output:** Enter the port number used for non-protocol specific commands and data output. (Default: 8500).
- **PC Program:** Enter the port number used to communicate with PC programs (XG-X VisionEditor, XG-X VisionTerminal, and ActiveX controls). (Default: 8502) Note that PC programs use three consecutive ports from the specified number. For example, when 8710 is specified, ports 8710 to 8712 are used by PC programs; and when 10108 is specified, ports 10108 to 10110 are used.

-  **Point**
- The same port number cannot be specified for [Command & Data Output], [PC Program], and [VNC Server Setup].
 - In addition to the above port numbers, port number 9010 is also used when communicating with Keyence software.

Start Delimiter

The specified delimiter is output at the head of the output data.

- **STX:** STX (=0x02) is output as the start delimiter.
- **ENQ:** ENQi=0x05) is output as the start delimiter.
- **ASCII Code:** The desired ASCII code value is output as the start delimiter.
- **None** (default): The start delimiter is not output.

End Delimiter

The specified delimiter is output at the end of the output data.

- **CR**(default): CR (=0x0D) is output as the end delimiter.
- **CR + LF:** CR (=0x0D) + LF (=0x0A) is output as the end delimiter.
- **LF:** LF (=0x0A) is output as the end delimiter.
- **ETX:** ETX (=0x03) is output as the end delimiter.
- **ASCII Code:** The desired ASCII code value is output as the end delimiter.

Use individual delimiters per function

When this option is checked, for each of the result data output, command reception, and command response, the start/end delimiters can be specified for each function.

- For the controller, select [Edit] to specify a desired value.
- The values which can be specified as the start/end delimiters are the same as those which can be specified with normal [Start Delimiter] and [End Delimiter] settings.



When the [Use individual delimiters per function] option is checked, normal [Start Delimiter] and [End Delimiter] settings are not operated.



When the system settings are uploaded, the delimiter settings in the Ethernet settings are always uploaded to the controller regardless of whether or not [Include controller name and Ethernet settings.] is selected.

CV Compatible Trigger Response

If you select this check box, you can make trigger command responses compatible with the CV-5000 Series. For details, refer to "Detailed Setting of Non-protocol Communication" (Page 1-303).

MAC Address (Controller only)

MAC address of the controller is displayed (Cannot be changed).

Jumbo Frame

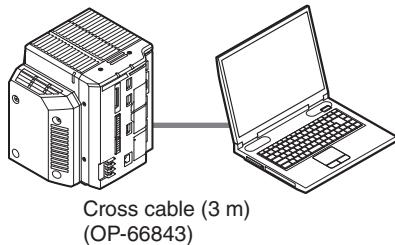
When performing communication with jumbo frames, select [4kB] (default: disabled).



When using jumbo frames, all devices on the network must support jumbo frames.

One-to-one connection with a PC

This section describes how to prepare and communicate when the controller is controlled in a one-to-one connection with a PC, and not via the LAN. To connect to your PC, an optional cross cable (3 m) OP-66843 should be used.



Connecting the controller to a PC

1 Change the TCP-IP settings on the controller.

The system uses the TCP/IP settings specified in the System Settings in XG-X VisionEditor. For more details, refer to "Controller System Settings" in the XG-X VisionEditor Reference Manual.

The IP address, subnet mask, and default gateway settings can be viewed and changed using [Ethernet] on the system settings.

2 Change the TCP-IP settings on a PC.

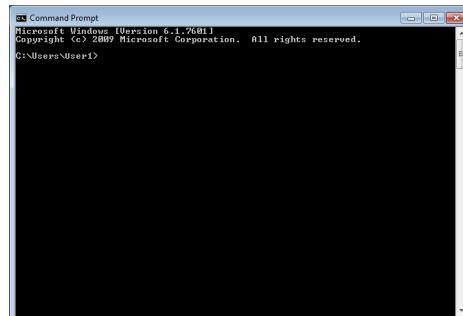
When the controller is directly connected to a PC with a cross cable, set the IP address between 192.168.0.1 and 192.168.0.255 excluding 192.168.0.10 (when the subnet mask of the controller and PC are 255.255.255.0).

See the instruction manual for your computer or LAN settings for more information.

3 Turn off the controller and the PC and connect the Ethernet connector on the PC to the Ethernet port using a cross cable.

4 Turn on the controller and the PC.

5 Start [Command Prompt] on the PC.

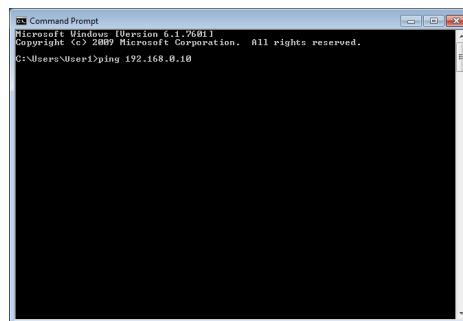


To start the command prompt (Windows 7), click the [Start] menu then click [All Programs] - [Accessories] - [Command Prompt].

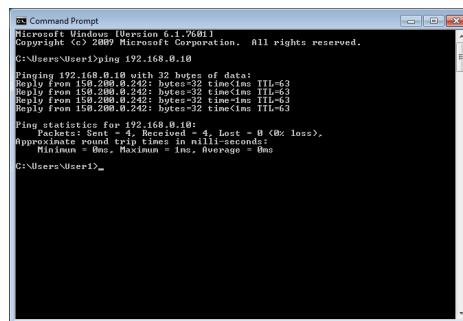
6 Enter [ping] followed by the IP address of the controller in alphanumeric characters and press the Enter key.

When the IP address of the controller is [192.168.0.10]

Enter [ping 192.168.0.10].

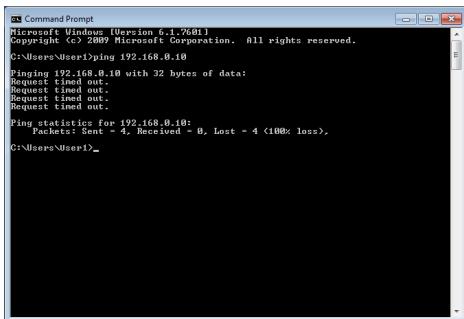


If the controller and the PC are properly configured, a message [Reply from (the IP address of the controller) ~] will appear.



When [Request timed out] appears

If a message [Request timed out] appears and the correct IP address of the controller has been specified in the ping command, the setting and configuration of the controller and the PC is incorrect.



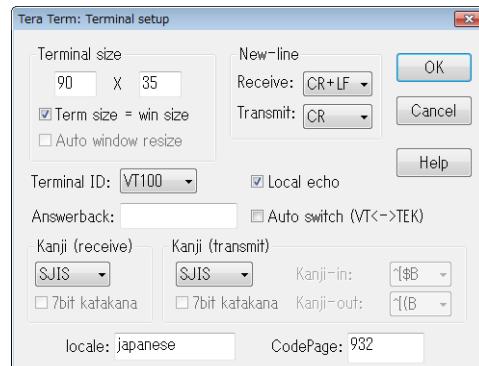
Check that the steps from 1 to 4 described on the previous page have been properly performed.

3 Connect the host.

If Tera Term is used, click [OK] after configuring the host computer connections.

The command system used in communication is the same as that of the no protocol mode in RS-232C. For more details, refer to "Standard Instruction" in the XG-X VisionEditor Reference Manual.

Setting example of Tera Term Terminal Setup



An example of communicating with the controller using Telnet software and no protocol mode

You can use Telnet software to communicate with the controller. In this example, the operation process using Tera Term (free software) is described.



See the following URL for details on Tera Term (as of January 2019).
ja.osdn.net/projects/ttssh2/releases/

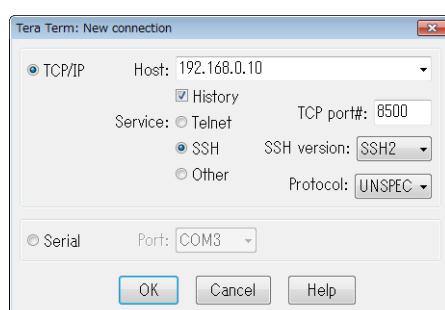
1 Prepare Telnet software.

Install Telnet software such as Tera Term (freeware).

2 Start Telnet software on your PC and configure settings for the host.

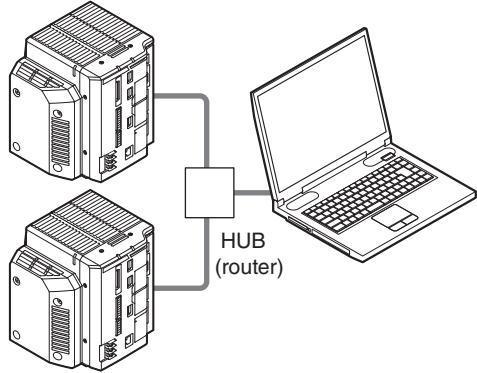
- Host: Enter the IP address of the controller. (Default value: 192.168.0.10)
- Enter the communication port specified for the controller. (Default value: 8500).

Example of host settings in using Tera Term



One-to-n connection with a PC

This section describes how to setup communications when more than one controller is controlled by one PC via a LAN.



Differences between one-to-one connections and one-to-n connections

Preparation and control methods for one-to-n connection are basically the same as those for one-to-one connection.

However, the following points differ.

- To connect multiple controllers, a hub or router that supports 1000BASE-T or 100BASE-TX is required. (Keyence recommends 1000BASE-T.)
- To connect a controller to a hub (or router), use a commercial straight cable. Keyence recommends using a shielded twisted pair (STP) straight cable, category 5e or greater.
- The IP addresses of the controllers on the network and that of the PC must be different to prevent communication breakdown.

An example of using two controllers (In this example the subnet mask of the controller and PC is

255.255.255.0)

- IP address of the first controller: 192.168.0.10 (default)
- IP address of the second controller: 192.168.0.11 (changed because the default value would be the same as first controller)
- The IP address of the PC: 192.168.0.12 (changed to not interfere with the other addresses but using the same first three ABC classes)
- If a router is used, the Ethernet settings of the controllers must be changed according to the settings of the router. For more details, see the instruction manual of the router or consult your system or network administrator.

Notes on one-to-n connections

- Multiple controllers cannot exchange data with each other or control each other.
- The maximum number of computers that can be connected at once depends on the software and hardware of the devices connected. For more details, contact the manufacturer of the software or hardware of the devices connected.
- Consult your system administrator or network administrator when connecting to an existing LAN. If any incorrect settings are made, the system, as well as other network equipment may not work properly.

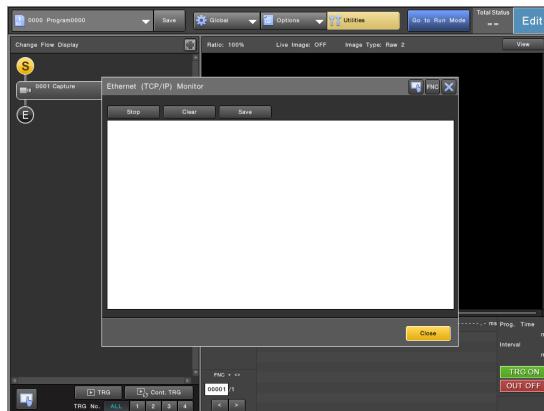
The baud rate and /or connection stability may vary depending on the combination of connected devices and the network status. Make sure to check the operational functionality of the network before starting actual operation.

Checking the Ethernet Communication Status (Ethernet (TCP/IP) Monitor)

You can check the system's Ethernet communication status on the controller's Ethernet (TCP/IP) monitor. This function is convenient because it allows you to check communications content when connected to an external device in situations such as when the appropriate data cannot be communicated between connected devices.

- From the [Utilities] menu at the top of the screen, select [Ethernet (TCP/IP) Monitor].

The [Ethernet (TCP/IP) Monitor] screen is displayed.



- Now check the communication status.

The current communication content is changed real time according to the command input/output.

- "<" is given to the head of the output data from the controller while ">" is given to the head of the input data to the controller.
- Numbers other than ASCII code are displayed in "Hexadecimal".

Reference

In setup mode, communication output other than response for external input commands is not performed. If you want to check the data output operation, switch to run mode.

- Use the following operations as required.

- To temporarily stop updating the content displayed on the screen: Click [Stop].
- To clear the log: Click [Clear].
- To save the log to the SD card: Click [Save] to save the log as text data. The log is saved in the "`\xg\rs_log`" folder on the specified SD card with the name "File creation date YYMMDD_HHMMSS_SD No._ProgramNo.log".

Reference

The SD card slot can be specified in [System Settings] - [File Output] - [Screen Capture] - [Save to] in the XG-X VisionEditor (default: SD2).

- Select [Close].

Outputting result data via no protocol communication

Change the settings of the data output unit in the flowchart so that the data will be output from the specified no protocol communication interface.

Reference For more details, see "Data Output Unit" in the XG-X VisionEditor Reference Manual.

- Point**
- Data can only be output when the controller is in run mode. Data cannot be output in other modes.
 - Images cannot be output via no protocol communication. To output images or other binary data, select PC Program (XG-X Vision Terminal or ActiveX control) as the destination.

1 In Flowchart View, double-click the data output unit to change its settings.

The properties menu of the data output unit is displayed.

2 Click the [Output Settings] tab.

3 Specify details for the output data.

Reference When using no protocol communication, it is unnecessary to change settings on the [Protocol Details] tab of the data output unit.

Output Method

Specify the destination of the data output.

- **RS-232C**: Output data to RS-232C.
- **Ethernet (TCP/IP)**: Output data to Ethernet.

Point The available destination varies depending on the [System Settings] menu settings.

Reference Some setting items in the [Output Settings] tab change depending on the specified destination.

Data Format

Define the format of the data to be output.

When the [Format Setting] menu is displayed, combine the following setting items to define format 1 to 16.

- **+/- prefix**: Check this option to add a + sign to a positive value for output.
- **Zero suppression**: Check this option to use zero suppression.
- **No. digits**: Specify the number of integer digits.
- **No. Decimal places**: Specify the number of decimal places.

Output List

Specify the output data (256 lines maximum).

- **Format**: Specify the format of the data to be output.
 - **Auto**: Output data using the format of the referenced result data.

- **Format 1 to 16**: Output data using the format setting defined in the [Data output format setting] dialog.

- **Character**: Output the data as character strings.

- **Non-ASCII**: Output the data as control characters.

- **ASCII Code**: The output content is replaced to the 1-byte ASCII code value (0x01 to 0x7F) and output.

Point

- If [PLC-Link], [CC-Link], [EtherNet/IP], [PROFINET], or [EtherCAT] is selected for [Output Method], settings are limited as follows:

- If Character, Non-ASCII, or ASCII Code is selected as the format, the item line is grayed out, and the data are excluded from the output.
- If [Format 1 to 16] is selected as the format, data is output but not using the pre-determined format setting.
- If [Auto] is selected, variables are set to "use +/- prefix", "zero suppression: OFF", and "7 integer digits, 3 decimal places".

• **Item**: Specify the data to be output such as variables, result data, desired character strings, or control characters. To assign a variable or result data, including an array, describe the index (from 0) to start output directly in the setting.

• **Number**: When array type data is specified, enter the number of data pieces to be output.

• **Preview**: Check the data output based on the specified data and quantity.

• **▲/▼**: Move the selected line upward or downward.

Reference When [Auto] is selected for [Format], the format of a variable will automatically be set to "use + prefix", "zero suppression: OFF", and "7 integer digits and 3 decimal places".

Delimiter

Select the character to separate the output data and header from a comma, tab, space, or none (do not use a delimiter).

Full output buffer

Specify which should have priority when the output buffer becomes full: Image processing (flowchart transition) or data output.

• **Skip output item**: Give priority to image processing and skip data output temporarily.

• **Wait for free space**: Give priority to data output and resume image processing after data output is complete.

4 Click [OK].

If there is any other data output unit in the flowchart, repeat the steps from step 1 for each unit.

Detailed Setting of Non-protocol Communication

According to your implementation environment, the trigger command response of the controller can be changed to the format compatible with the CV-3000/5000 series controller and the data delimiter for custom instructions can be changed to a desired character.

Processing the trigger command response in CV compatible mode

The trigger command response can be changed to the format compatible with the CV-3000/5000 series controller. When the XG-X series controller is implemented in the inspection that has used a CV-3000/5000 series controller, setting changes on other devices on the line can be minimized.

Operation in CV compatible mode

Operating conditions

When the conditions below are satisfied, the system operates in the mode compatible with the CV-3000/5000 series controller (CV compatible mode).

- [CV Compatible Trigger Response] is valid.
- The data output unit in which RS-232C or Ethernet is specified as the output device is available (One or more output items are specified in the data output unit concerned).

Trigger command response in CV compatible mode

The CV compatible mode operates as follows:

- With any input from T1 to T4, response as T1 is given.
- "T1," is output from the data output unit.
 - "T1<Specified delimiter>" is given and output.
 - Even when the trigger is input through any route such as terminal input, ActiveX, internal trigger, etc., "T1<Specified delimiter>" is given and output.
- In error response, response of "ER,T1,**" is given for any of T1 to T4.



Point

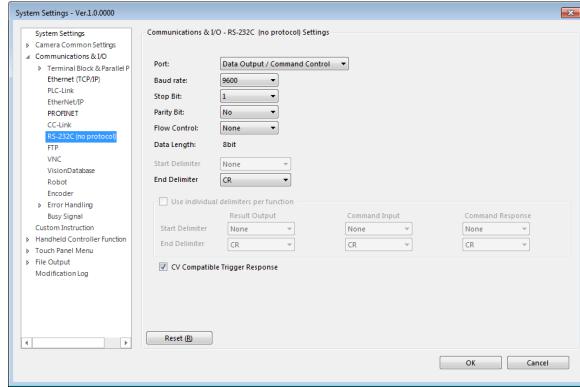
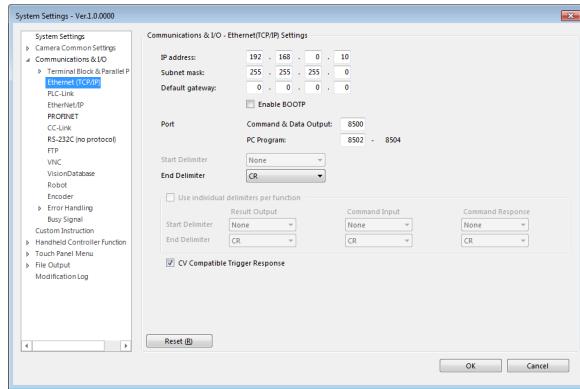
-
- The response for the command input from ActiveX is neither in accordance with the Ethernet settings nor RS-232C settings.
 - When multiple capture units are provided and the flow is changed by several inputs of triggers, the data output unit adds "T1," to the head in the CV compatible mode whatever number of times T1 to T4 are input (Although there is no individual trigger response, error response for T1 to T4 is individually returned).
 - Even in the CV compatible mode, when [Execute] of the data output unit is [Never Execute] or when the data output unit is not executed once as the result of flow branching, response for T1 to T4 is not returned.
 - When the CV compatible mode is enabled, the following are set.
 - The start delimiter is fixed to [None]. The end delimiter can be set to either [CR] or [CR+LF]. (The delimiter setting for each function is disabled.)
 - The [Delimiter] setting for the custom instruction setting and the output unit of result data are disabled. ([Comma] is always applied as the data delimiter.)

To change the setting in XG-X VisionEditor

Check the [CV Compatible Trigger Response] option on the [RS-232C] screen and [Ethernet] screen in the system settings.

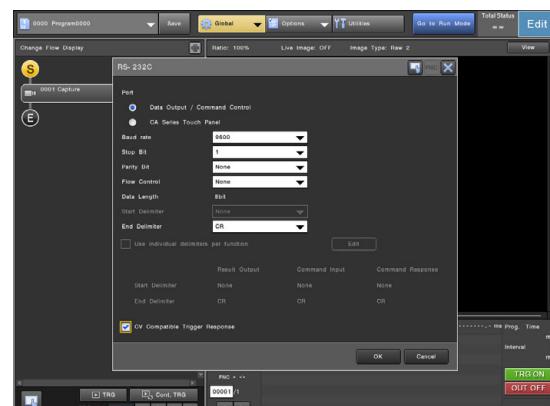
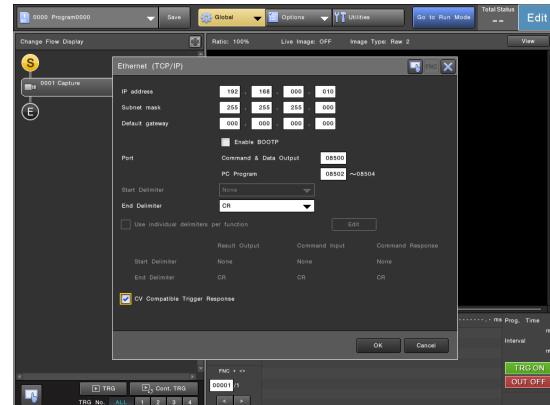


When the system settings are uploaded, the CV compatible mode settings are always uploaded to the controller regardless of whether or not [Include controller name and Ethernet settings] is selected.



To change the settings with the controller

Check [CV Compatible Trigger Response] on the [RS-232C] screen and [Ethernet] screen in the Global settings.



Specifying a desired data delimiter of the custom command

When a custom instruction is executed with its name in non-protocol communication (Ethernet and RS-232C), a desired data delimiter can be specified for the custom instruction.

Delimiter which can be specified

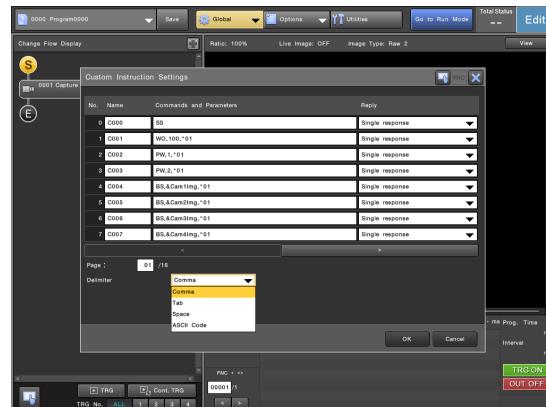
- Comma** (default): Comma is output as the delimiter.
- Tab**: Tab is output as the delimiter.
- Space**: Space (blank) is output as the delimiter.
- ASCII Code**: The desired ASCII code value is output as the delimiter.



- If the following errors occur due to input of the built-in command, the delimiter set here is applied.
- 02: Command error (There is no applicable command.)
 - 91: Time out error

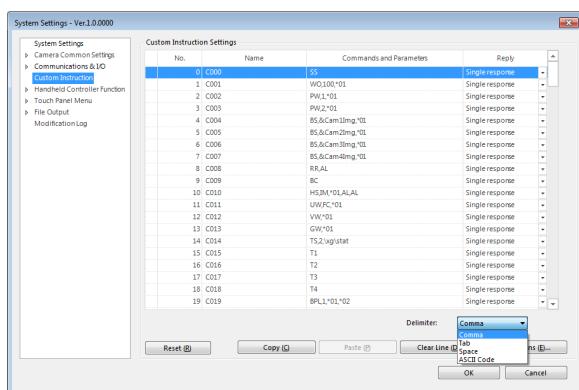
To change the settings with the controller

Change settings in the [Delimiter] field on the [Custom Instruction Settings] screen in the Global settings.



To change the setting in XG-X VisionEditor

Change settings in the [Delimiter] field on the [Custom Instruction] screen in the system settings.



Troubleshooting

Error Messages

Error Messages Assigned to System Variable %Error0.

The error messages below are assigned to %Error0 by default.

The errors assigned to %Error0 can be removed or switched to %Error1 as desired.

Error Message	Cause	Corrective Action	Error Code
Ethernet cable is not connected.	An error occurred with the LAN cable when using Ethernet as the destination for a data output unit.	<ul style="list-style-type: none"> Make sure the LAN cable is connected to the controller and the PC. Make sure there are no problems (kinks, breaks etc) with the Ethernet or USB cable. Check the LAN cable type (cross, straight). Make sure the orange LED connection indicator of the Ethernet connector is lit. 	144
Ethernet communication has failed.	An error occurred in the Ethernet connection when using Ethernet as the destination for a data output unit.	<ul style="list-style-type: none"> Check whether the PC / PLC at the other end of the connection is ready to transmit/receive data. Check that the communication software for Ethernet is running on the PC / PLC and that the PC / PLC is connected with the controller. 	145
An Ethernet communication time out error has occurred.	Ethernet communication has been down for 10 or more seconds when using Ethernet as the destination for a data output unit.	<ul style="list-style-type: none"> Check whether the PC / PLC at the other end of the connection is ready to transmit/receive data. Check that the communication software for Ethernet is running on the PC / PLC and that the PC / PLC is connected with the controller. 	146
An RS-232C communication time out error has occurred.	RS-232C communication has been down for 60 or more seconds when using RS-232C as the destination for a data output unit.	<ul style="list-style-type: none"> Make sure flow control is not set to [Enable] in the RS-232C settings. Make sure hardware flow control is not enabled on the PC / PLC. Make sure the serial cable is not disconnected. 	162

Errors Messages not Assigned to System Variables %Error0 or %Error1

These errors by default are not assigned to %Error0 or %Error1 but can be assigned through the XG-X Vision Editor software.

Error Message	Cause	Corrective Action	Error Code
External command error has occurred.	An error occurred when executing a command from one of these devices: <ul style="list-style-type: none">• PC Program• PLC-Link• Ethernet• RS-232C• CC-Link• Parallel Port• EtherNet/IP• PROFINET• EtherCAT	Review the command being sent, the program settings or the device status.	128
Unable to write to Ethernet output buffer.	The controller output buffer for outputting via the Ethernet port is full.	Reduce the amount of data to be output via Ethernet, so the data is output at a faster rate than it builds up. Or extend the time between triggers / processing to allow for data to be output. Note: Results data are not written when the buffer is full.	147
Ethernet output buffer is full.	The controller output buffer for outputting via the Ethernet port is full.	Reduce the amount of data to be output via Ethernet, so the data is output at a faster rate than it builds up. Or extend the time between triggers / processing to allow for data to be output. Note: Inspections processing can be put on hold until the buffer becomes free.	148
Unable to write to RS-232C output buffer.	The controller output buffer for outputting via the RS-232C port is full.	Reduce the amount of data to be output via RS-232C, so the data is output at a faster rate than it builds up. Or extend the time between triggers / processing to allow for data to be output. Note: Results data are not written when the buffer is full.	163
RS-232C output buffer is full.	The controller output buffer for outputting via the RS-232C port is full.	Reduce the amount of data to be output via RS-232C, so the data is output at a faster rate than it builds up. Or extend the time between triggers / processing to allow for data to be output. Note: Inspections processing can be put on hold until the buffer becomes free.	164

FTP client/server function

Overview of System Control/ Data Output

Control/Data Output via
External Terminals

Control/Data Output via
PLC-Link

Control/Data Output via
CC-Link

Control/Data Output via
EtherNet/IP

Control/Data Output via
PROFINET

Control/Data Output via
EtherCAT

Control/Data Output via
No protocol communication

► **FTP Client/Server Function**

Using the FTP Client/ Server functions

The FTP (File Transfer Protocol) client/server function allows access via the Ethernet interface to an FTP server (VisionDataStorage or PC, a network-enabled hard disk with FTP server capability) and is used for various purposes including the following.

[**Outputting archived data with the FTP Client Function \(Page 1-309\)**](#)

Files can be outputted to an FTP server by specifying [FTP] as the output destination for archived data (images and results) which was stored with the archive function on the controller.

Files can also be output to an FTP server that supports SFTP (SSH File Transfer Protocol).

[**Directly access the controller's SD card from an external FTP client via the FTP server function \(Page 1-314\)**](#)

By causing the controller to function as an FTP server, the controller's SD card can be directly accessed from an external FTP client so that files can be sent and received, and deleted, and folders can be created/deleted.

Outputting Archived Data with the FTP Client Function

Files can be outputted to an FTP server by specifying [FTP] as the output destination for images and data when using the image archive function on the controller. Additionally, it can be specified as the output destination for the desired measurement results from the data output unit and image data of the image variable from the image output unit.

- This function supports output of measurement result data, image data of image variables and archive data (archive images and archive result data). The output of other data and files is not supported. To output result files and large image files, an FTP server that supports the APPE command is required.
- Other than PCs, a commercially-available network-enabled hard disk called NAS (Network Attached Storage) can be used as an FTP server to receive data, as long as it has FTP server capability. To output result files and large image files, a NAS that supports the APPE command is required. Regarding the availability of FTP server functionality and APPE command support, check with the NAS manufacturer.
- If a firewall is present on the FTP server or the network of the FTP server, the connection may fail. In this case, you need to disable the firewall or take other measures. For details, consult the network administrator or manufacturer of the PC.
- Data output using the FTP client function can be used in conjunction with any other communication methods, including those that use the Ethernet port. If data is output using several different methods, the communication speed of the controller may be slow in comparison with the output speed when using a single method.

Reference

For more details on the archive function, refer to the XG-X VisionEditor Reference Manual.

Changing the FTP Settings on the Controller

Specify the settings of the FTP server to which the data will be output.

Reference

These settings are shared with the FTP server settings for the master OK/NG images in retest mode. For more details on retest mode, refer to the XG-X Series User's Manual.

Before changing the settings

Configure the FTP server and obtain the following setting parameters.

- IP address of the FTP server: The address must be unique on the network including the controller.
- User name to log in to the FTP server
- Password to log in to the FTP server
- Home directory of the logged in user

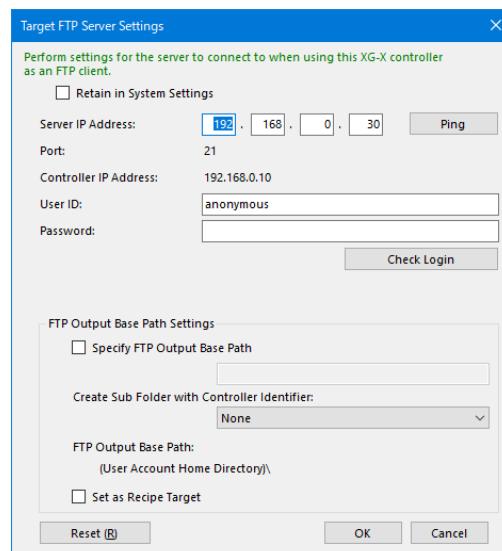
Changing the settings

- 1 Select [Other Settings] - [Target Server Settings] - [FTP] from the [Various Settings] menu on the [Program Setting] tab.**

The [Target FTP Server Settings] menu appears.

- 2 Enter [Server IP Address], [User ID] and [Password] used to log in, and then click [OK].**

Confirm settings of the target FTP server before entering the parameters (default: 192.168.0.30 for the server IP address, "anonymous" for the user ID and a blank space for the password).





For the address of the FTP server, specify a unique value that is different from the other IP addresses on the network including the controller IP address displayed in the menu (default: 192.168.0.10).



- Use [Ping] and [Check Login] to check the connection to and login on the FTP server set with [Server IP Address].
- To set the controller IP address and other Ethernet port settings, select [Communications & I/O] - [Ethernet (TCP/IP)] in the left pane of the [System Settings] menu. See the XG-X VisionEditor Reference Manual for more details.

Retain in System Settings

When this option is selected, the target FTP server settings are retained as system settings.



[Retain in System Settings] is commonly applied to all programs in the controller. If the [Retain in System Settings] check box is selected for any one of the programs, the [Target FTP Server Settings] will be retained in the system settings even for the other programs.

Specify FTP Output Base Path

When this option is selected, the base path for FTP output can be specified.

Note that the base path specified here applies to all FTP outputs such as archive output, result output (data and image) and target classification output.

Create Sub Folder with Controller Identifier

Select the subfolder name for controller identification from the format below.

- **None** (default): Subfolder is not created.
- **IP address**: Uses the controller IP address as the subfolder name.
- **%ControllerId**: The content of system variable %ControllerId is used as the subfolder name.
- **Controller Name**: The controller name is used as the subfolder name. The controller name can be specified by [System Settings] - [Controller Name] in the system settings (for XG VisionEditor) or [System Settings] - [Controller Name] in Setup mode (for controller).
- **PROFINET Device Name**: The PROFINET device name is used as the subfolder name. Note that the subfolder specified here applies to all FTP outputs such as archive output, result output (data and image), and target classification output.



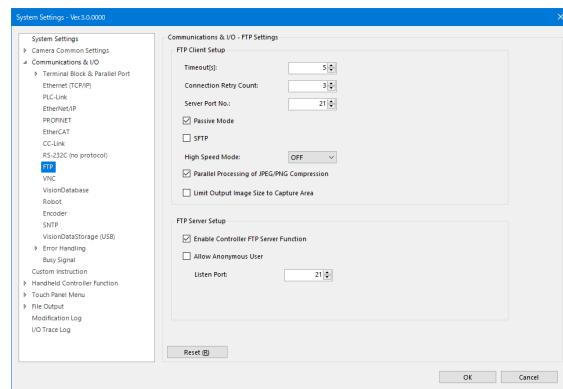
- If [Controller Name] is selected without setting of the controller name, the subfolder is not created and the action is the same as [None].
- When using SFTP (Page 1-310), only ASCII characters can be used.

Set as Recipe Target

When this option is selected, the FTP output base path settings can be set to be recipe targets. Refer to the XG-X VisionEditor Reference Manual for more details on the recipe functions.

3 When necessary, change the detailed FTP settings by selecting [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

When the [System Settings] menu appears, select [Communications & I/O] - [FTP] in the left pane to display the FTP client settings.



In normal situations, it is unnecessary to change the default values.

Timeout

Enter the timeout period in seconds to wait for a response from the FTP server during data output (default: 5 seconds).

Connection Retry Count

Enter the number of attempts to log in when logging in to the FTP server fails (default: 3).



The timeout period to wait for a response from the FTP server during image output and data output changes depending on the [Connection Retry Count] setting.

Server Port No.

Enter the port number of the FTP server used for control (default: 21 [22 when using SFTP]).

Passive Mode

Click to check this option when using FTP in passive mode (default: ON (Passive mode)).

SFTP

Select this check box when using SFTP transmission (default: OFF).

Point

- When using SFTP, it is recommended to disable the FTP server function (Page 1-314) to further increase security.
- When the [SFTP] check box is selected, the default [Server Port No.] setting changes to 22.
- FTP output to a VisionDataStorage is not supported for SFTP transmission. When using SFTP with a VisionDataStorage, use the dedicated USB cable (OP-88263: sold separately) for output to the VisionDataStorage.

High Speed Mode

Increases the processing priority of the FTP client and increases the data output speed. (default: OFF).

Point

When high speed mode is enabled, the response time for screen updates and other operations may be slower than when high speed mode is disabled.

Parallel Processing of JPEG/PNG Compression

Select this check box if you wish to process the image compression process in parallel when outputting images in JPEG/PNG format to an FTP server (default: ON).

JPEG/PNG compression of multiple camera images can be processed in parallel to reduce output time, for example, when outputting from multiple cameras simultaneously with a single image archive setting.

Point

- This is disabled when a CA-HF6400C is used.
- This is disabled in the XG-X2900LJ.

Limit Output Image Size to Capture Area

Select this check box to limit the size of the output image to the image capture area (default: OFF).

Changing the Archive Function Settings on the Controller

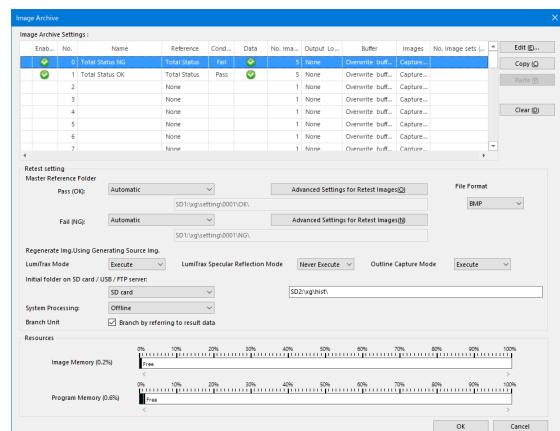
Specify the FTP server as the output destination to store archived data.

Reference

This section explains procedures from the state where setting of archive data storage settings on the controller has been completed. For more details on the archive function, see the XG-X VisionEditor Reference Manual.

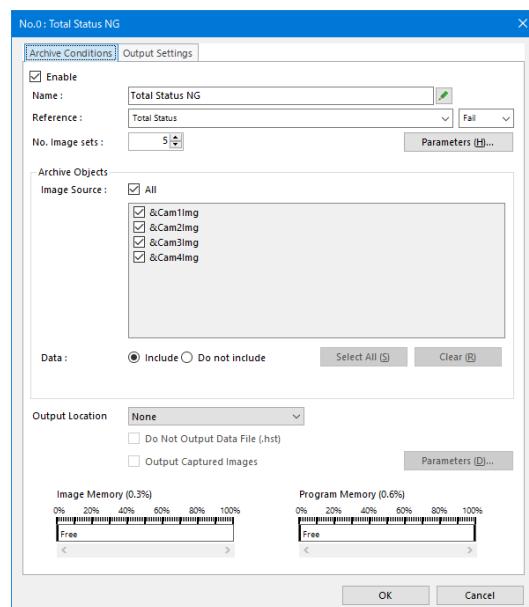
1 Select [Image Archive] from the [Various Settings] menu on the [Program Setting] tab.

The [Image Archive] screen appears.



2 Select the number of the archive condition to output archived data, and then click [Edit].

The [No.X] screen appears.



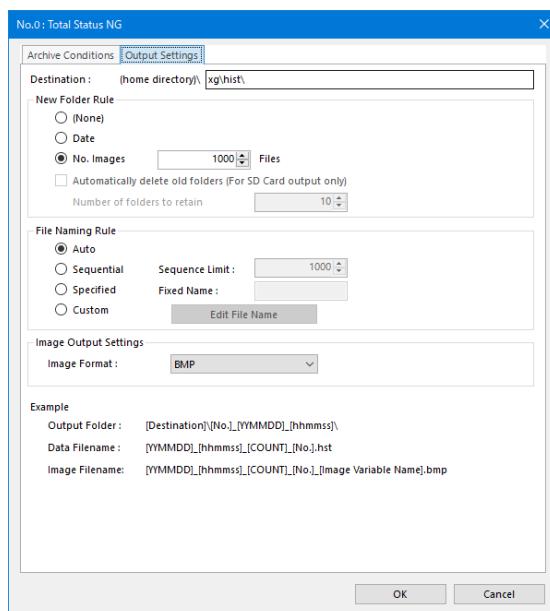
3 In [Output Location] on the [Archive Conditions] tab, specify [FTP] as the output destination.

This allows the controller to automatically output archived image and result data to the FTP server when the archive condition is satisfied.

4 To output screen captures when outputting images, select the [Output Captured Images] check box.

Click [Parameters] to set the [File Naming Rule] and [Image Format]. For details, refer to the XG-X VisionEditor Reference Manual.

5 When necessary, change the output destination in the FTP server on the [Output Settings] tab.



Destination

Specify the path to the folder to output archived data from the location immediately below the home directory of the FTP server (default: xg\hist).



- When you use the Buffalo NAS, the connection may fail unless the path to the destination folder is specified in a specific format in accordance with the product specifications. The recommended format is as follows. Contact the manufacturer of your NAS for details.

Recommended format (for Buffalo TS Series)

- mnt\array1\[Home directory of NAS]\xg\hist
(Example when a folder named xgx2000 is specified to be accessible via FTP in NAS:
mnt\array1\xgx2000\xg\hist)
- When using SFTP (Page 1-310), only ASCII characters can be used.

New Folder Rule

This rule is for creating new folders for saving archive data.

- None:** The archive data is saved in a specified destination folder without separating new folders.
- Date:** The archive data is saved in a folder created below the specified destination folder when each output begins. Folders are named [No.]_[YYMMDD]. When the date changes, a new folder is created and this becomes the new destination folder for archive data.
- No. Images:** The archived data is saved in a folder created below the specified destination folder. Folders are named [No.]_[YYMMDD]_[HHMMSS]. When the number of images in the folder reaches the specified limit, a new folder is created and this becomes the new destination folder for archive data.



If you select [None] and continue to save a large number of files to the same folder, saving may be time-consuming.

File Naming Rule

These are rules for naming files when saved.

- Auto:** Files are named automatically with the date and time when the data was output, [YYMMDD]_[HHMMSS]_[Count]_[No.].extension (bmp/jpg/png (image file) and hst (results file)).
- Sequential:** The files are named as [Sequential_fixed name_image bmp/jpg/png] (image file) and [Sequential_fixed name.hst] (results file). Specify the maximum number of images in the [Sequence Limit] field, and a fixed name to use in the [Fixed Name] field. Each field may contain no more than 32 characters.
- Specified:** Files are named as [Fixed Name].extension (bmp/jpg/png (image file) and hst (results file)). For [Fixed Name], you can enter up to 64 half-width alphanumeric characters.
- Custom:** Click [Edit File Name] to display the [Edit File Name] screen and use [Measured Value & Variable], [Date & Time], [String], [Externally Specified String], and [Image Identifier] to edit the format of the output file name. For more details, see the XG-X VisionEditor Reference Manual.

Point

- When the sequential number exceeds the limit, the count rolls over to 0. This may result in old output data files being overwritten if the new folder rule is set to [None] or [Date], or if the number of images set for [No. Images] is greater than the maximum serial number. Note that if you select [Specified] and do not change the file name every time you save a file, the existing file will be overwritten. Furthermore, note that even if you are outputting multiple image variables, the file is overwritten resulting in that you can only output one image.
- When using SFTP (Page 1-310), only ASCII characters can be used.

Reference

If [Sequential] is specified, the fixed name can be rewritten to desired characters with the OW command (Page 2-79).

Image Format

This specifies the file format for saving the image data.

- BMP:** Outputs the image as a Windows bitmap file (24-bit color: color camera, 8-bit grayscale: monochrome camera).
- BMP (1/2 Resolution):** Outputs the image as a Windows bitmap file, reducing the number of vertical and horizontal pixels to 1/2 (24-bit color: color camera, 8-bit grayscale: monochrome camera).
- BMP (1/4 Resolution):** Outputs the image as a Windows bitmap file, reducing the number of vertical and horizontal pixels to 1/4 (24-bit color: color camera, 8-bit grayscale: monochrome camera).
- BMP (1/8 Resolution):** Outputs the image as a Windows bitmap file, reducing the number of vertical and horizontal pixels to 1/8 (24-bit color: color camera, 8-bit grayscale: monochrome camera).
- JPG:** Outputs the image as a JPEG file.
- PNG:** Outputs the image as a PNG file.

6 Click [OK].

Using Controller as FTP Server (FTP server function)

This function allows the controller to function as an FTP server, enabling you to directly access the controller's SD card from an external FTP client and send, receive, or delete files, or create or delete folders.

Point

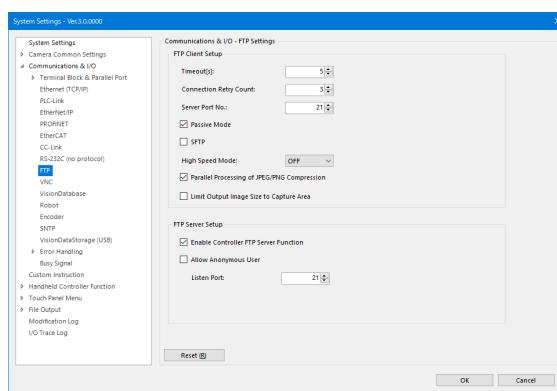
- To access the controller from an FTP client, use the user account and password set with [Account Settings] under [Other Settings].
- When an FTP client accesses the controller, the default folder is [/SD1/]. To access SD2, directly enter [/SD2/].
- USB HDD cannot be used.
- If a file or folder name is not comprised of alphanumeric characters, accessing it may fail.
- Up to two users are allowed to access simultaneously.
- This function does not affect measurements.
- The FTP server function and FTP client function can be used simultaneously. However, when using SFTP with the FTP client function (Page 1-309), it is recommended to disable the FTP server function to increase security.

1 Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] screen is displayed.

2 In the left pane of the [System Settings] menu, select [FTP].

The FTP Settings menu appears.



3 Change the settings as required.

Enable Controller FTP Server Function

Check this option when using the controller as the FTP server (default: enabled).

Point

To ensure that the change to your [Enable Controller FTP Server Function] setting takes effect, reboot the controller.

Allow Anonymous User

Check this option when allowing the access of anonymous users (default: disabled).

Reference

When anonymous users access the controller, they cannot manipulate files and folders located in the controller nor transfer files to the controller. (Only file retrieval is allowed.)

Listen Port

Enter the port number opened for FTP clients (default: 21).

Point

To ensure that the change to your [Listen Port] setting takes effect, reboot the controller.

4 Click [OK].

Troubleshooting

Error Messages

Error Messages Assigned to System Variable %Error0.

The errors messages below are assigned to %Error0 by default.

The errors assigned to %Error0 can be removed or switched to %Error1 as desired.

Error Message	Cause	Corrective Action	Error Code
Failed to connect to FTP server.	The FTP server is not operating.	Make sure the PC and FTP server on the NAS device (network archived storage) are configured and operating correctly.	
	An error occurred in the LAN connection with the FTP server.	<ul style="list-style-type: none"> • Make sure the Ethernet cable is connected to the controller and the PC or the NAS device (network archived storage) running the FTP server. • Make sure the Ethernet cable is not disconnected. • Check the Ethernet cable type (cross, straight). • Make sure the orange LED indicator (connection) of the Ethernet connector is lit. 	224
	The IP address for the FTP server is incorrect.	Check the server IP address settings in the FTP server (Page 1-309).	
Failed to login to FTP server.	The user ID and/or password for logging in to the FTP server is incorrect.	Make sure the user ID and password specified in the FTP server settings match the same settings defined in the FTP server (Page 1-309).	
Connecting by SFTP failed.	The user ID and password for the SFTP server have been set correctly, but the SFTP connection failed.	Check the SFTP connection settings (connection-permitted IP address, user ID, etc.) with the SFTP server administrator or the network administrator.	225
FTP data output time out error has occurred.	The controller logged in and began writing a file but was unable to complete the process with a specified time.	<ul style="list-style-type: none"> • Check the connection between the controller and the NAS device (network archived storage) running the FTP server software. • Make sure the FTP server is operating correctly. 	226
Failed to create file / folder on FTP server.	The controller was able to log into the FTP server, but was not able to create a file.	<ul style="list-style-type: none"> • Make sure the user account has write privileges on the FTP server. • Check the available disk space on the NAS device (network archived storage) running the FTP server software. • Check the connection between the controller and the NAS device (network archived storage) running the FTP server software. • Make sure the FTP server is operating correctly. 	227
	APPE command failed when attempting to output the results of the target classification to the FTP server.	To output the result data of the defect classification, the FTP server must support the APPE command.	

Chapter 2

Commands

Commands

Documentation for the installation and configuration methods of the controller, software, and CAD data can be downloaded from the following URL.

www.keyence.com/xgxus

Control via commands

► Control via commands

Overview of Control via Commands

You can use no protocol communication with an external device, such as a PC, via Ethernet or RS-232C to control the system and output data via commands. Although the commands are common for communication via the external terminals, PLC link, CC-Link, EtherNet/IP, PROFINET, EtherCAT, and command execution unit, the available commands vary depending on the device and operation mode.

Command Type

The following two types of commands can be used for the controller and XG-X VisionEditor.

Standard instruction (Page 2-9)

The standard instructions are used for basic input/output operation and are provided by default.

Custom instruction (Page 2-116)

A custom instruction is defined as a set of standard instructions. It can be defined according to use such as assigning several commands to one custom instruction for sequential execution, or specifying fixed values for some command parameters to skip input.

Notes on command input/output

Command execution times

The command execution times fluctuate depending upon the image processing loads and the kinds of operations to the controller at those times. For applications such as those where the next inspection is set to wait for command completion before starting, be mindful of the fluctuations in wait time.

Command execution

Operation mode

The command availability for each operation mode (run, setup mode) and device varies depending on the command. See "Command List (Available Operation vs. Situation)" (Page 2-9) for more details.

Command execution when retesting (offline)

- Commands that can be executed via no protocol, PLC link, CC-Link, EtherNet/IP, PROFINET, EtherCAT and external terminal:** In accordance with the setup mode in "Command List (Available Operation vs. Situation)" (Page 2-9). However, the following commands give an error:
Mode Control related commands (R0/S0), System control related commands (WG), 3D related commands (XTC)
- Commands that can be executed from the command execution unit :** In accordance with the setup mode under Command Execution Unit in "Command List (Available Operation vs. Situation)" (Page 2-9). However, commands that cannot be executed on the XG-X VisionEditor simulation availability and XTC commands will not execute.
- Commands that can be executed from the handheld controller / dialog:** In accordance with the setup mode in "Command List (Available Operation vs. Situation)" (Page 2-9). However, the following commands give an error:
Mode Control related commands (R0/S0), System control related commands (WG), 3D related commands (XTC)

Command execution when retesting (online)

- Commands issued from the command execution unit in the retest flow:** Not executed.
- Commands that can be executed from the command execution unit in the main measurement flow:** In accordance with run mode in "Command List (Available Operation vs. Situation)" (Page 2-9). However, the following commands give an error:
BC, BU, CL, DC, DO, ECU, ECV, FNW, FT, FV, FW, GW, HC, HS, ICU, ICV, KY, PMW, PN, PRW, PV, PW, R0, RPN, RPT, RPW, S0, SC, SS, UC, UW, VW, WI, ZM
- Commands that can be executed via no protocol, PLC-Link, CC-Link, EtherNet/IP, PROFINET, EtherCAT, and external terminals:** In accordance with run mode in "Command List (Available Operation vs. Situation)" (Page 2-9). However, the following commands give an error:
BPL, BPW, CL, DDF, ECU, ECV, FNR, FNW, HC, HS, ICU, ICV, PMW, PN, PRW, PW, R0, RPN, RPT, RPW, S0, SS, UC
- Commands that can be executed from the handheld controller/dialog:** In accordance with run mode in "Command List (Available Operation vs. Situation)" (Page 2-9). However, the following commands give an error:
BPL, BPW, BS, CA, CD, CL, CPW, CW, DDF, DSR, DSW, ECU, ECV, FNW, HC, HS, ICU, ICV, LK, OE, OPW, OW, PMW, PN, PRW, PW, R0, RPN, RPT, RPW, RS, RU, S0, SS, STR, STR1, STW, STW1, TE, UC, WO, WP
- The following commands are executed relative to the setting content of the retest flow.
Data input/output-related commands (MW, MS, IW, IS), system control-related commands (UT, NU, NW, UE, TG, AT), and utility-related commands (TC, TS)

Command execution during mode transition

- If a command is issued during mode transition, the command is placed on stand-by and executed once the mode has transitioned. Operation availability is determined by the mode during execution and an error is returned if operation is not possible.
 - Only the following commands can be executed during retest changeover and all other commands return an error.
 - Mode transition during retesting (offline): Trigger-related commands (T1 to T8, TA)
 - Mode transition during retesting (online): Trigger-related commands (T1 to T8, TA), Console virtual input (KY), Echo (EC), Cancel stand-by (WG), Data input/output-related commands (MR, IR, MW*, MS*, IW*, IS*, MRX, IRX, MWX, MSX, IWX, ISX, RP, WP, WO)
 - *If the command issuing device is the handheld controller/dialog, an error will be returned.
 - Command execution while the program is being changed: Although commands issued while the program is being changed will give an error, commands issued after the program change has been completed will be executed.
 - Command execution during simulation: Differs depending on the command. For details, see "Command List (Available Operation vs. Situation)" (Page 2-9).
 - Command execution while retest measurements are being carried out: The following commands return an error.
- Reset (RS), Restart (RB)

Restrictions on parameters

Specification of variables and parameters

- Variables and values can be used for parameter where numerical values are allowed.
- For a scalar variable, some parameters may need to be specified:
 - Example 1: To use the X coordinate of a circle type global variable "\$c" as a parameter, specify "\$c.CX".
 - Example 2: To use an element of a scalar array type local variable "#a" as a parameter, specify "#a[10]".
- The values of system variables cannot be changed except in the instance where WP or WO command is used.
- The setting parameters and result data cannot be used.

Restriction on characters

- Control codes other than "," (comma), ";" (semicolon), "CR" (carriage return), and "LF" (line feed) cannot be used.
- If it is necessary to input "," (comma) which is the delimiter of the command for the string argument of a command, input ", " (quotation + comma).

Restriction on symbols (External terminals, PLC link, CC-Link, EtherNet/IP, PROFINET, EtherCAT)

The following restrictions are imposed on character strings regarded as symbols (character strings used for command parameters other than numerical values, such as NX or AL).

- When a command is executed via PLC link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, symbols cannot be sent from the PLC.
- To use symbols, you need to define them in a custom instruction in advance. To use a symbol differently, switch between those custom instructions already defined.

Restriction on the number of parameters (External terminals)

- When a command is executed via the external terminal, %CmdParam shall be the first parameter.
- To use two or more parameters, assign system variables %InDataAsyncA through H to the terminals, and define the names of variables in a custom instruction.

Operation when parameters are less than those required for command input (CC-Link, EtherNet/IP, PROFINET, EtherCAT)

For control via the CC-Link, if the command area size for RWw is insufficient for the parameters required by a command, the parameters with no area assigned are assumed to have a value of 0 during the command execution. If the command area size in the output data area of the EtherNet/IP, PROFINET or EtherCAT is insufficient for the parameters required by a command, a parameter error occurs.

Maximum number of characters

Up to 256 characters can be entered in one instruction (excluding line feed codes).

Value output format for reading commands

Basic format policy

Output values are unsigned, meaning they will always have a positive value. Only the output values which may take negative values are signed (even when the value is positive).

- Integer digits: The integer digits are set to the minimum number to output the maximum output value.
- Decimal places: Generally, no decimal places are used. If the decimal value in an output value is significant, six decimal places are set.



Although the possible range of program number and unit ID's is from 0 to 999, these values are exceptions and are output in four integer digits.

Restrictions on the number of digits for specifying numerical values

The following restrictions are imposed on the command input format:

- Values available for integer input
 - Signed
 - 10 integer digits
- Values available for decimal input
 - Signed
 - 10 integer digits
 - 6 decimal places



When a decimal value is specified for a command argument other than MW or MS, the value is rounded off to the nearest integer before processing.

Password handling

Passwords are accepted as "single-byte alphanumeric characters and symbols (4 to 32 digits)".



Passwords are handled differently by commands depending on their type.

- When the password is set as "single-byte alphanumeric characters and symbols (4 to 32 digits)":
 - A double quotation mark ("") needs to be placed before the password because it is treated as a character string.
 - If ";" or ":" is used in a password, it is recognized as a "separator of the command" and "delimiter of the command" respectively when such a password is entered via an external command and does not properly function. However, by specifying "ASCII Code" for a delimiter of custom instruction settings and setting 0x3B (";") as the value, it can be set so that ";" will not be recognized as a termination character of a command.
 - If a password of "single-byte alphanumeric characters and symbols (4 to 32 digits)" is changed as an argument of PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, the command is executed assuming that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark ("").
- When the password is set as "single-byte alphanumeric characters(4 digits:0000 to 9999)":
 - Scalar type variable can be used for the password parameter.
In this case, you do not need to provide a double quotation mark ("").

Commands which use the administrator password

The administrator password is used as the User Account 0 password.

- If the command matches the User Account 0 password, it is executable.
- If User Account 0 does not exist, the command is always not executable.

Controller reset/Program change

If a command is input but the controller is reset or the program is changed before the command is executed, the command operation is terminated with an 03 error.

When an error occurs on command acceptance

An error response "ER, **, nn" will be returned.

The error response consists of the following information:

- **: Received command that caused the error
- nn: 2-digit error code
 - 02: Command error (The received command is invalid.)
 - 03: Command action disabled (The received command cannot work.)
 - 22: Parameter error (The value of parameter data or the number of data pieces is outside the range.)
 - 80: Password error (The specified password does not match.)
 - 81: Command acceptance disabled (The command was received while the device cannot accept it.)
 - 91: Timeout error



- For control via PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, only error codes are received.
- Error codes are not output when controlled via the external terminals.

Restrictions on commands related to registered image Nos.

- Registered images can be specified using the numbers ranging from 000 to 999. However, available numbers for images of 3D cameras or the LJ-X/LJ-V are restricted as follows.

Type of image variables	Available registered image Nos.
Other than resultant image	000 to 499
Resultant image	500 to 999

- For the capture unit, specifying image variables for height and grayscale images allows both images to be saved. In this case, the grayscale image is saved with the No. of a specified registered image No. + 500.

Registration Numbers of Images Captured with LumiTrax mode/LumiTrax Specular Reflection Mode

The registered image number [(Camera No.) - (Specified No.)] becomes as follows when registering images that are captured with LumiTrax mode/LumiTrax Specular Reflection mode.

When LumiTrax mode/LumiTrax Specular Reflection mode is used and the image variables that are the targets of batch registration are specified

The images are registered all at once in the registered image number ranges below.

For images captured with LumiTrax mode:

- Normal Image: 000 to 099
- Shape Image 1: 200 to 299
- Shape Image 2: 300 to 399
- Shape Image 3: 400 to 499
- Texture Pattern Image: 500 to 599
- Gradient X Image: 600 to 699
- Gradient Y Image: 700 to 799

For images captured with LumiTrax Specular Reflection mode:

- Normal Image: 000 to 099
- Specular Reflection Image: 200 to 299
- Diffuse Reflection Image: 300 to 399
- Shape Image 1: 400 to 499
- Shape Image 2: 500 to 599
- Phase X Image: 600 to 699
- Phase Y Image: 700 to 799
- Gloss Ratio Image: 800 to 899

For more details on the type of the images captured with LumiTrax mode/LumiTrax Specular Reflection mode, see the XG-X Series User's Manual.

Registration example:

When only the normal image, shape image 1, and texture pattern image are enabled as the image types to be acquired with LumiTrax mode and when the images are registered to the registered image number 3, three images are registered as shown below.

- Normal Image: 003
- Shape Image 1: 203
- Texture Pattern Image: 503

When Standard Lighting mode is used or when the image variables that are not the targets of batch registration are specified

Only one image is registered to a range from 000 to 999 in the conventional way.

Registration Numbers of Images Captured with MultiSpectrum Mode

When registering images captured with MultiSpectrum mode, they are each given a registration number [(Camera No.) - (Specified No.)] as follows.

When MultiSpectrum mode is used and the image variables that are the targets of batch registration are specified

The images are registered all at once in the 9 types of registered image number ranges below.

- Average Grayscale Image: 000 to 099
- UV (Ultraviolet) Image: 100 to 199
- B (Blue) Image: 200 to 299
- G (Green) Image: 300 to 399
- AM (Amber) Image: 400 to 499
- R (Red) Image: 500 to 599
- FR (Farred) Image: 600 to 699
- IR (Infrared) Image: 700 to 799
- W (White) Image: 800 to 899

For more details on the type of the images captured with MultiSpectrum mode, see the XG-X Series User's Manual.

Registration example:

When only the R image, G image, and B image are enabled as the image types to be acquired with

MultiSpectrum mode and when the images are registered to the registered image number 3, four images are registered as shown below.

- Average Grayscale Image: 003
- R Image: 503
- G Image: 303
- B Image: 203

When Standard Lighting mode is used or when the image variables that are not the targets of batch registration are specified

Only one image is registered to a range from 000 to 999 in the conventional way.

Registration numbers of images captured with 3D Capture mode

When registering images captured with 3D Capture mode, they are each given a registration number [(Camera No.) - (Specified No.)] as follows.

When the image variables that are the targets of batch registration are specified

The images are registered all at once in the 2 types of registered image number ranges below.

- Grayscale/Color Image: 000 to 399
- Height Image: 500 to 899

For more details on these types of images, see the XG-X Series User's Manual.

Registration example:

When 3D Capture mode is used and images are registered to registered image number 3, two images are registered as shown below.

- Grayscale/Color Image: 003
- Height Image: 503

When the image variables that are not the targets of batch registration are specified

Only one image is registered to a range from 000 to 999 in the conventional way.

Registration numbers of images captured with Outline Capture mode

When registering images captured with Outline Capture mode, they are each given a registration number [(Camera No.) - (Specified No.)] as follows.

When the image variables that are the targets of batch registration are specified

The images are registered all at once in the 4 types of registered image number ranges below.

- Grayscale/Color Image: 000 to 099
- Texture Pattern Image: 200 to 299
- Profile Image: 300 to 399
- Profile Composite Image: 400 to 499

For more details on these types of images, see the XG-X Series User's Manual.

Registration example:

When Outline Capture mode is used and images are registered to registered image number 3, four images are registered as shown below.

- Normal Image: 003
- Texture Pattern Image: 203
- Profile Image: 303
- Profile Composite Image: 403

When the image variables that are not the targets of batch registration are specified

Only one image is registered to a range from 000 to 999 in the conventional way.

Standard instruction

Command List (Available Operation vs. Situation)

= Possible

Description	Supported version	Name	Availability by device										Simulation availability	
			No protocol (including ActiveX no protocol)		PLC-Link/ CC-Link/ EtherNet/IP/ PROFINET/ EtherCAT		External terminals		Command Execution Unit		Handheld controller/ dialog		Edit Simulation	Simulator
			Setup	Run	Setup	Run	Setup	Run	Setup	Run	Setup	Run		
Cancel Auto Calibration (Page 2-94)	1.0	ACC	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>		
Execute Auto Calibration (Page 2-93)	1.0	ACE	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>		
Check Auto Calibration Result (Page 2-94)	1.0	ACR	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>		
End Auto Calibration (Page 2-94)	1.0	ACS	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>		
Interrupt sectional inspection (Page 2-39)	2.3	ASI	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>		<input type="circle"/>
Automatic tuning (Page 2-39)	1.0	AT	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>		<input type="circle"/>
Capture image (Page 2-67)	1.0	BC	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>		<input type="circle"/>
Load Setting in the Background (Page 2-107)	1.0	BPL	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>		<input type="circle"/>
Change Setting in the Background (Page 2-109)	1.0	BPW	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>		<input type="circle"/>
Register Image (Page 2-23)	1.0	BS	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>
Execute Retest Images (Page 2-111)	2.8	BTE	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>		<input type="circle"/>
Cancel Retest Images (Page 2-112)	2.8	BTC	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>		<input type="circle"/>
Check Retest Images Result (Page 2-113)	2.8	BTR	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>		<input type="circle"/>
Open Edit unit menu (Page 2-62)	1.0	BU	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>
Register character to library (Page 2-35)	1.0	CA	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>
Custom instruction execution (Page 2-100)	1.0	CC	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>
Delete character from library (Page 2-36)	1.0	CD	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>
Clear error (Page 2-27)	1.0	CE	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>
Read Target Classification Condition Enabled/Disabled (Page 2-68)	3.0	CER	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>
Write Target Classification Condition Enable/Disable (Page 2-68)	3.0	CEW	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>
Change of the number of lines (Page 2-88)	1.0	CL	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="circle"/>	<input type="circle"/>
Read Target Classification Condition Tolerance (Page 2-69)	3.0	CLR	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="circle"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>	<input type="x"/>

Description	Supported version	Name	Availability by device										Simulation availability	
			No protocol (including ActiveX no protocol)		PLC-Link/CC-Link/EtherNet/IP/PROFINET/EtherCAT		External terminals		Command Execution Unit		Handheld controller/dialog		Edit Simulation	Simulator
			Setup	Run	Setup	Run	Setup	Run	Setup	Run	Setup	Run		
Write Target Classification Condition Tolerance (Page 2-69)	3.0	CLW	○	○	○	○	○	○	○	○	○	○	○	○
Update Capture Position (Page 2-95)	1.0	CPW	○	○	○	○	○	○	○	○	○	○	○	○
Read REG (Page 2-38)	1.0	CR	○	○	○	○	○	○	○	○	○	○	○	○
Check Calibration Status (Page 2-95)	1.0	CSR	○	○	○	○	○	○	×	×	○	○		
Write REG (Page 2-37)	1.0	CW	○	○	○	○	○	○	○	○	○	○	○	○
Read Z-direction Measurement Range Center (Page 2-90)	2.6	CZR	×	○	×	○	×	×	×	×	×	×		
Change Z-direction Measurement Range Center (Page 2-89)	2.6	CZW	×	○	×	○	×	○	×	○	×	○		
Close menu (Page 2-60)	1.0	DC	○	○	○	○	○	○	○	○	○	○	○	○
For VisionDatabase Delete the output image (Page 2-96)	1.0	DDF	○	○	○	○	○	○	○	○	○	○	○	
Open menu (Page 2-61)	1.0	DO	×	○	×	○	×	○	×	○	×	○	○	○
Read menu ID (Page 2-62)	1.0	DR	○	○	○	○	×	×	×	×	×	×		
For VisionDatabase Reading External Input String (Page 2-97)	1.0	DSR	○	○	○	○	○	○	○	○	○	○	○	○
For VisionDatabase Change External Input String (Page 2-96)	1.0	DSW	○	○	○	○	○	○	○	○	○	○	○	○
Echo (Page 2-102)	1.0	EC	○	○	×	×	×	×	×	×	×	×		
Export Unit Settings CSV File (Page 2-104)	1.0	ECU	○	○	○	○	○	○	○	○	○	○	○	○
Export Variable Initial Values CSV File (Page 2-105)	1.0	ECV	○	○	○	○	○	○	○	○	○	○	○	○
Read show/hide flowchart status (Page 2-88)	1.0	FI	○	○	○	○	×	×	×	×	×	×		
Read focus screen No. (Page 2-54)	1.0	FR	×	○	×	○	×	○	×	○	×	○		
Fit (Page 2-57)	1.0	FT	×	○	×	○	×	○	×	○	×	○	○	○
Show flowchart in run mode (Page 2-87)	1.0	FV	×	○	×	○	×	○	×	○	×	○	○	○
Change focus screen (Page 2-53)	1.0	FW	×	○	×	○	×	○	×	○	×	○	○	○
Read page No. (Page 2-52)	1.0	GR	×	○	×	○	×	○	×	○	×	○		

Description	Supported version	Name	Availability by device										Simulation availability	
			No protocol (including ActiveX no protocol)		PLC-Link/ CC-Link/ EtherNet/IP/ PROFINET/ EtherCAT		External terminals		Command Execution Unit		Handheld controller/ dialog		Edit Simulation	Simulator
			Setup	Run	Setup	Run	Setup	Run	Setup	Run	Setup	Run		
Switch page No. (Page 2-51)	1.0	GW	×	○	×	○	×	○	×	○	×	○	○	○
Clear archived data (Page 2-65)	1.0	HC	○	○	○	○	○	○	○	○	○	○	○	○
Start/stop archive (Page 2-65)	1.0	HE	○	○	○	○	○	○	○	○	○	○	○	○
Read archive status (Page 2-65)	1.0	HR	○	○	○	○	×	×	×	×	×	×	×	×
Save archived data (Page 2-66)	1.0	HS	○	○	○	○	○	○	○	○	○	○	○	○
Import Unit Settings CSV File (Page 2-103)	1.0	ICU	×	○	×	○	×	○	×	○	×	○	○	○
Import Variable Initial Values CSV File (Page 2-104)	1.0	ICV	○	○	○	○	○	○	○	○	○	○	○	○
Integer read from variable (Page 2-43)	1.0	IR	○	○	○	○	×	×	×	×	×	×	×	×
Integer read from array variable (Page 2-50)	1.0	IRX	×	×	○	○	×	×	×	×	×	×	×	×
Simultaneous integer write to variable (Page 2-43)	1.0	IS	○	○	○	○	○	○	○	○	○	○	○	○
Simultaneous integer write to array variable (Page 2-49)	1.0	ISX	×	×	○	○	×	×	×	×	×	×	×	×
Integer write to variable (Page 2-42)	1.0	IW	○	○	○	○	○	○	○	○	○	○	○	○
Integer write to array variable (Page 2-48)	1.0	IWX	×	×	○	○	×	×	×	×	×	×	×	×
Console virtual input (Page 2-100)	1.0	KY	○	○	○	○	○	○	○	○	○	×	×	○
Start/stop modification logging (Page 2-67)	1.0	LE	○	○	○	○	○	○	○	○	○	○	○	○
Enable/disable device input (Page 2-18)	1.0	LK	○	○	○	○	○	○	○	○	○	○	○	○
Read modification logging status (Page 2-67)	1.0	LQ	○	○	○	○	×	×	×	×	×	×	×	×
Changing the measured value before correction of measured value correction (Page 2-98)	1.1	MCC	○	○	○	○	○	○	○	○	○	○	○	○
Measured value correction reading (Page 2-99)	1.1	MCR	○	○	○	○	×	×	×	×	×	×	×	×
Measured value correction writing (Page 2-98)	1.1	MCW	○	○	○	○	○	○	○	○	○	○	○	○
Read from variable (Page 2-42)	1.0	MR	○	○	○	○	×	×	×	×	×	×	×	×
Read from array variable (Page 2-47)	1.0	MRX	×	×	○	○	×	×	×	×	×	×	×	×
Simultaneous write to variable (Page 2-41)	1.0	MS	○	○	○	○	○	○	○	○	○	○	○	○

Description	Supported version	Name	Availability by device										Simulation availability	
			No protocol (including ActiveX no protocol)		PLC-Link/CC-Link/EtherNet/IP/PROFINET/EtherCAT		External terminals		Command Execution Unit		Handheld controller/dialog		Edit Simulation	Simulator
			Setup	Run	Setup	Run	Setup	Run	Setup	Run	Setup	Run		
Simultaneous write to array variable (Page 2-46)	1.0	MSX	x	x	o	o	x	x	x	x	x	x		
Write to variable (Page 2-40)	1.0	MW	o	o	o	o	o	o	o	o	o	o	o	o
Write to array variable (Page 2-45)	1.0	MWX	x	x	o	o	x	x	x	x	x	x		
Read registered image No. (Page 2-26)	1.0	NR	o	o	o	o	x	x	x	x	x	x		
Update referenced registered image No. (Page 2-26)	1.0	NU	o	o	o	o	o	o	o	o	o	o	o	o
Write registered image No. (Page 2-25)	1.0	NW	o	o	o	o	o	o	o	o	o	o	o	o
Enable/disable output (Page 2-19)	1.0	OE	o	o	o	o	o	o	o	o	o	o	o	o
Read destination folder name (Page 2-84)	1.0	OPR	o	o	o	o	o	o	o	o	o	o	o	o
Rewrite destination folder name (Page 2-82)	1.0	OPW	o	o	o	o	o	o	o	o	o	o	o	o
Read fixed name in file naming rule (Page 2-81)	1.0	OR	o	o	o	o	o	o	o	o	o	o	o	o
Change fixed name in file naming rule (Page 2-79)	1.0	OW	o	o	o	o	o	o	o	o	o	o	o	o
Copy program (Page 2-77)	1.0	PC	o	o	o	o	o	o	o	o	o	o	o	o
Delete program (Page 2-78)	1.0	PD	o	o	o	o	o	o	o	o	o	o	o	o
Move program (Page 2-78)	1.0	PM	o	o	o	o	o	o	o	o	o	o	o	o
Profile measurement item number reading (Page 2-58)	1.1	PMR	x	o	x	o	x	x	x	x	x	x		
Profile measurement item number switching (Page 2-58)	1.1	PMW	x	o	x	o	x	o	x	o	x	o		o
Change program name (Page 2-33)	1.0	PN	o	o	o	o	o	o	o	o	o	o	o	o
Program No. readout (Page 2-22)	1.0	PR	o	o	o	o	x	x	x	x	x	x		
Profile result display condition reading (Page 2-59)	1.1	PRR	x	o	x	o	x	x	x	x	x	x		
Profile result display condition switching (Page 2-59)	1.1	PRW	x	o	x	o	x	o	x	o	x	o		o
Change password (Page 2-70)	1.0	PS	o	o	o	o	o	o	o	o	o	o	o	o
Display Profile (Page 2-68)	1.0	PV	x	o	x	o	x	o	x	o	x	o		o
Switch program No. (Page 2-21)	1.0	PW	o	o	o	o	o	o	o	o	o	o		o

Description	Supported version	Name	Availability by device										Simulation availability	
			No protocol (including ActiveX no protocol)		PLC-Link/ CC-Link/ EtherNet/IP/ PROFINET/ EtherCAT		External terminals		Command Execution Unit		Handheld controller/ dialog		Edit Simulation	Simulator
			Setup	Run	Setup	Run	Setup	Run	Setup	Run	Setup	Run		
Switch to run mode (Page 2-20)	1.0	R0	○	○	○	○	○	○	○	○	○	○		○
Restart (Page 2-23)	1.0	RB	○	○	○	○	○	○	×	×	○	○		
Return to beginning of flowchart (Page 2-27)	1.0	RE	○	○	○	○	○	○	×	×	○	○		
Read image type (Page 2-55)	1.0	RI	○	○	○	○	×	×	×	×	×	×		
Read run/setup mode (Page 2-20)	1.0	RM	○	○	○	○	×	×	×	×	×	×		
Read from terminal variable (Page 2-44)	1.0	RP	○	○	○	○	×	×	×	×	×	×		
Copy Recipe (Page 2-92)	1.0	RPC	○	○	○	○	○	○	○	○	○	○		○
Delete Recipe (Page 2-92)	1.0	RPD	○	○	○	○	○	○	○	○	○	○		○
Move Recipe (Page 2-92)	1.0	RPM	○	○	○	○	○	○	○	○	○	○		○
Change Recipe Name (Page 2-93)	1.0	RPN	○	○	○	○	○	○	○	○	○	○		○
Read Recipe No. (Page 2-91)	1.0	RPR	○	○	○	○	×	×	×	×	×	×		
Change Recipe No. (Specify Recipe Name) (Page 2-91)	1.0	RPT	○	○	○	○	○	○	○	○	○	○		○
Change Recipe No. (Specify Recipe No.) (Page 2-90)	1.0	RPW	○	○	○	○	○	○	○	○	○	○		○
Update position reference (Page 2-28)	1.0	RR	○	○	○	○	○	○	○	○	○	○		○
Reset (Page 2-22)	1.0	RS	○	○	○	○	○	○	○	○	○	○		○
Update image reference (Page 2-29)	1.0	RU	○	○	○	○	○	○	○	○	○	○		○
Switch to setup mode (Page 2-20)	1.0	S0	○	○	○	○	○	○	○	○	○	○		○
Scroll (Page 2-57)	1.0	SC	×	○	×	○	×	○	×	○	×	○		○
Shading correction execution (Page 2-31)	1.0	SD	○	○	○	○	○	○	×	×	○	○		
Shading correction value write (Page 2-32)	1.0	SE	○	○	○	○	○	○	×	×	○	○		
Shading correction value read (Page 2-32)	1.0	SI	○	○	○	○	○	○	×	×	○	○		
Shading correction reset (Page 2-31)	1.0	SR	○	○	○	○	○	○	×	×	○	○		
Setting save (Page 2-23)	1.0	SS	○	○	○	○	○	○	○	○	○	○		○
Read externally specified string (Page 2-86)	2.5	STR	○	○	○	○	○	○	○	○	○	○		○
Read externally specified string 1 (Page 2-86)	3.2	STR1	○	○	○	○	○	○	○	○	○	○		○

Description	Supported version	Name	Availability by device								Simulation availability			
			No protocol (including ActiveX no protocol)		PLC-Link/CC-Link/EtherNet/IP/PROFINET/EtherCAT		External terminals		Command Execution Unit		Handheld controller/dialog		Edit Simulation	Simulator
			Setup	Run	Setup	Run	Setup	Run	Setup	Run	Setup	Run		
Change externally specified string (Page 2-85)	2.5	STW	○	○	○	○	○	○	○	○	○	○	○	○
Change externally specified string 1 (Page 2-85)	3.2	STW1	○	○	○	○	○	○	○	○	○	○	○	○
Trigger 1 (Page 2-16)	1.0	T1	○	○	○	○	○	○	×	×	○	○		
Trigger 2 (Page 2-16)	1.0	T2	○	○	○	○	○	○	×	×	○	○		
Trigger 3 (Page 2-16)	1.0	T3	○	○	○	○	○	○	×	×	○	○		
Trigger 4 (Page 2-16)	1.0	T4	○	○	○	○	○	○	×	×	○	○		
Issue all triggers (Page 2-16)	1.0	TA	○	○	○	○	○	○	×	×	○	○	○	○
Statistics data clear (Page 2-63)	1.0	TC	○	○	○	○	○	○	○	○	○	○	○	○
Enable/disable trigger input (Page 2-17)	1.0	TE	○	○	○	○	○	○	○	○	○	○	○	○
Teaching (Page 2-30)	1.0	TG	○	○	○	○	○	○	○	○	○	○	○	○
Timer (Page 2-75)	1.0	TM	×	×	×	×	×	×	○	○	×	×	○	○
Read trigger acceptance (Page 2-17)	1.0	TQ	○	○	○	○	×	×	×	×	×	×		
Read date/time (Page 2-74)	1.0	TR	○	○	○	○	×	×	×	×	×	×		
Save statistical data (Page 2-64)	1.0	TS	○	○	○	○	○	○	○	○	○	○	○	○
Write date/time (Page 2-74)	1.0	TW	×	○	×	○	×	○	×	○	×	○		
Read Time Zone (Page 2-76)	1.3	TZR	○	○	○	○	×	×	×	×	×	×		
Write Time Zone (Page 2-75)	1.3	TZW	×	○	×	○	×	○	×	○	×	○		
Add user account (Page 2-72)	1.0	UA	○	○	○	○	○	○	○	○	○	○	○	○
Change user login (Page 2-71)	1.0	UC	×	○	×	○	×	○	×	○	×	○	○	○
Delete user account (Page 2-73)	1.0	UD	○	○	○	○	○	○	○	○	○	○	○	○
Reset unit after test (Page 2-35)	1.0	UE	○	○	○	○	○	○	○	○	○	○	○	○
Search Unit No. (Page 2-102)	1.0	UQ	○	○	○	○	×	×	×	×	×	×		
Read display unit ID (Page 2-53)	1.0	UR	×	○	×	○	×	×	×	×	×	×		
Test unit (Page 2-34)	1.0	UT	○	○	○	○	○	○	○	○	○	○	○	○
Change display unit ID (Page 2-52)	1.0	UW	×	○	×	○	×	○	×	○	×	○	○	○
Version information readout (Page 2-101)	1.0	VI	○	○	○	○	×	×	×	×	×	×		

Description	Supported version	Name	Availability by device									Simulation availability		
			No protocol (including ActiveX no protocol)		PLC-Link/ CC-Link/ EtherNet/IP/ PROFINET/ EtherCAT		External terminals		Command Execution Unit		Handheld controller/ dialog		Edit Simulation	Simulator
			Setup	Run	Setup	Run	Setup	Run	Setup	Run	Setup	Run		
Read display template ID (Page 2-51)	1.0	VR	×	○	×	○	×	×	×	×	×	×		
Change display template ID (Page 2-50)	1.0	VW	×	○	×	○	×	○	×	○	×	○		○
Waiting status release (Page 2-28)	1.0	WG	○	○	○	○	○	○	×	×	○	○		
Read user account (Page 2-70)	1.0	WH	○	○	×	×	×	×	×	×	×	×		
Change image type (Page 2-54)	1.0	WI	○	○	○	○	○	○	○	○	○	○		○
Write terminal offset (Page 2-44)	1.0	WO	○	○	○	○	○	○	○	○	○	○		○
Write to terminal variable (Page 2-44)	1.0	WP	○	○	○	○	○	○	○	○	○	○		○
Execute 3D Calibration (for XR camera) (Page 2-106)	1.0	XTC	○	×	○	×	○	×	○	×	○	×		
Execute 3D Calibration (for XT camera) (Page 2-106)	2.3	XCE	○	×	○	×	○	×	○	×	○	×		
Zoom (Page 2-56)	1.0	ZM	×	○	×	○	×	○	×	○	×	○		○

Trigger (T1 to T4/TA)

T1 to T4: Issue Trigger

This command issues a specified trigger to the capture unit waiting for the trigger.

Send T1 [Delimiter] **Issue Trigger 1.**

 T2 [Delimiter] **Issue Trigger 2.**

 T3 [Delimiter] **Issue Trigger 3.**

 T4 [Delimiter] **Issue Trigger 4.**

Receive T1 [Delimiter]

 T2 [Delimiter]

 T3 [Delimiter]

 T4 [Delimiter]

 If there is no capture unit waiting for the trigger, a 03 error is returned.

Error Code

- 03: The command was sent when triggers could not be accepted or when trigger input was disabled (when all %Trg*Ready are not turned on).
- 22: The number of parameters is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

TA: Issue All Triggers

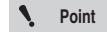
This command issues all triggers T1 to T4.

Send TA [Delimiter]

Receive TA [Delimiter]

 Reference

This command does not affect the measurement processing time.

 Point

Even if some triggers were not used, an error will not result.

Error Code

- 03: The command was sent when all triggers could not be accepted or when trigger input was disabled.
(when all %Trg*Ready are not turned on).
- 22: The number of parameters is invalid.

 Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

I/O Control (TE/TQ/LK/OE)

TE: Enable/Disable Trigger Input

When "TE,0" is sent, the Ready terminal (%Trg*Ready) is set to remain off and thus no trigger input will be accepted (both internal and external triggers).

Send TE,n **Delimiter**

Receive TE **Delimiter**

- n: Enable/disable settings

1: Enable

0: Disable



This command does not affect the measurement processing time.



- When "TE,1" is sent, the terminal is reset to normal.
- Even if "TE,1" is sent while the trigger input is enabled, or if "TE,0" is sent while the trigger input is disabled, it is not considered an error.
- The trigger disabled status cannot be stored in settings.
- Trigger input is reset to be enabled when the controller is turned off and on.

Error Code

- 22: The number of parameters is invalid.
The parameter data is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Relationship with %Ext

Although the TE command has the same function as %Ext, the controller is set based on the AND result of the settings. Consequently, using the TE command may mean the actual status is different from the ON/OFF status (level) of the %Ext terminal. Example:

Example: When "TE,0" is sent while %Ext is off (trigger enabled), the trigger input is disabled.

Relationship with camera settings

When the operation is switched to camera settings in setup mode or to remote capture mode, the trigger input is enabled temporarily.

Relationship to the flow editor and [Trigger On/Off] setting

- When [Trigger On/Off] is set to [Trigger Off]: During edit operation, trigger input to the controller is disabled regardless of the TE command and %Ext setting.
- When [Trigger On/Off] is set to [Trigger On]: During edit operation, trigger input to the controller is enabled or disabled depending on the relationship between the TE command and %Ext setting.

TQ: Read Trigger Acceptance

This command checks whether the controller accepts trigger input or not.

Send TQ **Delimiter**

Receive TQ,n **Delimiter**

- n: Enabled/disabled status

1: Enabled

0: Disabled



This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

LK: Enable/Disable Device Input

This command enables or disables the input from a specified device.

Send **LK,n,m,ssss** [Delimiter]

Receive **LK** [Delimiter]

- n: Enable/disable settings
 - 1: Enable
 - 0: Disable
- m: Target device
 - 0: RS-232C (no protocol)
 - 1: PLC
 - 2: Ethernet
 - 3: Handheld controller (Touch panel, mouse)
 - 4: CC-Link
 - 5: EtherNet/IP
 - 6: PROFINET
 - 7: EtherCAT
- ssss: Administrator password (single-byte alphanumeric characters and symbols (4 to 32 digits))



- This command does not affect the measurement processing time.
- If [Register personal user IDs to the user accounts] is enabled in the account settings, the password of the user ID registered to user account number 0 becomes the administrator password, and the password set on user account number 0 cannot be used.



- Even when input from the handheld controller is disabled, the controller virtual input command can be used.
- Once this command is set, the setting is stored as the global setting and effective even when the controller is restarted.
- You can cancel the disabled input status by turning the controller off and on while holding down the No.1 and No.2 buttons simultaneously.
- The LK command itself can also be used with the device from which the input is disabled, if the password is correct.
- You need to place a double quotation mark ("") before ssss.
- If ";" or ":" is used in ssss, it is recognized as a "delimiting character of the command" and "delimiter of the command" respectively when the password is entered via an external command and it will not properly function. However, by specifying "ASCII Code" for Delimiter in the custom instruction settings and setting 0x3B (";") as the value, it can be set so that ";" will not be recognized as a termination character of a command.
- If ssss is changed as an argument of PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, the command is executed assuming that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark ("").
- When the password is set as "single-byte alphanumeric characters(4 digits:0000 to 9999)", scalar type variable can be used for the password parameter. In this case, you do not need to provide a double quotation mark ("").
- If a command other than LK is input from an input disabled device, error code 81 is always returned and the command is not executed.

Error Code

- 22: The number of parameters is invalid.
The parameter data is invalid.
- 80: The password is wrong.
- 81: A command other than LK was input from an input disabled device.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

OE: Enable/Disable Output

This command controls data output to the external device.

Send **OE,n** **Delimiter**

Receive **OE** **Delimiter**

n: Enable/disable settings

1: Enable

0: Disable

Reference

This command does not affect the measurement processing time.

Point

- This command controls the following output functions:
Result output (Ethernet, RS-232C, PLC link, CC-Link, EtherNet/IP, PROFINET, EtherCAT, SD card, USB HDD, PC program, FTP, VisionDataStorage (USB)), image output (SD card, PC program, FTP, VisionDataStorage (USB), USB HDD), archive output (SD card, PC program, FTP, VisionDataStorage (USB), USB HDD), terminal output (external terminals), target classification output (SD card, FTP, VisionDataStorage (USB), USB HDD) and VisionDatabase.
- The data/image output to the output buffer of the output units is disabled and the output buffer is cleared.
- Even if "OE,1" (enable) is sent while the output is enabled or "OE,0" (disable) is sent while the output is disabled, it is not considered to be an error.

Data/image output

- Output is stopped at the end of each unit.
- When output is enabled, the output is resumed at the next execution of a unit.

Archive output

- The output is stopped after one generation of data (measurement count) is output.
- When output is enabled, the output is resumed from the next archive output.

Parallel terminal output

- Outputs to the external terminals to which %Sto, %OutDataA to H, %OutDataAsyncA to H, and %JAHold are assigned stop immediately and the terminals are reset to normal.
- Even while output is disabled, the values of %OutDataAsyncA to H and %JAHold changes. However, such changes are not applied to the external terminals.
- As for %Sto and %OutDataA to H, the values of variables do not change while the output is disabled.
- When output is enabled, the current values of %OutDataAsyncA to H and %JAHold are immediately applied to the external terminals.
- As for %Sto and %OutDataA to H, output is resumed at the next execution of the terminal output unit.

Target Classification

- The output is immediately interrupted.
- When output is enabled, the output is resumed from the next target classification output.

Error Code

- 22: The number of parameters is invalid.

The parameter data is invalid.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Relationship with %Test

- There is no priority setting between OE and %Test. The internal operation is enabled or disabled in the order the event changed.

Example: When "OE,1" (enable) is input while %Test is ON (disable), output is enabled. After this, when %Test is set to OFF (enable) once and set to ON (disable) again, output is disabled.

- Output is enabled or disabled based on the status (level) of %Test immediately after the controller is turned on, reset, or the program is changed.

Exmaple: When "OE,1" (enable) is input while %Test is ON (disable), output is enabled. After this, when the program is changed, output is disabled because %Test is ON (disable).

Relationship with the flow editor and [Output On/Off] setting in the unit properties dialog

- When [Output On/Off] is set to [Output Off]: During edit operation, output from the controller is disabled regardless of the OE command and %Test setting.
- When [Output On/Off] is set to [Output On]: During edit operation, output from the controller is enabled or disabled depending on the relationship between the OE command and %Test setting.

Mode Control (R0/S0/RM)

R0: Switch to Run Mode

This command switches the controller from setup mode to run mode.

Send R0 [Delimiter]

Receive R0 [Delimiter]



If the controller is already in run mode, the command finishes normally without making any changes.

Error Code

22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

S0: Switch to Setup Mode

This command switches the controller from run mode to setup mode.

Send S0 [Delimiter]

Receive S0 [Delimiter]



When the process is waiting status to a waiting unit or capture unit, the unit execution is forced to stop and the controller enters setup mode. When a different unit is being executed, the controller enters setup mode after execution of the unit is complete.



If the controller is already in setup mode, the command finishes normally without making any changes.

Error Code

22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RM: Read Run/Setup Mode

This command obtains the current operation mode.

Send RM [Delimiter]

Receive RM,n [Delimiter]

- n: Mode

0: Setup mode

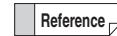
1: Run mode



This command does not affect the measurement processing time.

Error Code

22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Program Control (PW/PR)

PW: Switch Program No.

This command closes all open menus and loads the specified program from the SD card.

Send PW,d,nnn [Delimiter]

PW,d,nnn,t [Delimiter]

PW,ssss [Delimiter]

PW,ssss,t [Delimiter]

Receive PW [Delimiter]

- d: SD card No. (1 or 2)
 - 1: SD1
 - 2: SD2
- nnn: Program No. (0 to 999)
- ssss: Program name
- t: Saving of program No. after the switch (0 or 1)
 - 0 or omitted: Do not save the program No. after the switch.
 - 1: Save the program No. after the switch.

Reference

- When this command is received while the process is waiting status to a timing unit or capture unit, the unit execution is forced to stop and the program is changed.
- When the process starts waiting status to a timing unit or capture unit after this command is received, the program is changed.
- In cases other than those above, the program is changed after the flowchart processing finishes.
- If more than one program has the specified program name, the system searches for the program number from 000 to 999 in SD1 and then 000 to 999 in SD2, then loads the corresponding program which is found first.
- You need to place a double quotation mark ("") before ssss.
- When this command is executed as a custom instruction with one argument (Example: PW,*01) via PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, it is executed in the format for specifying the program name. The character string of the argument is read on the assumption that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark ("").
- To use the target program when the controller is turned on or restarted and parameter t has been omitted or set to 0, it is necessary to carry out the procedures for saving the program such as issuing an SS command after program change.

Point

Any changes to the setting data is discarded.

Error Code

- 03: The program number does not exist.

The SD card has not been inserted or cannot be accessed.

The program with the specified name does not exist.

- 22: The number of parameters is invalid.

The parameter data is invalid.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PR: Program No. Readout

This command returns the SD card number and program number of the current program.

Send PR [Delimiter] (1)

PR,NM [Delimiter] (2)

Receive PR,d,nnnn [Delimiter] **Response to (1)**

PR,ssss [Delimiter] **Response to (2)**

- d: SD card No. (1 or 2)
 - 1: SD1
 - 2: SD2
- nnn: Current program No. (0 to 999)
- ssss: Program name
- NM: Read program name



This command does not affect the measurement processing time.

Error Code

22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

System control (RS/RB/SS/BS/NW/NR/NU/CE/RE/WG/RR/RU/TG/SD/SR/SI/SE/PN/ASI)

RS: Reset

This command performs all of the following:

- Initialize all system variables that can be initialized.
Clear all buffers including the image buffer.
- Cancel the trigger/event waiting status of the unit.
- Create a new file name for the file used to store data.
- Initialize the user-defined local variables for which [Initialize on reset] is selected.
- Initialize the user-defined global variables for which [Initialize on reset] is selected.
- Initialize %JAHold.
- Return to the beginning of the flowchart.
- Clear all archived data.
- Clear all statistical data.
- All results of the target classification are cleared.

Send RS [Delimiter]

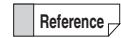
Receive RS [Delimiter]



- When the process is waiting status to a waiting unit or capture unit, the unit execution is forced to stop and the controller is reset.
- When a unit other than that above is being executed, the controller is reset after the execution of the unit is complete.

Error Code

22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RB: Reboot

This command restarts the controller.

Send RB [Delimiter]

Receive RB [Delimiter]

Reference

- When the process is waiting status to a waiting unit or capture unit, the unit execution is forced to stop and the controller is rebooted.
- When a unit other than that above is being executed, the controller is rebooted after the execution of the unit is complete.
- When data is being output, the process is synchronized according to the OE command timing, and then the controller is rebooted.

Error Code

22: The number of parameters is invalid.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

SS: Save Program

This command saves the current inspection settings, global variables, local variables, and global settings.

Send SS [Delimiter]

Receive SS [Delimiter]

Reference

This command does not affect the measurement processing time. However, while recipe settings are being loaded, the command pauses measuring where the unit ends and executes.

Error Code

- 03: The SD card has not been inserted or cannot be accessed.
- 22: The number of parameters is invalid.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

BS: Register Image

This command saves a specified image variable as the registered image with number nnnn, and then updates the reference image information based on the registered image. When the position adjustment ID is specified, the image is registered while its position is adjusted based on the specified position adjustment values.

Send BS,sssss,nnn [Delimiter]

BS,sssss,nnn,uuuu [Delimiter]

BS,sssss,nnn,uuuu,t [Delimiter]

BS,sssss,nnn,,t [Delimiter] (when uuuu is omitted)

BS,sssss,nnn,xxxx1,yyyy1,xxxx2,yyyy2 [Delimiter]

BS,sssss,nnn,uuuu,xxxx1,yyyy1,xxxx2,yyyy2 [Delimiter]

BS,sssss,nnn,uuuu,t,xxxx1,yyyy1,xxxx2,yyyy2 [Delimiter]

Receive BS [Delimiter]

- sssss: Image variable name

- nnn: Registered image No. 0 to 999

- uuuu: Position adjustment ID 0000 to 0999

- t: Target image
 - 0: Register the image captured with the last trigger. When the image is a black image, this black image is registered.
 - 1: Register the currently displayed image (excluding archived images). When this image is a black image, the image captured with the last trigger is registered.

- xxxx1 Partial registration area
Upper left X coordinate 0 to 8191

- yyyy1 Partial registration area
Upper left Y coordinate 0 to 16383

- xxxx2 Partial registration area
Lower right X coordinate 0 to 8191

- yyyy2 Partial registration area
Lower right Y coordinate 0 to 16383

 Reference

- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- When a result image variable for an image operation unit, calibration unit, or plugin unit is specified as the image variable, executing the UT command (Page 2-34) immediately before this command registers the result image of the unit test (UT result image).
- When the position adjustment ID is specified, executing the UT command (Page 2-34) for the position adjustment unit immediately before this command applies the position adjustment values used for the unit test to the image registration.
- If the partial registration area upper left X and Y coordinates or the partial registration area lower right X and Y coordinates exceed the capture range of the target camera, they are corrected to be within the capture range for registration.
- You can select the image type that you want to use in [Select Image] on the capture unit.
- When LumiTrax mode/LumiTrax Specular Reflection mode/MultiSpectrum mode/3D Capture mode/Outline Capture mode is used, if you specified an image variable with no extension, like "&Cam1Img," the image registration number will be in the range 000 to 099 (000 to 399 in 3D Capture mode) regardless of the default image type.
- Even if you specified 000 to 099 (000 to 399 in 3D Capture mode) with the BS command, the normal image (LumiTrax mode/LumiTrax Specular Reflection mode/Outline Capture mode), average grayscale image (MultiSpectrum mode), or grayscale/color image (3D Capture mode) is actually stored in the specified registration number.

 Point

- If a file with the same number exists, that file will be overwritten unless it is read-only.
- Even when the registered image used for teaching of a calibration unit is changed, teaching is not performed.
- For images of 3D cameras or the LJ-X/LJ-V, available registered image Nos. and other behaviors are restricted. For more details, refer to "Restrictions on commands related to registered image Nos." (Page 2-6).
- When a height image needs to be registered (excluding in 3D Capture mode), specifying image variables for height and grayscale images on the capture unit allows both images to be saved. In this case, the height image is saved and the grayscale image is saved with the No. of a specified registered image + 500 during image registration.
- All types of images selected as images to be used with LumiTrax mode/LumiTrax Specular Reflection mode/MultiSpectrum mode/3D Capture mode/Outline Capture mode are saved when the BS command is executed.

Error Code

- 03: The SD card has not been inserted or cannot be accessed.
The SD card is full and no more images can be registered.
The file of the specified number is read-only.
The unit of the specified position adjustment ID is not a position adjustment unit.
The registration of the reference image information failed.
The image capture range of the capture unit is set.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The specified image variable does not exist.
The effective area in the partial image registration region is 0.

 Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

NW: Write Registered Image No.

Switches the registered image number for the specified unit.
When necessary, the reference image information is updated with the registered image of that number.

Send NW,mmm,nnn [Delimiter]
 NW,mmm,nnn,x [Delimiter]

Receive NW [Delimiter]

- mmm: Unit ID 0 to 999
(AL: All units)
- nnn: Registered image No. 0 to 999
- x: When the unit ID for an image operation unit or plugin unit was specified: Source image No. (1 or 2)
When the unit ID for a calibration unit was specified: Teaching image No. (1 to 16)
(When AL was specified for the unit ID, this parameter is ignored by units other than image operation, plugin, and calibration units.)

Reference

- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- The region and color extraction information settings use the current values.

Point

- You must load the registered image from the file in the SD card.
- The reference image information will be updated for all units which use the registered image of the same number as the one being changed. (When the registered image number is changed to 001 in one unit, the reference image information will also be updated for other units which use the registered image No. 001.)

Error Code

- 03: Variable referencing is used to change the registered image number.
The registration of the reference image information failed.
The image memory is insufficient.
The specified unit ID does not exist.
There is no unit with the registered image number.
The [Registered Image] option is not set for the source image specified in the image operation unit or plugin unit (The registered image number will not be updated.).
A source image number or teaching image number was specified for units other than image operation, plugin, and calibration units.
The specified teaching image number is outside the range of the teaching images specified in the calibration unit.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

NR: Read Registered Image No.

This command returns the registered image number currently used for measurement.

Send **NR,mmm** [Delimiter]
NR,mmm,x [Delimiter]

Receive **NR,nnn** [Delimiter]

- mmm: Unit ID 0 to 999
- nnn: Registered image No. 0 to 999
- x: When the unit ID for an image operation unit or plugin unit was specified: Source image No. (1 or 2)
When the unit ID for a calibration unit was specified: Teaching image No. (1 to 16)



- This command does not affect the measurement processing time.
- Even when variable referencing is used for the specified registered image, the number of the registered image actually used is returned (instead of the value of the referenced variable).

Error Code

- 03: The specified unit ID does not exist.
The unit of the specified unit ID does not have a registered image number.
The [Registered Image] option is not set for the source image specified in the image operation unit.
A source image number or teaching image number was specified for units other than image operation, plugin, and calibration units.
Source image 2 was specified for the image operation unit which uses Source image 1 only.
The specified teaching image number is outside the range of the teaching images specified in the calibration unit.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

NU: Update Referenced Registered Image No.

This command changes the registered image number for a specified unit that uses variable referencing to change the registered image. The current value in the variable is retrieved and used to change the registered image number. When necessary, the reference image information is updated with the registered image of that number.

Send **NU,mmm** [Delimiter]
Receive **NU** [Delimiter]

- mmm: Unit ID 0 to 999 (AL: All units)



- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- The region and color extraction information settings use the current values.



- You must load the registered image from the file in the SD card.
- Regardless of the specification of the unit ID, the reference image information will be updated for all units which use the registered image of the same number as the changed one (When the registered image number is changed to 001 in one unit, the reference image information will also be updated for other units which use the registered image No. 001.).
- Even when the registered image number used for teaching of a calibration unit is changed, teaching is not performed.
- For images of 3D cameras or the LJ-X/LJ-V, available registered image Nos. and other behaviors are restricted. For more details, refer to "Restrictions on commands related to registered image Nos." (Page 2-6).

Error Code

- 03: There are no units which use variable referencing to change the registered image number.
The registration of the reference image information failed.
The image memory is insufficient.
The reference of a registered image is invalid in the image operation unit which references the same registered image as the specified unit.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CE: Clear Error

This command clears the error status and error code of a specified type (0 or 1).

Send	CE,n	Delimiter
Receive	CE	Delimiter

- n: Type of error (0 or 1)
 - 0: Clear %Error0 and %Error0Code
 - 1: Clear %Error1 and %Error1Code

 This command does not affect the measurement processing time.

 The command finishes normally even if the specified error type is not active.

Error Code

- 03: The command was sent when all triggers could not be accepted or when trigger input was disabled (when all %Trg*Ready are not turned on).
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

RE: Return to Beginning of Flowchart

This command makes the flowchart process jump to the unit after the start unit when the process is in a waiting status caused by a capture unit or a waiting unit other than a user menu or timer setup unit.

Send	RE	Delimiter
Receive	RE	Delimiter

 This command executes immediately when the flowchart is in a waiting status caused by the relevant unit.

Error Code

- 03: The process is not in a waiting status caused by the relevant unit.
- 22: The number of parameters is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

WG: Waiting Status Release

This command cancels the waiting status caused by a terminal I/O delay or variable delay unit. This command can also be issued with an input parameter to specify the desired status of result data (Judge No. and logical OR of satisfied conditions) of the unit for which the waiting status will be canceled.

- When you do not reference result data for the unit, specify 0 as the input parameter. In this case, the waiting status will be canceled while the Judge No. and logical OR of satisfied conditions for the unit remain 0.
- The input parameter is converted into a binary number and assigned to satisfied conditions. The condition assigned to the lowest order bit among the bits containing 1 is assumed to be the Judge No.

Send **WG,xxxx** [Delimiter]

Receive **WG** [Delimiter]

- xxxx: Bits assigned to satisfied conditions (in decimal notation, 0 to $2^{20}-1$)

-  Reference
- This command does not affect the measurement processing time.
 - For variable delay units, only the lower order 8 bits of the input parameter will be assigned.

Error Code

- 03: The process is not in the waiting status caused by a terminal I/O delay or variable delay unit.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

-  Reference
- For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Example of the WG command execution

Cancel the waiting status by assuming the Judge No.4 is satisfied

WG,16 [Delimiter]

RR: Update Position Reference

This command loads the latest value currently referenced by a specified position adjustment unit, or value of the recalculation result obtained with the registered image.

Send **RR,mmm** [Delimiter]

RR,mmm,n [Delimiter]

Receive **RR** [Delimiter]

- mmm: Unit ID 0 to 999

AL: All position adjustment units

- n: Value to be loaded as a reference value
 - 0: Latest result
 - 1: Recalculation result of the registered image

 Reference

- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- When the latest result is loaded as the reference value, executing the UT command (Page 2-34) to the referenced unit immediately before this command loads the measurement result of the unit test as the reference value.

 Point

- When the latest result is loaded as the reference value and the measurement result of the unit is referenced:
 - If the referenced unit is executed after the process passed the start unit, the result of the unit execution is used.
 - If the referenced unit is not executed in this execution cycle, the result of the previous execution is used.
 - If the referenced unit was not executed in either the previous cycle or it was executed but resulted in an error, an error is returned.
- When the recalculation result of the registered image is loaded as the reference value, the measurement results for tests of all units are cleared.
- The result of this command is not saved automatically. It needs to be saved with the SS command.
- Even when AL is specified and units other than a position adjustment unit are included, it is not considered to be an error. If there is no position adjustment unit which allows updating of the reference position, the 03 error occurs.

Error Code

- 03: The specified unit is not a position adjustment unit.

The [Use Base Position] option is set to [User set] for the specified unit.

(When the latest result is loaded as the reference value)

The specified unit has not been executed successfully.

The referenced unit was not executed or was executed but resulted in an error.

(When the recalculation result of the registered image is loaded as the reference value)

The recalculation result of the registered image for the referenced unit is an error.

- 22: The number of parameters is invalid.
The specified parameter is outside the range.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RU: Update Image Reference

This command updates the reference image information of the specified unit ID with the result of the recalculation using the current registered image and setting parameters.

Send RU,mmm [Delimiter]

Receive RU [Delimiter]

- mmm: Unit ID 0 to 999
(AL: All units)

Reference

- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- The registered image is set to the currently used image. The region, image enhancement filter, and color extraction settings use the current reference values.
- This command is used to apply changes in the setting parameter values to image processing when [High speed mode OFF (on-demand updates)] is set for the unit (Pattern Search unit, ShapeTrax3A unit, and units using the Subtract filter) with reference image information.

Point

- This command uses an already loaded image as the registered image. Consequently, the registered image will not be reloaded from the SD card.
- Even when the RU command is issued for a calibration unit, teaching is not performed.

Error Code

- 03: The unit ID does not exist.

The specified unit does not have reference image information.

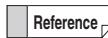
The specified unit is not allowed to update reference image information.

The registration of the reference image information failed.

The specified unit has reference image information and high speed mode is set to ON. AL was specified but there is no unit which can update reference image information or registration of the reference image information failed at least once (except in the instance the 03 error occurred due to another reason but registration succeeded for at least one unit).

- 22: The number of parameters is invalid.

The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

TG: Teaching

This command conducts teaching for a specified calibration unit using the currently set registered image.

Send **TG,mmm** Delimiter

Receive **TG** Delimiter

- mmm: Unit ID 0 to 999



This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.

Error Code

- 03: The unit does not exist or the specified unit is not a calibration unit.
Teaching could not be started.
- 22: The number of parameters is invalid.

The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

SD: Shading Correction Execution

This command calculates the shading correction value using the settings from the reference image and applies that value to the specified line scan camera.

Send	SD,n [Delimiter] (1)
	SD,n,ssss [Delimiter] (2)
Receive	SD [Delimiter]

- n: Camera No. 1 to 4
- ssss: Image variable name

- (1) Use the system image variable of the specified line scan camera as the reference image.
 - (2) Use the specified user image variable as the reference image.
- Reference**
- The conditions to calculate the shading correction value are set in [Shading Correction] in the waveform viewer and are saved in the global settings file (env.dat).
 - This command executes by waiting for completion of the current unit and then stopping the process. The flow moves to the start unit.

Error Code

- 03: The specified camera is not a line scan camera.
LumiTrax Specular Reflection mode is enabled with the specified camera
Execution of the shading correction failed.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The specified image variable does not exist.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

SR: Shading Correction Reset

This command resets the shading correction value applied to the specified line scan camera.

Send	SR,n [Delimiter]
Receive	SR [Delimiter]

- n: Camera No. 1 to 4

Reference This command executes by waiting for completion of the current unit and then stopping the process. The flow moves to the start unit.

Error Code

- 03: The specified camera is not a line scan camera.
Resetting of the shading correction failed.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

SI: Shading Correction Value Read

This command reads the shading correction value of the line scan camera from the specified CSV file and applies it to the specified line scan camera.

Send **SI,n,d,ssss** [Delimiter]

Receive **SI** [Delimiter]

- n: Camera No. 1 to 4
- d: SD card No. (1 or 2)
 - 1: SD1
 - 2: SD2
- ssss: CSV file name



- The source CSV file folder is fixed to /xg/linecam/.
- This command executes by waiting for completion of the current unit and then stopping the process. The flow moves to the start unit.

Error Code

- 03: Reading of the shading correction value failed.
The memory card has not been inserted or cannot be accessed.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The specified file name is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

SE: Shading Correction Value Write

This command writes the shading correction value applied to the specified line scan camera to the SD card as a CSV file.

Send **SE,n** [Delimiter]

Receive **SE** [Delimiter]

- n: Camera No. 1 to 4



- The SD card number is set in [Shading Correction] in the waveform viewer and is saved in the global settings file (env.dat).
- The name of the file which stores the data conforms to the file naming rules.
- If the destination folder is not available, it is created. If the same file name already exists, it is overwritten.
- This command does not affect the measurement processing time.

Error Code

- 03: The specified camera is not a line scan camera.
The memory card has not been inserted or cannot be accessed.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PN Change Program Name

This command changes the name of the specified program No.

Send	PN,d,nnn,ssss	Delimiter
	PN,d,nnn,xxxx	Delimiter
Receive	PN	Delimiter

- d: SD card No. (1 or 2)
1: SD1
2: SD2
- nnn: Program No. 0 to 999
- ssss: Program name
- xxxx: Scalar array variable
(System variables cannot be specified.)



This command does not affect the measurement processing time.



- If the target program is being executed on the controller, the changed data is not saved on the program file.
- You need to place a double quotation mark ("") before ssss.
- If ssss is changed as an argument of PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, the command is executed assuming that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark ("").
- At this time, reading stops if the command reaches 64 characters or an element with a value of 0 assuming two words (32 bits) of the data memory contain one character in the PLC-Link.
- For CC-Link, EtherNet/IP, PROFINET, and EtherCAT, reading stops if the command reaches 16 characters or an element with a value of 0 assuming every two words (4 bits) in Command Param contain one character.
- Only program names in the language set in the System Settings can be changed.

Error Code

- 03: The program No. does not exist.
The memory card has not been inserted or cannot be accessed.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ASI Interrupt Sectional Inspection

This command forcibly completes the inspection that is being executed in sectional inspection mode and enables the execution of the next inspection from the start.

Send	ASI	Delimiter
Receive	ASI	Delimiter



- If execution is in progress on a unit, this command waits for the completion of this unit's execution, and then forcibly jumps to the end unit.
- If the flowchart is in a waiting status caused by a waiting unit or an image capture unit, this command immediately completes the execution on this unit, and then forcibly jumps to the end unit.

Error Code

- 03: Sectional inspection is disabled.
- 22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Unit Test (UT/UE)

UT : Test Unit

Reinspect a unit specified by a number using the same image from the previous flowchart execution cycle.

- If the current image of the specified unit has been generated by the unit test of an image operation, plugin, or calibration unit, that image is used for the measurement.
 - If the current image has not been generated by the unit test of an image operation, plugin, or calibration unit and a user menu unit is being executed, the image of the current flowchart is used for the measurement.
 - If the specified unit is being edited in the unit properties menu based on the registered image, that registered image is used for the measurement.

Send **UT,mmm** **Delimiter**

UT,mmm, n Delimiter

Receive **UT** **Delimiter**

- mmm: unit ID 0 to 999
 - n: Display update setting 0: Do not update the display.
1: Update the display.

Reference

- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
 - The result of the unit test is cleared when:
 - The controller is reset.
 - The program number is changed.
 - The current flowchart process is complete.
 - The execution of a user menu unit starts.
 - The execution of a user menu unit is complete.
 - The UE command (Page 2-35) is executed.
 - Unit editing in the unit properties dialog is completed.
 - The reference position information is updated using the registered image by the RR command or the launcher menu.

Error Code

- 03: The unit ID does not exist.

The specified unit ID is not the ID of the unit available for the unit test (vision unit, image operation unit, position adjustment unit, calculation unit, and on-screen graphics unit).

- 22: The number of parameters is invalid.

The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

UE: Reset Unit After Test

This command deletes the test results for a single unit.

Send UE **Delimiter**

Receive UE **Delimiter**

Reference This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.

Error Code

22: The number of parameters is invalid.

Point The unit test result of the unit being edited using the registered image will not be deleted.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

OCR/OCR2/2D code reader/1D code reader related command (CA/CD/CW/CR/AT)

CA: Register Character to Library

This command registers a character specified in the latest search result^{*1}, archived image, or archived results with the library as a specified registration character.

Send CA,nnn,m,aa,ccc **Delimiter**
CA,nnn,h,j,m,aa,ccc **Delimiter**

Receive CA **Delimiter**

*1 The latest image (image captured with the trigger input) is registered with the library. If the latest image is a black image, the preceding image will be used. (If the preceding image is also a black image, that black image will be used.) If the CA command is issued without execution of the OCR/OCR2 unit, the OCR measurement is executed for the latest image and the result is registered. If the input image of the OCR/OCR2 unit has been generated by the unit test of an image operation unit, plugin unit, or calibration unit, execute the UT command for the OCR/OCR2 unit immediately before this command. The OCR measurement for the result image (UT result image) of the unit test is executed and the result is registered.

- nnn: Unit ID 0 to 999
- m: Line No. of the 1 to 2
search result
- aa: Character No. of the 1 to 20
search result
- ccc: Intended registration OCR unit:
character -1 to 59 (-1: No operation)
 OCR2 unit:
 -1 to 62 (-1: No
 operation. Up to 68
 only when "Lower
 Case Letters" is
 selected for User
 Character Selection.)
 See "Character Code
 Table for OCR/OCR2 Unit"
 (Page 2-113) for more
 details.
- h: Image archive 0 to 7
 conditions
- j: Go back to jth archive 0 to (Archive condition
 from the current one count -1)

Reference

- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- Executing the UT command (Page 2-34) for the target OCR unit immediately before this command registers the result of the unit test.

Point

- You cannot specify the registration number. The number next to the last registration number will be assigned automatically.
- To specify the image archive condition, you need to record both the archived image and archived result beforehand.
- The simulation functions do not support the specifications of the image archive condition (an 03 error will occur).

Error Code

- 03: The SD card has not been inserted or cannot be accessed.
The unit does not exist or the specified unit is not an OCR/OCR2 unit.
A library file does not exist.
Registration of the character with the library failed.
The specified archived image or archived result does not exist.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CD: Delete Character from Library

This command deletes the character of the last registration number for a specified registration character from the library.

Send **CD,nnn,ccc** [Delimiter]

Receive **CD** [Delimiter]

• nnn:	Unit ID	0 to 999
• ccc:	Registration character	OCR unit: -1 to 59 (-1: No operation) OCR2 unit: -1 to 62 (-1: No operation. Up to 68 only when "Lower Case Letters" is selected for User Character Selection.) See "Character Code Table for OCR/OCR2 Unit" (Page 2-113) for more details on registration characters.

Reference

This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.

Error Code

- 03: The SD card has not been inserted or cannot be accessed.
The unit does not exist or the specified unit is not an OCR/OCR2 unit.
A library file does not exist.
The specified registration character has not been registered.
Deletion of the character from the library failed.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CW: Write REG

This command changes the REG for an OCR/OCR2 unit, 2D code reader, or 1D code reader. The operation varies depending on the format. See "Character Code Table for OCR/OCR2 Unit" (Page 2-113) for more details on the ASCII codes that can be specified on the OCR/OCR2.

Send	CW,nnn,m,ssss	Delimiter	(1)
	CW,nnn,m,xxxx	Delimiter	(2)
	CW,nnn	Delimiter	(3)

Receive CW **Delimiter**

- nnn: Unit ID 0 to 999
- m: Line No. OCR/OCR2 unit: 1 to 2
2D code reader unit: 1 to 16
1D code reader unit: 1 to 16
- ssss: Text
OCR unit:
Number of characters 0 to 20
OCR2 unit:
Number of characters 0 to 40
2D code reader unit: Number
of characters 0 to 200
1D code reader unit: Number
of characters 0 to 128
- xxxx: Scalar type array variable: Number of arrays 1 to 10000



The value of REG will return to its previous status before being written when the controller is reset or turned off, unless it is saved manually using the SS command etc.

- (1) Set ssss as the content of REG for the mth line/mth match condition in unit ID nnn.
 - You need to place a double quotation mark ("") before ssss.
 - If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, CW, nnn, m, *01 and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed. In this case, double quotation marks ("") are not required.
 - For PLC-Link, you can set up to 64 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters. Reading stops if the command reaches an element with a value of 0.

- (2) Set the value of a scalar array type variable xxxx in ASCII codes as the content of REG for the mth line/mth match condition in unit ID nnn.

- Elements of the scalar array type variable (global or local) xxxx are read as ASCII codes (decimal numbers) from the element specified with the index and are interpreted as a character string.
- The reading finishes when it reaches the maximum length of REG, the end of the array, or an element of value 0.
- If you want to process less than 20 elements of an array containing 20 or more elements with an OCR unit or less than 40 elements of an array containing 40 or more elements with an OCR2 unit, you must provide an element of value 0 at the end.
- For a 2D Code Reader tool, the reading finishes when it reaches 512 characters, the end of the array, or an element of value 0 (If you want to read less than 512 elements of the array containing 512 or more elements, you must provide an element of value 0 at the end.).
- For a 1D Code Reader tool, if you want to read less than 128 elements of the array containing 128 or more elements, you must provide an element of value 0 at the end.

- (3) Set the latest reading result of the unit with unit ID nnn as REG for the unit.

If the unit has not been measured, REG is cleared (replaced with a space in an OCR/OCR2 unit).



- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- For the following case, * is set to REG on the OCR/OCR2 unit.
 - CW,nnn,m, **Delimiter**
 - CW,nnn,m,xxxx, **Delimiter** (The starting element value of xxxx is 0.) Executing the UT command (Page 2-34) for the target unit immediately before this command registers the result of the unit test.
- Here, 1 single byte character is indicated as 1 character. 2-byte characters such as Chinese character or Kana is equivalent to 2 characters of the indication above.

Error Code

- 03: A unit that is not OCR/OCR2, 2D code reader, or 1D code reader is specified.
REG has not been set.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CR: Read REG

This command reads the REG for an OCR/OCR2 unit, 2D code reader, or 1D code reader. The operation varies depending on the format.

Send CR,nnn,m [Delimiter] (1)

CR,nnn,m,xxxx [Delimiter] (2)

Receive CR,ssss [Delimiter] **Response to (1)**

CR [Delimiter] **Response to (2)**

- nnn: Unit ID 0 to 999
- m: Line number/
match OCR/OCR2 unit: 1 to 2
condition 2D code reader unit: 1 to 16
number 1D code reader unit: 1 to 16
- ssss: Text OCR unit:
Number of characters 0 to 20
OCR2 unit:
Number of characters 0 to 40
2D code reader unit: Number
of characters 0 to 512
1D code reader unit: Number
of characters 0 to 128
- xxxx: Scalar type array variable No. of arrays 1* to
10000

* Should be equal to or more than the number of characters of REG set for the target unit

- (1) The content of REG for the mth line/mth match condition in unit ID nnn is returned as a command response.
When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words are used for one character.



If the command is executed from ActiveX, the area exceeding 500 characters is discarded.

- (2) The content of REG for the mth line/mth match condition in unit ID nnn is stored as ASCII codes into the elements of a scalar array type variable xxxx from the element specified by the index.
 - The character string of REG is stored into a scalar array type variable (global or local) xxxx as ASCII codes.
 - When the reading reaches the maximum length of REG or the end of the character string, 0 is stored and the operation finishes.



- This command does not affect the measurement processing time.
- Here, 1 single byte character is indicated as 1 character. 2-byte characters such as Chinese or Japanese characters are equivalent to 2 characters of the indication above.

Error Code

- 03: A unit that is not OCR/OCR2, 2D code reader, or 1D code reader is specified.
Insufficient number of array elements.
REG has not been set.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

AT: Automatic Tuning

This command performs automatic tuning on the specified 2D and 1D code reader units using the input image or registered image.

Send **AT,mmm,n** Delimiter

Receive **AT** Delimiter

- mmm: Unit ID 0 to 999
- n: Image selection 0: Captured image
for automatic 1: Registered image
tuning

- When [Captured image] is specified, the system operates as follows:
 - If AT command is issued from the command execution unit: Executes automatic tuning using the latest image of the specified unit. If the latest image does not exist, use one previous image.
 - If AT command is issued from elsewhere: Executes automatic tuning using the previous flow image. If the current image of the specified unit has been generated by the execution of an image operation unit, plugin unit, or calibration unit, that image is used for automatic tuning. If the current image has not been generated by unit execution and the user menu unit is being executed, automatic tuning is executed using the latest image of the specified unit.
- After execution of automatic tuning, the unit test execution result is updated to the unit test execution result and the execution result display is updated.

 Reference

This command executes by stopping the measurement temporarily.

Error Code

- 03 : The unit does not exist or the specified unit is not a 2D or 1D code reader.
Automatic tuning failed.
- 22 : The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Data I/O (MW/MS/MR/IW/IS/IR/WP/RP/WO)**MW: Write to Variable**

This command changes the value of a specified scalar type variable (global or local) to a specified value. The variable is updated immediately when this command is executed.

Send **MW,aaaa,nnnn** Delimiter

MW,aaaa,nnnn,bbbb,mmmm Delimiter

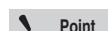
Values of up to 16 variables can be changed.

Receive **MW** Delimiter

- aaaa: Target variable
- bbbb: Target variable
- nnnn: Value or variable name to be written
- mmmm: Value or variable name to be written



This command does not affect the measurement processing time.



- Values of up to 16 variables can be changed simultaneously. The values are changed simultaneously and reading/writing by other processes is disabled during the change.
- The maximum value which can be written via no protocol communication is within 10 integers and 6 decimals.
- To change the value of a non-scalar type variable or an array type variable, use the unit of one element of a scalar type variable.

- **Example 1:** Specify as follows to change the value of a circle variable #a:

Send MW,#a.CX,200,#a.CY,150,#a.CR,100
Delimiter

- **Example 2:** Specify as follows to change the value of the first element of a scalar array type variable #b[10]:

Send MW,#b[0],200 Delimiter

- The values of system variables, setting parameters and result data cannot be changed.
- The values are updated immediately when this command is executed.
- Although this command changes the current value of the variable, it does not affect the initial value of the program file. To save the change, you need to select [Copy current value to initial value at save] in the [Variables] dialog and then issue the SS command.
- When PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT is used, the data type used for data memory which stores command parameters is always fixed to decimals (The use of fixed point or floating point depends on the global setting.).

Error Code

- 22: The specified variable is not found.
The number of parameters is invalid.
The specified parameter is outside the range.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

MS: Simultaneous Write to Variable

This command writes a specified value for a variable but changes it when the process reaches the first capture unit of the flowchart or the end unit at the end of the flowchart.

Send MS,aaaa,nnnn [Delimiter]

MS,aaaa,nnnn,bbbb,mmmm [Delimiter]

Values of up to 16 variables can be changed.

Receive MS [Delimiter]

- aaaa: Target variable
- bbbb: Target variable
- nnnn: Value or variable name to be written
- mmmm: Value or variable name to be written

Reference

This command does not affect the measurement processing time.

Point

- The variables are updated when the process reaches the first capture unit of the flowchart or the end unit of the flowchart.
- The maximum value which can be written via no protocol communication is within 10 integers and 6 decimals.
- For other details, see MW command (Page 2-40).

Error Code

- 22: The specified variable is not found.
The number of parameters is invalid.
The specified parameter is outside the range.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

MR: Read from Variable

This command reads the value of a specified scalar type variable.

Send **MR,aaaa** [Delimiter]

MR,aaaa,bbbb [Delimiter]

Values of up to 16 variables can be read.

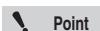
Receive **MR,nnnn** [Delimiter]

MR,nnnn,mmmm [Delimiter]

- aaaa: Name of the target variable
- bbbb: Name of the target variable
- nnnn: Value of the target variable
- mmmm: Value of the target variable



This command does not affect the measurement processing time.



- The maximum value that can be read via no protocol communication is within 10 integers and 6 decimals.
- To read a non-scalar type variable or an array type variable, use the unit of one element of a scalar type variable.

- **Example 1:** Specify as follows to read a circle variable #a:

Send **MR,#a.CX,#a.CY,#a.CR** [Delimiter]

Receive **MR,+0000000200.000000,**
+0000000150.000000,
+0000000100.000000 [Delimiter]

- **Example 2:** Specify as follows to read the first element of a scalar array type variable #b[10]:

Send **MR,#b[0]** [Delimiter]

Receive **MR,+0000000200.000000** [Delimiter]

- The values of setting parameters and result data cannot be read.
- When PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT is used, the data type used for data memory which stores command data is always fixed to decimals (The use of fixed point or floating point depends on the global setting.).

Error Code

- 22: The specified variable is not found.

The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

IW : Integer Write to Variable

This command rounds off a specified value to the nearest integer and writes it as the value of a specified variable.

The variable is updated immediately when this command is executed.

Send **IW,aaaa,nnnn** [Delimiter]

IW,aaaa,nnnn,bbbb,mmmm [Delimiter]

Values of up to 16 variables can be changed.

Receive **IW** [Delimiter]

- aaaa: Target variable

- bbbb: Target variable

- nnnn: Value or variable name to be written

- mmmm: Value or variable name to be written



This command does not affect the measurement processing time.



- When the PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT is used, the data type used for data memory that stores the command parameter is always fixed to integers.
- The values are updated immediately when this command is executed.
- The value which can be written via no protocol communication is within 10 integers with a sign.
- For other details, see MW command (Page 2-40).

Error Code

- 22: The specified variable is not found.

The number of parameters is invalid.

The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

IS: Simultaneous Integer Write to Variable

This command writes a specified value to a variable as integers but changes it when the process reaches the first capture unit of the flowchart or the end unit of the flowchart.

Send IS,aaaa,nnnn [Delimiter]

IS,aaaa,nnnn,bbbb,mmmm [Delimiter]

Values of up to 16 variables can be changed.

Receive IS [Delimiter]

- aaaa: Target variable
- bbbb: Target variable
- nnnn: Value or variable name to be written
- mmmm: Value or variable name to be written



This command does not affect the measurement processing time.



- The variables are updated when the process reaches the first capture unit of the flowchart or the end unit of the flowchart.
- The value which can be written via no protocol communication is within 10 integers with a sign.
- For other details, see MW command (Page 2-40).

Error Code

- 22: The specified variable is not found.
The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

IR: Integer Read from Variable

This command reads the value of a specified variable, rounds it off to the nearest integer, and outputs the result.

Send IR,aaaa [Delimiter]

IR,aaaa,bbbb [Delimiter]

Values of up to 16 variables can be read.

Receive IR,nnnn [Delimiter]

IR,nnnn,mmmm [Delimiter]

- aaaa: Name of the target variable
- bbbb: Name of the target variable
- nnnn: Value of the target variable
- mmmm: Value of the target variable



This command does not affect the measurement processing time.



- The output is in an integer format (10 integers with a sign).
- When the PLC-Link, CC-Link, EtherNet/IP, PROFINET or EtherCAT is used, the data type used for data memory that stores the command data is always fixed to integers.
- For other details, see MR command (Page 2-42).

Error Code

- 22: The specified variable is not found.
The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

WP: Write to Terminal Variable

This command changes the value of the system variable which allows terminal assignment and can be written via a command. The variable is updated immediately when this command is executed.

Send **WP,aaaa,nnnn** Delimiter

Receive **WP** Delimiter

- aaaa: Target system variable (%OutDataAsyncA to %OutDataAsyncH)
- nnnn: Value or variable name to be written (-2147483648 to 2147483647)

 This command does not affect the measurement processing time.

 The values are updated immediately when this command is executed.

Error Code

- 22: The specified variable is not one of %OutDataAsyncA to %OutDataAsyncH.
The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RP: Read from Terminal Variable

This command reads the status of a specified terminal.

Send **RP,aaaa** Delimiter

Receive **RP,nnnn** Delimiter

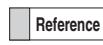
- aaaa: Target system variable (%OutDataAsyncA to %OutDataAsyncH)
- nnnn: Read value

 This command does not affect the measurement processing time.

 When this command is executed, the current array value will be read.

Error Code

- 22: The specified variable is not one of %OutDataAsyncA to %OutDataAsyncH.
The number of parameters is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

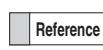
WO: Write Terminal Offset

This command writes aaaa*bbbb to %CmdParamOffset.

Send **WO,aaaa,bbbb** Delimiter

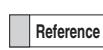
Receive **WO** Delimiter

- aaaa: Offset scale
- bbbb: Offset value

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

 For WO command arguments, %CmdParamOffset is not added.

PLC Communication (PLC Link, CC-Link, EtherNet/IP, PROFINET, EtherCAT)-specific Data I/O (MWX/MSX/MRX/IWX/ISX/IRX)

MWX: Write to Array Variable

This command changes the values of a specified array variable (global or local) of a specified type. The variable is updated immediately when this command is executed.

- Depending on the specified variable type and number of variable elements, the system references the data memory starting from the command parameter address for the PLC link, or the word devices starting from Command Parameter1 for the CC-Link, EtherNet/IP, PROFINET, or EtherCAT.
- The data memory is read as a decimal type in 32 bit units. (The use of fixed point or floating point depends on the global setting.).
- Up to 1000 elements of an array variable can be changed simultaneously. However, reading/writing by other processes is disabled during the change.

Send MWX,aaaa,n [Delimiter]

Receive MWX [Delimiter]

- aaaa: Name of the target array variable
- n: Number of elements of the variable (1 to 1000)

Reference This command executes by stopping the measurement temporarily.

Point

- The current values when this command is executed will be used.
- The values of system variables, setting parameters and result data cannot be changed.
- Although this command changes the current values of the variable, they are not saved in the program file. To save the change, you need to execute the SS command.
- If the number of variable elements "n" you specified exceeds the range of the array, the values are changed until the range is exceeded, and then an execution error is returned.
- When executed via the CC-Link, EtherNet/IP, PROFINET, or EtherCAT, this command reads the addresses of the specified number from the first element of the command parameter, without referencing the [Command function size] value specified in the global setting.

Error Code

- 03: Insufficient number of array elements.
- 22: The specified variable does not exist.
The number of parameters is invalid.
The specified parameter is outside the range.
The specified variable is not an array type.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Example of the command parameter input for the MWX command to use the PLC Link (Command parameter address = 1000)

- Example 1: To change two elements of a scalar array variable #a (No. of elements: 3) from the first one
MWX,#a[0],2 [Delimiter]
1000 #a[0] Updated
1001
1002 #a[1] Updated
1003
1004 #a[2] Not updated
1005
- Example 2: To change two elements of a circle variable #b (No. of elements: 3) from the first one
MWX,#b[0],2 [Delimiter]
1000 #b[0].CX Updated
1001
1002 #b[0].CY Updated
1003
1004 #b[0].CR Updated
1005
1006 #b[1].CX Updated
1007
1008 #b[1].CY Updated
1009
1010 #b[1].CR Updated
1011
1012 #b[2].CX Not updated
1013
1014 #b[2].CY Not updated
1015
1016 #b[2].CR Not updated
1017

- Example 3: To change two elements of a scalar array type variable #c (No. of elements: 3) from the second one

MWX,#c[1],2 [Delimiter]

—	#c[0]	Not updated
—		
1000	#c[1]	Updated
1001		
1002	#c[2]	Updated
1003		



If "MWX,#c[1],3" is specified, the number of elements exceeds the range of the array and an error occurs after the element #c[2] is updated.

MSX: Simultaneous Write to Array Variable

This command changes the values of a specified array variable (global or local) of a specified type. The variable is updated when the process reaches the end unit of the flowchart.

- Depending on the specified variable type and number of variable elements, the system references the data memory starting from the command parameter address for the PLC link, or the word devices starting from Command Parameter1 for the CC-Link, EtherNet/IP, PROFINET, or EtherCAT.
- The data memory is read as a decimal type in 32 bit units. (The use of fixed point or floating point depends on the global setting.).
- Up to 1000 elements of an array variable can be changed simultaneously. However, reading/writing by other processes is disabled during the change.

Send **MSX,aaaa,n** [Delimiter]

Receive **MSX** [Delimiter]

- aaaa: Name of the target array variable
- n: Number of elements of the variable (1 to 1000)



- This command executes by stopping the measurement temporarily.
- For details on how to specify the first element of an array variable, refer to the examples of MWX command (Page 2-45).



- The current values when this command is executed will be used.
- The values of system variables, setting parameters and result data cannot be changed.
- Although this command changes the current values of the variable, they are not saved in the program file. To save the change, you need to execute the SS command.
- If the number of variable elements "n" you specified exceeds the range of the array, the values are changed until the range is exceeded, and then an execution error is returned.
- When executed via the CC-Link, EtherNet/IP, PROFINET, or EtherCAT, this command reads the addresses of the specified number from the first element of the command parameter, without referencing the [Command function size] value specified in the global setting.

Error Code

- 03: Insufficient number of array elements.
- 22: The specified variable does not exist.
The number of parameters is invalid.
The specified parameter is outside the range.
The specified variable is not an array type.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

MRX: Read from Array Variable

This command reads the values of a specified array variable (global or local) of a specified type.

- Depending on the specified variable type and number of variable elements, the system outputs to the command data output address for the PLC link, or the word devices starting from Command Data1 for the CC-Link, EtherNet/IP, PROFINET, or EtherCAT.
- The values are stored into the data memory as a decimal type in 32 bit units. (The use of fixed point or floating point depends on the global setting.).
- Up to 1000 elements of an array variable can be read simultaneously. However, reading/writing by other processes is disabled during the reading.

Send **MRX,aaaa,n [Delimiter]**

Receive **MRX [Delimiter]**

- aaaa: Name of the target array variable
- n: Number of elements of the variable (1 to 1000)

Reference

- This command executes by stopping the measurement temporarily.
- For details on how to specify the first element of an array variable, refer to the examples of MWX command (Page 2-45).

Point

- When this command is executed, the current array value will be read.
- The values of system variables, setting parameters and result data cannot be read.
- If the number of variable elements "n" you specified exceeds the range of the array, the variable values are not read and an execution error is returned.

Error Code

- 03: Insufficient number of array elements.
- 22: The specified variable does not exist.
The number of parameters is invalid.
The specified parameter is outside the range.
The specified variable is not an array type.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

IWX: Integer Write to Array Variable

This command reads the value in the data memory of the parameter address as an integer and writes it to an array variable (global or local). The variable is updated immediately when this command is executed.

- Depending on the specified variable type and number of variable elements, the system references the data memory starting from the command parameter address for the PLC link, or the word devices starting from Command Parameter1 for the CC-Link, EtherNet/IP, PROFINET, or EtherCAT.
- The data memory is read as an integer type in 32 bit units.
- Up to 1000 elements of an array variable can be changed simultaneously. However, reading/writing by other processes is disabled during the change.

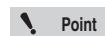
Send **IWX,aaaa,n** Delimiter

Receive **IWX** Delimiter

- aaaa: Name of the target array variable
- n: Number of elements of the variable (1 to 1000)



- This command executes by stopping the measurement temporarily.
- For details on how to specify the first element of an array variable, refer to the examples of MWX command (Page 2-45).



- The current values when this command is executed will be used.
- The values of system variables, setting parameters and result data cannot be changed.
- Although this command changes the current values of the variable, they are not saved in the program file. To save the change, you need to execute the SS command.
- If the number of variable elements "n" you specified exceeds the range of the array, the values are changed until the range is exceeded, and then an execution error is returned.
- When executed via the CC-Link, EtherNet/IP, PROFINET, or EtherCAT, this command reads the addresses of the specified number from the first element of the command parameter, without referencing the [Command function size] value specified in the global setting.

Error Code

- 03: Insufficient number of array elements.
- 22: The specified variable does not exist.
The number of parameters is invalid.
The specified parameter is outside the range.
The specified variable is not an array type.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ISX: Simultaneous Integer Write to Array Variable

This command reads the values in the data memory of the parameter address as integers and writes them to an array variable (global or local). The variable is updated when the process reaches the end unit of the flowchart.

- Depending on the specified variable type and number of variable elements, the system references the data memory starting from the command parameter address for the PLC link, or the word devices starting from Command Parameter1 for the CC-Link, EtherNet/IP, PROFINET, or EtherCAT.
- The data memory is read as an integer type in 32 bit units.
- Up to 1000 elements of an array variable are changed simultaneously. However, reading/writing by other processes is disabled during the change.

Send ISX,aaaa,n [Delimiter]
Receive ISX [Delimiter]

- aaaa: Name of the target array variable
- n: Number of elements of the variable (1 to 1000)

- Reference**
- This command executes by stopping the measurement temporarily.
 - For details on how to specify the first element of an array variable, refer to the examples of MWX command (Page 2-45).

- Point**
- The current values when this command is executed will be used.
 - The values of system variables, setting parameters and result data cannot be changed.
 - Although this command changes the current values of the variable, they are not saved in the program file. To save the change, you need to execute the SS command.
 - If the number of variable elements "n" you specified exceeds the range of the array, the values are changed until the range is exceeded, and then an execution error is returned.
 - When executed via the CC-Link, EtherNet/IP, PROFINET, or EtherCAT, this command reads the addresses of the specified number from the first element of the command parameter, without referencing the [Command function size] value specified in the global setting.

Error Code

- 03: Insufficient number of array elements.
- 22: The specified variable does not exist.
The number of parameters is invalid.
The specified parameter is outside the range.
The specified variable is not an array type.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

IRX: Integer Read from Array Variable

This command reads values of an array variable (global or local), rounds them off to the nearest integer, and outputs the result to the data memory of the parameter address.

- Depending on the specified variable type and number of variable elements, the system outputs to the command data output address for the PLC link, or the word devices starting from Command Data1 for the CC-Link, EtherNet/IP, PROFINET, or EtherCAT.
- The values are stored into the data memory as an integer type in 32 bit units.
- Up to 1000 elements of an array variable can be read simultaneously. However, reading/writing by other processes is disabled during the reading.

Send **IRX,aaaa,n** Delimiter

Receive **IRX** Delimiter

- aaaa: Name of the target array variable
- n: Number of elements of the variable (1 to 1000)



- This command executes by stopping the measurement temporarily.
- For details on how to specify the first element of an array variable, refer to the examples of MWX command (Page 2-45).



- When this command is executed, the current array value will be read.
- The values of system variables, setting parameters and result data cannot be read.
- If the number of variable elements "n" you specified exceeds the range of the array, the variable values are not read and an execution error is returned.

Error Code

- 03: Insufficient number of array elements.
- 22: The specified variable does not exist.
The number of parameters is invalid.
The specified parameter is outside the range.
The specified variable is not an array type.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Display (VW/VR/GW/GR/UW/UR/ FW/FR/WI/RI/ZM/SC/FT/PMW/PMR/ PRW/PRR)

VW: Change Display Template ID

This command switches the display to a specified display template.

Send **VW,n** Delimiter

Receive **VW** Delimiter

n: Display template ID 0 to 99

ID

PV: Previous display template

NX: Next display template



- This command does not affect the measurement processing time.
- When this command is executed while the process is temporarily paused due to a user menu unit, the results of the units executed thus far are applied to the camera screen display.

Error Code

- 03: The specified display template does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

VR: Read Display Template ID

This command reads the current display template ID.

Send	VR	Delimiter
Receive	VR,n	Delimiter

n: Display template ID 0 to 99

 This command does not affect the measurement processing time.

Error Code

- 03: Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
The current screen is the flowchart display, flow editor, or screen editor.
- 22: The number of parameters is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

GW: Switch Page No.

This command displays the specified page.

Send	GW,nnnn	Delimiter
Receive	GW	Delimiter

nnnn: Page No. 1 to 9999

PV: Previous page

NX: Next page



- This command does not affect the measurement processing time.
- When this command is executed while the process is temporarily paused due to a user menu unit, the results of the units executed thus far are applied to the camera screen display.



Even when an undefined page number is specified, it is not considered to be an error. However, in such a case the page frame does not appear because the page is not defined.

Error Code

- 03: Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
The current screen is the flowchart display, flow editor, or screen editor.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

GR: Read Page No.

This command reads the current page number.

Send GR [Delimiter]

Receive GR,nnnn [Delimiter]

 This command does not affect the measurement processing time.

Parameter details

nnnn: Page No. 1 to 9999

Error Code

- 03: Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
The current screen is the flowchart display, flow editor, or screen editor.
- 22: The number of parameters is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

UW: Change Display Unit ID

This command changes the camera screen to display the unit with the specified unit ID.

Send UW,n,mmm [Delimiter]

UW,aa,mmm [Delimiter]

UW,n,bb [Delimiter]

UW,aa,bb [Delimiter]

Receive UW [Delimiter]

n: Camera screen No. (0 to 9)

mmm: Unit ID 0 to 999

aa: Symbol specifying the camera screen

FC: Focused camera screen

AL: All camera screens

bb: Symbol specifying the unit

PV: Previous unit

NX: Next unit

 • This command does not affect the measurement processing time.
• When this command is executed while the process is temporarily paused due to a user menu unit, the results of the units executed thus far are applied to the camera screen display.

Error Code

- 03: The specified unit ID does not exist for the specified camera screen number.
The timing is inappropriate to switch the unit ID.
The specified camera screen number does not exist.
The unit is not targeted with [Display Unit Refinement] on the camera settings screen.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

UR: Read Display Unit ID

This command reads the unit ID of the unit currently displayed on the camera screen.

Send UR,n [Delimiter]

Receive UR,mmm [Delimiter]

- n: Camera 0 to 9
screen No.
- FC: Focused camera screen No.
- mmm: Unit ID 0 to 999

 This command does not affect the measurement processing time.

 If no unit has been set, -1 is returned.

Error Code

- 03: The specified camera screen number does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

FW: Change Focus Screen

This command selects a specified camera screen.

Send FW,n [Delimiter]

Receive FW [Delimiter]

- | | | |
|-----|------------------------|--------|
| n: | Camera | 0 to 9 |
| | screen No. | |
| PV: | Previous camera screen | |
| NX: | Next camera screen | |

-  • This command does not affect the measurement processing time.
• When this command is executed while the process is temporarily paused due to a user menu unit, the results of the units executed thus far are applied to the camera screen display.

Error Code

- 03: The specified camera screen does not exist.
The camera screen cannot be changed.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

FR: Read Focus Screen No.

This command reads the camera screen number of the currently selected screen.

Send **FR** [Delimiter]

Receive **FR,n** [Delimiter]

n: Camera screen No. of the selected camera screen 0 to 9

 This command does not affect the measurement processing time.

Error Code

- 03: Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
The current screen is the flowchart display, flow editor, or screen editor.
- 22: The number of parameters is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

WI: Change Image Type

This command changes the type of image processed on a specified camera screen.

Send **WI,n,m** [Delimiter]

Receive **WI** [Delimiter]

- n: Camera screen No. (0 to 9)
FC: Focused camera screen
AL: All camera screens
- m: Type of processed image (0 to 10)
 - 0: Raw image 1 (No graphics)
 - 1: Raw image 2
 - 2: Color-extracted image
 - 3: Filtered image
 - 4: Contrast image
 - 5: Color extracted image 1 (Available only when the Color menu is open)
 - 6: Color extracted image 2 (Available only when the Color menu is open)
 - 7: Filtered image 2 (Available only when flowchart is in edit or display mode)
 - 8: Grayscale image (The grayscale image related to the height image is displayed.
It is only available when the height camera is used in the program.)
 - 9: Zero plane image (Available only when the height measurement unit - zero plane specification dialog is open)
 - 10: Normal image (Displays the LumiTrax Normal image)
 - 11: Average Grayscale image
 - 12: Color-Difference image
 - 13: Subtracted image
- PV: Type of the previous image
NX: Type of the next image

 This command does not affect the measurement processing time.

Error Code

- 03: The specified camera screen number does not exist.
The specified display template does not exist.
The current screen is the screen editor.
View Files, Image Viewer, Target Classification, or Waveform Viewer is open.
The camera screen number displaying the 3D view is specified.
The screen displaying the profile view is specified.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The specified the type of processing image dose not supported (eg, a normal image was specified as the type of processing image in a setting not using LumiTrax)



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RI: Read Image Type

This command reads the type of image processed on a specified camera screen.

Send RI,n [Delimiter]

Receive RI,m [Delimiter]

- n: Camera screen No. (0 to 9)
FC: Focused camera screen
- m: Type of processed image (0 to 10)
 - 0: Raw image 1 (No graphics)
 - 1: Raw image 2
 - 2: Color-extracted image
 - 3: Filtered image
 - 4: Contrast image
 - 5: Color extracted image 1
 - 6: Color extracted image 2
 - 7: Filtered image 2
 - 8: Grayscale image
 - 9: Zero plane image
 - 10: Normal Image
 - 11: Average Grayscale image
 - 12: Color-Difference image
 - 13: Subtracted image



This command does not affect the measurement processing time.

Error Code

- 03: The specified camera screen number does not exist.
The specified display template does not exist.
View Files, Image Viewer, Target Classification, or Waveform Viewer is open.
The camera screen number displaying the 3D view is specified.
The screen displaying the profile view is specified.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ZM: Zoom

This command zooms in or out of the camera screen based on the specified magnification settings.

Send **ZM,n,m,zzzz,xxx,yyy** [Delimiter]

ZM,n,m,zzzz [Delimiter]

ZM,n,m,zzzz,xxx,yyy,XXX,YYY [Delimiter]

ZM,n,c,zzzz,XXX,YYY [Delimiter]

ZM,n,c,zzzz [Delimiter]

Receive **ZM** [Delimiter]

- n: Camera screen No. 0 to 9
- FC: Camera screen No. of the focused camera screen
- m: Zooming method 0: Absolute ratio, 1: Relative ratio
- c: Zooming method (Camera coordinate) 2: Camera coordinate system with absolute ratio
3: Camera coordinate system with relative ratio
- zzzz: Zoom ratio (%) -2499 to 2500 (Absolute ratio: 1 to 2500, Relative ratio: -2499 to 2499)
- xxxx: Zoom center coordinate X -1024 to 1024
- yyyy: Zoom center coordinate Y -1024 to 1024
- XXX: Center coordinate X of camera coordinates -32768 to 32767
- YYY: Center coordinate Y of camera coordinates -32768 to 32767

Reference

- This command does not affect the measurement processing time.
- When coordinates are omitted, (0,0) is assumed regardless of the coordinate system.
- The "zoom center coordinates" refer to the zooming center position based on the coordinate system with the origin located at the top left corner of the camera screen, and the "center coordinates of the camera coordinates" refer to the zooming center position based on the coordinate system with the origin located at the top left corner of a captured image.

Point

- When the relative ratio is selected and the sum of the current ratio and zoom ratio is not within the range of 1 to 2500, the ratio will be 1 or 2500, whichever is closer.
- When both center coordinate options are specified, the camera coordinates precede regardless of the coordinates specified for the "Zooming method", and only the ratio setting (absolute/relative) is effective in the "Zooming method" setting.

Error Code

- 03: The specified camera screen number does not exist.

The current screen is the flowchart display, flow editor, or screen editor.

Any of the following menus are open: View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification

The screen number selected is displaying a 3D image.

On the Screen Editor, the detected point/inspection region tracking setting is on.

The screen displaying the profile view is specified.

- 22: The number of parameters is invalid.

The specified parameter is outside the range.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

SC: Scroll

This command moves a specified camera screen in parallel with the original position by a specified distance.

Send	SC,n,dx,dy	Delimiter
Receive	SC	Delimiter

- n: Camera screen No. 0 to 9
- FC: Camera screen No. of the focused camera screen
- dx: Distance X No range limit
- dy: Distance Y No range limit

 This command does not affect the measurement processing time.

Error Code

- 03: The specified camera screen number does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
The camera screen number selected is displaying a 3D image.
The screen displaying the profile view is specified.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

FT: Fit

This command adjusts the magnification of the camera screen so that it fits in the display frame.

Send	FT,n	Delimiter
Receive	FT	Delimiter

- n: Camera screen No. 0 to 9
- FC: Camera screen No. of the focused camera screen

 This command does not affect the measurement processing time.

Error Code

- 03: The specified camera screen number does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
The camera screen number displaying the 3D view is specified.
The screen displaying the profile view is specified.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PMW: Profile Measurement Item Number Switching

This command switches the measurement item number of the profile view.

Send

PMW,n,m	<small>Delimiter</small>
PMW,aa,m	<small>Delimiter</small>

Receive

PMW	<small>Delimiter</small>
------------	--------------------------

- n: Camera screen No. 0 to 9
- aa: FC: Focused camera screen
- AL: All camera screens
- m: Measurement item number 0 to 31

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.
There are too many parameter digits.
- 03: The specified camera screen number does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Waveform Viewer, Target Classification

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PMR: Profile Measurement Item Number Reading

This command reads the measurement item number of the profile view.

Send

PMR,n	<small>Delimiter</small>
PMR,FC	<small>Delimiter</small>

Receive

PMR,m	<small>Delimiter</small>
--------------	--------------------------

- n: Camera screen No. 0 to 9
- FC: Focused camera screen
- m: Measurement item number 0 to 31

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
- 03: The specified camera screen number does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Waveform Viewer, Target Classification

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PRW: Profile Result Display Condition Switching

This command switches the result display condition of the profile view.

Send

PRW,n,m,p	Delimiter
PRW,n,m,p,I	Delimiter
PRW,aa,m,p	Delimiter
PRW,aa,m,p,I	Delimiter

Receive **PRW** **Delimiter**

- n: Camera screen No. 0 to 9
- aa: FC: Focused camera screen
AL: All camera screens
- m: Result display condition
 - 0: No change
 - 1: Display condition 1
 - 2: Display condition 2
 - 3: Display condition 3
 - 4: Display condition 4
- p: Profile No.
 - 0: No change
 - 1: Profile No. 1
 - 2: Profile No. 2
 - 3: Profile No. 3
 - 4: Profile No. 4
- I: Multiple profile view
 - 0: OFF
 - 1: ON

If "I" is omitted, there will be no change to the existing multiple profile view.

Error Code

- 22: The specified number of parameters is incorrect.
The specified parameter is outside the range.
There are too many parameter digits.
- 03: The specified camera screen number does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Waveform Viewer, Target Classification



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PRR: Profile Result Display Condition Reading

This command reads the profile result display condition and the profile number.

Send

PRR,n	Delimiter
PRR,FC	Delimiter

Receive **PRR,m,p,I** **Delimiter**

- n: Camera screen No. 0 to 9
- FC: Focused camera screen
- m: Result display condition
 - 0: Display condition 1
 - 1: Display condition 2
 - 2: Display condition 3
 - 3: Display condition 4
- p: Profile No. 1 to 4
- I: Multiple profile view
 - 0: OFF
 - 1: ON



This command does not affect the measurement processing time.

Error Code

- 22: The specified number of parameters is incorrect.
The specified parameter is outside the range.
There are too many parameter digits.
- 03: The specified camera screen number does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
Any of the following menus are open:
View Files, Waveform Viewer, Target Classification



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Dialog (DC/DO/DR/BU)

DC: Close Menu

This command closes the menu of the specified ID.

Send	DC,AL [Delimiter]
	DC,nnnnnnnn [Delimiter]
	DC,nnnnnnnn,a [Delimiter]

Receive	DC [Delimiter]
----------------	-----------------------

- nnnnnnnn: Menu ID (0 to 99999999)

To close a unit properties menu, specify the menu ID consisting of the unit ID in the first four digits and the unit properties menu number in the last four digits.

Example: To close a menu with a unit ID of 0004 and unit properties menu number of 3, specify 00040003.

For more details on unit properties menu numbers, refer to the items in the "List of Unit Properties" of the XG-X VisionEditor Reference Manual.

- a: Optional ID
 - 0: Close a specified menu together with all menus which were opened on top of the specified menu.
 - 1: Close all menus which were opened on top of the specified menu but do not close the specified menu.
- AL: Close all menus.



- When a unit properties menu is specified to be closed, this command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- This command does not affect the measurement processing time when a unit properties menu is not included in the menus to be closed.



When 1 is set for the optional ID, handling of the confirmation menu displayed from the specified menu is different as follows:

- When the specified menu is a unit properties menu: The confirmation menu displayed from the menu with ID "X" cannot be closed with the command "DC, X, 1".
- When the specified menu is not a unit properties menu: The confirmation menu displayed from the menu with ID "X" can be closed with the command "DC, X, 1".

Error Code

- 03: The specified menu is a menu which cannot be closed (startup menu).

The process failed to pause movement to the next unit.

(only when the specified menu is a unit properties menu)

- 22: The number of parameters is invalid.

The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

DO: Open Menu

This command opens the menu of the specified ID.

Send	DO,nnnnnnnn	Delimiter
	DO,nnnnnnnn,c	Delimiter
Receive	DO	Delimiter

nnnnnnnn: Menu ID 0 to 99999999

To open a unit properties menu, specify the menu ID consisting of the unit ID in the first four digits and the unit properties menu number in the last four digits.

Example:

- To open a menu with a unit ID of 0004 and unit properties menu number of 3, specify 00040003.

For more details on unit properties menu numbers, refer to the items in the "List of Unit Properties" of the XG-X VisionEditor Reference Manual.

c: Camera number 1 to 4

If a Capture unit is specified with the unit ID, the tab for the specified camera will open as long as an enabled camera number is specified (if the camera number is omitted, the tab for the camera with the smallest number among the enabled cameras will open).

When a unit other than the Capture unit is specified with the unit ID, the camera number parameter is ignored.

Reference

- When a unit properties menu is specified to be opened, this command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- This command does not affect the measurement processing time when the menu to be opened is not a unit properties menu.

Point

The startup settings that will be applied when the Unit Properties menu is opened are the configured unit edit startup settings.

Error Code

- 03: The menu does not exist.

The menu cannot be opened.

The process failed to pause movement to the next unit. (only when the specified menu is a unit properties menu)

When a different standard menu is already open, you may not be able to open another standard menu when it is specified.

The current screen is the flowchart display or flow editor.

When the number of a non-connected camera is specified.

- 22: The number of parameters is invalid.

The specified parameter is outside the range.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

DR: Read Menu ID

This command reads the ID of the selected menu.

Send DR [Delimiter]

Receive DR,nnnnnnnn [Delimiter]

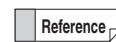
nnnnnnnn: Menu ID 0 to 99999999



- This command does not affect the measurement processing time.
- The number of digits of the ID to be read depends on the file format of the program.

Error Code

- 03: A menu is not open.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

BU: Open Unit Properties Menu

This command opens a unit properties menu.

Send BU,nnn,mmm [Delimiter]

BU,nnn,mmm,c [Delimiter]

Receive BU [Delimiter]

nnn: unit ID 0 to 999

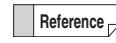
mmm: Unit properties menu No. 0 to 999

For more details on unit properties menu numbers, refer to the items in the "List of Unit Properties" of the XG-X VisionEditor Reference Manual.

c: Camera number 1 to 4

If a Capture unit is specified with the unit ID, the tab for the specified camera will open as long as an enabled camera number is specified (if the camera number is omitted, the tab for the camera with the smallest number among the enabled cameras will open).

When a unit other than the Capture unit is specified with the unit ID, the camera number parameter is ignored.



This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.



The startup settings that will be applied when the Unit Properties menu is opened are the configured unit edit startup settings.

Error Code

- 03: The unit does not exist or the specified menu number does not exist for the specified unit.
A unit properties menu is already open but another unit properties menu was specified.
The unit property menu cannot be opened.
The process failed to pause movement to the next unit.
The current screen is the flowchart display or flow editor.
When a different standard menu is already open, you may not be able to open another standard menu when it is specified.
When the number of a non-connected camera is specified.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Utility (TC/TS/HE/HR/HC/HS/LE/LQ/BC/ PV/CEW/CER/CLW/CLR)

TC: Clear Statistics Data

Clears statistical data.

After the data is cleared, the statistical analysis operation is resumed.

Send **TC** Delimiter

Receive **TC** Delimiter



This command does not affect the measurement processing time. It stops the statistical analysis and is executed immediately.

Error Code

- 22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

TS: Save Statistical Data

This command saves statistical data to the SD card.

Send **TS,n,[Folder name]** [Delimiter]

Receive **TS** [Delimiter]

- n: SD card No. (1 or 2)
 - 1: SD1
 - 2: SD2
- [Folder name]: Character string of maximum 221 characters
(Example: \xg\stat)(Single-byte characters only)



- This command does not affect the measurement processing time.
- This command does not affect the statistical analysis operation.



- When the statistical data becomes larger than the archived data, part of the measurement result may not be saved (because the oldest data is overwritten).
- Two CSV files will be created (Measurement result and measurement item name).
- The name of the file which stores the data conforms to the file naming rules.
- If the destination folder does not exist, a new folder will be created.
- If a destination file already exists, it will be overwritten (regardless of read-only or other file attributes).
- Once the data is saved, it will not be output any more (including data saved from the statistics menu).
- When all archived data has been saved and there is no statistical data to be saved, the command finishes successfully.

Error Code

- 03: The saving failed because:
 - The SD card has not been inserted.
 - The destination folder or file cannot be created.
 - The destination file cannot be opened.
 - The SD card is full.
- 22: The number of parameters is invalid.
 - The specified parameter is outside the range.
 - The folder name or SD card number is invalid.
 - The number of specified characters is 0 or exceeds the maximum number.
 - Any one of the following invalid characters is used:
0x7F, 0x80, 0xA0, 0xFD and later, *, ?, "",', '<', '>', '|', '/'



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

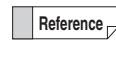
HE: Start/Stop Archive

This command starts or stops the archive operation.

Send HE,c [Delimiter]

Receive HE [Delimiter]

c: Start archiving (1), stop archiving (0)

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.
- 81: The archived data cannot be accessed.
(The data is currently being used by other software.)

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

HR: Read Archive Status

This command reads the current value of the system variable (%Hist0Status to %Hist31Status) corresponding to a specified archive condition number.

Send HR,n [Delimiter]

Receive HR,m [Delimiter]

- n: Archive condition No.(0 to 31)
- m: Control status (Value of %Hist0Status to %Hist31Status)

 • This command does not affect the measurement processing time.

- This command does not affect archive operation.
- See "List of System Variables" (Page 3-451) for more details on %Hist*Status.

 This command is not required to obtain authority to access the archived data. Consequently, error code 81 is not displayed even when archived data is being used by other software.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

HC: Clear Archived Data

This command clears the archived data for a specified archive condition number.

Send HC,n [Delimiter]

Receive HC [Delimiter]

n: Archive condition No. (0 to 31 or AL (all data))

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.
- 81: The archived data cannot be accessed.
(The data is currently being used by other software.)

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

HS: Save Archived Data

This command obtains authority to access the archived data and save the data to the SD card/USB HDD.

Send HS,aa,n,bb,cc [Delimiter]

Receive HS [Delimiter]

- aa: Data to be output:
AL (image and result), IM (image) or RS (result)
- n: Archive condition No. (0 to 31)
- bb: Measurement count:
AL (all generations), NW (latest measurement), or integer (measurement count)
- cc: Image variable name:
AL (all image variables) or character string (image variable name) (This parameter cannot be specified when the data to be output is set to RS (result).)

The operation varies depending on combination pattern of the parameters:

- Combination pattern (1):
Data to be output = AL (both), measurement count = AL (all generations), image variable name
= AL (all image variables)
Data to be output = IM (image), measurement count = AL (all generations), image variable name
= AL (all image variables)
Data to be output = RS (result), measurement count = AL (all generations)
- Combination pattern (2): Combinations other than above

Reference This command does not affect the measurement processing time.

Point

- If the archived data is being used by other software, the command ends by returning an 81 error.
- Output Location (SD Card/USB HDD), the file format (BMP/JPG/PNG), resolution setting, and file naming rule conform to the archive condition.
- If the destination folder does not exist, a new folder will be created.
- If a destination file already exists, it will be overwritten (regardless of read-only or other file attributes).
- Even when an error occurs during the process, the command tries to save all specified data (The process is not interrupted.)
- Operation for parameter combination pattern (1):
 - Once the data is saved to the SD card, or USB HDD, it will no longer be output (including data saved from an Image Archive menu).
 - When there is no archived data to be saved, the command ends successfully. (An error is issued only when access to the SD card, or USB HDD, failed.)

Point

- Operation for parameter combination pattern (2):
 - All specified image/result data is saved regardless of whether it is already saved or not.
 - When there is no archived data to be saved, an error occurs.
- When [Custom] is selected for the file naming rule, the HS command cannot be used.

Error Code

- 03: Data saving failed at least once.
(for each of image data and result data)
 - The SD card or USB HDD has not been inserted or cannot be accessed.
 - The SD card or USB HDD is full.
- The parameter combination is pattern (2) and:
The measurement count is set as NW or an integer but the corresponding archived data does not exist.
The measurement count is set as AL but one generation of archived data does not exist.
The measurement count is set as AL but the data archived when this command was received does not exist when it is output (because it was overwritten).
 - The [Output Location] was set to [FTP] or [VisionDataStorage (USB)].
 - [Custom] is selected for the file naming rule.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The specified archive condition is invalid.
The data to be output is specified as AL but the archive condition is set to not archive both image and result.
The data to be output is specified as IM but the archive condition is set not to archive images.
The data to be output is specified as RS but the archive condition is set not to archive results.
The specified image variable (character string) is not a valid variable or has not been specified to be archived.
- 81: The archived data cannot be accessed.
(The data is currently being used by other software.)

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

LE: Start/Stop Modification Logging

This command starts or stops the modification logging function.

Send LE,d [Delimiter]
Receive LE [Delimiter]

d: Start/stop setting

1: Start

0: Stop

Reference This command does not affect the measurement processing time.

Point The start command issued during the logging and the stop command while the logging is stopped are not considered to be an error.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

LQ: Read Modification Logging Status

This command reads the status of modification logging when operating or stopped.

Send LQ [Delimiter]
Receive LQ,d [Delimiter]

d: Logging status

1: Started

0: Stopped

Reference This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

BC: Capture Image

This command captures an image of the screen and saves it to the SD card or FTP server.

Send BC [Delimiter] (1)
BC,FTP [Delimiter] (2)
BC,USB [Delimiter] (3)

Receive BC [Delimiter]

- (1) Save screen capture to the SD card as a file.

The file name and the save destination folder can be specified in [System Settings] - [File Output] - [Screen Capture] in the XG-X VisionEditor.

- (2) Save screen capture to the FTP server.

The file name and the save destination folder can be specified by using the same method as with the SD card or by using the OW or OPW command.

Point When using SFTP (Page 1-310), only ASCII characters can be used.

- (3) Save screen capture to the VisionDataStorage connected via a USB cable. The file name and the save destination folder can be specified by using the same method as with the SD card or by using the OW or OPW command.

Reference This command does not affect the measurement processing time.

Point This command shows [Capturing Image] at the lower right of the screen.

Error Code

- 03: The SD card has not been inserted or cannot be accessed.
The SD card is full.
FTP output or VisionDataStorage (USB) output failed.
- 22: The number of parameters is invalid.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PV Display Profile

This command specifies the Display Profile ON/OFF and profile position.

Send **PV,n,m,xxxx,yyyy** [Delimiter]

(Screen specified by the number)

PV,FC,m,xxxx,yyyy [Delimiter]

(Focused screen)

Receive **PV** [Delimiter]

- n: Screen number: 0 to 9
- m: Display Profile
 - 0: OFF
 - 1: Horizontal direction
 - 2: Vertical direction
 - 3: Horizontal + Vertical direction
- xxxx: Profile position X 0 to 16383
- yyyy: Profile position Y 0 to 16383

 This command does not affect the measurement processing time.

Error Code

- 03: The specified camera screen number does not exist.
The current screen is the flowchart display, flow editor, or screen editor.
- Any of the following menus are open:
View Files, Register Image, Color, Inspection Region, Library, and Unit Properties (including the Edit Unit Menu), Waveform Viewer, Target Classification
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CEW Write Target Classification Condition Enable/Disable

This command writes enabling or disabling of the target classification condition.

Send **CEW,nn,m** [Delimiter]

Receive **CEW** [Delimiter]

- nn: Type ID (00 to 19)
- m: Target Classification Condition Enable/Disable
 - 0: Disable
 - 1: Enable

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CER Read Target Classification Condition Enabled/Disabled

This command reads whether the target classification condition is enabled or disabled.

Send **CER,nn** [Delimiter]

Receive **CER,m** [Delimiter]

- nn: Type ID (00 to 19)
- m: Target Classification Condition Enabled/Disabled
 - 0: Disabled
 - 1: Enabled

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CLW Write Target Classification Condition Tolerance

This command writes the tolerance (upper and lower limits of the features to be classified) for the target classification condition.

Send CLW,nn,mm,I,xxxx [Delimiter]
Receive CLW [Delimiter]

- nn: Type ID (01 to 19)
- mm: Feature to overwrite
 - 00: Y
 - 01: X
 - 02: Area
 - 03: Volume
 - 04: Maximum Intensity
 - 05: Average Intensity
 - 06: Bright & Dark
 - 07: Major Axis
 - 08: Minor Axis
 - 09: Angle
 - 10: Major / Minor Axes Ratio
 - 11: Perimeter
 - 12: Roundness
 - 13: Dist. Oval Major Axis
 - 14: Dist. Oval Minor Axis
 - 15: Dist. Oval Aspect Ratio
 - 16: Feret X
 - 17: Feret Y
- I: Tolerance to overwrite
 - 0: Upper Limit
 - 1: Lower Limit
- xxxx: Tolerance value to write to the specified target (upper or lower limit value)



You cannot specify the target classification with Type ID: 00 because the upper/lower limit value for each feature cannot be changed.



This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CLR Read Target Classification Condition Tolerance

This command reads the tolerance (upper and lower limits of the features to be classified) for the target classification condition.

Send CLR,nn,mm,I [Delimiter]
Receive CLR,xxxx [Delimiter]

- nn: Type ID (01 to 19)
- mm: Feature to read
 - 00: Y
 - 01: X
 - 02: Area
 - 03: Volume
 - 04: Maximum Intensity
 - 05: Average Intensity
 - 06: Bright & Dark
 - 07: Major Axis
 - 08: Minor Axis
 - 09: Angle
 - 10: Major / Minor Axes Ratio
 - 11: Perimeter
 - 12: Roundness
 - 13: Dist. Oval Major Axis
 - 14: Dist. Oval Minor Axis
 - 15: Dist. Oval Aspect Ratio
 - 16: Feret X
 - 17: Feret Y
- I: Tolerance to read
 - 0: Upper Limit
 - 1: Lower Limit
- xxxx: Tolerance value read from the specified target (upper or lower limit value)



You cannot specify the target classification with Type ID: 00 because the upper/lower limit value for each feature cannot be changed.



This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Account (PS/WH/UC/UA/UD)

Reference

For more details on the password used in the command, see "Password handling" (Page 2-5).

PS: Change Password

This command changes the password of a specified user.

Send PS,uuuu,ssss,ttt [Delimiter]

Receive PS [Delimiter]

- uuuu: User account name
Character string of 1 to 32 alphanumeric characters, "-" (hyphen) and "_" (underscore).
- ssss: Old password (single-byte alphanumeric characters and symbols (4 to 32 digits))
- ttt: New password (single-byte alphanumeric characters and symbols (4 to 32 digits))

Reference

This command does not affect the measurement processing time.

Point

- You need to place a double quotation mark ("") before ssss and tttt.
- If ";" or ":" is used in ssss or tttt, it is recognized as a "delimiting character of the command" and "delimiter of the command" respectively when the password is entered via an external command and does not properly function. However, by specifying "ASCII Code" for Delimiter of the custom instruction settings and setting 0x3B (";") as the value, it can be set so that ";" will not be recognized as a termination character of a command.
- If ssss and tttt are changed as an argument of PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, the command is executed assuming that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark ("").
- When the password is set as "single-byte alphanumeric characters(4 digits:0000 to 9999)", scalar type variable can be used for the password parameter.
In this case, you do not need to provide a double quotation mark ("").
- If [Register personal user IDs to the user accounts] is enabled in the account settings, specify the name and password of the user ID, not the name and password of the user account.

Error Code

- 03: The specified user account does not exist, the SD card has not been inserted or cannot be accessed.
The SD card is full.
- 22: The number of parameters is invalid.
- 80: The old password is incorrect.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

WH: Read User Account

This command reads the account which is currently logged in.

Send WH [Delimiter]

Receive WH,n,uuuu [Delimiter]

WH,n,uuuu,iiii [Delimiter]

(When [Register personal user IDs to the user accounts] is enabled in the account settings)

- n: User account No. 0 to 4
- uuuu: User account name
Character string of 1 to 32 alphanumeric characters, "-" (hyphen) and "_" (underscore).
- iiii: User ID
Character string of 1 to 32 alphanumeric characters, "-" (hyphen) and "_" (underscore).

Reference

This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

UC: Change Login User

This command changes the user account.

Send UC,uuuu,ssss [Delimiter]
Receive UC [Delimiter]

- uuuu: Name of the user account to switch to
Character string of 1 to 32 alphanumeric characters, "-" (hyphen) and "_" (underscore).
- ssss: Password of the user account to switch to (single-byte alphanumeric characters and symbols (4 to 32 digits))

 Reference

- If the user account is changed while menus are open, all of the open menus will be closed or the startup menu set for the changed user account will open.
- When a unit properties menu is open, this command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit. This command does not affect the measurement processing time when a unit properties dialog is not open.

 Point

- You need to place a double quotation mark ("") before ssss.
- If ";" or ":" is used in ssss, it is recognized as a "delimiting character of the command" and "delimiter of the command" respectively when the password is entered via an external command and does not properly function. However, by specifying "ASCII Code" for Delimiter of the custom instruction settings and setting 0x3B (";") as the value, it can be set so that ";" will not be recognized as a termination character of a command.
- If ssss is changed as an argument of PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, the command is executed assuming that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark ("").
- When the password is set as "single-byte alphanumeric characters(4 digits:0000 to 9999)", scalar type variable can be used for the password parameter.
In this case, you do not need to provide a double quotation mark ("").
- If [Register personal user IDs to the user accounts] is enabled in the account settings, specify the name and password of the user ID, not the name and password of the user account.

Error Code

- 03: The specified user account does not exist, or the flow is being edited.
The process failed to pause movement to the next unit. (only when a unit properties dialog is open)
Saving of the System Settings file failed.
- 22: The number of parameters is invalid.
- 80: The password is incorrect.

 Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

UA: Add User Account

This command adds a user.

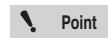
Send **UA,n,uuuu,ssss,ttt** Delimiter

Receive **UA** Delimiter

- n: Number of the new user account (0 to 4)
- uuuu: Name of the new user account
Character string of 1 to 32 alphanumeric characters, "-" (hyphen) and "_" (underscore).
- ssss: Password of the new user account (single-byte alphanumeric characters and symbols (4 to 32 digits))
- ttt: Password of the Administrator (single-byte alphanumeric characters and symbols (4 to 32 digits))



This command does not affect the measurement processing time.



- You need to place a double quotation mark ("") before ssss and tttt.
- If "," or ";" is used in ssss or tttt, it is recognized as a "delimiting character of the command" and "delimiter of the command" respectively when the password is entered via an external command and does not properly function. However, by specifying "ASCII Code" for Delimiter of the custom instruction settings and setting 0x3B (";") as the value, it can be set so that ";" will not be recognized as a termination character of a command.
- If ssss and tttt are changed as an argument of PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, the command is executed assuming that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark ("").
- When the password is set as "single-byte alphanumeric characters(4 digits:0000 to 9999)", scalar type variable can be used for the password parameter.
In this case, you do not need to provide a double quotation mark ("").
- If [Register personal user IDs to the user accounts] is enabled in the account settings, the operation becomes one in which the name and password of the user ID, not the name and password of the user account, are specified to add a user ID to user account number n.
- If [Register personal user IDs to the user accounts] is enabled in the account settings, the password of the user ID registered to user account number 0 becomes the administrator password, and the password set for user account number 0 itself cannot be used.

Error Code

- 03: The user with the specified user account name has already been registered.

The maximum number of user IDs have been registered for the specified user account number (when [Register personal user IDs to the user accounts] is enabled in the account settings).

The specified user account number does not exist (when [Register personal user IDs to the user accounts] is enabled in the account settings).

- 22: The number of parameters is invalid.
- 80: The administrator password is incorrect.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

UD: Delete User Account

This command deletes a specified user.

Send	UD,uuuu,ssss	Delimiter
Receive	UD	Delimiter

- uuuu: Name of the user account to be deleted
- ssss: Administrator password (single-byte alphanumeric characters and symbols (4 to 32 digits))

 Reference

This command does not affect the measurement processing time.

 Point

- You need to place a double quotation mark ("') before ssss.
- If ";" or ":" is used in ssss, it is recognized as a "delimiting character of the command" and "delimiter of the command" respectively when the password is entered via an external command and does not properly function. However, by specifying "ASCII Code" for Delimiter of the custom instruction settings and setting 0x3B (";") as the value, it can be set so that ";" will not be recognized as a termination character of a command.
- If ssss is changed as an argument of PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, the command is executed assuming that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark ("').
- When the password is set as "single-byte alphanumeric characters(4 digits:0000 to 9999)", scalar type variable can be used for the password parameter.
In this case, you do not need to provide a double quotation mark ("').
- If [Register personal user IDs to the user accounts] is enabled in the account settings, specify the name of the user ID, not the name of the user account.
- If [Register personal user IDs to the user accounts] is enabled in the account settings, the password of the user ID registered to user account number 0 becomes the administrator password, and the password set for user account number 0 itself cannot be used.

Error Code

- 03: The specified user account does not exist.

The specified user is the start up user account or the current user.

When, in the case where [Register personal user IDs to the user accounts] is enabled in the account settings, there is only one user ID registered to the specified user account.

- 22: The number of parameters is invalid.
- 80: The administrator password is incorrect.

 Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

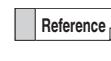
Date/Time (TW/TR/TM/TZW/TZR)

TW: Write Date/Time

This command sets the date and time of the controller.

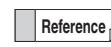
Send	TW,yy,mo,dd,hh,mi,ss	Delimiter
	TW,yyyy,mo,dd,hh,mi,ss	Delimiter
Receive	TW	Delimiter

- yy: Year: Lower two digits of the western calendar (08 for 2008)
0 to 99
When 00 to 99 is specified, 2000 will be added to the value before processing.
- yyyy: Year 2000 to 2099
- mo: Month 1 to 12
- dd: Day 1 to 31
- hh: Hour (24-hour format) 0 to 23
- mi: Minute 0 to 59
- ss: Second 0 to 59

 This command does not affect the measurement processing time.

Error Code

- 03: The date/time setting failed.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

TR : Read Date/Time

This command reads the current date and time on the controller.

Send	TR	Delimiter
Receive	TR,yy,mo,dd,hh,mi,ss	Delimiter

- yy: Lower two digits of the western calendar (16 for 2016) 0 to 99
- mo: Month 1 to 12
- dd: Day 1 to 31
- hh: Hour (24-hour format) 0 to 23
- mi: Minute 0 to 59
- ss: Second 0 to 59

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

TM: Timer

This command starts execution of a specified command string after a specified delay period. This command can only be used for Command Execution units.

Send TM,nnnn,ssss **Delimiter**
Receive TM **Delimiter**

- nnnn: Period to delay execution (100 to 60000 ms)
Although this parameter can be set in units of 1 ms, the actual execution will be controlled in units of 100 ms.
- ssss: Command string (All commands should be specified within 256 characters.)

Reference

This command does not affect the measurement processing time.

Point

- If a custom instruction is being executed, the execution of this command is delayed until the custom instruction is complete.
- The response of the timer command will be returned at the point when the timer is set successfully.
- Limitations of a recursive timer setting
 - A timer command cannot be used within ssss.
 - You cannot define a custom instruction which uses a timer command within ssss.
- Only one timer can be set for each controller.
- When a timer command is issued while the controller is waiting for timer expiration, an error is returned.
- The syntax of the command string specified within ssss is not checked.

Error Code

- 22: The characters in the parameter exceed the limit.
The number of parameters is invalid.
The specified parameter is outside the range.
- 81: The controller is already waiting for timer expiration.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

TZW: Write Time Zone

This command sets the specified time zone.

Send TZW,n **Delimiter**
Receive TZW **Delimiter**

- n: Time zone number (0 to 33)

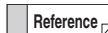
0:	GMT-12:00
1:	GMT-11:00
2:	GMT-10:00
3:	GMT-9:00
4:	GMT-8:00 Pacific Standard Time
5:	GMT-7:00
6:	GMT-6:00 Central Standard Time, Mexico City, Central America
7:	GMT-5:00
8:	GMT-4:30
9:	GMT-4:00 Atlantic Standard Time
10:	GMT-3:30
11:	GMT-3:00 Brasilia
12:	GMT-2:00 Central Atlantic
13:	GMT-1:00
14:	GMT London, Coordinated Universal Time
15:	GMT + 1:00 Berlin, Brussels, Rome, Paris, Bern
16:	GMT+2:00 Athens, Jerusalem
17:	GMT+3:00 Kuwait
18:	GMT+3:30
19:	GMT+4:00 Moscow
20:	GMT+4:30
21:	GMT+5:00
22:	GMT+5:30 New Delhi
23:	GMT+5:45
24:	GMT+6:00
25:	GMT+6:30
26:	GMT+7:00 Bangkok
27:	GMT+8:00 Kuala Lumpur, Singapore, Taipei, Beijing
28:	GMT+9:00 Japan, Seoul
29:	GMT+9:30
30:	GMT+10:00 Canberra, Sydney
31:	GMT+11:00
32:	GMT+12:00
33:	GMT+13:00

Reference

This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

TZR: Read Time Zone

This command reads the currently set time zone.

Send **TZR** Delimiter

Receive **TZR,n** Delimiter

- n: Time zone number (0 to 33)
 - 0: GMT-12:00
 - 1: GMT-11:00
 - 2: GMT-10:00
 - 3: GMT-9:00
 - 4: GMT-8:00 Pacific Standard Time
 - 5: GMT-7:00
 - 6: GMT-6:00 Central Standard Time, Mexico City, Central America
 - 7: GMT-5:00
 - 8: GMT-4:30
 - 9: GMT-4:00 Atlantic Standard Time
 - 10: GMT-3:30
 - 11: GMT-3:00 Brasilia
 - 12: GMT-2:00 Central Atlantic
 - 13: GMT-1:00
 - 14: GMT London, Coordinated Universal Time
 - 15: GMT+1:00 Berlin, Brussels, Rome, Paris, Bern
 - 16: GMT+2:00 Athens, Jerusalem
 - 17: GMT+3:00 Kuwait
 - 18: GMT+3:30
 - 19: GMT+4:00 Moscow
 - 20: GMT+4:30
 - 21: GMT+5:00
 - 22: GMT+5:30 New Delhi
 - 23: GMT+5:45
 - 24: GMT+6:00
 - 25: GMT+6:30
 - 26: GMT+7:00 Bangkok
 - 27: GMT+8:00 Kuala Lumpur, Singapore, Taipei, Beijing
 - 28: GMT+9:00 Japan, Seoul
 - 29: GMT+9:30
 - 30: GMT+10:00 Canberra, Sydney
 - 31: GMT+11:00
 - 32: GMT+12:00
 - 33: GMT+13:00



This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

File (PC/PM/PD/OW/OR/OPW/OPR/ STW/STR/STW1/STR1)

PC: Copy Program

This command copies the program folder with a specified program number to another program number. If a program folder exists in the destination, it is deleted before the copy operation.

Send PC,d,nnn,e,mmm [Delimiter]

Receive PC [Delimiter]

- d: Source SD card No. 1 to 2
1: SD1
2: SD2
- nnn: Program No. of the program 0 to 999
to be copied
- e: Destination SD card No. 1 to 2
1: SD1
2: SD2
- mmm: Program No. to which the 0 to 999
program is copied



- This command does not affect the measurement processing time.
- This command only copies the files. If you want to switch the controller to the program, you need to issue the PW command (Page 2-21) separately.

Error Code

- 03: The program folder with the specified program number does not exist.

The SD card has not been inserted or cannot be accessed.

The target files are being used by other processes.

The same program number on the same SD card was specified for the source and destination.

SD Card memory full. (The process finishes halfway through copying.)

- 22: The number of parameters is invalid.

The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PM: Move Program

This command moves the program folder with a specified program number to another program number. If a program folder exists in the destination, it is deleted before the copy operation.

When the program folder is copied successfully, the original folder is deleted.

Send **PM,d,nnn,e,mmm** [Delimiter]

Receive **PM** [Delimiter]

- d: Source SD card No. 1 to 2
1: SD1
2: SD2
- nnn: Program No. of the program 0 to 999
to be moved
- e: Destination SD card No. 1 to 2
1: SD1
2: SD2
- mmm: Program No. to which the 0 to 999
program is moved



- This command does not affect the measurement processing time.
- This command only moves the files. If you want to switch the controller to the program, you need to issue the PW command (Page 2-21) separately.

Error Code

- 03: The program folder with the specified program number does not exist.
The SD card has not been inserted or cannot be accessed.
The target files are being used by other processes.
The same program number on the same SD card was specified for the source and destination.
SD card memory full. (The process finishes halfway through copying. In this case, the original files are not deleted including those which have been copied successfully.)
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

PD: Delete Program

This command deletes the program folder with a specified program number.

Send **PD,d,nnn** [Delimiter]

Receive **PD** [Delimiter]

- d: SD card No. 1 to 2
1: SD1
2: SD2
- nnn: Program No. 0 to 999

This command does not affect the measurement processing time.

Error Code

- 03: The program folder with the specified program number does not exist.
The SD card has not been inserted or cannot be accessed.
The target files are being used by other processes.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

OW: Change Fixed Name in File Naming Rule

This command changes the fixed name in the file naming rule used for data output unit, image output unit, screen capture (output to the FTP server or VisionDataStorage (USB)), or archiving.

Send	OW,nnn, ssss [Delimiter] (1)
	OW,nnn, xxxx [Delimiter] (2)
	OW,HIST,m, ssss [Delimiter] (3)
	OW,HIST,m, xxxx [Delimiter] (4)
	OW,SCF, ssss [Delimiter] (5)
	OW,SCF, xxxx [Delimiter] (6)
	OW,SCF,I,ssss [Delimiter] (7)
	OW,SCF,I,xxxx [Delimiter] (8)

Receive	OW [Delimiter]
----------------	-----------------------

- nnn: Unit ID 0 to 999
- ssss: Text Number of Refer to each characters detailed explanation.
- xxxx: Numerical Number of 1 to 10000 array variable elements
- m: Image Archive No. 0 to 31
- I: Device 0 to 1
0: FTP
1: VisionDataStorage (USB)

(1) Change the fixed name in the file naming rule for the unit with unit ID nnn to ssss.

- You need to place a double quotation mark ("") before ssss.
- If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, OW, nnn, *01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed.

In this case, double quotation marks ("") are not required.

- For no protocol communication and PLC-Link, you can set up to 64 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters.

The reading finishes when it reaches an element of value 0.

(2) Set the value of a numerical array type variable xxxx in ASCII codes as the fixed name in the file naming rule for the unit with unit ID nnn.

- The elements of the numerical array type variable (global or local) xxxx are read as (typical) ASCII codes from the specified element and are interpreted as a character string.
- The reading finishes when it reaches the 64th character, the end of the array, or an element of value 0.

(3) Change the fixed name in the file naming rule for the archive condition No.m to ssss.

- You need to place a double quotation mark ("") before ssss.
- If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, OW, HIST, m, *01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed.

In this case, double quotation marks ("") are not required.

- If [Sequential] is selected for the file naming rule, for no protocol communication and PLC-Link, you can set up to 32 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters.

If [Specified] is selected for the file naming rule, for no protocol communication and PLC-Link, you can set up to 64 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters.

The reading finishes when it reaches an element of value 0.

(4) Set the value of a numerical array type variable xxxx in ASCII codes as the fixed name in the file naming rule for Archive condition No.m.

- The elements of the numerical array type variable (global or local) xxxx are read as (typical) ASCII codes from the specified element and are interpreted as a character string.
- If [Sequential] is selected for the file naming rule, you can set up to 32 characters.
- If [Specified] is selected for the file naming rule, you can set up to 64 characters.
- The reading finishes when it reaches the maximum number of characters, the end of the array, or an element of value 0.

(5) Change the fixed name in the file naming rule for when the screen capture is saved to the FTP server to ssss.

- You need to place a double quotation mark ("") before ssss.
- If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, OW, SCF, *01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed.

In this case, double quotation marks ("") are not required.

- For no protocol communication and PLC-Link, you can set up to 64 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters.

The reading finishes when it reaches an element of value 0.

- (6) Set the value of a numerical array type variable xxxx in ASCII codes as the fixed name in the file naming rule applied when the screen capture is saved to the FTP server.
- The elements of the numerical array type variable (global or local) xxxx are read as (typical) ASCII codes from the specified element and are interpreted as a character string.
 - The reading finishes when it reaches the 64th character, the end of the array, or an element of value 0.
- (7) Change the fixed name in the file naming rule for when the screen capture is saved to the specified output destination to ssss.
- You need to place a double quotation mark ("") before ssss.
 - If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, OW, SCF, 1, *01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed. In this case, double quotation marks ("") are not required.
 - For no protocol communication and PLC-Link, you can set up to 64 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters. The reading finishes when it reaches an element of value 0.
- (8) Set the value of a numerical array type variable xxxx in ASCII codes as the fixed name in the file naming rule applied when saving the screen capture to the specified output destination.
- The elements of the numerical array type variable (global or local) xxxx are read as (typical) ASCII codes from the specified element and are interpreted as a character string.
 - The reading finishes when it reaches the 64th character, the end of the array, or an element of value 0.

**Point**

- System variables cannot be specified.
- If the file name of the data output unit is changed to empty or to a name starting with "." (period) or " " (space), the file cannot be saved to the SD card, USB HDD, FTP or VisionDataStorage (USB).
- When using SFTP (Page 1-310) with the FTP client function, only ASCII characters can be used.

**Reference**

- This command executes by stopping the measurement temporarily.
- The file name will be updated at the following timing:
 - Data output unit (when the destination is other than a PC program): At the next output event
 - Data output unit (when the destination is a PC program): When the controller is reset, the program is changed, or the next logging starts
 - Image output unit: At the next output event
 - Image archive: At the next image archive event
 - Screen capture: At the next capturing event

Error Code

- 03: The specified unit is not a data output unit or image output unit.

The data output unit's [Device] setting is not the SD card, USB HDD, PC program, FTP or VisionDataStorage (USB).

Fixed Name is not set as the file naming rule for the data output unit.

Sequential or Specified is not set as the file naming rule for the image output unit.

Sequential or Specified is not set as the file naming rule for the image archive condition.

Sequential or Specified is not set as the file naming rule for the BC command.

- 22: The number of parameters is invalid.

The specified parameter is outside the range.

The specified file name is invalid.

- The number of characters exceed the maximum number.

- Any one of the following invalid characters is used. (Data output unit, image output unit, image archive condition)

0x7F, 0x80, 0xA0, 0xFD and later, *, ?, "", '<', '>', '|', '/', ":"

(Archive condition only)

Characters other than 0xA5, "\\", " "(space) and single byte alphanumerics

**Reference**

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

OR: Read Fixed Name in File Naming Rule

This command reads the fixed name in the file naming rule used for data output unit, image output unit, screen capture (output to the FTP/VisionDataStorage(Ether) or VisionDataStorage (USB)) or archiving.

Send	OR,nnn [Delimiter] (1)
	OR,nnn, xxxx [Delimiter] (2)
	OR,HIST,m [Delimiter] (3)
	OR,HIST,m,xxxx [Delimiter] (4)
	OR,SCF [Delimiter] (5)
	OR,SCF,xxxx [Delimiter] (6)
	OR,SCF,I [Delimiter] (7)
	OR,SCF,I,xxxx [Delimiter] (8)
Receive	OR,ssss [Delimiter] Response to (1)(3)(5)(7)
	OR [Delimiter] Response to (2)(4)(6)(8)

- nnn: Unit ID 0 to 999
- ssss: Text Number of 0 to 64 characters ((1)(5)(7)) 0 to 32 (3)
- xxxx: Numerical array Number of 1* to type variable elements 10000
- m: Image Archive No. 0 to 31
- I: Device 0 to 1
0: FTP
1: VisionDataStorage(USB)

* Should be equal to or more than the number of characters of the fixed name set for the target unit

- (1) The fixed name for the unit with unit ID nnn is returned in the command response.
 - When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.
- (2) The fixed name for the unit with unit ID nnn is stored as ASCII codes into a numerical array type variable (global or local) xxxx.
 - When the reading reaches the maximum length of the fixed name or the end of the character string, 0 is stored and the operation finishes.
- (3) The fixed name for the archive condition No.m is returned in the command response.
 - When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.

- (4) The fixed name for the archive condition No.m is stored as ASCII codes into a numerical array type variable xxxx.
 - When the reading reaches the maximum length of the fixed name or the end of the character string, 0 is stored and the operation finishes.
- (5) The fixed name to be used when the screen capture is saved to the FTP server is returned in the command response.
 - When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.
- (6) The fixed name to be used when the screen capture is saved to the FTP server is stored as ASCII codes into a numerical array type variable xxxx.
 - The fixed name is stored as ASCII codes into an array type variable xxxx.
 - When the reading reaches the maximum length of the fixed name or the end of the character string, 0 is stored and the operation finishes.
- (7) The fixed name to be used when the screen capture is saved to the specified output destination is returned in the command response.
 - When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.
- (8) The fixed name to be used when the screen capture is saved to the specified output destination is stored as ASCII codes into a numerical array type variable xxxx.
 - The fixed name is stored as ASCII codes into an array type variable xxxx.
 - When the reading reaches the maximum length of the fixed name or the end of the character string, 0 is stored and the operation finishes.



System variables cannot be specified.



This command does not affect the measurement processing time.

Error Code

- 03: The specified unit is not a data output unit or image output unit.
The data output unit's [Device] setting is not the SD card, USB HDD, PC program, FTP or VisionDataStorage (USB).
Fixed Name is not set as the file naming rule for the data output unit.
Sequential or Specified is not set as the file naming rule for the image output unit.
Insufficient number of array elements.
Sequential or Specified is not set as the file naming rule for the image archive condition.
Sequential or Specified is not set as the file naming rule for screen capture.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

OPW : Rewrite Destination Folder Name

This command rewrites the data destination folder name of the data output unit, image output unit, screen capture, or image archive. (Example: xg\hist)

Send	OPW,nnn, ssss [Delimiter] (1)
	OPW,nnn, xxxx [Delimiter] (2)
	OPW,HIST,m, ssss [Delimiter] (3)
	OPW,HIST,m, xxxx [Delimiter] (4)
	OPW,SCF, ssss [Delimiter] (5)
	OPW,SCF, xxxx [Delimiter] (6)
	OPW,SCFI,ssss [Delimiter] (7)
	OPW,SCFI,xxxx [Delimiter] (8)

Receive	OPW [Delimiter]
----------------	------------------------

• nnn:	Unit ID	0 to 999
• ssss:	Text	Number of characters Refer to each detailed explanation.
• xxxx:	Numerical array type variable	Number of elements No limit
• m:	Image Archive No.	0 to 31
• l:	Device 0: FTP 1: VisionDataStorage (USB)	0 to 1



Point

Since the SD card, USB HDD and PC Program drive names cannot be changed, specify the path after the drive name (SD1:\, SD2:\, USB:\) for the specified folder name.

- (1) Change the data destination folder name for the unit with unit ID nnn to ssss.
 - You need to place a double quotation mark ("") before ssss.
 - If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, OPW, nnn, *01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed. In this case, double quotation marks ("") are not required.
 - For no protocol communication, you can set up to 239 characters, for PLC-Link, you can set up to 249 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters. The reading finishes when it reaches an element of value 0.

- (2) Set the value of a numerical array type variable xxxx in ASCII codes as the data destination folder name for the unit with unit ID nnn.
- The elements of the numerical array type variable (global or local) xxxx are read as ASCII codes from the specified element and are interpreted as a character string.
 - The reading finishes when it reaches the 249th character, the end of the array, or an element of value 0.
- (3) Change the data destination folder name for the archive condition No.m to ssss.
- You need to place a double quotation mark ("") before ssss.
 - If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, OPW, HIST, m, *01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed.
- In this case, double quotation marks ("") are not required.
- For no protocol communication, you can set up to 239 characters, for PLC-Link, you can set up to 249 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters.
- The reading finishes when it reaches an element of value 0.
- (4) Set the value of a numerical array type variable xxxx in ASCII codes as the destination folder name for the archive condition No.m.
- The elements of the numerical array type variable (global or local) xxxx are read as ASCII codes from the specified element and are interpreted as a character string.
 - The reading finishes when it reaches the 249th character, the end of the array, or an element of value 0.
- (5) Change the folder name in the output destination settings for when the screen capture is to be saved on an FTP server to ssss.
- You need to place a double quotation mark ("") before ssss.
 - If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, OPW, SCF, *01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed.
- In this case, double quotation marks ("") are not required.
- For no protocol communication, you can set up to 239 characters, for PLC-Link, you can set up to 249 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters.
- The reading finishes when it reaches an element of value 0.
- (6) Set the value of a numerical array type variable xxxx in ASCII codes as the folder name in the output destination settings for when the screen capture is to be saved on an FTP server.
- The elements of the numerical array type variable (global or local) xxxx are read as ASCII codes from the specified element and are interpreted as a character string.
 - The reading finishes when it reaches the 239th character, the end of the array, or an element of value 0.
- (7) Change the folder name in the output destination settings for when the screen capture is to be saved to the specified output destination to ssss.
- You need to place a double quotation mark ("") before ssss.
 - If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, OPW, SCF, 1, *01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed.
- In this case, double quotation marks ("") are not required.
- For no protocol communication, you can set up to 239 characters, for PLC-Link, you can set up to 249 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters.
- The reading finishes when it reaches an element of value 0.
- (8) Set the value of a numerical array type variable xxxx in ASCII codes as the folder name in the output destination settings for when the screen capture is to be saved to the specified output destination.
- The elements of the numerical array type variable (global or local) xxxx are read as ASCII codes from the specified element and are interpreted as a character string.
 - The reading finishes when it reaches the 239th character, the end of the array, or an element of value 0.

 Point

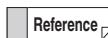
- System variables cannot be specified.
- When using SFTP (Page 1-310) with the FTP client function, only ASCII characters can be used.

 Reference

- This command executes by stopping the measurement temporarily.
- The folder name will be updated at the following timing:
 - Data output unit (when the destination is other than PC program): At the next output event
 - Data output unit (when the destination is PC program): When the controller is reset, the program is changed, or the next logging starts
 - Image output unit: At the next output event
 - Image archive: At the next image archive event
 - Screen capture: At the next capturing event

Error Code

- 03: The specified unit is not a data output unit or image output unit.
The [Device] setting is not the SD card, USB HDD, PC program, FTP or VisionDataStorage (USB) on the data output unit.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The specified folder name is invalid.
 - The number of characters exceed the maximum number.
 - Any one of the following invalid characters is used. 0x7F, 0x80, 0xA0, 0xFD and later, *, ?, "", '<', '>', |'
 - The specified folder name includes the drive name (SD1: \, SD2: \, or USB: \).



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

OPR: Read Destination Folder Name

This command reads the data destination folder name of the data output unit, image output unit, screen capture, or image archive. (Example: xg\hist)

Send	OPR,nnn Delimiter (1)
	OPR,nnn, xxxx Delimiter (2)
	OPR,HIST,m Delimiter (3)
	OPR,HIST,m,xxxx Delimiter (4)
	OPR,SCF Delimiter (5)
	OPR,SCF,xxxx Delimiter (6)
	OPR,SCF,I Delimiter (7)
	OPR,SCF,I,xxxx Delimiter (8)
Receive	OPR,ssss Delimiter Response to (1)(3)(5)(7)
	OPR Delimiter Response to (2)(4)(6)(8)

- nnn: Unit ID 0 to 999
- ssss: Text Number of characters 0 to 255
- xxxx: Numerical array Number of elements type variable No limit *
- m: Image Archive No. 0 to 31
- I: Device 0 to 1
0: FTP
1: VisionDataStorage (USB)

* Should be equal to or more than the number of characters of the destination folder set for the target unit

- (1) The folder name for the unit with unit ID nnn is returned in the command response.
 - When this command is executed via the PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.
- (2) The folder name for the unit with unit ID nnn is stored as ASCII codes into a numerical array type variable (global or local) xxxx.
 - When the reading reaches the maximum length of the destination folder or the end of the character string, 0 is stored and the operation finishes.
- (3) The folder name for the archive condition No. m is returned in the command response.
 - When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.
- (4) The folder name for the archive condition No.m is stored as ASCII codes into a numerical array type variable xxxx.
 - The destination folder is stored as ASCII codes in array variable xxxx.
 - When the reading reaches the maximum length of the destination folder or the end of the character string, 0 is stored and the operation finishes.

- (5) The folder name in the output destination settings for when the screen capture is to be saved on an FTP server is returned in the command response.
- When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.
- (6) The folder name in the output destination settings for when the screen capture is to be saved on an FTP server is stored as ASCII codes into a numerical array type variable xxxx.
- The folder name is stored as ASCII codes into an array type variable xxxx.
 - When the reading reaches the maximum length of the folder name or the end of the character string, 0 is stored and the operation finishes.
- (7) The specified output folder name in the output destination settings for when the screen capture is to be saved to the specified output destination is returned in the command response.
- When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.
- (8) The folder name in the output destination settings for when the screen capture is to be saved to the specified output destination is stored as ASCII codes into a numerical array type variable xxxx.
- The folder name is stored as ASCII codes into an array type variable xxxx.
 - When the reading reaches the maximum length of the folder name or the end of the character string, 0 is stored and the operation finishes.



- The path after the drive name (SD1:\, SD2:\, or USB:\) is read for the destination folder name.
- System variables cannot be specified.



This command does not affect the measurement processing time.

Error Code

- 03: The specified unit is not a data output unit or image output unit.
The data output unit's [Device] setting is not the SD card, USB HDD, PC program, FTP or VisionDataStorage (USB).
Insufficient number of array elements.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

STW: Change externally specified string

Change the externally specified string set to the output file name.

Send **STW,n, ssss [Delimiter] (1)**

STW,n, xxxx [Delimiter] (2)

Receive **STW [Delimiter]**

- n: Externally specified string 0 to 9
- ssss: Text Number of characters 0 to 64
- xxxx: Numerical array Number of elements 1 to 10000 type variable

- (1) Change externally specified string n to ssss.

- You need to place a double quotation mark ("") before ssss.
- If you use this command with PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, STW, n, *01 and so on are defined in a custom instruction, and data is stored as 2 words (32 bits) for 1 character from the CommandParam1 address and executed. In this case, double quotation marks ("") are not required.
- For no protocol communication and PLC-Link, you can set up to 64 characters, and for CC-Link, EtherNet/IP, PROFINET, and EtherCAT, you can set up to 16 characters.
The reading finishes when it reaches an element of value 0.

- (2) Set the value of a numerical array type variable xxxx as externally specified string n.

- The elements of the numerical array type variable (global or local) xxxx are read as ASCII codes from the specified element and are interpreted as a character string.
- The reading finishes when it reaches the 64th character, the end of the array, or an element of value 0.



When using SFTP (Page 1-310) with the FTP client function, only ASCII characters can be used.



- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- The externally specified string will be updated with the following timing:
 - Image output unit: At the next output event
 - Image archive: At the next image archive event.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The externally specified string is invalid.
 - The number of characters exceed the maximum number.
 - Any one of the following invalid characters is used.
0x81 to 0x9F, 0xE0 to 0xFC



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

STR: Read externally specified string

Read the externally specified string set to the output file name.

- | | |
|----------------|--|
| Send | STR,n [Delimiter] (1) |
| | STR,n, xxxx [Delimiter] (2) |
| Receive | STR, ssss [Delimiter] Response to (1) |
| | STR [Delimiter] Response to (2) |
- n: Externally specified string 0 to 9
 - ssss: Text Number of 0 to 64 characters
 - xxxx: Numerical array type variable Number of 1 to 10000 elements

- (1) Externally specified string n is returned in the command response. When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain one character.
- (2) Externally specified string n is stored as ASCII code in numerical array type variable (global variable, local variable) xxxx from the specified element. When the reading reaches the maximum length of the externally specified string or the end of the character string, 0 is stored and the operation finishes.



This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

STW1: Change externally specified string 1

Change the externally specified string set to the output file name.

Send **STW1,n, ssss [Delimiter]**

Receive **STW1 [Delimiter]**

- n: Externally specified string 0 to 9
- ssss: Text Number of 0 to 64 characters

Change externally specified string n to ssss.

- You need to place a double quotation mark ("") before ssss.
- If you use this command with PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, STW1, n, *01 and so on are defined in a custom instruction, and data is stored as 2 words (32 bits) for 4 characters from the CommandParam1 address and executed. In this case, double quotation marks ("") are not required.
- Regardless of the communication method, you can set up to 64 characters.

The reading finishes when it reaches an element of value 0.



When using SFTP (Page 1-310) with the FTP client function, only ASCII characters can be used.



- This command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.
- The externally specified string will be updated with the following timing:
 - Image output unit: At the next output event
 - Image archive: At the next image archive event.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The externally specified string is invalid.
 - The number of characters exceed the maximum number.
 - Any one of the following invalid characters is used.
0x81 to 0x9F, 0xE0 to 0xFC



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

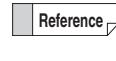
STR1: Read externally specified string 1

Read the externally specified string set to the output file name.

Send STR1,n [Delimiter]
Receive STR1, ssss [Delimiter]

- n: Externally specified string 0 to 9
- ssss: Text Number of 0 to 64 characters

Externally specified string n is returned in the command response. When this command is executed via the PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, two words contain four characters.

 This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Flowchart Display Control (FV/FI)

FV: Show Flowchart in Run Mode

This command switches the controller run screen to show or hide the flowchart.

Send FV,d [Delimiter]
Receive FV [Delimiter]

- d: Flowchart status
1: Show flowchart
0: Hide flowchart

 If this command is issued while a unit properties menu is open, the command executes by waiting for completion of the current unit and then stopping the process temporarily before moving to the next unit.

Error Code

- 03: The current screen is the flow editor.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

FI: Read Show/Hide Flowchart Status

This command returns whether the controller run screen is set to show or hide the flowchart.

Send **FI** [Delimiter]

Receive **FI,d** [Delimiter]

- d: Flowchart status
 - 1: Flowchart view is showing
 - 0: Flowchart view is hidden



This command does not affect the measurement processing time.

Error Code

- 03: The current screen is the flow editor.
- 22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Line Scan Camera/LJ-X/LJ-V series Head (CL/CZW/CZR)

CL: Change of line numbers

Change the image area when the line scan cameras, or LJ-X/LJ-V series heads are used.

In Sheet-fed

Sending **CL,n,I** [Delimiter]

Receiving **CL,00,I** [Delimiter]

In Continuous

Sending **CL,n,I,ol,tl** [Delimiter]

Receiving **CL,00,I,ol,tl** [Delimiter]

- n: Trigger No. (1 to 4)
- I: Number of lines (1 to 16384)

When using a line scan camera:

- For the XG-HL02M/HL04M, the number of lines is 1 to 16,384.
- For the XG-HL08M, the number of lines is 1 to 8,192.
- For the CA-HL02MX/HL04MX, the number of lines is 10 to 16,384.
- For the CA-HL08MX, the number of lines is 1 to 8,192.

When using an LJ-V Series sensor head:

- When the number of pixels for the X-direction is 512, the number of lines is 10 to 16,384.
- When the number of pixels for the X-direction is 1024, the number of lines is 10 to 8,192.
- When the number of pixels for the X-direction is 2048, the number of lines is 10 to 4,096.

When using an LJ-X Series sensor head:

- Regardless of the number of pixels for the X-direction, the number of lines is 10 to 16,000.

- ol: Overlapping lines

When using a line scan camera and an LJ-V Series sensor head:

- 0 or 64 to the number of lines/2

When using an LJ-X Series sensor head:

- 0 to the number of lines/2

- tl: Total number of lines
(0 (Disable), or over the number of lines to 999999)

Reference

- This command does not affect the processing time of measurement.
- The number of lines and total lines has to be twice or more the number of overlapping lines. If it is not satisfied, it is automatically adjusted. The number of lines applied can be checked by command response.

Point

- This command is valid only in online mode.
- Execution of this command stops the flow once. After implementation of settings, the flow goes back to the beginning.
- Although the number of measurements is maintained, the archived images are cleared.
- As this command executes changes only, processing with a command such as the SS command is separately needed to save the results of changes.

Error Code

- 03: When the mode is Edit Unit
When retest (including retest (online)) is performed
When not in run mode
When the capture unit is not executed
When image memory is not sufficient
- 22: When line scan cameras, or LJ-X/LJ-V series head are not allocated to the specified trigger Nos.
When the number of parameters is incorrect
When the parameter range is different
- 81: When the right to access archived data cannot be obtained (when data is used in other software)

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CZW: Change Z-direction Measurement Range Center

This command changes the set Z-direction measurement range center specified with the profile measurement range settings of the LJ-X Series head.

Send	CZW,nnnn,c1,r1	Delimiter (1)
	CZW,nnnn,c1,r1,c2,r2	Delimiter (2)
Receive	CZW	Delimiter (1) (2)

- nnnn: Capture unit ID 1 to 998
- c1, c2: Camera number 1: Head A of camera 1
2: Head B of camera 1
3: Head A of camera 3
4: Head B of camera 3
- r1, r2: Setting value 0.0 to 100.0 (%)

(1)Change the setting value of the specified head.

Specify head A when one head is connected or when the individual setting is OFF with two heads connected.

(2)Change the setting value of the specified head (A or B) when the individual setting is ON.

The heads of cameras 1 and 3 cannot be specified simultaneously.

Point

This command is only enabled when [Set measurement range center in detail] is ON.

Reference

Executing this command temporarily stops the flow. After the setting is applied, operation resumes at the start of the flow. The archive image is saved.

Error Code

- 03: The measurement range is "FULL."
The target camera is not an LJ-X Series head.
[Set measurement range center in detail] is OFF.
Head B was specified with one head.
Head B was specified with two heads and the individual setting OFF.
- 22: The number of parameters is invalid.
The specified parameter is outside the range.
The heads of cameras 1 and 3 were specified simultaneously.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CZR: Read Z-direction Measurement Range Center

This command reads the set Z-direction measurement range center specified with the profile measurement range settings of the LJ-X Series head.

Send	CZR,nnnn,c1	Delimiter (1)
	CZR,nnnn,c1,c2	Delimiter (2)
Receive	CZR,r1	Delimiter (1)
	CZR,r1,r2	Delimiter (2)

- r1, r2: Setting value 0.0 to 100.0 (%)
 - nnnn: Capture unit ID 1 to 998
 - c1, c2: Camera number 1: Head A of camera 1
2: Head B of camera 1
3: Head A of camera 3
4: Head B of camera 3

- (1)Read the setting value of the specified head.
Specify head A when one head is connected or
when the individual setting is OFF with two heads
connected.
- (2)Read the setting value of the specified head (A or
B) when the individual setting is ON.
The heads of cameras 1 and 3 cannot be specified
simultaneously.

Point This command is only enabled when [Set measurement range center in detail] is ON.

Reference This command does not affect the measurement processing time.

Error Code

- 03: The measurement range is “FULL.”
 - The target camera is not an LJ-X Series head.
 - [Set measurement range center in detail] is OFF.
 - Head B was specified with one head.
 - Head B was specified with two heads and the individual setting OFF.
 - 22: The number of parameters is invalid.
 - The specified parameter is outside the range.
 - The heads of cameras 1 and 3 were specified simultaneously.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Recipe Function (RPW/RPT/RPR/ RPC/RPM/RPD/RPN)

RPW: Change Recipe No. (Specify Recipe No.)

This command closes all open dialog boxes and changes to the recipe setting of the specified number.

Send RPW,nnn,t [Delimiter]
Receive RPW [Delimiter]

- nnn: Recipe No.
 - 1: Do not use recipe settings
 - 0 - 999: Changes to the recipe setting of the specified Recipe No.
 - t:
 - 0: Does not save the Recipe No. changed to (when omitted)
 - 1: Saves the Recipe No. changed to

Reference This command changes the settings in the timing below:

- When waiting units are on standby or the capture unit is on standby after receiving a command.
 - When waiting units are on standby or the capture unit is on standby and unit execution is forcibly terminated immediately.
 - In a case other than the above, after the flow is executed.

Error Code

- 03: The specified Recipe No. does not exist.
The memory card has not been inserted or cannot be accessed.
 - 22: The number of command parameters or the range is invalid.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RPT: Change Recipe No. (Specify Recipe Name)

This command closes all open dialog boxes and changes to the recipe setting of the specified name.

Send RPT,ssss,t [Delimiter]
Receive RPT [Delimiter]

- ssss: The Recipe Name or the name of the program setting currently loaded
- t: 0: Does not save the Recipe No. changed to (when omitted)
1: Saves the Recipe No. changed to

-  This command changes the settings in the timing below:
- When waiting units are on standby or the capture unit is on standby after receiving a command.
 - When waiting units are on standby or the capture unit is on standby and unit execution is forcibly terminated immediately.
 - In a case other than the above, after the flow is executed.

 You need to place a double quotation mark ("") before ssss.

Error Code

- 03: The recipe setting of the specified name does not exist.
The memory card has not been inserted or cannot be accessed.
- 22: The number of command parameters or the range is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Precautions for when executing from the PLC

If you define in a manner such as [RPT,*01,*02], as *01 is variable in length, *02 will not run. Set the second argument as a fixed value by creating a custom command as in [RPT,*01,1].

RPR: Read Recipe No.

The Recipe No. or Recipe Name in use will be returned.

Send RPR [Delimiter]
Receive RPR,nnn [Delimiter]

When specifying to read the name

Send RPR,NM [Delimiter]
Receive RPR,ssss [Delimiter]

- nnn: - When using recipe settings: Current Recipe No. (0 - 999)
- When not using recipe settings: -1
- ssss: - When using recipe settings:
Current Recipe Name
- When not using recipe settings: Blank

 The program names just return the name in the language which is set in the System settings.

 This command does not affect the measurement processing time.

Error Code

- 03: The specified Recipe No. does not exist.
The memory card has not been inserted or cannot be accessed.
- 22: The number of command parameters or the range is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RPC: Copy Recipe

Destination recipe settings are all overwritten by the source recipe settings.



- If copying fails along the process, the settings remain as they were before copying began.
- The content of the destination recipe setting folder is completely deleted.
- This command only copies the recipe setting content. To use a new recipe setting, issue the RPW command separately.

Send **RPC,mmm,nnn** [Delimiter]

Receive **RPC** [Delimiter]

- mmm: Source Recipe No. (0 - 999)
- nnn: Destination Recipe No. (0 - 999)



This command does not affect the measurement processing time.

Error Code

- 03: The Recipe No. does not exist.
The memory card has not been inserted or cannot be accessed.
- 22: The number of command parameters or the range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RPM: Move Recipe

Destination recipe settings are all overwritten by the source recipe settings. If a recipe is moved successfully, the source recipe settings are completely deleted.



- If moving fails along the process, the settings remain as they were before moving began.
- This command only moves the recipe setting content. To use a new recipe setting, issue the RPW command separately.

Send **RPM,mmm,nnn** [Delimiter]

Receive **RPM** [Delimiter]

- mmm: Source Recipe No. (0 - 999)
- nnn: Destination Recipe No. (0 - 999)



This command does not affect the measurement processing time.

Error Code

- 03: The Recipe No. does not exist.
The memory card has not been inserted or cannot be accessed.
- 22: The number of command parameters or the range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RPD: Delete Recipe Setting

This command deletes all the details of the specified recipe setting.

Send **RPD,mmm** [Delimiter]

Receive **RPD** [Delimiter]

- mmm: Recipe No. (0 - 999)



This command does not affect the measurement processing time.

Error Code

- 03: The Recipe No. does not exist.
The memory card has not been inserted or cannot be accessed.
- 22: The number of command parameters or the range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

RPN: Change Recipe Name

This command changes the name of the specified recipe number.

Reference If the specified recipe setting is currently in use, the name is not saved after it is changed. To save it, issue the save (SS) command separately.

Send RPN,nnn,ssss [Delimiter] (1)

RPN,nnn,xxxx [Delimiter] (2)

Receive RPN [Delimiter]

- nnn: Recipe No. (0 - 999)
- ssss: Recipe Name
- xxxx: Numerical array variable (system variables cannot be specified)

Reference This command does not affect the measurement processing time.

(1) Rewrite the name of the recipe setting No. nnn to ssss.

- You need to place a double quotation mark ("") before ssss.
- If you use this command with PLC-link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, RPN, nnn, *01 and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed. In this case, double quotation marks ("") are not required.
- For PLC-Link, you can set up to 64 characters, and for CC-Link, EtherNet/IP, PROFINET, or EtherCAT, you can set up to 16 characters. Reading stops if the command reaches an element with a value of 0.
- (2) Set the numerical array variable xxxx value as ASCII code to the name of recipe setting No. nnn.
- Elements of the numerical array type variable (global or local) xxxx are read as ASCII codes (common) from the element specified with the index and are interpreted as a character string.
- If an element that is the 64th character, the end of the array, or the value of which is 0 is reached, the reading ends.

Error Code

- 03: The Recipe No. does not exist.
The memory card has not been inserted or cannot be accessed.
- 22: The number of command parameters or the range is invalid.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Robot Vision (ACE/ACC/ACR/ACS/CSR/CPW)

ACE: Execute Auto Calibration

Opens the auto calibration dialog box of the specified calibration file and executes auto calibration.

Send ACE,s,nnn,m [Delimiter]

Receive ACE [Delimiter]

- s: File Type
1: Local
2: Global
- nnn: Calibration data No. (0 - 127)
- m: Calibration type
0: Calibration
1: Tool Center Calculation
2: High-Precision Calculation

Reference This command is executed by waiting for the completion of the current unit processing and then stopping the process temporarily before moving to the next unit.

Error Code

- 03: When the specified file number is a file created by manual calibration
When auto calibration cannot be started (does not meet start conditions)
When the auto calibration dialog box cannot be opened
When %RBCTrlStatus or %RBCalibExecStatus is 1
- 22: The number of command parameters or the range is invalid.

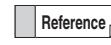
Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ACC: Cancel Auto Calibration

Stops the automatic calibration that is being executed.

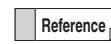
Send ACC [Delimiter]

Receive ACC [Delimiter]

 This command does not affect the measurement processing time.

Error Code

- 22: The number of command parameters or the range is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

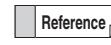
ACR: Check Auto Calibration Result

Returns the auto calibration result.

Send ACR,m [Delimiter]

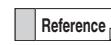
Receive ACR,t [Delimiter]

- m: Calibration type
 - 0: Calibration
 - 1: Tool Center Calculation
 - 2: High-Precision Calculation
- t: Calibration execution result
 - 0: Success
 - 1: Fail or not executed (includes half-done state)
 - Execution result of high-precision calculation
 - 0: Success or stopped (through an operation)
 - 1: Fail or not executed

 This command does not affect the measurement processing time.

Error Code

- 03: When auto calibration is being executed
When the auto calibration file is not being edited
- 22: The number of command parameters or the range is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ACS: End Auto Calibration

Saves the auto calibration state and then ends calibration.

Send ACS,s [Delimiter]

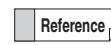
Receive ACS [Delimiter]

- s:
 - 0: Save the file and end
 - 1: End without saving to file

 This command does not affect the measurement processing time.

Error Code

- 03: When auto calibration is being executed
When executed while manual calibration is being edited
When the auto calibration file is not being edited
- 22: The number of command parameters or the range is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CSR: Check Calibration Status

Returns the status of the specified calibration data.

Send	CSR,s,nnn	Delimiter
Receive	CSR,t	Delimiter

- s: File Type
 - 1: Local
 - 2: Global
- nnn: Calibration data No. (0 - 127)
- t: Calibration status
 - 0: Completed
 - 1: Other than completed



This command does not affect the measurement processing time.

Error Code

- 03: When the specified calibration file does not exist
When auto calibration is being executed
- 22: The number of command parameters or the range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

CPW: Update Capture Position

Updates the capture position of the specified robot coordinate conversion unit.

Send	CPW,c,x,y,z,rx,ry,rz	Delimiter
Receive	CPW	Delimiter

- c: Unit ID (0 - 999)
- x: X position (-9999.999 - 9999.999)
- y: Y position (-9999.999 - 9999.999)
- z: Height (-9999.999 - 9999.999)
- rx: Angle X (-179.9 - 180.0)
- ry: Angle Y (-179.9 - 180.0)
- rz: Angle Z (-179.9 - 180.0)



This command is only enabled When the Calibration Data (for On-Hand camera) is specified or when "Master Pos. to Detected Pt." is selected for Direction.



- This command does not affect the measurement processing time.
- You can also specify the position, height, and angle in exponential form. To specify in exponential form, use the following format:
 - Mantissa: -9.99999999999999 +9.99999999999999 (Integer is one digit; integer plus decimal is one to 17 digits; the plus sign (+) can be omitted)
 - Exponent part: e-308 - e+308 ("e" can be capitalized; the plus sign (+) can be omitted; integer is one to three digits)
- Example: 1.23e2

Error Code

- 03: When the unit of the specified unit ID is not a robot coordinate conversion unit
When the capture position of the specified robot coordinate conversion unit cannot be updated
- 22: The number of command parameters or the range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

VisionDatabase (DDF/DSW/DSR)

DDF: Delete the output image

The images output via the VisionDatabase function are deleted in accordance with the VisionDatabase settings. This command is only received and then a response is returned.

Delete processing is implemented separately after the command is received.

 The DDF command can be implemented at any time, it does not depend on the [Timing of Deletion] setting.

Send **DDF** **Delimiter**

Receive **DDF** **Delimiter**

 This command does not affect the measurement processing time.

Error Code

- 03: A command is received during deletion processing.
- 22: Some unnecessary parameters are included.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

DSW: Change External Input String

Change the External Input String available to export to VisionDatabase to the specified string ssss.

Send **DSW,n,ssss** **Delimiter** (1)

DSW,n,xxxx **Delimiter** (2)

Receive **DSW** **Delimiter**

 This command does not affect the measurement processing time.

- n: Specifies the External Input String to change
0: External Input String 1
1: External Input String 2
External input strings 1 and 2 are used when stipulating 2 kinds of optional character strings.
- ssss: Changing string (Number of characters 0 - 200)
- xxxx: Numerical array variable (Number of array elements 1 - 10000)

 Point

Case of (1)

- The external input string is rewritten with ssss.
- A double quotation mark ("") needs to be placed in front of ssss.
- If implementing via the PLC link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, define DSW, n, *01 and so on via custom commands, and store the data as two words (32 bits) for 1 character beginning from the CommandParam1 address, and then execute the command.
In this case double quotation marks ("") are not needed.
- Up to 64 characters can be stipulated via the PLC link, and up to 16 characters can be stipulated via CC-Link, EtherNet/IP, PROFINET, or EtherCAT, and for the character string's terminal position stipulate the value 0.

Case of (2)

- The numerical type array variable xxxx values are read as ASCII codes, and the specified external input string is rewritten with the read character string.
- If an element that is the 200th character, the end of the array, or the value of which is 0 is reached, the reading ends.

Error Code

- 22: Some unnecessary parameters are included.
A character that cannot be used has been specified.
The number of parameters is incorrect.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

DSR: Reading External Input String

Read the External Input String that will be exported to VisionDatabase.

Send	DSR,n [Delimiter] (1)
	DSR,n,xxxx [Delimiter] (2)
Receive	DSR,ssss [Delimiter] Case of (1)
	DSR,n [Delimiter] Case of (2)

 This command does not affect the measurement processing time.

- n: Specifies the External Input String to read
0: External Input String 1
1: External Input String 2
- ssss: Read string (Number of characters 0 - 200)
- xxxx: Numerical array variable (Number of array elements 1 - 10000)



Case of (1)

- The external input string details are stored in ssss.
- If implemented via PLC link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, 2 words are used per each character.

Case of (2)

- The external input string is stored as an ASCII code in the numerical type array variable (global variable, local variable) xxxx.
- If the fixed character string maximum length, or character string termination is reached, 0 is stored and the readout ends.

Error Code

- 22: Some unnecessary parameters are included.
A character that cannot be used has been specified.
The number of parameters is incorrect.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Measurement Correction (MCC/MCW/MCR)

Reference

The measurement item numbers (m:) when a 3D-blob unit is specified with a command related to measurement correction (MCC/MCW/MCR) are shown below.
 00: Height/01: Volume/02: Area/03: Feret X/04: Feret Y/
 05: Long Side/06: Short Side/07: Major Axis/
 08: Minor Axis/09: Oval Maj.Axis/10: Oval Min.Axis/
 11: Perimeter/12: Position X/13: Position Y/
 14: Max. Height X/15: Max. Height Y/16: Max. Height Z/
 17: Max. Height H/18: Ave. Height Z/19: Ave. Height H/
 20: Min. Height X/21: Min. Height Y/22: Min. Height Z/
 23: Min. Height H/24: Concave Volume/
 25: Convex Volume/26: Convex Area/27: Convex Area

MCC: Changing Meas. Value before Correction of Measured Value Correction

This command calculates the measured value before correction for the specified value.

Send **MCC,uuu,m,nnnn** [Delimiter]
MCC,uuu,m,nnnn,aaaa [Delimiter]

Receive **MCC** [Delimiter]

- uuu: Unit ID 0 to 999
- m: Measurement item number 0 to 31 (fixed to 0 when a 3D geometry unit is specified)
- nnnn: Value or variable name
- aaaa: Target variable

Reference

This command does not affect the measurement processing time.

Error Code

- 22: The specified number of parameters is incorrect. The specified parameter is outside the range. There are too many parameter digits.
- 03: The unit does not exist or the unit specified is not a profile measurement, continuous profile measurement, 3D geometry, or 3D blob unit. When a 3D geometry unit is specified and a value other than 0 is specified for the measurement item number argument. When a profile measurement unit, continuous profile measurement unit, or 3D blob unit is specified and a non-targetable measurement item number is specified.

The calculation of the Meas. Value before Correction failed.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

MCW: Measured Value Correction Writing

This command changes the measured value correction setting of the specified measurement item number for a given unit and also calculates the corrected value.

- (1) Change the correction method to 1-point correction, and then specify the value before correction and the value after correction to calculate the corrected value.
- (2) Change the correction method to 1-point correction, subtract the specified offset value from the set value after correction, and then set this result as the corrected value.
- (3) Change the correction method to 2-point correction, and then specify the value before correction and the value after correction for corrected values 1 and 2 in order to calculate these values.
- (4) Change the correction method to 2-point correction, perform an inverse calculation on coefficients A and B from the set value after correction, and then set this result as the corrected value.

Send **MCW,uuu,m,n,c,f** [Delimiter] (1)
MCW,uuu,m,n,o [Delimiter] (2)
MCW,uuu,m,n,c1,f1,c2,f2 [Delimiter] (3)
MCW,uuu,m,n,a,b [Delimiter] (4)

Receive **MCW** [Delimiter]

- uuu: Unit ID 0 to 999
- m: Measurement item number 0 to 31 (fixed to 0 when a 3D geometry unit is specified)
- AL: All measurement items

- n: Correction method

0: 1-point correction
 1: 2-point correction

- c: Value before correction
- f: Value after correction
- o: Offset value
- c1: Value 1 before correction
- c2: Value 2 before correction
- f1: Value 1 after correction
- f2: Value 2 after correction
- a: Coefficient A
- b: Coefficient B

Reference

This command will be executed after the completion of the unit processing that is currently being executed and will pause the transition to the next unit.

Error Code

- 22: The specified number of parameters is incorrect.
The specified parameter is outside the range.
There are too many parameter digits.
- 03: The unit does not exist or the unit specified is not a profile measurement, continuous profile measurement, 3D geometry, or 3D blob unit.
When a 3D geometry unit is specified and a value other than 0 is specified for the measurement item number argument.
When a profile measurement unit, continuous profile measurement unit, or 3D blob unit is specified and a non-targetable measurement item number is specified.
The correction calculation failed.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

MCR: Measured Value Correction Reading

This command reads the measured value correction setting of the specified measurement item number for a given unit.

Send	MCR,uuu,m	Delimiter
Receive	MCR,0,c,f,o	Delimiter
.....		During 1-point correction
.....		MCR,1,c1,f1,c2,f2,a,b Delimiter
.....		During 2-point correction

- uuu: Unit ID 0 to 999
- m: Measurement 0 to 31 (fixed to 0 when a item number 3D geometry unit is specified)
- c: Value before correction
- f: Value after correction
- o: Offset value
- c1: Value 1 before correction
- c2: Value 2 before correction
- f1: Value 1 after correction
- f2: Value 2 after correction
- a: Coefficient A
- b: Coefficient B

Reference

This command does not affect the measurement processing time.

Error Code

- 22: The specified number of parameters is incorrect.
The specified parameter is outside the range.
There are too many parameter digits.
- 03: The unit does not exist or the unit specified is not a profile measurement, continuous profile measurement, 3D geometry, or 3D blob unit.
When a 3D geometry unit is specified and a value other than 0 is specified for the measurement item number argument.
When a profile measurement unit, continuous profile measurement unit, or 3D blob unit is specified and a measurement item number not added to these units is specified.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Others (CC/KY/VI/EC/UQ/ICU/ECU/ICV/ECV/XTC/XCE/BPL/BPW/BTE/BTC/BTR)

CC: Execute Custom Instruction

This command executes a custom instruction.

Send CC,nnn [Delimiter]

CC,nnn,p1 [Delimiter]

CC,nnn,p1,p2,p3,...,pN [Delimiter]

Receive CC [Delimiter] (**when batch response mode is selected**)

- nnn: Custom instruction No. 0 to 127
- p1: First parameter of the custom instruction Any value
- p2: Second parameter of the custom instruction Any value
- Any value
- p15: Fifteenth parameter of the custom instruction Any value
- p16: Sixteenth parameter of the custom instruction Any value



- To edit the execution content of the custom instruction, see "Controller Global Settings".
- Whether this command affects the measurement processing time depends on the properties of the commands in the custom instruction to be executed.



- In the individual response mode, the response will be returned from each of the standard instructions to be executed. An error code will also be returned from each of the standard instructions.
- In the batch response mode, "CC" is the only response even if the standard instructions to be executed are of the type that yields a return value. Therefore, select the individual response mode if a return value is required. In the case of error occurrence, the error code for the standard instruction that first encountered the error will be returned.
- When [No response] is selected, no response will be returned.

Error Code

- 03: The specified custom instruction does not exist.
- 22: The number of parameters is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

KY: Console Virtual Input

This command allows a communication command to serve as the input from the button of the handheld controller.

Send KY,mm [Delimiter]

KY,mm,mm [Delimiter] (**Pressing two buttons simultaneously**)

Receive KY [Delimiter]

- mm: Key code

- | | |
|-----|--------------|
| 0: | No. 0 button |
| 1: | No. 1 button |
| 2: | No. 2 button |
| 3: | No. 3 button |
| 4: | No. 4 button |
| 5: | No. 5 button |
| 6: | No. 6 button |
| 7: | No. 7 button |
| 8: | No. 8 button |
| 11: | Lower left |
| 12: | Down |
| 13: | Lower right |
| 14: | Left |
| 16: | Right |
| 17: | Upper left |
| 18: | Up |
| 19: | Upper right |

These codes correspond to the numeric keypad of the PC.
The value of each code is obtained by adding 10 to the number assigned to the key in each direction from key 5 at the center.



This command does not affect the measurement processing time.



- The response to KY will be returned when the command is accepted, instead of when the process caused by KY is complete.
- There may be cases where a process caused by KY (such as capturing an image) will be performed after the response to KY is returned. Consequently, execution of the command entered after KY may be delayed.

Error Code

- 22: The number of parameters is invalid.

The parameter data is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

VI: Version Information Readout

This command reads the system information (model, firmware version) from the controller.

Send VI [Delimiter]

Receive VI, [Model], [Firmware version] [Delimiter]

- Model: Character string representing the model
- Firmware version:

Character string of 14 characters ([four-digit number showing the first number of the major version].[four-digit number showing the second number of the major version].[Four-digit number showing the minor version])

 Reference

- This command does not affect the measurement processing time.
- The character string for the model is "XG-X (the model's four digit value)" and when "LJ" is appended at the end of the value, it represents an LJ-X/LJ-V dedicated controller.
- The firmware version consists of two digits showing the major version and four digits showing the minor version (Example: "1.0.0000" means major version 1.0 and minor version 0000).

Output example for the XG-X2002 Version 1.0.0000:
VI,XG-X2002,0001.0000.0000[Delimiter]

Error Code

- 22: The number of parameters is invalid.

 Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

When PLC Communication (PLC Link, CC-Link, EtherNet/IP, PROFINET, EtherCAT) is used

The received data is represented as values.

- Return value 1: Numerical value in the model
- Return value 2: Indicates the controller type in value.
 - 0: Nomal type
 - 1: LJ type
- Return value 3: First number of the major version of the firmware version information
- Return value 4: Second number of the major version of the firmware version information
- Return value 5: Value of the minor version of the firmware version information

Output example for PLC link:

When the model is "XG-X2502", the firmware version is "1.0.0000", and the command response is output to the memory starting from DM0000

DM0000	2502
DM0001	0
DM0002	0
DM0003	0
DM0004	1
DM0005	0
DM0006	0
DM0007	0
DM0008	0
DM0009	0

EC: Echo

This command returns the same character string as the one that was sent from the external device.

Send	EC,ssss	[Delimiter]
Receive	EC,ssss	[Delimiter]

ssss: Character string of 128 characters or less
(alphabet and numbers only)

 This command does not affect the measurement processing time.

Error Code

- 22: The characters in the parameter exceed 128 characters.
The character string of the parameter includes a character other than those specified above.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

UQ: Search Unit No.

This command searches the unit corresponding to the specified name in the flowchart and then returns the unit number. When multiple units with the same name exist, it returns the lowest unit number.

Send	UQ,ssss	[Delimiter]
	UQ,xxxx	[Delimiter]
Receive	UQ,nnn	[Delimiter]

ssss: Unit name
xxxx: Scalar array variable
(System variables cannot be specified.)
nnn: Unit number 0 to 999

 This command does not affect the measurement processing time.

Point

- You need to place a double quotation mark ("") before ssss.
- If ssss is changed as an argument of PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, the command is executed assuming that two words (32 bits) of the data memory contain one character. In this case, you do not need to provide a double quotation mark (""). At this time, reading stops if the command reaches 64 characters or an element with a value of 0 assuming two words (32 bits) of the data memory contain one character in the PLC-Link.
- For CC-Link, EtherNet/IP, PROFINET, and EtherCAT, reading stops if the command reaches 16 characters or an element with a value of 0 assuming every two words (four bits) in Command Param contain one character.
- Only names in the language set in the System Settings can be searched.

Error Code

- 03: The specified unit does not exist.
- 22: The number of parameters is invalid.

 For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ICU: Import Unit Settings CSV File

This command imports the specified CSV file from the Program No. folder and applies the contents to the unit settings.

If you specified a CSV reference file, only the unit settings listed in the CSV reference file are imported from the source settings.

Send **ICU,nnnn [Delimiter]**

ICU,nnnn,t [Delimiter]

: Format with a specified result log output

ICU,nnnn,mmmmm,t [Delimiter]

: Format with reference CSV file and result log output specified

Receive **ICU,0 [Delimiter]**

: If an error did not occur during import

ICU,1 [Delimiter]

: If one or more errors occurred during import (regardless of the specified result log output, if an error occurred "1" is returned)

ICU,2 [Delimiter]

: If a fatal error occurred (Keyence recommends importing the program settings or the CSV file again)

You cannot check the error via the terminal.

nnnn: The name of the source CSV file.

Specify a number between 00000 and 99999.
The file name is from u00000.csv to u99999.csv

mmmm: Number of the CSV reference file name.
Specify a number between 00000 and 99999.

The file name is from u00000.csv to u99999.csv

t:
0 The result log is not output and (When the settings are all applied (when omitted) it fails, the settings are reloaded)*1

1 The result log is output and the settings are all applied (when it fails, the settings are reloaded)

10 The result log is not output and the settings are applied to each unit individually (for debugging)*2

11 The result log is output and the settings are applied to each unit individually (for debugging)

Reference

*1: The settings are applied quickly but if a fatal error occurred when the settings are applied the cause is not listed in a log. Use this when using settings that have been calibrated.

If the settings failed to reload, an error menu appears. The system is in an unstable state, so change to other program settings or restart the controller.

*2: The settings are applied slowly but if a fatal error occurred when the settings are applied, which unit the application of the settings failed for is listed in the log. If a fatal error occurred, Keyence recommends that you check the cause of the error in this mode.

Point

- When outputting a result log, it is output to [selected program settings folder/csv_log/file where the source CSV file extension is changed to .log].
- The error that occurred when settings are loaded is listed in the result log.
- The result log is output even if there are no errors (a log indicating that import was successfully completed is output).
- If there is a file system error, an error menu appears regardless of whether the result log is specified to be output or not.
- The settings are not reset.
- However, the flow returns to the start unit, and the output buffer is cleared.
- Whether the archive results, image variable, and target classification results are cleared depends on the imported settings.
- During execution, %UnitEditStatus is "1". Be aware of this when an external device is connected.

Error Code

- 03: There is no memory card or it cannot be accessed.
The CSV file of the specified name does not exist.
When the flowchart or a unit is being edited, or when a standard menu is running.
- 22: The number of command parameters or the range is invalid.

Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ECU: Export Unit Settings CSV File

This command writes the unit settings to the specified CSV file in the program setting folder.

If you specified a CSV reference file, the settings for the unit number listed in the CSV reference file are exported. Any information other than the unit ID is ignored. If the unit ID has been omitted, the settings for all units will be exported. However, export is limited to units and settings that can be partially pasted.

Settings are exported by unit. All settings that are in a unit associated with the listed setting parameters are exported.

Send **ECU,nnnnn** [Delimiter]

ECU,nnnnn,t [Delimiter]

: Specifies items to export

ECU,nnnnn,mmmmm,t [Delimiter]

: Format that specifies items to export and CSV reference file

Receive **ECV** [Delimiter]

nnnn: Number of the CSV file name that the settings are exported to.

Specify a number between 00000 and 99999.

The file name is from u00000.csv to u99999.csv

mmmmm: Number of the CSV reference file name.

Specify a number between 00000 and 99999.

The file name is from u00000.csv to u99999.csv

t:
0 The settings are exported with
(When omitted) the column for the description of the settings left blank.

1 The column for the description of the settings is also exported.



This command does not affect the measurement processing time.

Error Code

- 03 There is no memory card or it cannot be accessed.
The CSV file of the specified name does not exist.
There are no settings targeted for export.
- 22 The number of command parameters or the range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ICV: Import Variable Initial Values CSV File

This command imports the specified CSV file from the Program No. folder and applies the contents to the initial values of the user variables.

The variables that will be imported are the local variables and global variables listed in the CSV file. The variables that are to be applied are reset (the current value is returned to the initial value). This command is executed regardless of the variable options.

Send **ICV,nnnnn** [Delimiter]

ICV,nnnnn,t [Delimiter]

: Format with a specified result log output

ICV,nnnnn,mmmmm,t [Delimiter]

: Format with reference CSV file and result log output specified

Receive **ICV,0** [Delimiter]

: If an error did not occur during import

ICV,1 [Delimiter]

: If one or more errors occurred during import (regardless of the specified result log output, if an error occurred "1" is returned)

You cannot check the error via the terminal.

nnnn: The name of the source CSV file.

Specify a number between 00000 and 99999.

The file name is from v00000.csv to v99999.csv

mmmmm: Number of the CSV reference file name.

Specify a number between 00000 and 99999.

The file name is from v00000.csv to v99999.csv

t:
0 The result log is not output, and (When omitted) the current value is synchronized with the flowchart and updated.

1 The result log is output, and the current value is synchronized with the flowchart and updated.

10 The result log is not output, and the current value is updated immediately.

11 The result log is output, and the current value is updated immediately.



This command pauses measuring where the unit ends and executes.



- The particle size to be updated for the current value is the element unit for which the initial value is imported.
Example:
If only the first element of the array variable for the initial value is imported, only the first element for the current value also is updated. Other elements do not change. For initial values for which import from the CSV was performed, the current value is updated to the initial value even if the value is the same as before.
- If you specified a CSV reference file, only the variable settings listed in the CSV reference file are imported from the source variables. The particle size to be imported in this case is in variable units.
Example: If the first element of the array variable is listed in the CSV reference file, all elements for the same variables listed in the source CSV file are imported.
- When outputting a result log, it is output to [active program settings folder/csv_log/file where the source CSV file extension is changed to .log].
- The error that occurred when settings are loaded is listed in the result log.
- The result log is output even if there are no errors (a log indicating that import was successfully completed is output).
- If there is a file system error, an error menu appears regardless of whether the result log is specified to be output or not. The settings are not reset. However, the flow returns to the start unit, and the output buffer is cleared.

Error Code

- 03 There is no memory card or it cannot be accessed.
The CSV file of the specified name does not exist.
- 22 The number of command parameters or the range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

ECV: Export Variable Initial Values CSV File

This command writes the initial values for the user variables to the specified CSV file in the program setting folder.

If you specified a CSV reference file, the variables listed in the CSV reference file are exported. Any information other than the variable name is ignored.

If the name was omitted, all local variables are exported.

Global variables will not be exported.

However, any global variable listed in the CSV reference file will be exported.

Exporting is performed by variable (for variables that have multiple elements, such as arrays, all elements that belong to a variable will be exported).

Send **ECV,nnnnn** **Delimiter**

ECV,nnnnn,t **Delimiter**

: Format with a specified result log output

ECV,nnnnn,mmmmm,t **Delimiter**

: Specifies items to export

Receive **ECV,0** **Delimiter**

nnnnn: The name of the CSV file.

Specify a number between 00000 and 99999.

The file name is from v00000.csv to v99999.csv

mmmmm: Number of the CSV reference file name.

Specify a number between 00000 and 99999.

The file name is from v00000.csv to v99999.csv

t:
0 The values are exported with the column for comments about the variables left blank.

1 Comments about the variables are also exported.



This command does not affect the measurement processing time.

Error Code

- 03 There is no memory card or it cannot be accessed.
The CSV file of the specified name does not exist.
There are no settings targeted for export.
- 22 The number of command parameters or the range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

XTC: Execute 3D Calibration (for XR camera)

This command executes 3D calibration for the 3D camera (XR) of the specified ID.

When this command is executed, the 3D Calibration menu opens and indicates the same behavior as when executing calibration manually.

Send XTC, c, m[, u] [Delimiter]

Receive XTC [Delimiter]

c: Camera number (1 or 3)

m: 0 Executes 3D calibration

 1 Initializes 3D calibration

u: 0 Sets Screen Update mode to [Trigger]

 1 Sets Screen Update mode to [Live Image]

 **Point** This command can only be executed on a screen other than the Correction screen of Global Settings (with the exception of 3D Calibration). When executing the command, a calibration target is required (OP-87740 or OP-87741).

Error Code

- 03 The specified camera is not XR
3D calibration failed
The command was issued on a screen for which the XTC command cannot be executed
- 22 The number of command parameters or the range is invalid.
The number of arguments is invalid

 **Reference** For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

XCE: Execute 3D Calibration (for XT camera)

This command executes 3D calibration for the 3D camera (XT) of the specified ID.

When this command is executed, the 3D Calibration menu opens and indicates the same behavior as when executing calibration manually.

Send XCE, c, m[, u] [Delimiter]

Receive XCE [Delimiter]

XCE,t [Delimiter]

c: Camera number (1 or 3)

m: 0 Start 3D calibration, transition to calibration mode, and return to the 3D calibration start screen.

 1 Check the warm-up information.

 2 Open the height adjustment screen.

 3 Execute the 3D calibration of plane 1.

 4 Execute the 3D calibration of plane 2.

 5 End 3D calibration and return to setup mode.

 6 Return the calibration data to its factory default.

t: Warm-up status

 0 Warm-up complete

 1 Warm-up not complete

 **Point** • 3D calibration can only be started in setup mode. All other operations can only be executed in calibration mode.
• To calibrate an XT camera, a calibration target (OP-88400, OP-88401) is required.
• The calibration data is updated when the calibration of plane 2 is successful.

Error Code

- 03 The specified camera is not XT.
3D calibration failed.
The command was issued on a screen for which the XCE command cannot be executed.
- 22 The number of command parameters or the range is invalid.
The number of arguments is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

BPL: Load Setting in the Background

This command loads program settings in the background.

Send **BPL,d,nnn,m** [Delimiter]
When specifying a value
BPL,"ssss [Delimiter]
When specifying a name

Receive **BPL** [Delimiter]

- d: SD card No.
 - 1 SD1
 - 2 SD2
- nnn: Setting No. (0 - 999)
- ssss: Program Setting Name
- m: Mode (can be omitted)
 - 0 Overwrites the initial value for the variable. (When omitted)
 - 1 The initial value for the variable depends on the [Keep Controller Initial Value] setting.



- If you use the ECU or ICU commands to import or export a CSV file while the controller is operating, the settings may not change correctly. Do not combine the ECU or ICU commands with the BPL command.
- If you change the program settings by editing the unit or the like while settings are being loaded in the background with the BPL command, the loaded background settings may be discarded. Settings may fail to change with the BPW command.
- You cannot save the current settings while settings are being loaded in the background with the BPL command. The SS command returns a 03 error.



- This command has no impact on the measurement processing time. However, SD card output will be paused.
- A small [Loading Program Settings] menu will appear to the bottom right while the command executes, and the handheld controller, mouse, and touch panel are disabled until the settings change.
- The command processing time depends upon the operation load.



Point

- This command is used in combination with the BPW command. You can import the source program settings in advance using the BPL command and execute the BPW command at the desired time to change the program settings.
- If you specified a program setting name and a program setting exists with the same name, the SD cards are searched in the order of SD1 000 → SD1 999 → SD2 000 → SD2 999 and the program setting that is found first is imported.
- In order to not impact controller operations, settings are loaded with a low processing priority.
- The load time depends upon the operation load.
- The controller must not be in Setup mode nor running the below operations:
 - Edit Flowchart
 - Edit Unit
 - Image Viewer
 - Editing that pauses operations (target classification condition settings and the like)
 - Statistics
 - Adjustment utility that pauses operations (robot connection settings, robot calibration data management, and so on)
- If you specify the program setting name with PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, BPL,*01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed. In this case, double quotation marks ("") are not required. For PLC-Link, you can set up to 32 characters, and for CC-Link, EtherNet/IP, PROFINET, or EtherCAT, you can set up to 16 characters. The reading finishes when it reaches an address of value 0.

Error Code

- 03 The setting number does not exist.
There is no memory card or it cannot be accessed.
The program setting of the specified name does not exist.
Settings failed to load.
- 22 The number of command parameters or the range is invalid.
- 30 Change error due to something related to capture.
- 31 Change error due to something related to image variables.
- 32 Change error due to something related to image archives and VisionDatabase.
- 33 Change error due to something related to target classification.
- 34 Change error due to something related to output.
- 35 Change error due to something related to a recipe.
- 36 Change error due to something related to memory consumption.



Reference

For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Operation Restrictions

There are restrictions on the program settings that can use this command.

In addition, since this command assumes that the switching is between "program settings that were created by copying off of a single program setting as their source**", if program settings that were created via other methods are used, errors may occur even if these restriction conditions are satisfied.

Setting	Details
Camera/Capture Settings	If there are differences in the source and destination settings for the following, an error will occur: <ul style="list-style-type: none"> • Camera Selection • Image Capture Buffer ON/OFF Count • Trigger Settings • Light Model Settings • Capture Unit • Multi-Camera Image Variable
Image Variable	If there are differences in the source and destination settings, an error will occur. (Variable Name, Type, Processed, Quantity)
Image Archive Settings	If there are differences in the source and destination settings, an error will occur. <ul style="list-style-type: none"> • Image Archive Settings • VisionDataBase Output Settings • (All settings including Enable/Disable, Reference, and Archive Objects)
VisionDataBase Output Settings	If there are differences in the source and destination settings for the following, an error will occur: <ul style="list-style-type: none"> • Target Classification/Include Image Output Settings • Target Classification Map (Select Camera, Display Settings), Conditions, Judgment Conditions
Target Classification	Even if there are no differences in the above settings, if the unit IDs for the following units are different, an error will occur: <ul style="list-style-type: none"> • Defect • Blob • Grayscale Blob
Device	If there is a data output unit, image output unit, or parallel terminal output unit, and the source and destination units have a different unit ID and/or type, an error will occur. (Each output unit cannot be added or deleted.) The settings for each unit must also be the same.
Recipe Setting	If the source or destination are using recipes, an error will occur.

Setting	Details
Resources	If settings cannot be changed due to the memory consumption of program settings, an error will occur. <ul style="list-style-type: none"> • If image memory consumption of the destination program settings exceeds 100% However, for units that have High Speed mode turned off, or if the image source for the image operation and PlugIn units is a registered image, settings cannot be loaded in some cases even if the image consumption is set to less than 100% because space is required to load the registered image in the background. • If program memory consumption of the source or destination program settings exceeds 50% • If processing capacity consumption of the source or destination program settings exceeds 50% • If there are differences in the number of image archives displayed on the display template.

* In concrete terms, this means that the Capture unit, image variables, processes involving output (Data Output unit, Parallel Terminal Output unit, Image Output unit, VisionDatabase Output Settings, Target Classification) and archive condition settings must all be used in the same state as when they were copied (state where no additions or deletions have been made). Other units can be edited freely.

BPW: Change Setting in the Background

This command changes to the program settings that were loaded in the background. If the end unit is reached, the settings change immediately and return to the start unit. If the standby unit is waiting, the process stops immediately, the settings change and return to the start unit.

Send	BPW [Delimiter] No Format BPW,d,nnn,m [Delimiter] When specifying a value BPW,"ssss [Delimiter] When specifying a name
Receive	BPW [Delimiter]

Not specified Changes to the settings loaded in advance
(Omitted) with the BPL command.
d: SD card No.
 1 SD1
 2 SD2
nnn: Setting No. (0 - 999)
ssss: Program Setting Name
m:
 Mode (can be omitted)
 0 Overwrites the initial value for the variable.
 (When omitted)
 1 The initial value for the variable depends on
 the [Keep Controller Initial Value] setting.



Point

- If the parameters are not specified, the settings change to the settings loaded in advance with the BPL command. There is impact on the measurement processing time (10 ms or less).
- If the parameters are specified, the settings are loaded in the background and if the end unit is reached, the settings change immediately. As the settings are loaded in the background, there is no impact on the measurement processing time.
- This command can only be executed when the controller is not in Run mode and retesting is not being performed.
- The following settings are maintained even after settings change.
 - Processing count
 - Variable values (local variables, global variables, and system variables)
 - Images in the image capture buffer
 - Archived images
 - Result data and images in the output buffer
- The following settings are cleared when settings change.
 - Statistical data
 - Archived data
- If you edit the settings, such as adding units and so on, on the controller after changing settings with the BPW command, you cannot perform editing which will make the program memory and processing capacity consumption exceed 50%.
- If you specify the program setting name with PLC-Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, BPW,*01, and so on are defined in a custom instruction, and data is stored as two words (32 bits) for 1 character from the CommandParam1 address and executed. In this case, double quotation marks ("") are not required. For PLC-Link, you can set up to 32 characters, and for CC-Link, EtherNet/IP, or PROFINET, EtherCAT, you can set up to 16 characters. The reading finishes when it reaches an address of value 0.

Error Code

- 03 The setting number does not exist.
There is no memory card or it cannot be accessed.
The program setting of the specified name does not exist.
(When parameters are omitted) settings are not loaded with the BPL command
- 22 The number of command parameters or the range is invalid.
- 30 Change error due to something related to capture.
- 31 Change error due to something related to image variables.
- 32 Change error due to something related to image archives and VisionDatabase.
- 33 Change error due to something related to target classification.
- 34 Change error due to something related to output.
- 35 Change error due to something related to a recipe.
- 36 Change error due to something related to memory consumption.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Operation Restrictions

There are restrictions on the program settings that can use this command.

Setting	Details
Camera/ Capture Settings	If there are differences in the source and destination settings for the following, an error will occur: <ul style="list-style-type: none"> • Camera Selection • Image Capture Buffer ON/OFF Count • Trigger Settings • Light Model Settings • Capture Unit • Multi-Camera Image Variable
Image Variable	If there are differences in the source and destination settings, an error will occur. (Variable Name, Type, Processed, Quantity)
Image Archive Settings VisionDataBase Output Settings	If there are differences in the source and destination settings, an error will occur. <ul style="list-style-type: none"> • Image Archive Settings • VisionDataBase Output Settings • (All settings including Enable/Disable, Reference, and Archive Objects)

Setting	Details
Target Classification	If there are differences in the source and destination settings for the following, an error will occur: <ul style="list-style-type: none"> • Target Classification/Include Image Output Settings • Target Classification Map (Select Camera, Display Settings), Conditions, Judgment Conditions Even if there are no differences in the above settings, if the unit IDs for the following units are different, an error will occur: <ul style="list-style-type: none"> • Defect • Blob • Grayscale Blob
Device	If there is a data output unit, image output unit, or parallel terminal output unit, and the source and destination units have a different unit ID and/or type, an error will occur. (Each output unit cannot be added or deleted.) The settings for each unit must also be the same.
Recipe Setting	If the source or destination are using recipes, an error will occur.
Resources	If settings cannot be changed due to the memory consumption of program settings, an error will occur. <ul style="list-style-type: none"> • If image memory consumption of the destination program settings exceeds 100% However, for units that have High Speed mode turned off, or if the image source for the image operation and PlugIn units is a registered image, settings cannot be loaded in some cases even if the image consumption is set to less than 100% because space is required to load the registered image in the background. • If program memory consumption of the source or destination program settings exceeds 50% • If processing capacity consumption of the source or destination program settings exceeds 50% • If there are differences in the number of image archives displayed on the display template.

BTE: Execute Retest Images

This command switches the system to setup mode and executes retesting (Retest Images). If this command is issued in run mode, moving to the next unit will be interrupted and the system will switch to setup mode to run Retest Images. Once retesting has completed, the system will switch back to run mode.

Send **BTE,s** [Delimiter]

BTE,AL [Delimiter]

Receive **BTE** [Delimiter]

s: Target master image

0 Pass (OK) master images

1 Fail (NG) master images

AL: Pass (OK) master images and fail (NG) master images

 **Reference** This command will be executed after the completion of the unit processing that is currently being executed and will interrupt the transition to the next unit. Once the command has completed, the workflow returns to the start unit.

 **Point**

- If the command is issued with AL, the pass (OK) master images are retested and then the fail (NG) master images are retested. If there is a mismatch with the expected value for a pass (OK) master image, fail (NG) master images are not retested.
 - During the execution of Retest Images, the system variable that stores the execution status of Retest Images "%BatchRetestBusy" (Page 3-462) turns ON (=1). Additionally, a dialog box that shows the progress will appear and retesting can be stopped using the "Stop" button.
 - If an expected value settings file for retesting images (CSV file) is specified in "Options" in "Image Viewer", the retest results are only compared against the expected values.
 - The execution result is stored in the system variable "%BatchRetestStatus" (Page 3-462).
 - 0: Matched with expected values
 - 1: Did not match with expected values
 - 2: There was error that does not allow retesting to continue or retesting was aborted
 - 3: Not run
 - When the BTE command is executed or when Retest Images is run manually, the system variable that stores the execution result "%BatchRetestStatus" is first initialized and set to "3" (Not run), and it will then be overwritten with the test result after Retest Images is completed.
- When retesting is executed per image or when the UT command (Retest) is executed, the system variable "%BatchRetestStatus" is not updated.

Error Code

- 03: Retesting (Retest Images) could not be run.
The image strip or [Image Viewer] screen is displayed.
- 22: The number of parameters or parameter range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

BTC: Cancel Retest Images

This command aborts retesting that is in progress. The value which signifies that execution was aborted is stored in the system variable that stores the execution result "%BatchRetestStatus" (Page 3-462) and the value which signifies that Retest Images is not being executed is stored in the system variable that stores the execution status of Retest Images "%BatchRetestBusy" (Page 3-462).

The image that was being retested at the time of the cancellation remains displayed as is on the image display.

Send **BTC** Delimiter

Receive **BTC** Delimiter



This command does not affect the measurement processing time.

Error Code

- 22: The number of parameters or parameter range is invalid.



For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

BTR: Check Retest Images Result

This command reads the execution result of Retest Images from the system variable "%BatchRetestStatus" (Page 3-462).

Send **BTR** [Delimiter]

Receive **BTR,t** [Delimiter]

- t: Execution result of Retest Images
- When retesting pass (OK) master images
 - 0 All OK
 - 1 At least one image failed (NG)
 - 2 There was error that does not allow retesting to continue or retesting was aborted
 - 3 Not run
 - When retesting fail (NG) master images
 - 0 All NG
 - 1 At least one image passed (OK)
 - 2 There was error that does not allow retesting to continue or retesting was aborted
 - 3 Not run
 - When an expected value settings file for retesting images (CSV file) is specified
 - 0 Matched with expected values
 - 1 Did not match with expected values
 - 2 There was error that does not allow retesting to continue or retesting was aborted
 - 3 Not run

Reference This command does not affect the measurement processing time.

Error Code

- 03: Retesting images
- 22: The number of parameters or parameter range is invalid.

Reference For more details about errors other than those listed above, see "When an error occurs on command acceptance" (Page 2-6).

Character Code Table for OCR/OCR2 Unit

All character codes used in this system are decimal numbers. There are two types of code including user-specified characters (1) to (20).

Reference

- Normal ASCII codes 32 to 126 (0x20 to 0x7e) can be used only for the Decimal to ASCII option in the On-screen Graphics unit.
- The codes which can be used for the calculation result conversion of the OCR/OCR2 unit are within the range 0 to 35 (Maximum).

Registration character	Character code dedicated for CA/CD/calculation reference	Character code under OCR/OCR2 unit conversion rule
Unspecified	-1	Cannot be specified
0	0	48
1	1	49
2	2	50
3	3	51
4	4	52
5	5	53
6	6	54
7	7	55
8	8	56
9	9	57
A	10	65
B	11	66
C	12	67
D	13	68
E	14	69
F	15	70
G	16	71
H	17	72
I	18	73
J	19	74
K	20	75
L	21	76
M	22	77
N	23	78
O	24	79
P	25	80
Q	26	81
R	27	82
S	28	83
T	29	84
U	30	85
V	31	86
W	32	87

Registration character	Character code dedicated for CA/CD/calculation reference	Character code under OCR/OCR2 unit conversion rule
Characters indicated by (a) to (z) are supported only by the OCR2 unit when "Lower Case Letters" is selected for User Character Selection.	Character code used by the CA/CD commands and the calculation result conversion of the OCR/OCR2 unit	Character code used by the CW command, the data output of the OCR/OCR2 unit, and the calculation unit
X	33	88
Y	34	89
Z	35	90
-	36	45
.	37	46
:	38	58
/	39	47
① (a)	40	97
② (b)	41	98
③ (c)	42	99
④ (d)	43	100
⑤ (e)	44	101
⑥ (f)	45	102
⑦ (g)	46	103
⑧ (h)	47	104
⑨ (i)	48	105
⑩ (j)	49	106
⑪ (k)	50	107
⑫ (l)	51	108
⑬ (m)	52	109
⑭ (n)	53	110
⑮ (o)	54	111
⑯ (p)	55	112
⑰ (q)	56	113
⑱ (r)	57	114
⑲ (s)	58	115
⑳ (t)	59	116
*	Cannot be specified	42
#	Cannot be specified	35
(space)	Cannot be specified	32
(*)	60	40
) *	61	41
+ *	62	43
(u)	63	117
(v)	64	118
(w)	65	119
(x)	66	120
(y)	67	121
(z)	68	122

* This is only supported by OCR2 units.

ASCII code table (hexadecimal/decimal notation)

When the detected character of the OCR/OCR2 unit is referred in the calculation, the ASCII code value of each character is returned. The ASCII code value (hexadecimal, decimal) is as follows:

Symbol	(*)	*	+	*	-	.	/	:
Hexadecimal number	28	29	2B	2D	2E	2F	3A			
Decimal number	40	41	43	45	46	47	58			
Number	0	1	2	3	4	5	6	7	8	9
Hexadecimal number	30	31	32	33	34	35	36	37	38	39
Decimal number	48	49	50	51	52	53	54	55	56	57
Alphabet	A	B	C	D	E	F	G	H	I	J
Hexadecimal number	41	42	43	44	45	46	47	48	49	4A
Decimal number	65	66	67	68	69	70	71	72	73	74
	N	O	P	Q	R	S	T	U	V	W
Hexadecimal number	4E	4F	50	51	52	53	54	55	56	57
Decimal number	78	79	80	81	82	83	84	85	86	87
	i	j	k	l	m					
Hexadecimal number	69	6A	6B	6C	6D					
Decimal number	97	98	99	100	101	102	103	104	105	106
	n	o	p	q	r	s	t	u	v	w
Hexadecimal number	71	72	73	74	75	76	77	78	79	7A
Decimal number	110	111	112	113	114	115	116	117	118	119
	x	y	z							
Other	SPACE									
Hexadecimal number	20									
Decimal number	32									

* This is only supported by OCR2 units.

Custom instruction

Overview of Custom Instruction

You can define a custom instruction by assigning desired standard instructions to C000 to C127. A custom instruction can be defined according to use such as assigning several commands to one custom instruction for sequential execution, or specifying fixed values for some command parameters to skip input.

You can execute the defined custom instruction by specifying its name or by using the CC command (Page 2-100) and specifying the custom instruction number.

Reference

- Defined custom instructions can be used in the same way as standard instructions.
- Since control via the PLC Link (Page 1-71), CC-Link (Page 1-113), EtherNet/IP (Page 1-148), PROFINET (Page 1-210), EtherCAT (Page 1-252), and external terminals (Page 1-6) is available only through specification of the custom instruction number, all commands to be used should be defined as custom instructions in advance.

Devices Supporting Custom Instructions

- External terminals (Page 1-6)
- No protocol communication (RS-232C/Ethernet)
- PLC Link (RS-232C/Ethernet) (Page 1-71)
- CC-Link (Page 1-113)
- EtherNet/IP (Page 1-148)
- PROFINET (Page 1-210)
- EtherCAT (Page 1-252)
- Command Execution Unit
- Handheld controller button assignment
- Menu part (Button)

The custom instruction must be supported by the devices used for its control as well as by the devices used for the standard instructions assigned to it.

- See "Command List (Available Operation vs. Situation)" (Page 2-9) for more details on the relationship between standard instructions and devices.
- For details on how to execute commands using each device, see the description for respective devices.

Point

Defining a custom instruction

In the [Custom Instruction] menu of [System Settings], enter a standard instruction(s) as execution content and define the custom instruction to control the controller.

Point

The standard instruction to be assigned must be supported by the device used for the custom instruction. See "Command List (Available Operation vs. Situation)" (Page 2-9) for more details on the relationship between standard instructions and devices.

1 Select [System Settings] from the [Various Settings] menu on the [Program Setting] tab.

The [System Settings] menu appears.

2 Select [Custom Instruction] in the left pane of the [System Settings] menu.

The [Custom Instruction Settings] list is displayed.

The screenshot shows the 'System Settings - Ver.1.0.0000' dialog box. In the left pane, under 'Custom Instruction', the 'Custom Instruction Settings' list is displayed. The list contains 19 entries, each with a number (No.), name (Name), command (EC), and reply type (Reply). The commands listed include various standard instructions like WD, PW, BS, and RR, along with specific device-related commands like HSIJA1*01A1A1, UWFC*01, and GW*01.

No.	Name	EC	Commands and Parameters	Reply
1	C001	WD:100*01		Single response
2	C003	PW:1*01		Single response
3	C003	PW:2*01		Single response
4	C004	BS:&Cam1Img.*01		Single response
5	C005	BS:&Cam2Img.*01		Single response
6	C006	BS:&Cam3Img.*01		Single response
7	C007	BS:&Cam4Img.*01		Single response
8	C009	RR:AL		Single response
9	C009	BC		Single response
10	C010	HSIJA1*01A1A1		Single response
11	C011	UWFC*01		Single response
12	C012	VW*01		Single response
13	C013	GW*01		Single response
14	C014	TS:2*Upstat		Single response
15	C015	T1		Single response
16	C016	T2		Single response
17	C017	T3		Single response
18	C018	T4		Single response
19	C019	BPL1,*01*02		Single response

3 In the [No.] column, select a desired custom instruction number (0 to 127) and specify the necessary settings.

Reference

Typical commands have already been assigned by default. Change the setting as necessary.

- For details on custom commands defined by default, see "List of Custom Instructions" (Page 2-120).
- For more details on individual commands which have already been assigned to the instructions, see "Standard instruction" (Page 2-9).

Name

Enter the name of the custom instruction to be defined using up to 31 single-byte alphanumeric characters.



When no protocol communication is used, you can execute the custom instruction by directly entering this name and necessary arguments.



- The name of a custom instruction is case-sensitive.
- A comma (,) cannot be used as the name of a custom instruction.
- The name must be unique among the standard instructions and existing custom instructions.
- Using names consisting of three or less uppercase characters and numbers is not recommended. A name with those characteristics may be used as standard instruction in a future version upgrade. It is recommended to use four or more characters or to include at least one lowercase character for the name of a custom instruction.

Commands and Parameters

The current content of the custom instruction is displayed. To change the content, click the line of the instruction and then click [Edit Actions].

Reply

Select the method to return the command execution result to the controller.

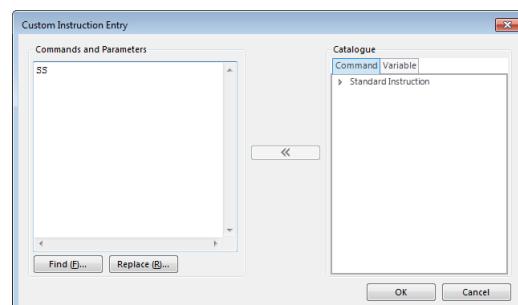
- **Single response:** The execution result is returned when all standard instructions included in the custom instruction have been executed.
- **Each command in string:** The execution results are returned from each of the standard instructions included in the custom instruction.
- **No response:** No execution result is returned for either the custom instruction as a whole or the individual standard instructions.



- When a custom instruction consists of several standard instructions and one of the standard instructions encounters an error, the subsequent standard instructions are not executed. When [Single response] is selected for [Reply], the error code of the standard instruction which encountered an error is returned as the response. If a custom instruction includes a standard instruction which is not supported by the device used to issue the instruction, the custom instruction itself is not executed. See "Command List (Available Operation vs. Situation)" (Page 2-9) for more details on the relationship between the instructions and devices.
- If a custom instruction includes a standard instruction like PW, which involves a Reset operation, no instructions after that standard instruction are executed. In this case, if [Single response] is selected for [Reply], execution error code [03] for custom instruction is returned as the response.
- For command execution via the external terminals, PLC Link, CC-Link, EtherNet/IP, PROFINET, or EtherCAT, even when [Each command in string] is selected for [Reply], the execution result is always returned as [Single response].
- When using with a command execution unit, console command assignment, or custom menu, there is no response regardless of the setting.

4 Click [Edit Actions].

The [Custom Instruction Entry] menu appears.



5 Edit the content of the custom instruction on the selected line.

Up to 256 single-byte alphanumeric characters can be used in one custom instruction (A line feed is counted as two characters.).

- See "Input Format and Control Method of the Execution Content" (Page 2-118) for more details on how to enter execution content.
- Select a command or variable you want to add from the tree in the [Catalogue] field on the right and click [<>], or enter the characters directly.
- To execute several standard instructions sequentially, separate them with a line feed. Up to 16 standard instructions can be executed in sequence.
- You can click [Find] or [Replace] to find or replace the character string in the custom instruction.

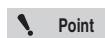
6 When editing is complete, click [OK].



To apply the defined custom instruction to the controller, you need to upload the global settings file to the controller and then restart the controller.

Input Format and Control Method of the Execution Content

Basically, the execution content is entered in the same format as the standard instructions (Page 2-9) without delimiters. You can define values, variables, and up to 16 custom instruction arguments (*01 to *16) simultaneously for the command parameters which are the arguments for the instruction.



- Control via the external terminals allows the entry of only one custom instruction argument %CmdParam (*01) to execute a custom instruction.
- For control via the CC-Link, if the command area size is insufficient for the custom instruction arguments, values of arguments with no area assigned are assumed to be 0 during the command execution.
- For control via the EtherNet/IP, if the command area size is insufficient for the custom instruction arguments, a parameter error occurs.

Example 1: Defining the switch program No. command for SD Card 1, "Pw1", as custom instruction No.2

You can reduce the entry by specifying a value for the command parameter which is always fixed and only using the custom instruction argument to specify the program number. Use the following format to set this instruction as custom instruction No. 2.

Input format (Items displayed in the [Custom Instruction] menu)

Instruction No.	Custom instruction name	Execution content
2	Pw1	PW, 1, *01 <ul style="list-style-type: none"> • PW: Switch program No. • 1: The first parameter is fixed to a value "1" (SD Card 1). • 01: The second parameter which specifies the program number is defined as a custom instruction argument "*01".

Example of issuing the command to change the program to Program No. SD1-009

- Pw1, 9 **Delimiter**
 - Pw1: Custom instruction name
 - 9: Command parameter for a custom instruction argument "*01"
- CC, 2, 9 **Delimiter**
 - CC: Execute custom instruction command
 - 2: Custom instruction No.
 - 9: Command parameter for a custom instruction argument "*01"



To execute a custom instruction via the PLC Link, CC-Link, EtherNet/IP, PROFINET, EtherCAT, or External Terminal, specify the custom instruction No. and custom instruction argument.

Example 2: Defining the change display template command referencing a variable #NgCam, "NgVW", as custom instruction No. 19

Set an instruction to reference the value of the variable during command execution and to change the display template ID to show the image of the camera with an error. This allows you to execute the instruction for an appropriate display template according to the variable value obtained in the calculation unit, even when the information in the flowchart (camera with an error) is unknown at the destination of the instruction. Use the following format to set this instruction as custom instruction No. 19.

Input format (Items displayed in the [Custom Instruction] menu)

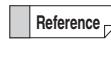
Instruction No.	Custom instruction name	Execution content
19	NgVW	VW, #NgCam • VW: Change display template ID • #NgCam: The first parameter which specifies the display template is defined as a scalar type local variable "#NgCam".

Example of issuing the command

- NgVW [Delimiter]
 - NgVW: Custom instruction name (command parameter unnecessary)
- CC, 19 [Delimiter]
 - CC: Execute custom instruction command
 - 19: Custom instruction No. (command parameter unnecessary)

List of Custom Instructions

The following list shows the content and assignment of the custom instructions provided by default in [Custom instruction] of the global setting (Page 2-116).

 For more details on the individual commands in each custom instruction and related parameters, see "Standard instruction" (Page 2-9).

Custom instruction No.	Assigned commands	Description
0	SS	Save program
1	WO,100,*01	Write terminal offset
2	PW,1,*01	Switch program No. (SD1)
3	PW,2,*01	Switch program No. (SD2)
4	BS,&Cam1Img,*01	Register image (Camera1)
5	BS,&Cam2Img,*01	Register image (Camera 2)
6	BS,&Cam3Img,*01	Register image (Camera3)
7	BS,&Cam4Img,*01	Register image (Camera 4)
8	RR,AL	Update position reference using the current image
9	BC	Capture image
10	HS,IM,*01,AL,AL	Save archived data
11	UW,FC,*01	Change display unit ID
12	VW,*01	Change display template ID
13	GW,*01	Switch page No.
14	TS,2,\xg\stat	Save statistical data
15	T1	Issue trigger
16	T2	Issue trigger
17	T3	Issue trigger
18	T4	Issue trigger
19	BPL,1,*01,*02	Load Setting in the Background (SD1)
20	BPL,2,*01,*02	Load Setting in the Background (SD2)
21	BPW,1,*01	Change Setting in the Background (SD1)
22	BPW,2,*01	Change Setting in the Background (SD2)
23	TA	Issue all triggers
24	TE,*01	Enable/disable trigger input
25	TQ	Read trigger acceptance
26	LK,*01,*02,*03	Enable/disable device input
27	OE,*01	Enable/disable output
28	R0	Switch to run mode
29	S0	Switch to setup mode
30	RM	Read run/setup mode
31	PW,*01,*02	Switch program No.
32	PR	Program No. readout
33	RS	Reset
34	RB	Restart
35	SS	Save program
36	NW,AL,*01	Write registered image No.
37	NW,*01,*02	Write registered image No.
38	NR,*01	Read registered image No.
39	NU,AL	Update referenced registered image No.
40	NU,*01	Update referenced registered image No.
41	CE,*01	Clear error

Custom instruction No.	Assigned commands	Description
42	RE	Return to beginning of flowchart
43	WG,*01	Waiting status release
44	RR,AL,*01	Updating the reference position adjustment value
45	RR,*01,*02	Updating the reference position adjustment value
46	RU,AL	Update image reference
47	RU,*01	Update image reference
48	TG,*01	Teaching
49	UT,*01,*02	Test Unit
50	UE	Reset unit after test
51	CA,*01,*02,*03,*04	Register character to library
52	CA,*01,*02,*03,*04,*05,*06	Register character to library
53	CD,*01,*02	Delete character from library
54	CW,*01	Write REG
55	CW,*01,*02,*03	Write REG
56	CR,*01,*02	Read REG
57	WO,*01,*02	Write terminal offset
58	VW,*01	Change display template ID
59	VW,PV	Change display template ID
60	VW,NX	Change display template ID
61	VR	Read display template ID
62	GW,*01	Switch page No.
63	GW,PV	Switch page No.
64	GW,NX	Switch page No.
65	GR	Read page No.
66	UW,FC,*01	Change display unit ID
67	UW,FC,PV	Change display unit ID
68	UW,FC,NX	Change display unit ID
69	UR,FC	Read display unit ID
70	FW,*01	Change camera screen
71	FW,PV	Change camera screen
72	FW,NX	Change camera screen
73	FR	Read camera screen No.
74	WI,FC,*01	Change image type
75	RI,FC	Read image type
76	ZM,FC,*01,*02,*03,*04	Zoom
77	SC,FC,*01,*02	Scroll
78	FT,FC	Fit
79	DC,*01,*02	Close dialog
80	DC,AL	Close dialog
81	DO,*01	Open dialog
82	DR	Read dialog ID
83	BU,*01,*02	Open unit properties dialog
84	TC	Statistics data clear
85	TS,*01, xglstat	Save statistical data
86	HE,*01	Start/stop archive
87	HR,*01	Read archive status
88	HC,*01	Clear archived data

Custom instruction No.	Assigned commands	Description
89	HC,AL	Clear archived data
90	HS,IM,*01,AL,AL	Save archived data
91	HS,AL,*01,AL,AL	Save archived data
92	LE,*01	Start/stop modification logging
93	LQ	Read modification logging status
94	BC	Capture image
95	PS,Administrator,*01,*02	Change password
96	PS,Operator,*01,*02	Change password
97	WH	Read user account
98	UC,Administrator,*01	Change login user
99	UC,Operator,*01	Change login user
100	TW,*01,*02,*03,*04,*05,*06	Write date/time
101	TR	Read date/time
102	PC,*01,*02,*03,*04	Copy program
103	PM,*01,*02,*03,*04	Move program
104	PD,*01,*02	Delete program
105	OW,*01,*02	Change fixed name in file naming rule
106	OR,*01	Read fixed name in file naming rule
109	FV,*01	Show flowchart in run mode
110	FI	Read show/hide flowchart status
111	KY,*01	Console virtual input
112	KY,*01,*02	Console virtual input
113	VI	Version information readout

Chapter 3

Appendix

Appendix

Documentation for the installation and configuration methods of the controller, software, and CAD data can be downloaded from the following URL.

www.keyence.com/xgxus

List of Setting Parameters / Result Data / Error Codes

► List of Setting Parameters / Result Data / Error Codes

List of System Variables

Overview of the Setting Parameters/Result Data/ Error Codes List

This section provides a list of setting parameters for each unit.

The list provides information about unit settings as well as a list of result data upon unit execution.

Both setting parameters and result data can be referenced as read-only data through direct input in a calculation unit or by using the Watch View in the format: !U[Unit ID].Name (Prefixed by "PRM" for a setting parameter and by "RSLT" for result data). Parameters and result data can also be referenced by dragging and dropping from the parts list. Error codes are categorized as error codes (UEIDs) output as result data for a unit that has encountered an execution error and calculation error codes (ERRCs) output only by calculation units.



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Using the List of Setting Parameters/Result Data

List Organization

Both lists of setting parameters and result data are organized into two sections; common data and unit specific data (apart from units which do not have specific data).

The following table shows the common data categories and their application to each unit type.

Table of units and applicable common data categories

Unit type	Category	Unit parameter	Result data	Common settings				
				Image settings	Color extraction settings	Inspection region settings	Pattern region settings	Image enhancement filter settings
Capture Unit	Image acquisition	○ - - - -	○ - -	○	○	-	○	-
Area Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Pattern Search Unit	Vision tool	○ ○ ○ ○ ○ ○	○ ○ ○	○	○	○	○	○
ShapeTrax3A Unit	Vision tool	○ ○ ○ ○ ○ ○	○ ○ ○	○	○	○	○	○
PatternTrax Unit	Vision tool	○ ○ ○ ○ ○ ○	○ ○ ○	○	○	○	○	○
Edge Position Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Edge Width Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Edge Pitch Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Edge Angle Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Edge Pairs Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Defect Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Blob Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Grayscale Blob Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Profile Position Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Profile Width Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Profile Defect Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Multi-Profile Defect Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Intensity Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○	○	○	○	○	○
Color Unit	Vision tool	○ ○ - ○ - -	○ ○ ○	○	○	○	○	○

Unit type	Category	Unit parameter	Result data	Common settings				
				Image settings	Color extraction settings	Inspection region settings	Pattern region settings	Image enhancement filter settings
Color Grouping Unit	Vision tool	○ ○ - ○ - -	○ ○ ○	○	○	-	○	-
OCR Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○ ○	○	○	○	○	○
OCR2 Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○ ○	○	○	○	○	○
2D Code Reader Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○ ○	○	○	○	○	○
1D Code Reader Unit	Vision tool	○ ○ ○ ○ - ○	○ ○ ○ ○	○	○	○	○	○
3D Comparison Unit	Vision tool	○ ○ - ○ - ○	○ ○ ○ ○	○	○	-	○	○
Height Measurement Unit	Vision tool	○ ○ - ○ - ○	○ ○ ○ ○	○	○	-	○	○
Profile Measurement Unit	Vision tool	○ ○ - - - ○	○ ○ ○ ○	○	○	-	○	○
Continuous Profile Measurement Unit	Vision tool	○ ○ - ○ - ○	○ ○ ○ ○	○	○	-	○	○
3D Geometry Unit	Vision tool	○ ○ - - - ○	○ ○ ○ ○	○	○	-	○	○
3D blob	Vision tool	○ ○ - ○ - ○	○ ○ ○ ○	○	○	-	○	○
Position Adjustment Unit	Position Adjustment	○ ○ - - - -	○ ○ ○ ○	○	○	-	○	○
Branch Unit	Flowchart Functions	○ - - - - -	○ ○ ○ ○	○	-	-	○	○
Join Unit	Flowchart Functions	○ - - - - -	○ ○ ○ ○	○	-	-	○	-
Loop Function Unit	Flowchart Functions	○ - - - - -	○ ○ ○ ○	○	-	-	○	○
Loop End Unit	Flowchart Functions	○ - - - - -	○ ○ ○ ○	○	-	-	○	-
Break Unit	Flowchart Functions	○ - - - - -	○ ○ ○ ○	○	-	-	○	-
Start Unit	Flowchart Functions	○ - - - - -	○ ○ ○ ○	○	-	-	○	-
End Unit	Flowchart Functions	○ - - - - -	○ ○ ○ ○	○	-	-	○	-
Calculation Unit	Operations	○ - - - - -	○ ○ ○ ○	○	-	-	○	○
Group Judgment Unit	Operations	○ - - - - -	○ ○ ○ ○	○	-	-	○	-
Image Operation Unit	Operations	○ ○ ○ ○ - ○	○ ○ ○ ○	○	○	○	○	○
C Plugin Unit	Operations	○ ○ ○ - - ○	○ ○ ○ ○	○	○	-	○	-
Calibration Unit	Operations	○ ○ - ○ - -	○ ○ ○ ○	○	○	-	○	○

Unit type	Category	Unit parameter					Result data				
		Common settings	Image settings	Color extraction settings	Inspection region settings	Pattern region settings		Image enhancement filter settings			
									Common results Inspection region results Unit properties settings		
Contour Region Generator Unit	Operations	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Defect Extraction Operation Unit	Operations	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Image Stitching Unit	Operations	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Robot Coordinate Conversion Unit	Operations	<input type="radio"/>	<input type="radio"/>	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Robot Coordinate Operation Unit	Operations	<input type="radio"/>	<input type="radio"/>	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
String Generator Unit	Operations	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Pause Unit	Timing	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Timer Start Unit	Timing	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Timer End Unit	Timing	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Terminal I/O Delay Unit	Timing	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Variable Delay Unit	Timing	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
User Menu Unit	Timing	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
On-screen Graphics Unit	Display	<input type="radio"/>	<input type="radio"/>	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Parallel Terminal Output Unit	Output	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Data Output Unit	Output	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Image Output Unit	Output	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		
Command Execution Unit	Commands	<input type="radio"/>	-	-	-	-	<input type="radio"/>	-	<input type="radio"/>		

Naming Convention

The following naming convention is used to refer to each parameter/data in the program.

Setting parameter

!U[Unit ID].Name

(The symbol "!" is a prefix to the format and "PRM." is a prefix to each parameter name.)

Result data

!U[Unit ID].Name

(The symbol "!" is a prefix to the format and "RSLT." is a prefix to each result data name.)

Reference During manual input, the auto-complete function becomes operational.
This function is useful as it shows the list of available units when "!" is typed. And enables the selection of different setting parameters and result data by typing "..".

Setting parameter/result data with array structure

- In the following list of setting parameters and result data, an array may be used to contain multiple information within one unit. The first item (Index 0) is used as an example and the subsequent items are shown in simplified forms.
- An array which contains more than one detection is represented by a [*].

Typical notation used at the end of items

Unit parameter

- HL (Upper limit)**: The upper limit used for judgment.
- LL (Lower limit)**: The lower limit used for judgment.

Result data

- MS (Measured value)**: The measured result data from the unit.
- AB (Absolute measured value)**: The measured result data before the origin coordinates are changed, the coordinate axes are corrected, or scaling is applied.
- EC (Encoder measured value)**: The measured result data based on a coordinate system where the encoder value is reflected when a line scan camera or LJ-X/LJ-V series head is used in Continuous capture.
- JG (Judgment value)**: The result of a judged value (OK / Pass: 0, NG / Fail: 1).
- RG (Region setting value)**: The value output as the measured result before the origin coordinates are changed, the coordinate axes are corrected, or scaling or a position correction is applied.

List of setting parameters

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing
			Label	Value	Initial value						
Common	Unit type	PRM.CMN.UTYP	Area	0				X	X	X	O
			Pattern search	1							
			ShapeTrax3A	73							
			PatternTrax	50							
			Edge position	4							
			Edge width	5							
			Edge pitch	6							
			Edge angle	8							
			Edge pair	9							
			Profile position	12							
			Profile width	13							
			Profile defect	40							
			Multi-profile defect	59							
			Defect	10							
			Blob	11							
			Grayscale blob	45							
			Intensity	14							
			Color	15							
			Color Grouping	62							
			OCR	17							
			OCR2	63							
			2D code reader	44							
			1D code reader	47							
			Height measurement	48							
			Profile	54							
			Measurement Unit								
			Continuous Profile Measurement Unit	57							
			3D Geometry Unit	56							
			3D Comparison	65							
			3D blob	64							
			Start	19							
			End	20							
			Branch	22							
			Join	23							
			Loop function	24							
			Timer start	27							
			Timer end	28							
			Pause	29							
			Variable delay	30							
			Terminal I/O delay	31							
			User menu	32							
			Calculation	38							
			Group Judgment (Start)	67							
			Group Judgment (End)	68							
			Image operation	41							
			Contour Region Generator	60							
			Defect Extraction Operation	58							
			Robot Coordinate Conversion	51							
			Robot Coordinate Operation	52							

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Referencing	Result data	Unit properties
				Value	Initial value										
Common (continued)	Unit type	PRM.CMN.UTYP	Calibration	43											
			Image Stitching	46											
			On-screen graphics	18											
			Command Execution	34											
			Data output	35											
			Parallel terminal output	36											
			Image output	37											
			Position Adjustment	39											
			Capture	21											
			Loop end	25											
			Break	26											
			C Plug In	42											
	Unit ID	PRM.CMN.UID		0	999	0	4	0	X	X	X	O			
	Unit Name	PRM.CMN.UNM			Character string up to 100 bytes							X	O		
General	Unit execution	PRM.CMN.ENB	Always execute	0								O	O	O	O
			Never execute	1											
	Comment	PRM.CMN.CMNT			Character string up to 512 bytes							X	X	X	O
Inspection region	Position Adjustment ID	PRM.CMN.PUID		-	999	0	4	0	X	X	X	O			
Parameters	Scaling	PRM.CMN.SCL	OFF	0								X	X	X	O
			ON	1											
Common	Total Status Target	PRM.CMN.JGAC	Not include	0								X	X	X	O
			Include	1											
	Total Error Target	PRM.CMN.ERAC	Not include	0								X	X	X	O
			Include	1											
	Camera 1 Judgment Target	PRM.CMN.CJGAC[0]	Not include	0								X	X	X	O
			Include	1											
	Camera 2 Judgment Target	PRM.CMN.CJGAC[1]	Not include	0								X	X	X	O
			Include	1											
	Camera 3 Judgment Target	PRM.CMN.CJGAC[2]	Not include	0								X	X	X	O
			Include	1											
	Camera 4 Judgment Target	PRM.CMN.CJGAC[3]	Not include	0								X	X	X	O
			Include	1											

Image setting

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	Numerical value format		Referencing
				Value	Initial value			No. of integer digits	No. of decimal places	
Image setting: Common	Captured image	PRM.CMN.IIMG						X	X	X
	Registered image No.	PRM.CMN.RIMG		0	999	0	3	0	X	X
	Assign variable to registered image No.	PRM.CMN.UVR	Enable	1			1	0	X	X
			Disable	0					X	O
	Reference variable	PRM.CMN.RIREF						O	O	X
	Assign variable only when changing programs	PRM.CMN.UPEN	Enable	1			1	0	X	X
			Disable	0					X	O
	Output Contrast Image/ Binary Image	PRM.CMN.MIMGEN	Enable	1				X	X	X
			Disable	0					X	O
	Contrast Image/Binary Image: Use for processing	PRM.CMN.MIMG						X	X	X

Color Extraction

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Referencing	Result data	Unit properties
			Label	Value	Initial value									
Color Extraction Common	Color type	PRM.CLREXT.WAY	OFF	-1				X	X	X	X	O		
			Color to Binary	0										
			Color to Gray	2										
			Gray	3										
			RGB Gray	5										
			R Grayscale	6										
			G Grayscale	7										
			B Grayscale	8										
			Fine Color	4										
	Enable Color Extraction	PRM.CLREXT.CEXTEN	Enable	1				X	X	X	X	X		
			Disable	0										
Color Extraction: Color to Binary	Sensitivity	PRM.CLREXT.ESEN		3	10	0	2	0	X	X	X	O		
	Extraction area	PRM.CLREXT.EW		3	32	1	2	0	X	X	X	O		
	Background color	PRM.CLREXT.BCLR	Black	0					X	X	X	O		
			White	255										
	Array reference	PRM.CLREXT.AREF						O	O	X	O			
	Hue: Min	PRM.CLREXT.HTH:LL		0	255	0	3	0	O	O	X	O		
	Hue: Max	PRM.CLREXT.HTH:HL		255	255	0	3	0	O	O	X	O		
	Saturation: Min	PRM.CLREXT.STH:LL		0	255	0	3	0	O	O	X	O		
	Saturation: Max	PRM.CLREXT.STH:HL		255	255	0	3	0	O	O	X	O		
	Brightness: Min	PRM.CLREXT.VTH:LL		0	255	0	3	0	O	O	X	O		
	Brightness: Max	PRM.CLREXT.VTH:HL		255	255	0	3	0	O	O	X	O		
Color Extraction: Color to Gray	Sensitivity	PRM.CLREXT.ESEN		3	10	0	2	0	X	X	X	O		
	Extraction area	PRM.CLREXT.EW		3	32	1	2	0	X	X	X	O		
	Array reference	PRM.CLREXT.AREF						O	O	X	O			
	Hue: Min	PRM.CLREXT.HTH:LL		0	255	0	3	0	O	O	X	O		
	Hue: Max	PRM.CLREXT.HTH:HL		255	255	0	3	0	O	O	X	O		
	Hue Slope: Min	PRM.CLREXT.HCO:LL		10	100	10	3	0	O	O	X	O		
	Hue Slope: Max	PRM.CLREXT.HCO:HL		10	100	10	3	0	O	O	X	O		
	Saturation: Min	PRM.CLREXT.STH:LL		0	255	0	3	0	O	O	X	O		
	Saturation: Max	PRM.CLREXT.STH:HL		255	255	0	3	0	O	O	X	O		
	Saturation Slope: Min	PRM.CLREXT.SCO:LL		10	100	10	3	0	O	O	X	O		
	Saturation Slope: Max	PRM.CLREXT.SCO:HL		10	100	10	3	0	O	O	X	O		
	Brightness: Min	PRM.CLREXT.VTH:LL		0	255	0	3	0	O	O	X	O		
	Brightness: Max	PRM.CLREXT.VTH:HL		255	255	0	3	0	O	O	X	O		
	Brightness Slope: Min	PRM.CLREXT.VCO:LL		10	100	10	3	0	O	O	X	O		
	Brightness Slope: Max	PRM.CLREXT.VCO:HL		10	100	10	3	0	O	O	X	O		

Color Extraction Settings (Image Operation Unit/PlugIn Unit: Source Image 1)

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value	Initial value			No. of integer digits	No. of decimal places	
Source image 1: Color Extraction	Color type	PRM.CLREXT1.WAY	OFF	-1				X	X	X
			Color to Binary	0						
			Color to Gray	2						
			Gray	3						
			RGB Gray	5						
			R Grayscale	6						
			G Grayscale	7						
			B Grayscale	8						
	Enable Color Extraction	PRM.CLREXT1.CEXTEN	Enable	1				X	X	X
			Disable	0						
Source image 1: Color Extraction: Color to Binary	Sensitivity	PRM.CLREXT1.ESEN		3	10	0	2	0	X	X
	Extraction area	PRM.CLREXT1.EW		3	32	1	2	0	X	X
	Background color	PRM.CLREXT1.BCLR	Black	0				X	X	X
			White	255						
	Array reference	PRM.CLREXT1.AREF						O	O	X
	Hue: Min	PRM.CLREXT1.HTH:LL		0	255	0	3	0	O	X
	Hue: Max	Max PRM.CLREXT1.HTH:HL		255	255	0	3	0	O	X
	Saturation: Min	PRM.CLREXT1.STH:LL		0	255	0	3	0	O	X
	Saturation: Max	PRM.CLREXT1.STH:HL		255	255	0	3	0	O	X
Source image 1: Color Extraction: Color to Gray	Brightness: Min	PRM.CLREXT1.VTH:LL		0	255	0	3	0	O	X
	Brightness: Max	PRM.CLREXT1.VTH:HL		255	255	0	3	0	O	X
	Sensitivity	PRM.CLREXT1.ESEN		3	10	0	2	0	X	X
	Extraction area	PRM.CLREXT1.EW		3	32	1	2	0	X	X
	Array reference	PRM.CLREXT1.AREF						O	O	X
	Hue: Min	PRM.CLREXT1.HTH:LL		0	255	0	3	0	O	X
	Hue: Max	PRM.CLREXT1.HTH:HL		255	255	0	3	0	O	X
	Hue Slope: Min	PRM.CLREXT1.HCO:LL		10	100	10	3	0	O	X
	Hue Slope: Max	PRM.CLREXT1.HCO:HL		10	100	10	3	0	O	X
Source image 1: Color Extraction: Color to Gray	Saturation: Min	PRM.CLREXT1.STH:LL		0	255	0	3	0	O	X
	Saturation: Max	PRM.CLREXT1.STH:HL		255	255	0	3	0	O	X
	Saturation Slope: Min	PRM.CLREXT1.SCO:LL		10	100	10	3	0	O	X
	Saturation Slope: Max	PRM.CLREXT1.SCO:HL		10	100	10	3	0	O	X
	Brightness: Min	PRM.CLREXT1.VTH:LL		0	255	0	3	0	O	X
	Brightness: Max	PRM.CLREXT1.VTH:HL		255	255	0	3	0	O	X
	Brightness Slope: Min	PRM.CLREXT1.VCO:LL		10	100	10	3	0	O	X
	Brightness Slope: Max	PRM.CLREXT1.VCO:HL		10	100	10	3	0	O	X

Color Extraction Settings (Image Operation Unit/PlugIn Unit: Source Image 2)

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing	
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable
Source image 2: Color Extraction	Color type	PRM.CLREXT2.WAY	OFF	-1				X	X	X	O
			Color to Binary	0							
			Color to Gray	2							
			Gray	3							
			RGB Gray	5							
			R Grayscale	6							
			G Grayscale	7							
			B Grayscale	8							
Source image 2: Color Extraction:	Enable Color Extraction	PRM.CLREXT2.CEXTEN	Enable	1				X	X	X	X
			Disable	0							
Source image 2: Color Extraction: Color to Binary	Sensitivity	PRM.CLREXT2.ESEN		3	10	0	2	0	X	X	O
	Extraction area	PRM.CLREXT2.EW		3	32	1	2	0	X	X	O
	Background color	PRM.CLREXT2.BCLR	Black	0				X	X	X	O
			White	255							
	Array reference	PRM.CLREXT2.AREF						O	O	X	O
	Hue: Min	PRM.CLREXT2.HTH:LL		0	255	0	3	0	O	O	X
	Hue: Max	PRM.CLREXT2.HTH:HL		255	255	0	3	0	O	O	X
	Saturation: Min	PRM.CLREXT2.STH:LL		0	255	0	3	0	O	O	X
Source image 2: Color Extraction: Color to Gray	Saturation: Max	PRM.CLREXT2.STH:HL		255	255	0	3	0	O	O	X
	Brightness: Min	PRM.CLREXT2.VTH:LL		0	255	0	3	0	O	O	X
	Brightness: Max	PRM.CLREXT2.VTH:HL		255	255	0	3	0	O	O	X
	Sensitivity	PRM.CLREXT2.ESEN		3	10	0	2	0	X	X	O
	Extraction area	PRM.CLREXT2.EW		3	32	1	2	0	X	X	O
	Array reference	PRM.CLREXT2.AREF						O	O	X	O
	Hue: Min	PRM.CLREXT2.HTH:LL		0	255	0	3	0	O	O	X
	Hue: Max	PRM.CLREXT2.HTH:HL		255	255	0	3	0	O	O	X
Source image 2: Color Extraction: Color to Gray	Hue Slope: Min	PRM.CLREXT2.HCO:LL		10	100	10	3	0	O	O	X
	Hue Slope: Max	PRM.CLREXT2.HCO:HL		10	100	10	3	0	O	O	X
	Saturation: Min	PRM.CLREXT2.STH:LL		0	255	0	3	0	O	O	X
	Saturation: Max	PRM.CLREXT2.STH:HL		255	255	0	3	0	O	O	X
	Saturation Slope: Min	PRM.CLREXT2.SCO:LL		10	100	10	3	0	O	O	X
	Saturation Slope: Max	PRM.CLREXT2.SCO:HL		10	100	10	3	0	O	O	X
	Brightness: Min	PRM.CLREXT2.VTH:LL		0	255	0	3	0	O	O	X
	Brightness: Max	PRM.CLREXT2.VTH:HL		255	255	0	3	0	O	O	X
Source image 2: Color Extraction: Color to Gray	Brightness Slope: Min	PRM.CLREXT2.VCO:LL		10	100	10	3	0	O	O	X
	Brightness Slope: Max	PRM.CLREXT2.VCO:HL		10	100	10	3	0	O	O	X

Color Extraction Settings (MultiSpectrum Mode)

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Referencing	Result data	Unit properties
				Value	Initial value										
Color Extraction (MultiSpectrum): Common	No. of colors	PRM.MCLREXT.FG_N		0	32		0		2	0	x	x	x	x	O
	No. of colors	PRM.MCLREXT.BG_N		0	32		0		2	0	x	x	x	x	O
	Color type	PRM.MCLREXT.WAY	OFF	-1								x	x	x	O
			Color to Binary	0											
			Color to Gray	1											
			Fine Color	2											
			RGB Gray	3											
			Refer to Other Unit	4											
	Reference Unit ID	PRM.MCLREXT.MCRUID		-1	999		-1		3	0	x	x	x	x	O
	(Averaging) Size	PRM.MCLREXT.FKSZ		3; VGA 7: 2M/5M	63		3		3	0	x	x	x	x	O
Color Extraction (MultiSpectrum): Extraction color	(Averaging) Enable/ Disable	PRM.MCLREXT.SMENB		1	1		0		1	0	x	x	x	x	O
	(Averaging) No. of times	PRM.MCLREXT.PTMS		1	9		1		1	0	x	x	x	x	O
	Brightness range, whole	PRM.MCLREXT.CMN_BR		0	50		0		2	1	x	x	x	x	O
	Color range, whole	PRM.MCLREXT.CMN_CH		1	999.999		0.001		3	3	x	x	x	x	O
	(Extracted Colors 0) Enable/Disable	PRM.MCLREXT.CFG.CI [0].EN		1	1		0		1	0	x	x	x	x	O
	(Extracted Colors 0) Color range	PRM.MCLREXT.CFG.CI [0].CHROM		1	999.999		0.001		3	3	x	x	x	x	O
	(Extracted Colors 0) Brightness range	PRM.MCLREXT.CFG.CI [0].BRIGHT		0	50		0		2	1	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (UV)	PRM.MCLREXT.CFG.CI [0].AVCUV		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (B)	PRM.MCLREXT.CFG.CI [0].AVCB		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (G)	PRM.MCLREXT.CFG.CI [0].AVCG		-	999.999		0		3	3	x	x	x	x	O
Color Extraction (MultiSpectrum): Extraction color	(Extracted Colors 0) Mean value of each color (AM)	PRM.MCLREXT.CFG.CI [0].AVCAM		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (R)	PRM.MCLREXT.CFG.CI [0].AVCR		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (FR)	PRM.MCLREXT.CFG.CI [0].AVCFR		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (IR)	PRM.MCLREXT.CFG.CI [0].AVCIR		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (W)	PRM.MCLREXT.CFG.CI [0].AVCW		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Color information	PRM.MCLREXT.CFG.CI [0].CDIST[s]		-	-99999.999		99999.999		5	3	x	x	x	x	O
	(Extracted Colors 1) [1]***	PRM.MCLREXT.CFG.CI [1]***													
	:	:													
	(Extracted Colors 31) [31]***	PRM.MCLREXT.CFG.CI [31]***													

Category	Setting item	Name	Label	Selection			Numerical value format	System variable	Referencing	Result data	Unit properties
				Value	Initial value	Upper limit					
Color Extraction (MultiSpectrum): Exclusion color	(Excluded Colors 0) Enable/Disable	PRM.MCLREXT.CBG.CI [0].EN		1	1	0	1 0 x	x x	x x	O	
	(Excluded Colors 0) Color range	PRM.MCLREXT.CBG.CI [0].CHROM		1	999.999	0.001	3 3 x	x x	x x	O	
	(Excluded Colors 0) Brightness range	PRM.MCLREXT.CBG.CI [0].BRIGHT		0	50	0	2 1 x	x x	x x	O	
	(Excluded Colors 0) Mean value of each color (UV)	PRM.MCLREXT.CBG.CI [0].AVCUV		-	999.999	0	3 3 x	x x	x x	O	
	(Excluded Colors 0) Mean value of each color (B)	PRM.MCLREXT.CBG.CI [0].AVCB		-	999.999	0	3 3 x	x x	x x	O	
	(Excluded Colors 0) Mean value of each color (G)	PRM.MCLREXT.CBG.CI [0].AVCG		-	999.999	0	3 3 x	x x	x x	O	
	(Excluded Colors 0) Mean value of each color (AM)	PRM.MCLREXT.CBG.CI [0].AVCAM		-	999.999	0	3 3 x	x x	x x	O	
	(Excluded Colors 0) Mean value of each color (R)	PRM.MCLREXT.CBG.CI [0].AVCR		-	999.999	0	3 3 x	x x	x x	O	
	(Excluded Colors 0) Mean value of each color (FR)	PRM.MCLREXT.CBG.CI [0].AVCFR		-	999.999	0	3 3 x	x x	x x	O	
	(Excluded Colors 0) Mean value of each color (IR)	PRM.MCLREXT.CBG.CI [0].AVCIR		-	999.999	0	3 3 x	x x	x x	O	
	(Excluded Colors 0) Mean value of each color (W)	PRM.MCLREXT.CBG.CI [0].AVCW		-	999.999	0	3 3 x	x x	x x	O	
	(Excluded Colors 0) Color information	PRM.MCLREXT.CBG.CI [0].CDIST[s]		-	-99999.999	99999.999	5 3 x	x x	x x	O	
	(Excluded Colors 1) [1].***	PRM.MCLREXT.CBG.CI [1].***									
:	:										
(Excluded Colors 31)		PRM.MCLREXT.CBG.CI [31].***									

Color Extraction Settings (MultiSpectrum Mode: Image Operation Unit/Plugin Unit: Source Image 1)

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	Numerical value format			Referencing
				Value	Initial value				No. of integer digits	No. of decimal places	User variable	
Color Extraction (MultiSpectrum): Common	No. of colors	PRM.MCLREXT1.FG_N		0	32	0	2	0	x	x	x	○
	No. of colors	PRM.MCLREXT1.BG_N		0	32	0	2	0	x	x	x	○
	Color type	PRM.MCLREXT1.WAY	OFF	-1						x	x	x
			Color to Binary	0								
			Color to Gray	1								
			Fine Color	2								
			RGB Gray	3								
			Refer to Other Unit	4								
	Reference Unit ID	PRM.MCLREXT1.MCRUID		-1	999	-1	3	0	x	x	x	○
	(Averaging) Size	PRM.MCLREXT1.FKSZ	3: VGA 7: 2M/5M	63	3	3	3	0	x	x	x	○
	(Averaging) Enable/ Disable	PRM.MCLREXT1.SMENB		1	1	0	1	0	x	x	x	○
	(Averaging) No. of times	PRM.MCLREXT1.PTMS		1	9	1	1	0	x	x	x	○
	Brightness range, whole	PRM.MCLREXT1.CMN_BR		0	50	0	2	1	x	x	x	○
	Color range, whole	PRM.MCLREXT1.CMN_CH		1	999.999	0.001	3	3	x	x	x	○
Color Extraction (MultiSpectrum): Extraction color	(Extracted Colors 0) Enable/Disable	PRM.MCLREXT1.CFG.CI [0].EN		1	1	0	1	0	x	x	x	○
	(Extracted Colors 0) Color range	PRM.MCLREXT1.CFG.CI [0].CHROM		1	999.999	0.001	3	3	x	x	x	○
	(Extracted Colors 0) Brightness range	PRM.MCLREXT1.CFG.CI [0].BRIGHT		0	50	0	2	1	x	x	x	○
	(Extracted Colors 0) Mean value of each color (UV)	PRM.MCLREXT1.CFG.CI [0].AVCUV		-	999.999	0	3	3	x	x	x	○
	(Extracted Colors 0) Mean value of each color (B)	PRM.MCLREXT1.CFG.CI [0].AVCB		-	999.999	0	3	3	x	x	x	○
	(Extracted Colors 0) Mean value of each color (G)	PRM.MCLREXT1.CFG.CI [0].AVCG		-	999.999	0	3	3	x	x	x	○
	(Extracted Colors 0) Mean value of each color (AM)	PRM.MCLREXT1.CFG.CI [0].AVCAM		-	999.999	0	3	3	x	x	x	○
	(Extracted Colors 0) Mean value of each color (R)	PRM.MCLREXT1.CFG.CI [0].AVCR		-	999.999	0	3	3	x	x	x	○
	(Extracted Colors 0) Mean value of each color (FR)	PRM.MCLREXT1.CFG.CI [0].AVCFR		-	999.999	0	3	3	x	x	x	○
	(Extracted Colors 0) Mean value of each color (IR)	PRM.MCLREXT1.CFG.CI [0].AVCIR		-	999.999	0	3	3	x	x	x	○
	(Extracted Colors 0) Mean value of each color (W)	PRM.MCLREXT1.CFG.CI [0].AVCW		-	999.999	0	3	3	x	x	x	○
	(Extracted Colors 0) Color information	PRM.MCLREXT1.CFG.CI [0].CDIST[s]		-	-99999.999	99999.999	5	3	x	x	x	○
	(Extracted Colors 1)	PRM.MCLREXT1.CFG.CI[1]***		:	:							
	(Extracted Colors 31)	PRM.MCLREXT1.CFG.CI[31]***										

Category	Setting item	Name	Label	Selection			Numerical value format	Referencing
				Value	Initial value	Upper limit		
Color Extraction (MultiSpectrum): Exclusion color	(Excluded Colors 0) Enable/Disable	PRM.MCLREXT1.CBG.CI [0].EN		1	1	0	1 0 × × × ×	○
	(Excluded Colors 0) Color range	PRM.MCLREXT1.CBG.CI [0].CHROM		1	999.999	0.001	3 3 × × ×	○
	(Excluded Colors 0) Brightness range	PRM.MCLREXT1.CBG.CI [0].BRIGHT		0	50	0	2 1 × × ×	○
	(Excluded Colors 0) Mean value of each color (UV)	PRM.MCLREXT1.CBG.CI [0].AVCUV		-	999.999	0	3 3 × × ×	○
	(Excluded Colors 0) Mean value of each color (B)	PRM.MCLREXT1.CBG.CI [0].AVCB		-	999.999	0	3 3 × × ×	○
	(Excluded Colors 0) Mean value of each color (G)	PRM.MCLREXT1.CBG.CI [0].AVCG		-	999.999	0	3 3 × × ×	○
	(Excluded Colors 0) Mean value of each color (AM)	PRM.MCLREXT1.CBG.CI [0].AVCAM		-	999.999	0	3 3 × × ×	○
	(Excluded Colors 0) Mean value of each color (R)	PRM.MCLREXT1.CBG.CI [0].AVCR		-	999.999	0	3 3 × × ×	○
	(Excluded Colors 0) Mean value of each color (FR)	PRM.MCLREXT1.CBG.CI [0].AVCFR		-	999.999	0	3 3 × × ×	○
	(Excluded Colors 0) Mean value of each color (IR)	PRM.MCLREXT1.CBG.CI [0].AVCIR		-	999.999	0	3 3 × × ×	○
	(Excluded Colors 0) Mean value of each color (W)	PRM.MCLREXT1.CBG.CI [0].AVCW		-	999.999	0	3 3 × × ×	○
	(Excluded Colors 0) Color information	PRM.MCLREXT1.CBG.CI [0].CDIST[s]		-	-99999.999	99999.999	5 3 × × ×	○
	(Excluded Colors 1) [1].***	PRM.MCLREXT1.CBG.CI [1].***						
	:	:						
Excluded Colors 31)	(Excluded Colors 31)	PRM.MCLREXT1.CBG.CI [31].***						

Color Extraction Settings (MultiSpectrum Mode: Image Operation Unit/Plugin Unit: Source Image 2)

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Referencing	Result data	Unit properties
				Value	Initial value										
Color Extraction (MultiSpectrum): Common	No. of colors	PRM.MCLREXT2.FG_N		0	32		0		2	0	x	x	x	x	O
	No. of colors	PRM.MCLREXT2.BG_N		0	32		0		2	0	x	x	x	x	O
	Color type	PRM.MCLREXT2.WAY	OFF	-1								x	x	x	O
			Color to Binary	0											
			Color to Gray	1											
			Fine Color	2											
			RGB Gray	3											
			Refer to Other Unit	4											
	Reference Unit ID	PRM.MCLREXT2.MCRUID		-1	999		-1		3	0	x	x	x	x	O
	(Averaging) Size	PRM.MCLREXT2.FKSZ		3: VGA 7: 2M/5M	63		3		3	0	x	x	x	x	O
	(Averaging) Enable/Disable	PRM.MCLREXT2.SMENB		1	1		0		1	0	x	x	x	x	O
	(Averaging) No. of times	PRM.MCLREXT2.PTMS		1	9		1		1	0	x	x	x	x	O
	Brightness range, whole	PRM.MCLREXT2.CMN_BR		0	50		0		2	1	x	x	x	x	O
	Color range, whole	PRM.MCLREXT2.CMN_CH		1	999.999		0.001		3	3	x	x	x	x	O
Color Extraction (MultiSpectrum): Extraction color	(Extracted Colors 0) Enable/Disable	PRM.MCLREXT2.CFG.CI[0].EN		1	1		0		1	0	x	x	x	x	O
	(Extracted Colors 0) Color range	PRM.MCLREXT2.CFG.CI[0].CHROM		1	999.999		0.001		3	3	x	x	x	x	O
	(Extracted Colors 0) Brightness range	PRM.MCLREXT2.CFG.CI[0].BRIGHT		0	50		0		2	1	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (UV)	PRM.MCLREXT2.CFG.CI[0].AVCUV		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (B)	PRM.MCLREXT2.CFG.CI[0].AVCB		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (G)	PRM.MCLREXT2.CFG.CI[0].AVCG		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (AM)	PRM.MCLREXT2.CFG.CI[0].AVCAM		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (R)	PRM.MCLREXT2.CFG.CI[0].AVCR		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (FR)	PRM.MCLREXT2.CFG.CI[0].AVCFR		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (IR)	PRM.MCLREXT2.CFG.CI[0].AVCIR		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Mean value of each color (W)	PRM.MCLREXT2.CFG.CI[0].AVCW		-	999.999		0		3	3	x	x	x	x	O
	(Extracted Colors 0) Color information	PRM.MCLREXT2.CFG.CI[0].CDIST[s]		-	-99999.999		99999.999		5	3	x	x	x	x	O
	(Extracted Colors 1)	PRM.MCLREXT2.CFG.CI[1].***		:	:										
	(Extracted Colors 31)	PRM.MCLREXT2.CFG.CI[31].***		:	:										

Category	Setting item	Name	Label	Selection			Numerical value format	Referencing	Result data	Unit properties
				Value	Initial value	Upper limit				
Color Extraction (MultiSpectrum): Exclusion color	(Excluded Colors 0) Enable/Disable	PRM.MCLREXT2.CBG.CI [0].EN		1	1	0	1 0 x x x x	x	x	○
	(Excluded Colors 0) Color range	PRM.MCLREXT2.CBG.CI [0].CHROM		1	999.999	0.001	3 3 x x x x	x	x	○
	(Excluded Colors 0) Brightness range	PRM.MCLREXT2.CBG.CI [0].BRIGHT		0	50	0	2 1 x x x x	x	x	○
	(Excluded Colors 0) Mean value of each color (UV)	PRM.MCLREXT2.CBG.CI [0].AVCUV		-	999.999	0	3 3 x x x x	x	x	○
	(Excluded Colors 0) Mean value of each color (B)	PRM.MCLREXT2.CBG.CI [0].AVCB		-	999.999	0	3 3 x x x x	x	x	○
	(Excluded Colors 0) Mean value of each color (G)	PRM.MCLREXT2.CBG.CI [0].AVCG		-	999.999	0	3 3 x x x x	x	x	○
	(Excluded Colors 0) Mean value of each color (AM)	PRM.MCLREXT2.CBG.CI [0].AVCAM		-	999.999	0	3 3 x x x x	x	x	○
	(Excluded Colors 0) Mean value of each color (R)	PRM.MCLREXT2.CBG.CI [0].AVCR		-	999.999	0	3 3 x x x x	x	x	○
	(Excluded Colors 0) Mean value of each color (FR)	PRM.MCLREXT2.CBG.CI [0].AVCFR		-	999.999	0	3 3 x x x x	x	x	○
	(Excluded Colors 0) Mean value of each color (IR)	PRM.MCLREXT2.CBG.CI [0].AVCIR		-	999.999	0	3 3 x x x x	x	x	○
	(Excluded Colors 0) Mean value of each color (W)	PRM.MCLREXT2.CBG.CI [0].AVCW		-	999.999	0	3 3 x x x x	x	x	○
	(Excluded Colors 0) Color information	PRM.MCLREXT2.CBG.CI [0].CDIST[s]		-	-99999.999	99999.999	5 3 x x x x	x	x	○
	(Excluded Colors 1)	PRM.MCLREXT2.CBG.CI [1].***		:	:					
	(Excluded Colors 31)	PRM.MCLREXT2.CBG.CI [31].***								

Inspection region

* "Full Image" for the image operation unit

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing		
				Value	Initial value	User variable					System variable	Result data	Unit properties
Inspection region	Enable region	PRM.RGN.RGNEN	Enable	1							X	X	O
			Disable	0									
	Shape	PRM.RGN.SHP	None *	0							X	X	O
			Rectangle	1									
			Rotated rectangle (* Edge angle unit only)	2									
			Rotated rectangle (* Units other than the edge angle unit)	3									
			Circle	4									
			Oval	5									
			Ring	6									
			Arc	7									
			Polygon	8									
			Composition region	15									
Inspection region: Rectangle	Upper left XY	PRM.RGN.LUXY							5	0	O	X	O
	Upper left X	PRM.RGN.LUX		16383	0		5	0	O	O	O	O	O
	Upper left Y	PRM.RGN.LUY		16383	0		5	0	O	O	O	O	O
	Lower right XY	PRM.RGN.RDXY							5	0	O	X	O
	Lower right X	PRM.RGN.RDX		16383	0		5	0	O	O	O	O	O
	Lower right Y	PRM.RGN.RDY		16383	0		5	0	O	O	O	O	O
Inspection region: Rotated rectangle: (Edge angle unit only)	Width	PRM.RGN.WI		16383	1		5	0	O	O	O	O	O
	Height	PRM.RGN.HI		16383	1		5	0	O	O	O	O	O
	Segment height	PRM.RGN.SH		16383	1		5	0	O	O	O	O	O
	Center XY	PRM.RGN.RCXY					5	0	O	X	O	O	O
	Center X	PRM.RGN.RCX		16382	0		5	0	O	O	O	O	O
	Center Y	PRM.RGN.RCY		16382	0		5	0	O	O	O	O	O
	Rotation angle	PRM.RGN.T		359.9	0.0		3	1	O	O	O	O	O
Inspection region: Rotated rectangle: (Units other than the edge angle unit)	Width	PRM.RGN.WI		16383	1		5	0	O	O	O	O	O
	Height	PRM.RGN.HI		16383	1		5	0	O	O	O	O	O
	Center XY	PRM.RGN.RCXY					5	0	O	X	O	O	O
	Center X	PRM.RGN.RCX		16382	0		5	0	O	O	O	O	O
	Center Y	PRM.RGN.RCY		16382	0		5	0	O	O	O	O	O
	Rotation angle	PRM.RGN.T		359.9	0.0		3	1	O	O	O	O	O
Inspection region: Circle	Center XY	PRM.RGN.CXY					5	0	O	X	O	O	O
	Center X	PRM.RGN.CX		16383	-16383		5	0	O	O	O	O	O
	Center Y	PRM.RGN.CY		16383	-16383		5	0	O	O	O	O	O
	Radius	PRM.RGN.CR		9600	0		4	0	O	O	O	O	O
Inspection region: Oval	Center XY	PRM.RGN.CXY					5	0	O	X	O	O	O
	Center X	PRM.RGN.CX		16383	-16383		5	0	O	O	O	O	O
	Center Y	PRM.RGN.CY		16383	-16383		5	0	O	O	O	O	O
	Radius 1	PRM.RGN.CR1		2580	8		4	0	O	O	O	O	O
	Radius 2	PRM.RGN.CR2		2580	8		4	0	O	O	O	O	O
	Rotation angle	PRM.RGN.T		359.9	0.0		3	1	O	O	O	O	O

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	Numerical value format			Referencing
				Value	Initial value			No. of integer digits	No. of decimal places	User variable	
Inspection region: Ring	Center XY	PRM.RGN.CXY						5	0	○	X ○ ○
	Center X	PRM.RGN.CX			16383	-16383		5	0	○	○ ○
	Center Y	PRM.RGN.CY			16383	-16383		5	0	○	○ ○
	Radius 1	PRM.RGN.CR1			9600	0		4	0	○	○ ○ ○ ○
	Radius 2	PRM.RGN.CR2			9600	0		4	0	○	○ ○ ○ ○
Inspection region: Arc	Center XY	PRM.RGN.CXY						5	0	○	X ○ ○
	Center X	PRM.RGN.CX			16383	-16383		5	0	○	○ ○
	Center Y	PRM.RGN.CY			16383	-16383		5	0	○	○ ○
	Radius 1	PRM.RGN.CR1			9600	0		4	0	○	○ ○ ○ ○
	Radius 2	PRM.RGN.CR2			9600	0		4	0	○	○ ○ ○ ○
	Start angle	PRM.RGN.STA			359.9	0.0		3	1	○	○ ○ ○ ○
	End angle	PRM.RGN.ENA			359.9	0.0		3	1	○	○ ○ ○ ○
Inspection region: Polygon	No. of vertices	PRM.RGN.PN			12	0		2	0	X	X X ○
	Max. No. of vertices	PRM.RGN.MXPN			12	12	12	2	0	X	X X X X
	Point * XY	PRM.RGN.PXY[*]						5	0	○	X ○ ○
	Point * X	PRM.RGN.PX[*]			16383	0		5	0	○	○ ○ ○ ○
	Point * Y	PRM.RGN.PY[*]			16383	0		5	0	○	○ ○ ○ ○
Composition region 0	Enable region	PRM.RGN.CMP[0].RGNEN	Enable	1						X	X X ○
			Disable	0							
	Shape	PRM.RGN.CMP[0].SHP	OFF	0						X	X X ○
			Rectangle	1							
			Rotated rectangle	3							
			Circle	4							
			Oval	5							
			Ring	6							
			Arc	7							
			Polygon	8							
	Enable mask	PRM.RGN.CMP[0].MSKEN	Enable	1						X	X X ○
			Disable	0							
Composition region 0: Rectangle	Upper left XY	PRM.RGN.CMP[0].LUXY						5	0	○	X ○ ○
	Upper left X	PRM.RGN.CMP[0].LUX			16383	0		5	0	○	○ ○ ○ ○
	Upper left Y	PRM.RGN.CMP[0].LUY			16383	0		5	0	○	○ ○ ○ ○
	Lower right XY	PRM.RGN.CMP[0].RDXY						5	0	○	X ○ ○
	Lower right X	PRM.RGN.CMP[0].RDX			16383	0		5	0	○	○ ○ ○ ○
	Lower right Y	PRM.RGN.CMP[0].RDY			16383	0		5	0	○	○ ○ ○ ○
Composition region 0: Rotated rectangle	Width	PRM.RGN.CMP[0].WI			16383	1		5	0	○	○ ○ ○ ○
	Height	PRM.RGN.CMP[0].HI			16383	1		5	0	○	○ ○ ○ ○
	Center XY	PRM.RGN.CMP[0].RCXY						5	0	○	X ○ ○
	Center X	PRM.RGN.CMP[0].RCX			16382	0		5	0	○	○ ○ ○ ○
	Center Y	PRM.RGN.CMP[0].RCY			16382	0		5	0	○	○ ○ ○ ○
	Rotation angle	PRM.RGN.CMP[0].T			359.9	0.0		3	1	○	○ ○ ○ ○
Composition region 0: Circle	Center XY	PRM.RGN.CMP[0].CXY						5	0	○	X ○ ○
	Center X	PRM.RGN.CMP[0].CX			16383	-16383		5	0	○	○ ○ ○ ○
	Center Y	PRM.RGN.CMP[0].CY			16383	-16383		5	0	○	○ ○ ○ ○
	Radius	PRM.RGN.CMP[0].CR			9600	0		4	0	○	○ ○ ○ ○

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Referencing	Result data	Unit properties	
				Value	Initial value										
Composition region 0: Oval	Center XY	PRM.RGN.CMP[0].CXY						5	0	O	X	O	O		
	Center X	PRM.RGN.CMP[0].CX		16383	-16383	5	0	O	O	O	O	O			
	Center Y	PRM.RGN.CMP[0].CY		16383	-16383	5	0	O	O	O	O	O			
	Radius 1	PRM.RGN.CMP[0].CR1		2580	8	4	0	O	O	O	O	O			
	Radius 2	PRM.RGN.CMP[0].CR2		2580	8	4	0	O	O	O	O	O			
	Rotation angle	PRM.RGN.CMP[0].T		359.9	0.0	3	1	O	O	O	O	O			
Composition region 0: Ring	Center XY	PRM.RGN.CMP[0].CXY						5	0	O	X	O	O		
	Center X	PRM.RGN.CMP[0].CX		16383	-16383	5	0	O	O	O	O	O			
	Center Y	PRM.RGN.CMP[0].CY		16383	-16383	5	0	O	O	O	O	O			
	Radius 1	PRM.RGN.CMP[0].CR1		9600	0	4	0	O	O	O	O	O			
	Radius 2	PRM.RGN.CMP[0].CR2		9600	0	4	0	O	O	O	O	O			
	Start angle	PRM.RGN.CMP[0].STA		359.9	0.0	3	1	O	O	O	O	O			
Composition region 0: Arc	Center XY	PRM.RGN.CMP[0].CXY						5	0	O	X	O	O		
	Center X	PRM.RGN.CMP[0].CX		16383	-16383	5	0	O	O	O	O	O			
	Center Y	PRM.RGN.CMP[0].CY		16383	-16383	5	0	O	O	O	O	O			
	Radius 1	PRM.RGN.CMP[0].CR1		9600	0	4	0	O	O	O	O	O			
	Radius 2	PRM.RGN.CMP[0].CR2		9600	0	4	0	O	O	O	O	O			
	Start angle	PRM.RGN.CMP[0].STA		359.9	0.0	3	1	O	O	O	O	O			
Composition region 0: Polygon	End angle	PRM.RGN.CMP[0].ENA		359.9	0.0	3	1	O	O	O	O	O			
	No. of vertices	PRM.RGN.CMP[0].PN		12	0	2	0	X	X	X	X	O			
	Max. No. of vertices	PRM.RGN.CMP[0].MXPN		12	12	12	2	0	X	X	X	X			
	Point * XY	PRM.RGN.CMP[0].PXY[*]						5	0	O	X	O	O		
	Point * X	PRM.RGN.CMP[0].PX[*]		16383	0	5	0	O	O	O	O	O			
	Point * Y	PRM.RGN.CMP[0].PY[*]		16383	0	5	0	O	O	O	O	O			
Composition region 1		PRM.RGN.CMP[1].***										O			
:		:										O			
Composition region 31		PRM.RGN.CMP[31].***										O			
Mask region 0	Enable mask	PRM.RGN.MSK[0].RGNEN	Enable	1								X	X	X	O
			Disable	0											
	Shape	PRM.RGN.MSK[0].SHP	OFF	0								X	X	X	O
			Rectangle	1											
			Rotated rectangle	3											
			Circle	4											
			Oval	5											
			Ring	6											
			Arc	7											
			Polygon	8											
Mask region 0: Rectangle	Upper left XY	PRM.RGN.MSK[0].LUXY						5	0	O	X	O	O		
	Upper left X	PRM.RGN.MSK[0].LUX		16383	0	5	0	O	O	O	O	O			
	Upper left Y	PRM.RGN.MSK[0].LUY		16383	0	5	0	O	O	O	O	O			
	Lower right XY	PRM.RGN.MSK[0].RDXY						5	0	O	X	O	O		
	Lower right X	PRM.RGN.MSK[0].RDX		16383	0	5	0	O	O	O	O	O			
	Lower right Y	PRM.RGN.MSK[0].RDY		16383	0	5	0	O	O	O	O	O			
Mask region 0: Rotated rectangle	Width	PRM.RGN.MSK[0].WI		16383	1	5	0	O	O	O	O	O			
	Height	PRM.RGN.MSK[0].HI		16383	1	5	0	O	O	O	O	O			
	Center XY	PRM.RGN.MSK[0].RCXY						5	0	O	X	O	O		
	Center X	PRM.RGN.MSK[0].RCX		16382	0	5	0	O	O	O	O	O			
	Center Y	PRM.RGN.MSK[0].RCY		16382	0	5	0	O	O	O	O	O			
	Rotation angle	PRM.RGN.MSK[0].T		359.9	0.0	3	1	O	O	O	O	O			

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	Numerical value format			Referencing
				Value	Initial value			No. of integer digits	No. of decimal places	User variable	
Mask region 0: Circle	Center XY	PRM.RGN.MSK[0].CXY						5	0	X	O O
	Center X	PRM.RGN.MSK[0].CX		16383	-16383			5	0	O	O O
	Center Y	PRM.RGN.MSK[0].CY		16383	-16383			5	0	O	O O
	Radius	PRM.RGN.MSK[0].CR		9600	0			4	0	O	O O
Mask region 0: Oval	Center XY	PRM.RGN.MSK[0].CXY						5	0	X	O O
	Center X	PRM.RGN.MSK[0].CX		16383	-16383			5	0	O	O O
	Center Y	PRM.RGN.MSK[0].CY		16383	-16383			5	0	O	O O
	Radius 1	PRM.RGN.MSK[0].CR1		2580	8			4	0	O	O O
	Radius 2	PRM.RGN.MSK[0].CR2		2580	8			4	0	O	O O
	Rotation angle	PRM.RGN.MSK[0].T		359.9	0.0			3	1	O	O O
Mask region 0: Ring	Center XY	PRM.RGN.MSK[0].CXY						5	0	X	O O
	Center X	PRM.RGN.MSK[0].CX		16383	-16383			5	0	O	O O
	Center Y	PRM.RGN.MSK[0].CY		16383	-16383			5	0	O	O O
	Radius 1	PRM.RGN.MSK[0].CR1		9600	0			4	0	O	O O
	Radius 2	PRM.RGN.MSK[0].CR2		9600	0			4	0	O	O O
Mask region 0: Arc	Center XY	PRM.RGN.MSK[0].CXY						5	0	X	O O
	Center X	PRM.RGN.MSK[0].CX		16383	-16383			5	0	O	O O
	Center Y	PRM.RGN.MSK[0].CY		16383	-16383			5	0	O	O O
	Radius 1	PRM.RGN.MSK[0].CR1		9600	0			4	0	O	O O
	Radius 2	PRM.RGN.MSK[0].CR2		9600	0			4	0	O	O O
	Start angle	PRM.RGN.MSK[0].STA		359.9	0.0			3	1	O	O O
	End angle	PRM.RGN.MSK[0].ENA		359.9	0.0			3	1	O	O O
Mask region 0: Polygon	No. of vertices	PRM.RGN.MSK[0].PN		12	0			2	0	X	X X O
	Max. No. of vertices	PRM.RGN.MSK[0].MXPN			12	12		2	0	X	X X X X
	Point * XY	PRM.RGN.MSK[0].PXY[*]						5	0	O	X O O
	Point * X	PRM.RGN.MSK[0].PX[*]		16383	0			5	0	O	O O O
	Point * Y	PRM.RGN.MSK[0].PY[*]		16383	0			5	0	O	O O O
Mask region 1		PRM.RGN.MSK[1].***									
Mask region 2		PRM.RGN.MSK[2].***									
Mask region 3		PRM.RGN.MSK[3].***									
Processed image region	Processed image region	PRM.RGN.IMG.IRGNEN		ON	1					X X X O	
				OFF	0						
	Area	PRM.RGN.IMG.DC		Black	0					O O O O	
				White	255						

Inspection Region (for Multi-Profile Defect/Contour Region Generator)

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Model Line Region: Common	(Auto Extract Settings) Search Step Width	PRM.RGN.FLEX.E.AESTW	Narrow	1				x	x	x
			Standard	2						
			Wide	3						
	(Auto Extract Settings) Edge Search Direction	PRM.RGN.FLEX.E.AEPRD	Darker→Brighter	2				x	x	x
			Brighter→Darker	1						
	(Default Settings) Region Width	PRM.RGN.FLEXD.RGWD		20	200	5	3	0	x	x
	(Default Settings) Detection Direction	PRM.RGN.FLEXD.RGPRD	→	16				x	x	x
			←	17						
	(Default Settings) Edge Direction	PRM.RGN.FLEXD.RGEGD	Both	3				x	x	x
			Brighter→Darker	1						
			Darker→Brighter	2						
Model Line Region: Individual	Region Count	PRM.RGN.FLEX.MXFN		0	128	0	3	0	x	x
	Region array No.	PRM.RGN.FLEX.ARID[s]		0	999	0	3	0	x	x
	Inspection Region 0: Region enabled	PRM.RGN.FLEX[0].RGNEN	Enable	1				x	x	x
			Disable	0						
	Inspection Region 0: Shape	PRM.RGN.FLEX[0].SHP	Auto Extract	0			1	0	x	x
			Line	1						
			Arc	2						
			Ring	3						
	Inspection Region 0: Region No.	PRM.RGN.FLEX[0].RGNO		0	999	0	3	0	x	x
	Inspection Region 0: Region Width	PRM.RGN.FLEX[0].RGWD		20	200	5	3	0	x	x
	Inspection Region 0: Detection Direction	PRM.RGN.FLEX[0].RGPRD	→	16				x	x	x
			←	17						
Model Line	Inspection Region 0: Edge Direction	PRM.RGN.FLEX[0].RGEGD	Both	3				x	x	x
			Brighter→Darker	1						
			Darker→Brighter	2						
	Inspection Region 0: Model Line	PRM.RGN.FLEX[0].RGBML	Circle	1				x	x	x
			Line	2						
			Oval	3						
			Free Curve	4						
	Inspection Region 0: Smoothing Range (%)	PRM.RGN.FLEX[0].SMR		20.000	200.000	0.000	3	3	x	x
	Inspection Region 0: Specified Edge	PRM.RGN.FLEX[0].RID		0	3599	-3600	4	0	x	x
	Inspection Region 0: Defect Detection Enabled	PRM.RGN.FLEX[0].DFEN		1	1	0	1	0	x	x
	Inspection Region 0: Detection Condition Setting	PRM.RGN.FLEX[0].DTNO		0	4	0	1	0	x	x
:	Inspection Region 0: No. of control points	PRM.RGN.FLEX[0].CPN		0	16384	0	5	0	x	x
	Inspection Region 0: Control point XY	PRM.RGN.FLEX[0].CONT.P.CPXY[s]					5	0	x	x
	Inspection Region 0: Control point X	PRM.RGN.FLEX[0].CONT.P.CPX[s]		331	16383	0	5	0	x	x
	Inspection Region 0: Control point Y	PRM.RGN.FLEX[0].CONT.P.CPY[s]		337	16383	0	5	0	x	x
	Inspection Region 1	PRM.RGN.FLEX[1]***								
	Inspection Region 127	PRM.RGN.FLEX[127]***								

Pattern region

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value	Initial value			No. of integer digits	No. of decimal places	
Pattern region	Enable region	PRM.PTRN.RGNEN	Enable	1				X	X	X O
			Disable	0						
Shape	Shape	PRM.PTRN.SHP	OFF	0						X X X O
			Rectangle	1						
			Rotated rectangle	3						
			Circle	4						
			Oval	5						
			Ring	6						
			Arc	7						
			Polygon	8						
Pattern region: Rectangle	Upper left XY	PRM.PTRN.LUXY						5	0	X O O O O
	Upper left X	PRM.PTRN.LUX			16383	0		5	0	O O O O O
	Upper left Y	PRM.PTRN.LUY			16383	0		5	0	O O O O O
	Lower right XY	PRM.PTRN.RDXY						5	0	X O O O O
	Lower right X	PRM.PTRN.RDX			16383	0		5	0	O O O O O
	Lower right Y	PRM.PTRN.RDY			16383	0		5	0	O O O O O
Pattern region: Rotated rectangle	Width	PRM.PTRN.WI			16383	1		5	0	O O O O O
	Height	PRM.PTRN.HI			16383	1		5	0	O O O O O
	Center XY	PRM.PTRN.RCXY						5	0	X O O O O
	Center X	PRM.PTRN.RCX			16382	0		5	0	O O O O O
	Center Y	PRM.PTRN.RCY			16382	0		5	0	O O O O O
	Rotation angle	PRM.PTRN.T			359.9	0.0		3	1	O O O O O
Pattern region: Circle	Center XY	PRM.PTRN.CXY						5	0	X O O O O
	Center X	PRM.PTRN.CX			16383	-16383		5	0	O O O O O
	Center Y	PRM.PTRN.CY			16383	-16383		5	0	O O O O O
	Radius	PRM.PTRN.CR			9600	0		4	0	O O O O O
Pattern region: Oval	Center XY	PRM.PTRN.CXY						5	0	X O O O O
	Center X	PRM.PTRN.CX			16383	-16383		5	0	O O O O O
	Center Y	PRM.PTRN.CY			16383	-16383		5	0	O O O O O
	Radius 1	PRM.PTRN.CR1			2580	8		4	0	O O O O O
	Radius 2	PRM.PTRN.CR2			2580	8		4	0	O O O O O
	Rotation angle	PRM.PTRN.T			359.9	0.0		3	1	O O O O O
Pattern region: Ring	Center XY	PRM.PTRN.CXY						5	0	X O O O O
	Center X	PRM.PTRN.CX			16383	-16383		5	0	O O O O O
	Center Y	PRM.PTRN.CY			16383	-16383		5	0	O O O O O
	Radius 1	PRM.PTRN.CR1			9600	0		4	0	O O O O O
	Radius 2	PRM.PTRN.CR2			9600	0		4	0	O O O O O
Pattern region: Arc	Center XY	PRM.PTRN.CXY						5	0	X O O O O
	Center X	PRM.PTRN.CX			16383	-16383		5	0	O O O O O
	Center Y	PRM.PTRN.CY			16383	-16383		5	0	O O O O O
	Radius 1	PRM.PTRN.CR1			9600	0		4	0	O O O O O
	Radius 2	PRM.PTRN.CR2			9600	0		4	0	O O O O O
	Start angle	PRM.PTRN.STA			359.9	0.0		3	1	O O O O O
	End angle	PRM.PTRN.ENA			359.9	0.0		3	1	O O O O O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties	Referencing
				Initial value	Upper limit	Lower limit							
Pattern region: Polygon	No. of vertices	PRM.PTRN.PN			12	0	4	0	X	X	X	O	
	Max. No. of vertices	PRM.PTRN.MXPN		12	12	12	4	0	X	X	X	X	
	Point * XY	PRM.PTRN.PXY[*]					5	0	O	X	O	O	
	Point * X	PRM.PTRN.PX[*]			16383	0	5	0	O	O	O	O	
	Point * Y	PRM.PTRN.PY[*]			16383	0	5	0	O	O	O	O	
Mask region 0	Enable mask	PRM.PTRN.MSK[0].RGNEN	Enable	1						X	X	X	O
			Disable	0									
Mask region 0: Shape	Shape	PRM.PTRN.MSK[0].SHP	OFF	0						X	X	X	O
			Rectangle	1									
			Rotated rectangle	3									
			Circle	4									
			Oval	5									
			Ring	6									
			Arc	7									
			Polygon	8									
			Multiple area	16									
Mask region 0: Rectangle	Upper left XY	PRM.PTRN.MSK[0].LUXY					5	0	O	X	O	O	
	Upper left X	PRM.PTRN.MSK[0].LUX			16383	0	5	0	O	O	O	O	
	Upper left Y	PRM.PTRN.MSK[0].LUY			16383	0	5	0	O	O	O	O	
	Lower right XY	PRM.PTRN.MSK[0].RDXY					5	0	O	X	O	O	
	Lower right X	PRM.PTRN.MSK[0].RDX			16383	0	5	0	O	O	O	O	
	Lower right Y	PRM.PTRN.MSK[0].RDY			16383	0	5	0	O	O	O	O	
Mask region 0: Rotated rectangle	Width	PRM.PTRN.MSK[0].WI			16383	1	5	0	O	O	O	O	
	Height	PRM.PTRN.MSK[0].HI			16383	1	5	0	O	O	O	O	
	Center XY	PRM.PTRN.MSK[0].RCXY					5	0	O	X	O	O	
	Center X	PRM.PTRN.MSK[0].RCX			16382	0	5	0	O	O	O	O	
	Center Y	PRM.PTRN.MSK[0].RCY			16382	0	5	0	O	O	O	O	
Mask region 0: Circle	Rotation angle	PRM.PTRN.MSK[0].T			359.9	0.0	3	1	O	O	O	O	
	Center XY	PRM.PTRN.MSK[0].CXY					5	0	O	X	O	O	
	Center X	PRM.PTRN.MSK[0].CX			16383	-16383	5	0	O	O	O	O	
	Center Y	PRM.PTRN.MSK[0].CY			16383	-16383	5	0	O	O	O	O	
Mask region 0: Oval	Radius	PRM.PTRN.MSK[0].CR			9600	0	4	0	O	O	O	O	
	Center XY	PRM.PTRN.MSK[0].CXY					5	0	O	X	O	O	
	Center X	PRM.PTRN.MSK[0].CX			16383	-16383	5	0	O	O	O	O	
	Center Y	PRM.PTRN.MSK[0].CY			16383	-16383	5	0	O	O	O	O	
	Radius 1	PRM.PTRN.MSK[0].CR1			2580	8	4	0	O	O	O	O	
	Radius 2	PRM.PTRN.MSK[0].CR2			2580	8	4	0	O	O	O	O	
Mask region 0: Ring	Rotation angle	PRM.PTRN.MSK[0].T			359.9	0.0	3	1	O	O	O	O	
	Center XY	PRM.PTRN.MSK[0].CXY					5	0	O	X	O	O	
	Center X	PRM.PTRN.MSK[0].CX			16383	-16383	5	0	O	O	O	O	
	Center Y	PRM.PTRN.MSK[0].CY			16383	-16383	5	0	O	O	O	O	
	Radius 1	PRM.PTRN.MSK[0].CR1			9600	0	4	0	O	O	O	O	
Mask region 0: Arc	Radius 2	PRM.PTRN.MSK[0].CR2			9600	0	4	0	O	O	O	O	
	Center XY	PRM.PTRN.MSK[0].CXY					5	0	O	X	O	O	
	Center X	PRM.PTRN.MSK[0].CX			16383	-16383	5	0	O	O	O	O	
	Center Y	PRM.PTRN.MSK[0].CY			16383	-16383	5	0	O	O	O	O	
	Radius 1	PRM.PTRN.MSK[0].CR1			9600	0	4	0	O	O	O	O	
Mask region 0: Arc	Radius 2	PRM.PTRN.MSK[0].CR2			9600	0	4	0	O	O	O	O	
	Start angle	PRM.PTRN.MSK[0].STA			359.9	0.0	3	1	O	O	O	O	
	End angle	PRM.PTRN.MSK[0].ENA			359.9	0.0	3	1	O	O	O	O	

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	User variable	System variable	Referencing	Result data	Unit properties
				Value	Initial value	Upper limit							
Mask region 0: Polygon	No. of vertices	PRM.PTRN.MSK[0].PN			12	0	4	0	X	X	X	O	
	Max. No. of vertices	PRM.PTRN.MSK[0].MXPN		12	12	12	4	0	X	X	X	X	
	Point * XY	PRM.PTRN.MSK[0].PXY[*]					5	0	O	X	O	O	
	Point * X	PRM.PTRN.MSK[0].PX[*]			16383	0	5	0	O	O	O	O	
	Point * Y	PRM.PTRN.MSK[0].PY[*]			16383	0	5	0	O	O	O	O	
Mask region 0: Multiple area (ShapeTrax 3A Unit only)	Shape of multiple figure	PRM.PTRN.MSK[0].PFSHP	Rectangle Circle	1 0						O	O	O	O
	Size	PRM.PTRN.MSK[0].PFSZ		10	100	3	3	0	O	O	O	O	
	Number of multiple figure	PRM.PTRN.MSK[0].PFN		0	15	0	2	0	O	O	O	O	
	Maximum quantity	PRM.PTRN.MSK[0].MXPFN		15	15	15	2	0	X	X	X	X	
	Array reference	PRM.PTRN.MSK[0].PFAR							O	O	O	O	
	Position * XY	PRM.PTRN.MSK[0].PFXY[*]					5	0				O	
	Position * X	PRM.PTRN.MSK[0].PFX[*]		160	16383	0	5	0	X	X	X	O	
Mask region 1	Position * Y	PRM.PTRN.MSK[0].PFY[*]		160	16383	0	5	0	X	X	X	O	
	Mask region 2	PRM.PTRN.MSK[1].***											
	Mask region 3	PRM.PTRN.MSK[2].***											
		PRM.PTRN.MSK[3].***											

Image Enhancement Filter

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing		
			Label	Value	Initial value						User variable	System variable	Result data
Image enhance 0	Filter Type	PRM.FLTR[0].FTYP	None	0				X	X		X	X	O
			Binary	17									
			Expand	1									
			Shrink	2									
			Average	5									
			Median	6									
			Sharpen	7									
			Sobel X	11									
			Sobel Y	12									
			Sobel	13									
			Prewitt	15									
			Roberts	16									
			Laplacian	14									
			Subtract	19									
			Preserve intensity	22									
			Contrast conversion	23									
			Image extraction	24									
			Shading correction	25									
			Blur	26									
			Custom	18									
			Custom (Advance)	27									
			Blob	50									
			Scratch Defect Extraction	82									
			Noise Isolation	83									
			Contrast Expansion	84									
			Convex Hull	110									
			Average (height image)	75									
			Median (height image)	76									
			Gaussian	77									
			Smoothing	80									
			Invalid pixel suppression	51									
			Spike noise cut	85									
			Image Extraction (3D)	102									
Image enhance 0:	Upper limit	PRM.FLTR[0].BIN:HL		255	255	0	3	0	○	○	X	○	
Binary	Lower limit	PRM.FLTR[0].BIN:LL		128	255	0	3	0	○	○	X	○	
	Count	PRM.FLTR[0].PTMS		1	1	0	1	0	○	○	X	○	

Category	Setting item	Name	Selection		Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value			No. of integer digits	No. of decimal places		
Image enhance 0: Expand	Size	PRM.FLTR[0].FKSZ	3 x 3	0					<input type="radio"/>	<input checked="" type="radio"/>
			5 x 5	1					<input type="radio"/>	<input checked="" type="radio"/>
			7x7	2					<input type="radio"/>	<input checked="" type="radio"/>
			9x9	3					<input type="radio"/>	<input checked="" type="radio"/>
			11x11	4					<input type="radio"/>	<input checked="" type="radio"/>
			13x13	5					<input type="radio"/>	<input checked="" type="radio"/>
			15x15	6					<input type="radio"/>	<input checked="" type="radio"/>
			17x17	7					<input type="radio"/>	<input checked="" type="radio"/>
			19x19	8					<input type="radio"/>	<input checked="" type="radio"/>
			21x21	9					<input type="radio"/>	<input checked="" type="radio"/>
			23x23	10					<input type="radio"/>	<input checked="" type="radio"/>
			25x25	11					<input type="radio"/>	<input checked="" type="radio"/>
			27x27	12					<input type="radio"/>	<input checked="" type="radio"/>
			29x29	13					<input type="radio"/>	<input checked="" type="radio"/>
			31x31	14					<input type="radio"/>	<input checked="" type="radio"/>
Image enhance 0: Shrink	Direction	PRM.FLTR[0].PRD	X	1					<input type="radio"/>	<input checked="" type="radio"/>
			Y	2					<input type="radio"/>	<input checked="" type="radio"/>
			XY	3					<input type="radio"/>	<input checked="" type="radio"/>
Count	PRM.FLTR[0].PTMS			1	9	0	1	0	<input type="radio"/>	<input checked="" type="radio"/>
Border	PRM.FLTR[0].CFR	ON	0						<input type="radio"/>	<input checked="" type="radio"/>
		OFF	1						<input type="radio"/>	<input checked="" type="radio"/>
Processing Shape	PRM.FLTR[0].FKSHP	Square	0						<input type="radio"/>	<input checked="" type="radio"/>
		Circle	1						<input type="radio"/>	<input checked="" type="radio"/>
Image enhance 0: Shrink	Size	PRM.FLTR[0].FKSZ	3 x 3	0					<input type="radio"/>	<input checked="" type="radio"/>
			5 x 5	1					<input type="radio"/>	<input checked="" type="radio"/>
			7x7	2					<input type="radio"/>	<input checked="" type="radio"/>
			9x9	3					<input type="radio"/>	<input checked="" type="radio"/>
			11x11	4					<input type="radio"/>	<input checked="" type="radio"/>
			13x13	5					<input type="radio"/>	<input checked="" type="radio"/>
			15x15	6					<input type="radio"/>	<input checked="" type="radio"/>
			17x17	7					<input type="radio"/>	<input checked="" type="radio"/>
			19x19	8					<input type="radio"/>	<input checked="" type="radio"/>
			21x21	9					<input type="radio"/>	<input checked="" type="radio"/>
			23x23	10					<input type="radio"/>	<input checked="" type="radio"/>
			25x25	11					<input type="radio"/>	<input checked="" type="radio"/>
			27x27	12					<input type="radio"/>	<input checked="" type="radio"/>
			29x29	13					<input type="radio"/>	<input checked="" type="radio"/>
			31x31	14					<input type="radio"/>	<input checked="" type="radio"/>
Image enhance 0: Shrink	Direction	PRM.FLTR[0].PRD	X	1					<input type="radio"/>	<input checked="" type="radio"/>
			Y	2					<input type="radio"/>	<input checked="" type="radio"/>
			XY	3					<input type="radio"/>	<input checked="" type="radio"/>
Count	PRM.FLTR[0].PTMS			1	9	0	1	0	<input type="radio"/>	<input checked="" type="radio"/>
Border	PRM.FLTR[0].CFR	ON	0						<input type="radio"/>	<input checked="" type="radio"/>
		OFF	1						<input type="radio"/>	<input checked="" type="radio"/>
Processing Shape	PRM.FLTR[0].FKSHP	Square	0						<input type="radio"/>	<input checked="" type="radio"/>
		Circle	1						<input type="radio"/>	<input checked="" type="radio"/>

Category	Setting item	Name	Selection		Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value			No. of integer digits	No. of decimal places			
Image enhance 0: Average	Size	PRM.FLTR[0].FKSZ	3x3	0			X	X	O		
			5x5	1							
	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O		
	Expansion suppression	PRM.FLTR[0].SPEX	ON	0			1	0	O O X O		
			OFF	1							
Image enhance 0: Median	Size	PRM.FLTR[0].FKSZ	3 x 3	0			O	O	X O		
			5 x 5	1							
			7x7	2							
			9x9	3							
			11x11	4							
			13x13	5							
			15x15	6							
			17x17	7							
			19x19	8							
			21x21	9							
			23x23	10							
			25x25	11							
			27x27	12							
			29x29	13							
			31x31	14							
Image enhance 0: Sharpen	Size (height image)	PRM.FLTR[0].FKSZ	3x3	0			X	X	O		
			5x5	1							
	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O		
	Expansion suppression	PRM.FLTR[0].SPEX	ON	0			1	0	O O X O		
			OFF	1							
Image enhance 0: Sobel X	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O		
Image enhance 0: Sobel Y	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O		
Image enhance 0: Sobel	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O		
Image enhance 0: Prewitt	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O		
Image enhance 0: Roberts	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O		
Image enhance 0: Laplacian	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O		
Image enhance 0: Subtract	Mask area Extract	PRM.FLTR[0].STMS		2	9	0	1	0	O O X O		
			Bright & Dark	0							
			Bright	1			O	O	X O		
			Dark	2							
Registered image			PRM.FLTR[0].HSM	Fixed (fast)	1		X	X	O		
				Updated each process (slow)	0						
				User updated (fast)	2						

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		User variable	System variable	Referencing	Result data	Unit properties
			Label	Value	Initial value			No. of integer digits	No. of decimal places					
Image enhance 0: Subtract	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X	O	
	Large area mode	PRM.FLTR[0].SBLAM	Disable	0							X	X	X	O
Image enhance 0: Preserve intensity	Reference Unit ID	PRM.FLTR[0].RUID		-1	999	-1		3	0	O	O	X	O	
	Base value specification	PRM.FLTR[0].RVSW	Refer unit results	0							X	X	X	O
	Base value	PRM.FLTR[0].RVAL		0.000	255.000	0.000		3	3	O	O	X	O	
	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X	O	
Image enhance 0: Contrast conversion	Offset	PRM.FLTR[0].OFFS		0	255	-255		3	0	O	O	X	O	
	Span	PRM.FLTR[0].SPAN		1.0	7.9	0.0		1	1	O	O	X	O	
Image enhance 0: Image extraction	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X	O	
	Extract color	PRM.FLTR[0].ECLR	Bright	1						O	O	X	O	
			Dark	2										
	Reduction size	PRM.FLTR[0].ESZ		5	39	3		3	0	O	O	X	O	
	Direction	PRM.FLTR[0].PRD	X	1						O	O	X	O	
			Y	2										
			XY	3										
	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X	O	
Image Enhance 0: Shading Correction	Border	PRM.FLTR[0].CFR	ON	0						O	O	X	O	
			OFF	1										
	Correction method	PRM.FLTR[0].MTD	Average correction	0						O	O	X	O	
			Median correction	1										
			Shading correction	2										
			High-speed shading correction	3										
	Reduction size	PRM.FLTR[0].ESZ		16	2000	4		4	0	O	O	X	O	
	Direction	PRM.FLTR[0].PRD	X	1						O	O	X	O	
			Y	2										
			XY	3										
	Extract color	PRM.FLTR[0].ECLR	Bright	1						X	X	X	O	
			Dark	2										
			Bright & Dark	0										
			Individual	3										
	Bright gain	PRM.FLTR[0].GNBR		2.0	10.0	0.0		2	1	O	O	X	O	
	Bright noise cut	PRM.FLTR[0].NSBR		0.0	255.0	0.0		3	1	O	O	X	O	
	Dark gain	PRM.FLTR[0].GNDR		2.0	10.0	0.0		2	1	O	O	X	O	
	Dark noise cut	PRM.FLTR[0].NSDR		0.0	255.0	0.0		3	1	O	O	X	O	
	Uniform contrast	PRM.FLTR[0].ENUNF	ON	1						O	O	X	O	
			OFF	0										
	Border	PRM.FLTR[0].CFR	ON	0						O	O	X	O	
			OFF	1										
	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X	O	
Image Enhance 0: Blur	Level	PRM.FLTR[0].BLDG		1	99	1		2	0	O	O	X	O	
	Direction	PRM.FLTR[0].PRD	X	1						O	O	X	O	
			Y	2										
			XY	3										
	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X	O	

Category	Setting item	Name	Selection		Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value			No. of integer digits	No. of decimal places	
Image enhance 0: Custom	Size	PRM.FLTR[0].FKSZ	3 x 3	0					X X X O
			5 x 5	1					
	Offset	PRM.FLTR[0].OFFS		0	255	-255	3	0	O O X O
	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	O O X O
	Array reference	PRM.FLTR[0].AREF							O O X O
	Filter coefficient 0	PRM.FLTR[0].FKC00		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 1	PRM.FLTR[0].FKC01		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 2	PRM.FLTR[0].FKC02		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 3	PRM.FLTR[0].FKC03		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 4	PRM.FLTR[0].FKC04		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 5	PRM.FLTR[0].FKC05		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 6	PRM.FLTR[0].FKC06		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 7	PRM.FLTR[0].FKC07		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 8	PRM.FLTR[0].FKC08		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 9	PRM.FLTR[0].FKC09		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 10	PRM.FLTR[0].FKC10		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 11	PRM.FLTR[0].FKC11		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 12	PRM.FLTR[0].FKC12		1.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 13	PRM.FLTR[0].FKC13		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 14	PRM.FLTR[0].FKC14		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 15	PRM.FLTR[0].FKC15		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 16	PRM.FLTR[0].FKC16		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 17	PRM.FLTR[0].FKC17		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 18	PRM.FLTR[0].FKC18		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 19	PRM.FLTR[0].FKC19		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 20	PRM.FLTR[0].FKC20		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 21	PRM.FLTR[0].FKC21		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 22	PRM.FLTR[0].FKC22		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 23	PRM.FLTR[0].FKC23		0.0	32.0	-32.0	2	1	O O X O
	Filter coefficient 24	PRM.FLTR[0].FKC24		0.0	32.0	-32.0	2	1	O O X O
Image Enhance 0: Custom Advance	Size	PRM.FLTR[0].FKSZ	3 x 3	0					X X X O
			5 x 5	1					
			7 x 7	2					
			9 x 9	3					
			11 x 11	4					
			13 x 13	5					
			15 x 15	6					
			17 x 17	7					
			19 x 19	8					
			21 x 21	9					
Operation	PRM.FLTR[0].PMTD	Convolution	0						X X X O
		Expand	1						
		Shrink	2						
	Filter coefficient	PRM.FLTR[0].FKCE					O O X O		
Divisor	PRM.FLTR[0].DIV		1.000		99999.999	0.001	5	3	O O X O
				0	255	-255	3	0	O O X O
Negative pixel correction	PRM.FLTR[0].MNTR	Fixed to 0	0						O O X O
		Absolute value	1						
Count	PRM.FLTR[0].PTMS		1		9	0	1	0	O O X O
Border	PRM.FLTR[0].CFR	ON	0						O O X O
		OFF	1						

Category	Setting item	Name	Selection		Upper limit	Lower limit	Numerical value format		User variable	System variable	Referencing	Result data	Unit properties
			Label	Value			No. of integer digits	No. of decimal places					
Image enhance 0: Blob	Detect	PRM.FLTR[0].DC	White	255									
			Black	0									
	Count	PRM.FLTR[0].DBN		30	9999	1	4	0	O	O	X	O	
	Fill holes	PRM.FLTR[0].FILL	OFF	0									
			ON	1									
	Active border	PRM.FLTR[0].CAN	OFF	0									
			ON	1									
	Detection order	PRM.FLTR[0].LOD	Y>X: Ascend	5									
			X>Y: Ascend	6									
			X:Ascend	1									
			X:Descend	2									
			Y:Ascend	3									
			Y:Descend	4									
			Area:Ascend	14									
			Area:	13									
			Descend										
			Roundness:	16									
Starting angle	PRM.FLTR[0].STA		Ascend										
			Clockwise	9									
			Counterclockwise	10									
					0.000	359.999	0.000	3	3	O	O	X	O
			Primary target specification	PRM.FLTR[0].LBS	All	0							
					Specified	1							
			Primary target	PRM.FLTR[0].LLBS		0	9998	0	4	0	O	O	X
			Pixel values after conversion: Detected color	PRM.FLTR[0].CODOC		255	255	0	3	0	O	O	X
			Pixel values after conversion: Background color	PRM.FLTR[0].COBC		0	255	0	3	0	O	O	X
			Count	PRM.FLTR[0].PTMS		1	1	0	1	0	O	O	X
Area filter	PRM.FLTR[0].ARI_EN		Disable	0									
			Enable	1									
			Roundness filter	PRM.FLTR[0].CIR_EN	Disable	0							
					Enable	1							
			Major axis filter	PRM.FLTR[0].MAA_EN	Disable	0							
					Enable	1							
			Axes ratio filter	PRM.FLTR[0].RTO_EN	Disable	0							
					Enable	1							
			Distributed oval filter	PRM.FLTR[0].MAA2_EN	Disable	0							
					Enable	1							
Aspect ratio filter	PRM.FLTR[0].RTO2_EN		Disable	0									
					Enable	1							
			Area filter: Maximum	PRM.FLTR[0].ARI_THRES:HL		99999999	99999999	0	8	0	O	O	X
			Area filter: Minimum	PRM.FLTR[0].ARI_THRES:LL		100	99999999	0	8	0	O	O	X
			Roundness filter: Maximum	PRM.FLTR[0].CIR_THRES:HL		1.000	1.000	0.000	1	3	O	O	X
			Roundness filter: Minimum	PRM.FLTR[0].CIR_THRES:LL		0.000	1.000	0.000	1	3	O	O	X
			Major axis filter: Maximum	PRM.FLTR[0].MAA_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Referencing
			Label	Value	Initial value							
Image enhance 0: Blob (continued)	Major axis filter: Minimum	PRM.FLTR[0].MAA_THRES: LL		0.000	99999.999	0.000		5	3	O	O	X
	Axes ratio filter: Maximum	PRM.FLTR[0].RTO_THRES: HL		99999.999	99999.999	0.000		5	3	O	O	X
	Axes ratio filter: Minimum	PRM.FLTR[0].RTO_THRES: LL		0.000	99999.999	0.000		5	3	O	O	X
	Distributed oval filter: Maximum	PRM.FLTR[0].MAA2_THRES:HL		99999.999	99999.999	0.000		5	3	O	O	X
	Distributed oval filter: Minimum	PRM.FLTR[0].MAA2_THRES:LL		0.000	99999.999	0.000		5	3	O	O	X
	Aspect ratio filter: Maximum	PRM.FLTR[0].RTO2_THRES:HL		99999.999	99999.999	0.000		5	3	O	O	X
	Aspect ratio filter: Minimum	PRM.FLTR[0].RTO2_THRES:LL		0.000	99999.999	0.000		5	3	O	O	X
Image enhance 0: Inv. Pixel Suppress.	Level	PRM.FLTR[0].IPO_DG		1	19	1		1	0	O	O	X
	Adj. Width	PRM.FLTR[0].IPO_PS	Large	0				1	0	X	X	X
			Small	1								O
	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X
	Outline	PRM.FLTR[0].IPO_CCF	ON	0				1	0	O	O	X
	Interpolation Suppression		OFF	1								O
	Smoothing Size	PRM.FLTR[0].IPO_SMSZ	Match w/ Level	0				1	0	O	O	X
			Narrow	1								O
			Normal	2								O
			Wide	3								O
	Processing Shape	PRM.FLTR[0].IPO_CFT	Square	0				1	0	O	O	X
			Circle	1								O
Image enhance 0: Scratch Defect Extraction	Processing Method	PRM.FLTR[0].LSMTD	Scratch Defect Extraction	0				1	0	X	X	X
			High-Speed Scratch Defect Extraction	1								O
	Reduction	PRM.FLTR[0].RDR		2	32	1		2	0	O	O	X
	Extract Size	PRM.FLTR[0].BG_RDR		4	32	2		2	0	O	O	X
	Extract Tone	PRM.FLTR[0].LSTC	Dark	1				1	0	O	O	X
			Bright	0								O
			Bright & Dark	2								O
Image enhance 0: Noise Isolation	Gain	PRM.FLTR[0].GNM		2.0	99.9	0.0		2	1	O	O	X
	Linearity	PRM.FLTR[0].LNRTY		2	4	1		1	0	X	X	X
	Linear Length	PRM.FLTR[0].SMLVL		2	16	1		2	0	O	O	X
	Noise Cut	PRM.FLTR[0].NSR		0.0	255.0	0.0		3	1	O	O	X
	Extraction Direction	PRM.FLTR[0].ATYP	All Angles	0				1	0	X	X	X
			Specify Angle	1								O
	Starting Angle	PRM.FLTR[0].TANG		0.000	179.999	0.000		3	3	O	O	X
	Angle Range	PRM.FLTR[0].ARG		45.000	90.000	1.000		2	3	O	O	X
	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X
	Target Tone	PRM.FLTR[0].CLR	Dark	1				1	0	O	O	X
			Bright	0								O
	Process Type	PRM.FLTR[0].PROCTYP	Remove	0				1	0	O	O	X
			Extract	1								O
	Area	PRM.FLTR[0].ARSZ		10	99999999	1		8	0	O	O	X
	Reduction	PRM.FLTR[0].RDR		2	32	1		2	0	O	O	X
	Count	PRM.FLTR[0].PTMS		1	1	0		1	0	O	O	X

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	User variable	System variable	Referencing	Result data	Unit properties
				Value	Initial value	Upper limit							
Image enhancement 0: Contrast Expansion	Expansion Width	PRM.FLTR[0].CEI		15	30	0	2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Noise Cut	PRM.FLTR[0].SNRDR		0	30	0	2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Count	PRM.FLTR[0].PTMS		1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
Image enhancement 0: Convex Hull	Detection Color	PRM.FLTR[0].DC	White	255						<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			Black	0									
	Difference	PRM.FLTR[0].DIFF_EN	ON	1						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Detection		OFF	0									
	Noise Cut	PRM.FLTR[0].SNRDR		0	99	0	2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
Image enhancement 0: Gaussian	Fill Holes	PRM.FLTR[0].FILL	ON	1						<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			OFF	0									
	Count	PRM.FLTR[0].PTMS		1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Size	PRM.FLTR[0].FKSZ	3 x 3	0						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			5 x 5	1									
Image enhancement 0: Smoothing	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Expansion suppression	PRM.FLTR[0].SPEX	ON	0						<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			OFF	1									
	Size	PRM.FLTR[0].FKSZ		3	127	3	3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Width	PRM.FLTR[0].FWK		3	127	3	3	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
Image enhancement 0: Spike Noise Cut	Height	PRM.FLTR[0].FKH		3	127	3	3	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Border	PRM.FLTR[0].CFR	ON	0						<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			OFF	1									
	Count	PRM.FLTR[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Expansion suppression	PRM.FLTR[0].SPEX	ON	0						<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			OFF	1									
Image enhancement 0: Spike Noise Cut	Cut Size	PRM.FLTR[0].CSZ		4	30	2	2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Cut Threshold (mm)	PRM.FLTR[0].CTH		0.5	99.999	0.000 (CA-DQP25X:1.0)	2	3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Cut Target	PRM.FLTR[0].CDR	Upper	0						<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			Lower	1									
			Both	2									
	Count	PRM.FLTR[0].PTMS		1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Enable Specify Processing Direction	PRM.FLTR[0].CPDEN	Enable	1						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			Disable	0									
	Processing Direction Type	PRM.FLTR[0].CPD	X Direction	0						<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Y Direction	1									
			XY Individual	2									
X Direction Cut Size	X Direction Cut Size	PRM.FLTR[0].CSZ_X		4	30	2	2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Y Direction Cut Size	PRM.FLTR[0].CSZ_Y		4	30	2	2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	User variable	System variable	Referencing
			Label	Value									
Image enhance 0: Image Extraction (3D)	Extraction Direction	PRM.FLTR[0].EDIR	High	1									<input type="radio"/>
			Low	2									
			High/Low	0									
	Direction	PRM.FLTR[0].PRD	X	1									<input type="radio"/>
			Y	2									
			XY	3									
	Extraction Size	PRM.FLTR[0].ESZ		11	99	3	2	0	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Extraction Height Range Upper Limit	PRM.FLTR[0].NSTH:HL		999.999	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Extraction Height Range Lower Limit	PRM.FLTR[0].NSTH:LL		0.005	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
	Segment Size	PRM.FLTR[0].SGSZ		2	2	1	1	0	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
Image enhance 1	Border	PRM.FLTR[0].CFR	ON	0									<input type="radio"/>
			OFF	1									
	Count	PRM.FLTR[0].PTMS		1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>
Image enhance 12	PRM.FLTR[1].***												
	PRM.FLTR[12].***												

Image Enhancement Filter Settings (Image Operation Unit: Source Image)

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Source image 1: Image Enhance 0	Filter Data Type	PRM.FLTR1[0].FTYP	None	0						X X X O
			Binary	17						
			Expand	1						
			Shrink	2						
			Average	5						
			Median	6						
			Sharpen	7						
			Sobel X	11						
			Sobel Y	12						
			Sobel	13						
			Prewitt	15						
			Roberts	16						
			Laplacian	14						
			Preserve intensity	22						
			Contrast conversion	23						
			Image extraction	24						
			Shading correction	25						
			Blur	26						
			Custom	18						
			Custom (Advance)	27						
			Blob	50						
			Scratch	82						
			Defect Extraction							
			Noise	83						
			Isolation							
			Contrast	84						
			Expansion							
Source image 1: Image Enhance 0:	Upper limit Lower limit Count Binary	PRM.FLTR1[0].BIN:HL PRM.FLTR1[0].BIN:LL PRM.FLTR1[0].PTMS		255 128 1	255 255 0	0 0 0	3 3 1	0 0 0	O O O X X	O O O X O

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Source image 1: Image Enhance 0: Expand	Size	PRM.FLTR1[0].FKSZ	3 x 3	0						<input type="radio"/> User variable <input type="radio"/> System variable <input checked="" type="radio"/> Result data <input type="radio"/> Unit properties
			5 x 5	1						
			7 x 7	2						
			9 x 9	3						
			11 x 11	4						
			13 x 13	5						
			15 x 15	6						
			17 x 17	7						
			19 x 19	8						
			21 x 21	9						
			23 x 23	10						
			25 x 25	11						
			27 x 27	12						
			29 x 29	13						
			31 x 31	14						
Direction	PRM.FLTR1[0].PRD		X	1				<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> X <input type="radio"/>
			Y	2						
			XY	3						
Count	PRM.FLTR1[0].PTMS			1	9	0	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> X <input type="radio"/>
Border	PRM.FLTR1[0].CFR		ON	0				<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> X <input type="radio"/>
			OFF	1						
Processing Shape	PRM.FLTR1[0].FKSHP		Square	0				<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/> X <input checked="" type="radio"/> X <input type="radio"/>
			Circle	1						
Source image 1: Image Enhance 0: Shrink	Size	PRM.FLTR1[0].FKSZ	3 x 3	0				<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> X <input type="radio"/>
			5 x 5	1						
			7 x 7	2						
			9 x 9	3						
			11 x 11	4						
			13 x 13	5						
			15 x 15	6						
			17 x 17	7						
			19 x 19	8						
			21 x 21	9						
			23 x 23	10						
			25 x 25	11						
			27 x 27	12						
			29 x 29	13						
			31 x 31	14						
Direction	PRM.FLTR1[0].PRD		X	1				<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> X <input type="radio"/>
			Y	2						
			XY	3						
Count	PRM.FLTR1[0].PTMS			1	9	0	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> X <input type="radio"/>
Border	PRM.FLTR1[0].CFR		ON	0				<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> X <input type="radio"/>
			OFF	1						
Processing Shape	PRM.FLTR1[0].FKSHP		Square	0				<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/> X <input checked="" type="radio"/> X <input type="radio"/>
			Circle	1						
Source image 1: Image Enhance 0: Average	Count	PRM.FLTR1[0].PTMS		1	9	0	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> X <input type="radio"/>

List of setting parameters

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	Numerical value format		Referencing		
				Value	Initial value	No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties		
Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Image Enhance 0:	Size	PRM.FLTR1[0].FKSZ	3 x 3 5 x 5 7 x 7 9 x 9 11 x 11 13 x 13 15 x 15 17 x 17 19 x 19 21 x 21 23 x 23 25 x 25 27 x 27 29 x 29 31 x 31	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14						<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Median	Processing Shape	PRM.FLTR1[0].FKSHP	Square Circle	0 1						X	X	X	<input type="radio"/>
Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Image Enhance 0:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Sharpen	Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Image Enhance 0:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Sobel X	Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Image Enhance 0:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Sobel Y	Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Image Enhance 0:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Sobel	Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Image Enhance 0:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Prewitt	Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Image Enhance 0:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Roberts	Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Image Enhance 0:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Laplacian	Source image 1:	Count	PRM.FLTR1[0].PTMS		1	9	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Image Enhance 0:	Reference Unit ID	PRM.FLTR1[0].RUID		-1	999	-1	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Preserve intensity	Base value specification	PRM.FLTR1[0].RVSW	Refer unit results User set	0 1						X	X	X	<input type="radio"/>
	Base value	PRM.FLTR1[0].RVAL		0.000	255.000	0.000	3	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	Numerical value format		User variable	System variable	Result data	Unit properties
				Value	Initial value	No. of integer digits			No. of decimal places					
Source image 1: Image Enhance 0: Contrast conversion	Offset	PRM.FLTR1[0].OFFS		0	255	-255	3	0	O	O	X	O		
	Span	PRM.FLTR1[0].SPAN		1.0	7.9	0.0	1	1	O	O	X	O		
	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	O	O	X	O		
Source image 1: Image Enhance 0: Image extraction	Extract color	PRM.FLTR1[0].ECLR	Bright Dark	1 2						O	O	X	O	
	Reduction size	PRM.FLTR1[0].ESZ		5	39	3	2	0	O	O	X	O		
	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	O	O	X	O		
	Direction	PRM.FLTR1[0].PRD	X Y XY	1 2 3						O	O	X	O	
	Border	PRM.FLTR1[0].CFR	ON OFF	0 1						O	O	X	O	
Source image 1: Image Enhance 0: Shading Correction	Correction method	PRM.FLTR1[0].MTD	Average correction Median correction Shading correction High-speed shading correction	0 1 2 3						O	O	X	O	
	Reduction size	PRM.FLTR1[0].ESZ		16	2000	4	4	0	O	O	X	O		
	Direction	PRM.FLTR1[0].PRD	X Y XY	1 2 3						O	O	X	O	
	Extract color	PRM.FLTR1[0].ECLR	Bright Dark Bright & Dark Individual	1 2 0 3						X	X	X	O	
	Bright gain	PRM.FLTR1[0].GNBR		2.0	10.0	0.0	2	1	O	O	X	O		
Source image 1: Image Enhance 0: Blur	Bright noise cut	PRM.FLTR1[0].NSBR		0.0	255.0	0.0	3	1	O	O	X	O		
	Dark gain	PRM.FLTR1[0].GNDR		2.0	10.0	0.0	2	1	O	O	X	O		
	Dark noise cut	PRM.FLTR1[0].NSDR		0.0	255.0	0.0	3	1	O	O	X	O		
	Uniform contrast	PRM.FLTR1[0].ENUNF	ON OFF	1 0						O	O	X	O	
	Border	PRM.FLTR1[0].CFR	ON OFF	0 1						O	O	X	O	
Source image 1: Image Enhance 0: Blur	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	O	O	X	O		
	Level	PRM.FLTR1[0].BLDG		1	99	1	2	0	O	O	X	O		
	Direction	PRM.FLTR1[0].PRD	X Y XY	1 2 3						O	O	X	O	
	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	O	O	X	O		

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing			
			Label	Value						User variable	System variable	Result data	Unit properties
Source image 1: Image	Size	PRM.FLTR1[0].FKSZ	3 x 3	0						X	X	X	O
			5 x 5	1									
Enhance 0: Custom	Offset	PRM.FLTR1[0].OFFS		0	255	-255		3	0	O	O	X	O
	Count	PRM.FLTR1[0].PTMS		1	9	0		1	0	O	O	X	O
Filter coefficient 0 Filter coefficient 1 Filter coefficient 2 Filter coefficient 3 Filter coefficient 4 Filter coefficient 5 Filter coefficient 6 Filter coefficient 7 Filter coefficient 8 Filter coefficient 9 Filter coefficient 10 Filter coefficient 11 Filter coefficient 12 Filter coefficient 13 Filter coefficient 14 Filter coefficient 15 Filter coefficient 16 Filter coefficient 17 Filter coefficient 18 Filter coefficient 19 Filter coefficient 20 Filter coefficient 21 Filter coefficient 22 Filter coefficient 23 Filter coefficient 24	PRM.FLTR1[0].AREF									O	O	X	O
	PRM.FLTR1[0].FKC00		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC01		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC02		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC03		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC04		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC05		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC06		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC07		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC08		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC09		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC10		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC11		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC12		1.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC13		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC14		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC15		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC16		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC17		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC18		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC19		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC20		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC21		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC22		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC23		0.0	32.0	-32.0		2	1	O	O	X	O	
	PRM.FLTR1[0].FKC24		0.0	32.0	-32.0		2	1	O	O	X	O	
Source image 1: Image Enhance 0: Custom Advance	Size	PRM.FLTR1[0].FKSZ	3 x 3	0						X	X	X	O
			5 x 5	1									
			7 x 7	2									
			9 x 9	3									
			11 x 11	4									
			13 x 13	5									
			15 x 15	6									
			17 x 17	7									
			19 x 19	8									
			21 x 21	9									
Operation	PRM.FLTR1[0].PMTD	Convolution	0							X	X	X	O
		Expand	1										
Filter coefficient	PRM.FLTR1[0].FKCE									O	O	X	O
	Divisor	PRM.FLTR1[0].DIV											
Shift	PRM.FLTR1[0].OFFS									O	O	X	O
	Negative pixel correction	PRM.FLTR1[0].MNTR	Fixed to 0										
Count	PRM.FLTR1[0].PTMS									O	O	X	O
	Border	PRM.FLTR1[0].CFR	ON										
			OFF							1			

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		User variable	System variable	Result data	Unit properties
			Label	Value				No. of integer digits	No. of decimal places				
Source image 1: Image	Detect	PRM.FLTR1[0].DC	White	255						O	O	X	O
			Black	0									
Enhance 0: Blob	Count	PRM.FLTR1[0].DBN		30	9999	1	4	0	O	O	X	O	
	Fill holes	PRM.FLTR1[0].FILL	OFF	0						O	O	X	O
			ON	1									
	Active border	PRM.FLTR1[0].CAN	OFF	0						O	O	X	O
			ON	1									
	Detection order	PRM.FLTR1[0].LOD	Y>X: Ascend	5						O	O	X	O
			X>Y: Ascend	6									
			X:Ascend	1									
			X:Descend	2									
			Y:Ascend	3									
			Y:Descend	4									
			Area:Ascend	14									
			Area:Descend	13									
			Roundness: Ascend	16									
			Roundness: Descend	15									
			Clockwise	9									
			Counterclockwise	10									
	Starting angle	PRM.FLTR1[0].STA		0.000	359.999	0.000	3	3	O	O	X	O	
	Primary target specification	PRM.FLTR1[0].LBS	All	0						X	X	X	O
			Specified	1									
	Primary target	PRM.FLTR1[0].LLBS		0	9998	0	4	0	O	O	X	O	
	Pixel values after conversion: Detected color	PRM.FLTR1[0].CODC		255	255	0	3	0	O	O	X	O	
	Pixel values after conversion: Background color	PRM.FLTR1[0].COBC		0	255	0	3	0	O	O	X	O	
	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	O	O	X	O	
	Area filter	PRM.FLTR1[0].ARI_EN	Disable	0						O	O	X	O
			Enable	1									
	Roundness filter	PRM.FLTR1[0].CIR_EN	Disable	0						O	O	X	O
			Enable	1									
	Major axis filter	PRM.FLTR1[0].MAA_EN	Disable	0						O	O	X	O
			Enable	1									
	Axis ratio filter	PRM.FLTR1[0].RTO_EN	Disable	0						O	O	X	O
			Enable	1									
	Distributed oval filter	PRM.FLTR1[0].MAA2_EN	Disable	0						O	O	X	O
			Enable	1									
	Aspect ratio filter	PRM.FLTR1[0].RTO2_EN	Disable	0						O	O	X	O
			Enable	1									
	Area filter: Maximum	PRM.FLTR1[0].ARI_THRES:HL		99999999	99999999	0	8	0	O	O	X	O	
	Area filter: Minimum	PRM.FLTR1[0].ARI_THRES:LL		100	99999999	0	8	0	O	O	X	O	
	Roundness filter: Maximum	PRM.FLTR1[0].CIR_THRES:HL		1.000	1.000	0.000	1	3	O	O	X	O	
	Roundness filter: Minimum	PRM.FLTR1[0].CIR_THRES:LL		0.000	1.000	0.000	1	3	O	O	X	O	
	Major axis filter: Maximum	PRM.FLTR1[0].MAA_THRES:HL		9999.999	9999.999	0.000	5	3	O	O	X	O	
	Major axis filter: Minimum	PRM.FLTR1[0].MAA_THRES:LL		0.000	9999.999	0.000	5	3	O	O	X	O	
	Axes ratio filter: Maximum	PRM.FLTR1[0].RTO_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O	

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing		
				Value	Initial value						User variable	System variable	Result data
Source image 1: Image Enhance 0: Blob (continued)	Axes ratio filter: Minimum	PRM.FLTR1[0].RTO_THRES:LL		0.000	99999.999	0.000	5	3	○	○	X	○	
	Distributed oval filter: Maximum	PRM.FLTR1[0].MAA2_THRES:HL		99999.999	99999.999	0.000	5	3	○	○	X	○	
	Distributed oval filter: Minimum	PRM.FLTR1[0].MAA2_THRES:LL		0.000	99999.999	0.000	5	3	○	○	X	○	
	Aspect ratio filter: Maximum	PRM.FLTR1[0].RTO2_THRES:HL		99999.999	99999.999	0.000	5	3	○	○	X	○	
	Aspect ratio filter: Minimum	PRM.FLTR1[0].RTO2_THRES:LL		0.000	99999.999	0.000	5	3	○	○	X	○	
Source image 1: Image enhance 0: Scratch Defect Extraction	Processing Method	PRM.FLTR1[0].LSMTD	Scratch Defect Extraction	0					1	0	×	×	×
			High-Speed Scratch Defect Extraction	1									
	Reduction	PRM.FLTR1[0].RDR		2	32	1	2	0	○	○	×	○	
	Extract Size	PRM.FLTR1[0].BG_RDR		4	32	2	2	0	○	○	×	○	
	Extract Tone	PRM.FLTR1[0].LSTC	Dark	1					1	0	○	○	×
			Bright	0									
			Bright & Dark	2									
	Gain	PRM.FLTR1[0].GNM		2.0	99.9	0.0	2	1	○	○	×	○	
	Linearity	PRM.FLTR1[0].LNRTY		2	4	1	1	0	×	×	×	○	
	Linear Length	PRM.FLTR1[0].SMLVL		2	16	1	2	0	○	○	×	○	
	Noise Cut	PRM.FLTR1[0].NSR		0.0	255.0	0.0	3	1	○	○	×	○	
	Extraction	PRM.FLTR1[0].ATYP	All Angles	0					1	0	×	×	×
	Direction		Specify Angle	1									
	Starting Angle	PRM.FLTR1[0].TANG		0.000	179.999	0.000	3	3	○	○	×	○	
	Angle Range	PRM.FLTR1[0].ARG		45.000	90.000	1.000	2	3	○	○	×	○	
	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	○	○	×	○	
Source image 1: Image enhance 0: Noise Isolation	Target Tone	PRM.FLTR1[0].CLR	Dark	1					1	0	○	○	×
			Bright	0									
	Process Type	PRM.FLTR1[0].PROCTYP	Remove	0					1	0	○	○	×
			Extract	1									
	Area	PRM.FLTR1[0].ARSZ		10	99999999	1	8	0	○	○	×	○	
	Reduction	PRM.FLTR1[0].RDR		2	32	1	2	0	○	○	×	○	
	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	○	○	×	○	
Source image 1: Image enhance 0: Contrast Expansion	Expansion Width	PRM.FLTR1[0].CEI		15	30	0	2	0	○	○	×	○	
	Noise Cut	PRM.FLTR1[0].SNRDR		0	30	0	2	0	○	○	×	○	
	Count	PRM.FLTR1[0].PTMS		1	1	0	1	0	○	○	×	○	

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	Numerical value format		User variable	System variable	Result data	Unit properties
				Value	Initial value	No. of integer digits	No. of decimal places							
Source image 1: Image enhance 0: Spike Noise Cut	Cut Size	PRM.FLTR1[0].CSZ		4	30	2			2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Cut Threshold	PRM.FLTR1[0].CTH		0.050	99.999	0.000			2	3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Cut Target	PRM.FLTR1[0].CDR	Upper	0							<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			Lower	1										
			Both	2										
	Count	PRM.FLTR1[0].PTMS		1	1	0			1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable Specify Processing Direction	PRM.FLTR1[0].CPDEN	Enable	1					1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			Disable	0										
	Processing Direction Type	PRM.FLTR1[0].CPD	X Direction	0					1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
			Y Direction	1										
			XY Individual	2										
	X Direction Cut Size	PRM.FLTR1[0].CSZ_X		4	30	2			2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Y Direction Cut Size	PRM.FLTR1[0].CSZ_Y		4	30	2			2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
Source image 1: Image enhance 1		PRM.FLTR1[1].***												
:		:												
Source image 1: Image enhance 12		PRM.FLTR1[12].***												
Source image 2:		PRM.FLTR2[*].***												
Source image 3:		PRM.FLTR3[*].***												

Capture Unit

Category	Setting item	Name	Label	Selection			Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable
Parameters	Capture priority	PRM.DTL.BPRI[*]		1	4	1		1	0	X	X
Camera 1	Enable camera	PRM.CAM1.CM_EN	Enable	1				1	0	X	X
			Disable	0							
	Shutter speed (area camera)	PRM.CAM1.SSPD		16.67	9000.00	0.01		4	2	O	O
	Shutter speed (line scan camera)	PRM.CAM1.LSSPD		50	20000	2		5	0	O	O
	Camera sensitivity	PRM.CAM1.GN_S		3.0	9.0	1.0		1	1	O	O
	R shift	PRM.CAM1.GN_R_OT		0	255	-255		3	0	X	X
	G shift	PRM.CAM1.GN_G_OT		0	255	-255		3	0	X	X
	B shift	PRM.CAM1.GN_B_OT		0	255	-255		3	0	X	X
	R span *	PRM.CAM1.GN_R_CF[*]		1	7.9	0.0		1	1	X	X
	G span *	PRM.CAM1.GN_G_CF[*]		1	7.9	0.0		1	1	X	X
	B span *	PRM.CAM1.GN_B_CF[*]		1	7.9	0.0		1	1	X	X
	White balance	PRM.CAM1.WB_EN	Enable	1				1	0	X	X
	Use system settings		Disable	0							
	White balance R multiplier	PRM.CAM1.WB_R		1.000	5.000	0.000		1	3	O	O
	White balance G multiplier	PRM.CAM1.WB_G		1.000	5.000	0.000		1	3	O	O
	White balance B multiplier	PRM.CAM1.WB_B		1.000	5.000	0.000		1	3	O	O
	CCD line offset	PRM.CAM1.SL_OT		0	2049	0		4	0	O	O
	Camera combination No.	PRM.CAM1.BOND		0	3	0		1	0	X	X
	Trigger selection	PRM.CAM1.TID		0	3	0		1	0	X	X
	Trigger delay time	PRM.CAM1.TDLY		0	999.999	0		3	3	O	O
	Trigger delay time (Encoder pulse specification)	PRM.CAM1.TDLYC		0	65535	0		5	0	O	X
HDR	HDR	PRM.CAM1.HDR_EN	Enable	1				1	0	X	X
			Disable	0							
	Lowlight level	PRM.CAM1.HDR_SL		1	6	0		1	0	X	X
	Highlight level	PRM.CAM1.HDR_HL		1	6	0		1	0	X	X
	No. of images	PRM.CAM1.HDR_N		3	13	1		2	0	X	X
	No. of images setting	PRM.CAM1.HDR_NMD	Auto (speed priority)	0				1	0	X	X
			Auto (quality priority)	1							
	Brightness	PRM.CAM1.HDR_BR		50	100	0		3	0	O	X
	Contrast	PRM.CAM1.HDR_CN		50	100	0		3	0	O	X
	Number of lines	PRM.CAM1.LLN						4	0	X	X
Rotation	Overlapping lines	PRM.CAM1.LOLN						4	0	X	X
	Total number of lines	PRM.CAM1.LTLN						6	0	X	X
	Rotation	PRM.CAM1.ROTA	None	0				3	0	X	X
			90°Rotate	90							
			270°Rotate	270							

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Camera1: 3D Imaging	Filter Type	PRM.CAM1.HG_FTYP	None	0				1	0	X	X	X	X
			Median	1									
			Gaussian	3									
			Average	2									
Count		PRM.CAM1.HG_PTMS			1	9	0	1	0	X	X	X	X
XY Normalization		PRM.CAM1.HG_XYNM	OFF	0				1	0	X	X	X	X
			ON	1									
			ON(fast)	2									
Space Encoding		PRM.CAM1.HG_SPEN	OFF	0				1	0	X	X	X	X
			ON(2-image)	2									
			ON(3-image)	3									
			ON(4-image)	4									
			ON(Max.)	1									
Projector		PRM.CAM1.HG_PSL	1	0				1	0	X	X	X	X
			2	1									
			1+2	2									
One-Shot HDR		PRM.CAM1.HG_OSHDR	OFF	0	1	1	0	1	0	X	X	X	X
			ON	1									
HDR (No. of Captures)		PRM.CAM1.HG_HDR			1	3	1	1	0	X	X	X	X
Capture Height Image		PRM.CAM1.ENB_3D	ON	1				1	0	X	X	X	X
			OFF	0									
Capture 2D Image		PRM.CAM1.ENB_2D	ON	1				1	0	X	X	X	X
			OFF	0									
2D Image Type		PRM.CAM1.OIMG_TYP	Color	0				1	0	X	X	X	X
			Monochrome	1									
Remove Halations and Shadows		PRM.CAM1.TXT_EN	ON	1				1	0	X	X	X	X
			OFF	0									
2D Image Shutter Speed		PRM.CAM1.SSPD_2D			2.40	200.00	0.05	4	2	O	O	X	X
Hairline Influence Suppression		PRM.CAM1.ARR_EN	ON	1				1	0	X	X	X	X
			OFF	0									
Gain		PRM.CAM1.DGA	1	0				1	0	X	X	X	X
			2	1									
			4	2									
Projection Pattern		PRM.CAM1.HG_PRPT	Standard	0				1	0	X	X	X	X
			Echo	1									
			Suppression										
Allow Single Projector Data		PRM.CAM1.HG_SPPEN	ON	1				1	0	X	X	X	X
			OFF	0									
Fill Hole Suppression: Enabled		PRM.CAM1.RVBEN	ON	1				1	0	X	X	X	X
			OFF	0									
Fill Hole Suppression: Area Enabled		PRM.CAM1.RVBAR_EN	Enable	1				1	0	X	X	X	X
			Disable	0									
Fill Hole Suppression: Area (Lower Limit)		PRM.CAM1.RVBAR_THRES:LL			0.0100	99999.9999	0.0000	5	4	X	X	X	X
Fill Hole Suppression: Perimeter Enabled		PRM.CAM1.RVBCL_EN	Enable	1				1	0	X	X	X	X
			Disable	0									
Fill Hole Suppression: Perimeter (Lower Limit)		PRM.CAM1.RVBCL_THRES:LL			0.000	99999.999	0.000	5	3	X	X	X	X
Fill Hole Suppression: Roundness Enabled		PRM.CAM1.RVBCD_EN	Enable	1				1	0	X	X	X	X
			Disable	0									
Fill Hole Suppression: Roundness (Upper Limit)		PRM.CAM1.RVBCD_THRES:HL			1.000	1.000	0.000	1	3	X	X	X	X

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Camera1: 3D Imaging (continued)	Fill Hole Suppression: Roundness (Lower Limit)	PRM.CAM1.RVBCD_THRES:LL		0.000	1.000	0.000	1	3	X	X	X	X
	Fill Hole Suppression: Rectangularity Enabled	PRM.CAM1.RVBRTD_EN	Enable Disable	1 0			1	0	X	X	X	X
	Fill Hole Suppression: Rectangularity (Upper Limit)	PRM.CAM1.RVBRTD_THRES:H_L		1.000	1.000	0.000	1	3	X	X	X	X
	Fill Hole Suppression: Rectangularity (Lower Limit)	PRM.CAM1.RVBRTD_THRES:LL		0.000	1.000	0.000	1	3	X	X	X	X
Projector Selection	PRM.CAM1.HG_PRSL	T+B+L+R T+B L+R T B L R	6 2 5 0 1 3 4				1	0	X	X	X	X
Low Contrast Rejection	PRM.CAM1.HG_LCRRJ	Low Mid High	1 2 3				1	0	X	X	X	X
Outlier Removal	PRM.CAM1.HG_OTLRM	None Low Mid High	0 1 2 3				1	0	X	X	X	X
2-axis Projection	PRM.CAM1.HG_DAPOFF	OFF ON	0 1				1	0	X	X	X	X
Single Projected Part Removal	PRM.CAM1.HG_SPPR	OFF ON	0 1				1	0	X	X	X	X
Invalid Pixel Suppression: Enable Invalid Pixel Suppression	PRM.CAM1.IPO_EN	Enable Disable	1 0				1	0	X	X	X	X
Invalid Pixel Suppression: Level	PRM.CAM1.IPO_DG		1	19	1	1	1	0	X	X	X	X
Invalid Pixel Suppression: Smoothing Size	PRM.CAM1.IPO_SMSZ	Match w/ Level Narrow Normal Wide	0 1 2 3				1	0	O	O	X	O
Invalid Pixel Suppression: Adjustment Width	PRM.CAM1.IPO_PS	Large Small	0 1				1	0	X	X	X	X
Invalid Pixel Suppression: Outline Interpolation Suppress	PRM.CAM1.IPO_CCF	ON OFF	1 0				1	0	X	X	X	X
Invalid Pixel Suppression: Processing Shape	PRM.CAM1.IPO_CFT	Square Circle	0 1				1	0	X	X	X	X
Target	PRM.CAM1.IPO_IMG	Height Image Grayscale Image Height+Grayscale	0 1 2				1	0	X	X	X	X
Spike Noise Cut: Enable Spike Noise Cut	PRM.CAM1.CEN	Enable Disable	1 0				1	0	X	X	X	X
Spike Noise Cut: Cut Size	PRM.CAM1.CSZ		1	30	2	2	2	0	X	X	X	X

Category	Setting item	Name	Label	Value	Selection		Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format			Referencing
					Initial value	Upper limit					User variable	System variable	Result data	
Camera1: 3D Imaging (continued)	Spike Noise Cut: Cut Threshold	PRM.CAM1.CTH		0.5 (CA-DQP25X:1.0)	99.999	0			2	3	X	X	X	X
	Spike Noise Cut: Cut Target	PRM.CAM1.CDR	Upper Lower Both	0 1 2					1	0	X	X	X	X
	Spike Noise Cut: Enable Specify Processing Direction	PRM.CAM1.CPDEN	Enable Disable	1 0					1	0	X	X	X	X
	Spike Noise Cut: Processing Direction Type	PRM.CAM1.CPD	X Direction Y Direction XY Individual	0 1 2					1	0	X	X	X	X
	Spike Noise Cut: X Direction Cut Size	PRM.CAM1.CSZ_X		4	30	2			2	0	X	X	X	X
	Spike Noise Cut: Y Direction Cut Size	PRM.CAM1.CSZ_Y		4	30	2			2	0	X	X	X	X
	Smoothing: Enable Smoothing	PRM.CAM1.SMEN	Enable Disable	1 0					1	0	X	X	X	X
	Smoothing: Smoothing Size	PRM.CAM1.SMSZ		5	127	3			3	0	X	X	X	X
	Smoothing: Expansion Suppression	PRM.CAM1.SPEX	OFF ON	1 0					1	0	X	X	X	X
	Vibration Correction: Enable Vibration Correction	PRM.CAM1.VCEN	Enable Disable	1 0					1	0	X	X	X	X
	Vibration Correction: Set Individually by Head	PRM.CAM1.VC_ECH	Enable Disable	1 0					1	0	X	X	X	X
	Vibration Correction: Correction Type	PRM.CAM1.VC_CTY[*]	Plane (Zθ) Plane (Z) Uniform Section (Z)	0 1 2					1	0	X	X	X	X
	Vibration Correction: Correction Strength	PRM.CAM1.VC_STAB[*]	Weak Normal Strong Very Strong	0 1 2 3					1	0	X	X	X	X
	Vibration Correction: Correction Reference Region	PRM.CAM1.VC_RTY[*]	Whole 1 Rectangle 2 Rectangles	0 1 2					1	0	X	X	X	X
	Vibration Correction: Allowable Range for Reference Detection (mm)	PRM.CAM1.VC_AER[*]		1	999.999	0			3	3	X	X	X	X
	Vibration Correction: Reference Number of Lines	PRM.CAM1.VC_SLN[*]		16383	16383	0			5	0	X	X	X	X
	Vibration Correction: Rect. Upper Left XY	PRM.CAM1.VC_LUXY[*]							5	0	X	X	X	X
	Vibration Correction: Rect. Upper Left X	PRM.CAM1.VC_LUX[*]							4	0	X	X	X	X
	Vibration Correction: Rect. Upper Left Y	PRM.CAM1.VC_LUY[*]							5	0	X	X	X	X
	Vibration Correction: Rect. Lower Right XY	PRM.CAM1.VC_RDXY[*]							5	0	X	X	X	X
	Vibration Correction: Rect. Lower Right X	PRM.CAM1.VC_RDX[*]							4	0	X	X	X	X
	Vibration Correction: Rect. Lower Right Y	PRM.CAM1.VC_RDY[*]							5	0	X	X	X	X

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Camera1: 3D Imaging (continued)	2-Head Dead Angle Cut: PRM.CAM1.DHDEN	Enable	1					1	0	X	X	X	X
	Enable 2-Head Dead Angle Cut	Disable	0										
	2-Head Dead Angle Cut: PRM.CAM1.DHD_FTY	Dead Angle Cut	0					1	0	X	X	X	X
	Processing Type	Noise Cut	1										
		Height Diff. Display	2										
		Dead Angle Cut (Far)	3										
	2-Head Dead Angle Cut: PRM.CAM1.DHD_GGIMG	Enable	1					1	0	X	X	X	X
	Combine Grayscale Images	Disable	0										
	2-Head Dead Angle Cut: PRM.CAM1.DHD_AHD		0.1		999.999	0		3	3	X	X	X	X
	Noise Judgment Threshold (mm)												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_GEN	Enable	1					1	0	X	X	X	X
	Use Grayscale Image	Disable	0										
	Also in Dead Angle Judgment												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_LUXY							5	0	X	X	X	X
	Rect. Upper Left XY												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_LUX		0		1023	0		4	0	X	X	X	X
	Rect. Upper Left X												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_LUY							5	0	X	X	X	X
	Rect. Upper Left Y												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_RDXY							5	0	X	X	X	X
	Rect. Lower Right XY												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_RDX		1023		1023	0		4	0	X	X	X	X
	Rect. Lower Right X												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_RDY							5	0	X	X	X	X
	Rect. Lower Right Y												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_DRY		0		0.999	-0.999		1	3	X	X	X	X
	Ry Angular Difference (deg)												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_DRZ		0		0.999	-0.999		1	3	X	X	X	X
	Rz Angular Difference (deg)												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_DRX		0		0.999	-0.999		1	3	X	X	X	X
	Rx Angular Difference (deg)												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_BRSLT	Enable	1					1	0	X	X	X	X
	Start from previous result	Disable	0										
	2-Head Dead Angle Cut: PRM.CAM1.DHD_SHX		0		9999.999	-999.999		4	3	X	X	X	X
	X Offset												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_SHY		0		9999.999	-999.999		4	3	X	X	X	X
	Y Offset												
	2-Head Dead Angle Cut: PRM.CAM1.DHD_SHZ		0		999999.999	-99999.999		6	3	X	X	X	X
	Z Offset												
	2-Head Dead Angle Cut: PRM.CAM1.LS_MRL	Enable	1					1	0	X	X	X	X
	Vertical Invert: Sensor Head Unit A	Disable	0										
	2-Head Dead Angle Cut: PRM.CAM1.LS_MRR	Enable	1					1	0	X	X	X	X
	Vertical Invert: Sensor Head Unit B	Disable	0										
	2-Head Dead Angle Cut: PRM.CAM1.LS_OFSTEN	Enable	1					1	0	X	X	X	X
	Enable Y Offset	Disable	0										
	2-Head Dead Angle Cut: PRM.CAM1.LS_OFSTL		0		16384	0		5	0	X	X	X	X
	Y Offset: Sensor Head Unit A												

Category	Setting item	Name	Label	Selection			Initial value	Upper limit	Lower limit	Numerical value format		Referencing
				Value						No. of integer digits	No. of decimal places	
Camera1: 3D Imaging (continued)	2-Head Dead Angle Cut: Y Offset: Sensor Head Unit B	PRM.CAM1.LS_OFSTR		0	16384	0	5	0	X	X	X	X
	Dead Zone Noise Removal: Enable Dead Zone Noise Removal	PRM.CAM1.DNREN	Enable	1			1	0	X	X	X	X
			Disable	0								
	Dead Zone Noise Removal: Dead Zone Location	PRM.CAM1.DNR_POS	After	0			1	0	X	X	X	X
			Before	1								
			After/Before	2								
			Before/After	3								
	Dead Zone Noise Removal: Dead Zone Angle	PRM.CAM1.DNR_ANG	(LJ-X8020: 45) (LJ-X8060: 35) (LJ-X8080: 35) (LJ-X8200: 22) (LJ-X8300: 32) (LJ-X8400: 18) (LJ-X8900: 15)	70	5	2	0	X	X	X	X	X
	Dead Zone Noise Removal: Detection Count	PRM.CAM1.DNR_CNT	10	99	1	2	0	X	X	X	X	X
	Dead Zone Noise Removal: Dead Zone Processing Range	PRM.CAM1.DNR RNG	100	950	50	3	0	X	X	X	X	X
	Dead Zone Noise Removal: Skipping	PRM.CAM1.DNR_SKP	1 Point 2 Points 4 Points 8 Points 16 Points	1 2 4 8 16			2	0	X	X	X	X
	Spike Noise Cut (1)	PRM.CAM1.CEN1	Enable	1			1	0	X	X	X	X
	Enable Spike Noise Cut (1)		Disable	0								
	Spike Noise Cut (1)	PRM.CAM1.CSZ1		1	30	2	2	0	X	X	X	X
	Spike Noise Cut (1)	PRM.CAM1.CTH1	Cut Threshold (1)	0.5 (CA-DQP25X:1.0)	99.999	0	2	3	X	X	X	X
	Spike Noise Cut (1)	PRM.CAM1.CDR1	Upper Cut Target (1)	0 1			1	0	X	X	X	X
			Both	2								
	Spike Noise Cut (1)	PRM.CAM1.CPDEN1	Enable Specify Processing Direction (1)	1 Disable 0			1	0	X	X	X	X
	Spike Noise Cut (1)	PRM.CAM1.CPD1	X Direction Direction Type (1)	0 Y Direction XY Individual 1 2			1	0	X	X	X	X
	Spike Noise Cut (1)	PRM.CAM1.CSZ_X1	X Direction Cut Size (1)	4	30	2	2	0	X	X	X	X
	Spike Noise Cut (1)	PRM.CAM1.CSZ_Y1	Y Direction Cut Size (1)	4	30	2	2	0	X	X	X	X
Camera 2*		PRM.CAM2.***										
Camera 3*		PRM.CAM3.***										
Camera 4*		PRM.CAM4.***										
Trigger setting	Capture on trigger input	PRM.DTL.WTRG	Enable	1			1	0	X	X	X	X
			Disable	0								
	Screen update	PRM.DTL.DISp	Trigger	0			1	0	O	O	X	X
			Live Image	1								

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Emission Timing 1	Use FLASH	PRM.FLASH1.FL_EN	Enable	1				1	0	X	X	X	X
			Disable	0									
	Camera Allocation	PRM.FLASH1.CID		0	3	0		1	0	X	X	X	X
	ON-Delay	PRM.FLASH1.SOT		0	50000	-50000		5	0	O	O	X	X
	ON-Delay (Encoder Pulse Count)	PRM.FLASH1.SOTC		0	32767	-32767		5	0	O	O	X	X
	Duration	PRM.FLASH1.OTIM		100.0	999.9	0.1		3	1	O	O	X	X
Emission Timing 12	Synchronize with Shutter Speed	PRM.FLASH1.SSS	Enable	1				1	0	X	X	X	O
			Disable	0									
:		PRM.FLASH12.***											
External Flash 1	Use FLASH	PRM.FLASH13.FL_EN	Enable	1				1	0	X	X	X	X
			Disable	0									
	Camera Allocation	PRM.FLASH13.CID		0	3	0		1	0	X	X	X	X
	ON-Delay	PRM.FLASH13.SOT		0	50000	-50000		5	0	O	O	X	X
	ON-Delay (Encoder Pulse Count)	PRM.FLASH13.SOTC		0	32767	-32767		5	0	O	O	X	X
	Duration	PRM.FLASH13.OTIM		100.0	999.9	0.1		3	1	O	O	X	X
External Flash 4	Synchronize with Shutter Speed	PRM.FLASH13.SSS	Enable	1				1	0	X	X	X	O
			Disable	0									
:		PRM.FLASH16.***											
Light 1	Enable light	PRM.LIGHT1.LT_EN	Enable	1				1	0	X	X	X	X
			Disable	0									
	Flash assignment	PRM.LIGHT1.FLS	Emission Timing 1	0				2	0	X	X	X	X
			Emission Timing 2	1									
			Emission Timing 3	2									
			Emission Timing 4	3									
			Emission Timing 5	4									
			Emission Timing 6	5									
			Emission Timing 7	6									
			Emission Timing 8	7									
			Emission Timing 9	8									
			Emission Timing 10	9									
			Emission Timing 11	10									
			Emission Timing 12	11									
			External Flash 1	12									
			External Flash 2	13									
			External Flash 3	14									
			External Flash 4	15									
Light intensity		PRM.LIGHT1.VLM		511	1023	0		4	0	O	O	X	X

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Light 1 (continued)	Continuous lighting	PRM.LIGHT1.CONT	ON	1				1	0	X	X	X	X
			OFF	0									
	Lighting color	PRM.LIGHT1.LCLR	UV	0				1	0	X	X	X	X
			B	1									
			G	2									
			AM	3									
			R	4									
			FR	5									
			IR	6									
			W	7									
	Light volume feedback control	PRM.LIGHT1.LQ	ON	1				1	0	X	X	X	X
			OFF	0									
Light 2		PRM.LIGHT2.***											
:		:											
Light 16		PRM.LIGHT16.***											
Capture mode setting	Capture mode	PRM.LTRX1.LENB	Standard Lighting	0				1	0	X	X	X	X
			LumiTrax	1									
			LumiTrax	2									
			Specular Reflection										
			MultiSpectrum	3									
			3D Capture Mode	4									
			Outline Capture Mode	5									
LumiTrax mode Settings 1	Track Moving Object	PRM.LTRX1.MENB	Disabled	0				1	0	X	X	X	X
			Enabled	1									
	Halation Cut	PRM.LTRX1.AHS	Off	0				1	0	O	O	X	X
			Weak	1									
			Strong	2									
			Very Strong	3									
	Emphasis: Direction	PRM.LTRX1.DE	Off	0				1	0	X	X	X	X
			X Direction	1									
			Y Direction	2									
	Emphasis: Degree	PRM.LTRX1.DEDG	Weak	1				1	0	O	O	X	X
			Strong	2									
			Very Strong	3									
	Ambient Light Cut	PRM.LTRX1.ABM	Disabled	0				1	0	X	X	X	X
			Enabled	1									
	Lighting Count	PRM.LTRX1.CPM	4	0				1	0	X	X	X	X
			8	1									
	Lighting Width	PRM.LTRX1.LPW	Standard	0				1	0	O	O	X	X
			Narrow	1									
	Intensity	PRM.LTRX1.VLM		511		1023	0	4	0	O	O	X	X
	Lighting color	PRM.LTRX1.LCLR	UV	0				1	0	X	X	X	X
			B	1									
			G	2									
			AM	3									
			R	4									
			FR	5									
			IR	6									
			W	7									

List of setting parameters

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value				No. of integer digits	No. of decimal places		
LumiTrax mode Settings 1 (continued)	Share Lighting With Other Cameras	PRM.LTRX1.DLSH	Do Not Share	-1						x	x
			Camera 1	0						x	x
			Camera 2	1							
			Camera 3	2							
			Camera 41	3							
Emission Timing		PRM.LTRX1.LTFL	Emission Timing 1	0						x	x
			Emission Timing 2	1						x	x
			Emission Timing 3	2							
			Emission Timing 4	3							
			Emission Timing 5	4							
			Emission Timing 6	5							
			Emission Timing 7	6							
			Emission Timing 8	7							
			Emission Timing 9	8							
			Emission Timing 10	9							
			Emission Timing 11	10							
			Emission Timing 12	11							
			External Flash 1	12							
			External Flash 2	13							
			External Flash 3	14							
			External Flash 4	15							
Sensitivity		PRM.LTRX1.SNS	Lowest (-3)	-3				1	0	o	x
			Lower (-2)	-2							
			Low (-1)	-1							
			Normal (0)	0							
			High (1)	1							
			Higher (2)	2							
			Highest (3)	3							
			Highest + (4)	4							
Accuracy		PRM.LTRX1.PRC	Lowest (-3)	-3				1	0	o	x
			Lower (-2)	-2							
			Low (-1)	-1							
			Normal (0)	0							
			High (1)	1							
			Higher (2)	2							
			Highest (3)	3							
Min. Match%		PRM.LTRX1.DLV		60.000	99.999	0.000	2	3	o	x	x
Angle Range		PRM.LTRX1.ARG		0.000	90.000	0.000	2	3	o	x	x

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data
LumiTrax mode	Fine Feature Search	PRM.LTRX1.TFENB	Disabled	0				1	0	x	x	x
			Enabled	1								
Settings 1 (continued)	Vibration Correction	PRM.LTRX1.OENB	Disabled	0				1	0	x	x	x
			Enabled	1								
Shape Image 1: Feature Size			PRM.LTRX1.SH_FS[0]	4	999	1		3	0	○	○	x
Shape Image 1: Feature Size Margin			PRM.LTRX1.SH_FM[0]	2	5	0		1	0	○	○	x
Shape Image 1: Contrast			PRM.LTRX1.SH_GA[0]	1.0	9.9	0.1		1	1	○	○	x
Shape Image 1: Level			PRM.LTRX1.SH_LV[0]	128	255	0		3	0	○	○	x
Shape Image 1: Noise Cut			PRM.LTRX1.SH_NR[0]	0.0	255.0	0.0		3	1	○	○	x
Texture Pattern Cut	Shape Image 1: Texture Pattern Cut	PRM.LTRX1.SH_TR[0]	Off	0				1	0	○	○	x
			Weak	1								
			Strong	2								
			Very Strong	3								
Shape Image 1: Image Selection			PRM.LTRX1.SH_ENO[0]					1	0	x	x	x
Shape Image 1: Guided Filter			PRM.LTRX1.SH_GI[0]	0	255	0		3	0	○	○	x
Shape Image 2			PRM.LTRX1.SH_***[1]									
Shape Image 3			PRM.LTRX1.SH_***[2]									
Texture Pattern Image: Contrast			PRM.LTRX1.TXT_GA	1.0	99.9	0.1		1	1	○	○	x
Halation Cut	Texture Pattern Image: Halation Cut	PRM.LTRX1.TXT_AHS	Off	0				1	0	○	○	x
			Weak	1								
			Strong	2								
			Very Strong	3								
Texture Pattern Image: Image Selection			PRM.LTRX1.TXT_ENO					1	0	x	x	x
Gradient X Image: Image Selection			PRM.LTRX1.GRX_ENO					1	0	x	x	x
Gradient Y Image: Image Selection			PRM.LTRX1.GRY_ENO					1	0	x	x	x
Normal Image: Image Selection			PRM.LTRX1.REF1_ENO					1	0	x	x	x
Registered Pattern Center XY			PRM.LTRX1.PTSTXY					5	3	x	x	x
Registered Pattern Center X			PRM.LTRX1.PTSTX	0.0	99999.999	-99999.999		5	3	x	x	x
Registered Pattern Center Y			PRM.LTRX1.PTSTY	0.0	99999.999	-99999.999		5	3	x	x	x
Search Region			PRM.LTRX1.RGN									
Upper Left XY			PRM.LTRX1.RGN.LUXY					5	0	○	x	x
Upper Left X			PRM.LTRX1.RGN.LUX	16383	0			5	0	○	○	x
Upper Left Y			PRM.LTRX1.RGN.LUY	16383	0			5	0	○	○	x
Lower Right XY			PRM.LTRX1.RGN.RDXY					5	0	○	x	x
Lower Right X			PRM.LTRX1.RGN.RDX	16383	0			5	0	○	○	x
Lower Right Y			PRM.LTRX1.RGN.RDY	16383	0			5	0	○	○	x
Pattern Region			PRM.LTRX1.PTRN									
Upper Left XY			PRM.LTRX1.PTRN.LUXY					5	0	x	x	x
Upper Left X			PRM.LTRX1.PTRN.LUX	16383	0			5	0	x	x	x
Upper Left Y			PRM.LTRX1.PTRN.LUY	16383	0			5	0	x	x	x
Lower Right XY			PRM.LTRX1.PTRN.RDXY					5	0	x	x	x
Lower Right X			PRM.LTRX1.PTRN.RDX	16383	0			5	0	x	x	x
Lower Right Y			PRM.LTRX1.PTRN.RDY	16383	0			5	0	x	x	x

List of setting parameters

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value				No. of integer digits	No. of decimal places		
LumiTrax mode Settings 2		PRM.LTRX2.***									
LumiTrax mode Settings 3		PRM.LTRX3.***									
LumiTrax mode Settings 4		PRM.LTRX4.***									
LumiTrax Specular Reflection Mode Setting 1	LumiTrax light	PRM.LTRX1.LTAS	Unset	-1				x	x	x	○
			Light 1	0							
			Light 2	1							
			Light 3	2							
			Light 4	3							
			Light 5	4							
			Light 6	5							
			Light 7	6							
			Light 8	7							
			Light 9	8							
			Light 10	9							
			Light 11	10							
			Light 12	11							
			Light 13	12							
			Light 14	13							
			Light 15	14							
			Light 16	15							
Light intensity		PRM.LTRX1.VLM			511	1023	0	4	0	○	○
Emitted Pattern Size		PRM.LTRX1.SPRF.DLPL	Small	0				x	x	x	○
			Medium	1							
			Large	2							
Use Transmitted Light		PRM.LTRX1.SPRF.DFLTL	Reflected Light Installation	0				x	x	x	○
			Transmitted Light Installation	1							
Object Movement Direction		PRM.LTRX1.SPRF.DFLWMV	From Camera Base to Top	0				x	x	x	○
			From Camera Top to Base	1							
Light cable direction		PRM.LTRX1.SPRF.DFLLTD	Reference Direction	0				x	x	x	○
			90°	90							
			180°	180							
			270°	-90							
Share light of other camera		PRM.LTRX1.SPRF.DLSH	Do Not Share	-1				x	x	x	○
			Camera 1	0							
			Camera 2	1							
			Camera 3	2							
			Camera 4	3							
Specular Reflection Image: Gain		PRM.LTRX1.SPRF.GLGN			3.0	20.0	0.1	2	1	○	x
Specular Reflection Image: Directional emphasis		PRM.LTRX1.SPRF.GLDE	None	0				x	x	x	○
			X Direction	1							
			Y Direction	2							

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
LumiTrax Specular Reflection Mode Setting 1 (continued)	Specular Reflection Image: Intensity Degree	PRM.LTRX1.SPRF.GLDEDG	Weak Strong Very strong	1 2 3	3.0	20.0	0.1	2	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
	Diffuse Reflection Image: Gain	PRM.LTRX1.SPRFDIGN											<input type="radio"/>
	Diffuse Reflection Image: Directional emphasis	PRM.LTRX1.SPRFDIDE	None X Direction Y Direction	0 1 2									<input type="radio"/>
	Diffuse Reflection Image: Emphasis degree	PRM.LTRX1.SPRFDIDE	Weak Strong Very strong	1 2 3									<input type="radio"/>
	Shape Image 1: Contrast	PRM.LTRX1.SPRFDSHGA[0]											<input type="radio"/>
	Shape Image 1: Feature Size	PRM.LTRX1.SPRFDSHFS[0]						3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 1: Feature Size Margin	PRM.LTRX1.SPRFDSHFM[0]						1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 1: Level	PRM.LTRX1.SPRFDSHLV[0]						3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 1: Noise Cut	PRM.LTRX1.SPRFDSHNR[0]						0.0	255.0	0.0	3	1	<input type="radio"/>
	Shape Image 1: Absolute Value Mode	PRM.LTRX1.SPRFDSHAM[0]	OFF ON	0 1									<input type="radio"/>
Shape Image 1: Emphasis degree	Shape Image 1: Directional emphasis	PRM.LTRX1.SPRFDSDE[0]	None X Direction Y Direction	0 1 2	1	5	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 1: Emphasis degree	PRM.LTRX1.SPRFDSDEDG[0]	Weak Strong Very strong	1 2 3									<input type="radio"/>
	Shape Image 2: Contrast	PRM.LTRX1.SPRFDSHGA[1]						2	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 2: Feature Size	PRM.LTRX1.SPRFDSHFS[1]						3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 2: Feature Size Margin	PRM.LTRX1.SPRFDSHFM[1]						1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 2: Level	PRM.LTRX1.SPRFDSHLV[1]						3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 2: Noise Cut	PRM.LTRX1.SPRFDSHNR[1]						0.0	255.0	0.0	3	1	<input type="radio"/>
	Shape Image 2: Absolute Value Mode	PRM.LTRX1.SPRFDSHAM[1]	OFF ON	0 1									<input type="radio"/>
	Shape Image 2: Directional emphasis	PRM.LTRX1.SPRFDSDE[1]	None X Direction Y Direction	0 1 2									<input type="radio"/>
	Shape Image 2: Emphasis degree	PRM.LTRX1.SPRFDSDEDG[1]	Weak Strong Very strong	1 2 3									<input type="radio"/>
Gloss Ratio Image: Gain	Gloss Ratio Image: Gain	PRM.LTRX1.SPRFBAGN			1.0	99.9	0.1	2	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Gloss Ratio Image: Level	PRM.LTRX1.SPRFDGNY			128	255	0	3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Specular Reflection Image: Select image	PRM.LTRX1.SPRFGL_EN			1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Diffuse Reflection Image: Select image	PRM.LTRX1.SPRFDI_EN			1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 1: Select image	PRM.LTRX1.SPRFSH_EN[0]			1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Shape Image 2: Select image	PRM.LTRX1.SPRFSH_EN[1]			1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Numerical value format			Referencing
				Value	Initial value	Upper limit			User variable	System variable	Result data	
LumiTrax Specular Reflection Mode Setting 1 (continued)	Phase X Image: Select image	PRM.LTRX1.SPRF.PX_EN		0	1	0	1	0	x	x	x	○
	Phase Y Image: Select image	PRM.LTRX1.SPRF.PY_EN		0	1	0	1	0	x	x	x	○
	Gloss Ratio Image: Select image	PRM.LTRX1.SPRF.BA_EN		0	1	0	1	0	x	x	x	○
	Normal Image: Select image	PRM.LTRX1.SPRF.NO_EN		1	1	0	1	0	x	x	x	○
	X1 Image: Select image	PRM.LTRX1.SPRF.X1_EN		0	1	0	1	0	x	x	x	○
	X2 Image: Select image	PRM.LTRX1.SPRF.X2_EN		0	1	0	1	0	x	x	x	○
	X3 Image: Select image	PRM.LTRX1.SPRF.X3_EN		0	1	0	1	0	x	x	x	○
	X4 Image: Select image	PRM.LTRX1.SPRF.X4_EN		0	1	0	1	0	x	x	x	○
	Y1 Image: Select image	PRM.LTRX1.SPRF.Y1_EN		0	1	0	1	0	x	x	x	○
	Y2 Image: Select image	PRM.LTRX1.SPRF.Y2_EN		0	1	0	1	0	x	x	x	○
LumiTrax Specular Reflection Mode Setting 2	Y3 Image: Select image	PRM.LTRX1.SPRF.Y3_EN		0	1	0	1	0	x	x	x	○
	Y4 Image: Select image	PRM.LTRX1.SPRF.Y4_EN		0	1	0	1	0	x	x	x	○
	Registered Pattern Center XY	PRM.LTRX1.PTSTXY					5	3	x	x	x	x
	Registered Pattern Center X	PRM.LTRX1.PTSTX		0.0	99999.999	-99999.999	5	3	x	x	x	x
	Registered Pattern Center Y	PRM.LTRX1.PTSTY		0.0	99999.999	-99999.999	5	3	x	x	x	x
	Search Region	PRM.LTRX1.RGN										
	Upper Left XY	PRM.LTRX1.RGN.LUXY					5	0	○	x	x	x
	Upper Left X	PRM.LTRX1.RGN.LUX		16383	0		5	0	○	○	x	x
	Upper Left Y	PRM.LTRX1.RGN.LUY		16383	0		5	0	○	○	x	x
	Lower Right XY	PRM.LTRX1.RGN.RDXY					5	0	○	x	x	x
LumiTrax Specular Reflection Mode Setting 3	Lower Right X	PRM.LTRX1.RGN.RDX		16383	0		5	0	○	○	x	x
	Lower Right Y	PRM.LTRX1.RGN.RDY		16383	0		5	0	○	○	x	x
	Pattern Region	PRM.LTRX1.PTRN										
	Upper Left XY	PRM.LTRX1.PTRN.LUXY					5	0	x	x	x	x
	Upper Left X	PRM.LTRX1.PTRN.LUX		16383	0		5	0	x	x	x	x
	Upper Left Y	PRM.LTRX1.PTRN.LUY		16383	0		5	0	x	x	x	x
	Lower Right XY	PRM.LTRX1.PTRN.RDXY					5	0	x	x	x	x
	Lower Right X	PRM.LTRX1.PTRN.RDX		16383	0		5	0	x	x	x	x
	Lower Right Y	PRM.LTRX1.PTRN.RDY		16383	0		5	0	x	x	x	x
	LumiTrax Specular Reflection Mode Setting 4	PRM.LTRX2.***										
LumiTrax Specular Reflection Mode Setting 3	LumiTrax Specular Reflection Mode Setting 4	PRM.LTRX3.***										
	LumiTrax Specular Reflection Mode Setting 4	PRM.LTRX4.***										

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Initial value	Upper limit	Lower limit			User variable	System variable	Result data	Unit properties
MultiSpectrum Mode Setting 1	LED intensity for UV	PRM.LTRX1.MLSP.LIN[0]		511	1023	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	LED intensity for B	PRM.LTRX1.MLSP.LIN[1]		511	1023	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	LED intensity for G	PRM.LTRX1.MLSP.LIN[2]		511	1023	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	LED intensity for AM	PRM.LTRX1.MLSP.LIN[3]		511	1023	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	LED intensity for R	PRM.LTRX1.MLSP.LIN[4]		511	1023	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	LED intensity for FR	PRM.LTRX1.MLSP.LIN[5]		511	1023	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	LED intensity for IR	PRM.LTRX1.MLSP.LIN[6]		511	1023	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	LED intensity for W	PRM.LTRX1.MLSP.LIN[7]		511	1023	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Share Lighting With Other Cameras	PRM.LTRX1.MLSP.DLSH	Do Not Share Camera 1 Camera 2 Camera 3 Camera 4	-1 0 1 2 3					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Track Moving Object	PRM.LTRX1.MLSP.MENB		0	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Ambient Light Cut	PRM.LTRX1.MLSP.ABM		0	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable lighting color UV	PRM.LTRX1.MLSP.WENB[0]		1	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable lighting color B	PRM.LTRX1.MLSP.WENB[1]		1	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable lighting color G	PRM.LTRX1.MLSP.WENB[2]		1	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable lighting color AM	PRM.LTRX1.MLSP.WENB[3]		1	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable lighting color R	PRM.LTRX1.MLSP.WENB[4]		1	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable lighting color FR	PRM.LTRX1.MLSP.WENB[5]		1	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable lighting color IR	PRM.LTRX1.MLSP.WENB[6]		1	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Enable lighting color W	PRM.LTRX1.MLSP.WENB[7]		1	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Vibration correction	PRM.LTRX1.MLSP.OENB		0	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Fine feature search	PRM.LTRX1.MLSP.TFENB		0	1	0	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Search sensitivity	PRM.LTRX1.MLSP.SNS	Low (-3) Rather low (-2) Somewhat low (-1) Normal (0) Somewhat high (1) Rather high (2) High (3) Very high (4)						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Search accuracy	PRM.LTRX1.MLSP.PRC	Very rough (-3) Rough (-2) Somewhat rough (-1) Normal (0) Somewhat fine (-1) Fine (2) Very fine (3)						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Match % lower limit	PRM.LTRX1.MLSP.DLV		60.000	99.999	0.000	2	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Angle Range (°)	PRM.LTRX1.MLSP.ARG		0.000	90.000	0.000	2	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
MultiSpectrum Mode Setting 1 (continued)	Lighting color	PRM.LTRX1.MLSP.LCLR	UV	0				1	0	x	x	x	○
			B	1									
			G	2									
			AM	3									
			R	4									
			FR	5									
			IR	6									
			W	7									
	Individual settings	PRM.LTRX1.MLSP.VIND		0		1	0	1	0	x	x	x	○
	Enable color image	PRM.LTRX1.MLSP.COL_EN		1		1	0	1	0	x	x	x	○
	Enable Color-Difference Image	PRM.LTRX1.MLSP.EXCOL_EN		1		1	0	1	0	x	x	x	○
	Registered Pattern Center XY	PRM.LTRX1.PTSTXY						5	3	x	x	x	x
	Registered Pattern Center X	PRM.LTRX1.PTSTX		0.0		99999.999	-99999.999	5	3	x	x	x	x
	Registered Pattern Center Y	PRM.LTRX1.PTSTY		0.0		99999.999	-99999.999	5	3	x	x	x	x
	Search Region	PRM.LTRX1.RGN											
	Upper Left XY	PRM.LTRX1.RGN.LUXY						5	0	○	x	x	x
	Upper Left X	PRM.LTRX1.RGN.LUX			16383	0		5	0	○	○	x	x
	Upper Left Y	PRM.LTRX1.RGN.LUY			16383	0		5	0	○	○	x	x
	Lower Right XY	PRM.LTRX1.RGN.RDXY						5	0	○	x	x	x
	Lower Right X	PRM.LTRX1.RGN.RDX			16383	0		5	0	○	○	x	x
	Lower Right Y	PRM.LTRX1.RGN.RDY			16383	0		5	0	○	○	x	x
	Pattern Region	PRM.LTRX1.PTRN											
	Upper Left XY	PRM.LTRX1.PTRN.LUXY						5	0	x	x	x	x
	Upper Left X	PRM.LTRX1.PTRN.LUX			16383	0		5	0	x	x	x	x
	Upper Left Y	PRM.LTRX1.PTRN.LUY			16383	0		5	0	x	x	x	x
	Lower Right XY	PRM.LTRX1.PTRN.RDXY						5	0	x	x	x	x
	Lower Right X	PRM.LTRX1.PTRN.RDX			16383	0		5	0	x	x	x	x
	Lower Right Y	PRM.LTRX1.PTRN.RDY			16383	0		5	0	x	x	x	x
MultiSpectrum Mode Setting 2		PRM.LTRX2.MLSP.***											
MultiSpectrum Mode Setting 3		PRM.LTRX3.MLSP.***											
MultiSpectrum Mode Setting 4		PRM.LTRX4.MLSP.***											
3D Capture Mode Settings 1	2D Capture Settings:	PRM.CAM1.TEXTN						1	0	x	x	x	x
	Contrast	PRM.CAM1.TEXTCN		1	8	0.1		1	1	x	x	x	x
	Capture Settings:	PRM.LTRX1.PP_TD.SSPD		5	100	0.5		3	1	x	x	x	x
	Shutter Speed (3D)	PRM.LTRX1.PP_TD.GN_S		3	7	1		1	1	x	x	x	x
	Capture Settings:	PRM.LTRX1.PP_TD.MSHDR_EN						1	0	x	x	x	x
	Camera Sensitivity (3D)	PRM.LTRX1.PP_TD.MSHDR_RATIO	1/2	2									
			1/4	4									
			1/8	8									
			1/16	16									
	Capture Settings:	PRM.LTRX1.PP_TD.TPC	4	0	8			1	0	x	x	x	x
	Projection Count	PRM.LTRX1.PP_TD.TPC	8		1								

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Numerical value format			Referencing
				Value	Initial value	Upper limit			User variable	System variable	Result data	
3d Capture Mode	Capture Settings: Light Volume (3D)	PRM.LTRX1.PP_TD.TVLM		1023	1023	0	4	0	x	x	x	x
Settings 1 (continued)	Calibration Settings: Calibration Data ID	PRM.LTRX1.PP_TD.TCLB_ID		0	127	0	3	0	x	x	x	x
	Calibration Settings: Scaling Calculation Height	PRM.LTRX1.PP_TD.SZCTYP					1	0	x	x	x	x
	Noise Cut: Hole Noise Suppression	PRM.LTRX1.PP_TD.TRH					1	0	x	x	x	x
	Noise Cut: Ambient Light Noise Cut	PRM.LTRX1.PP_TD.AMBNC					1	0	x	x	x	x
	Noise Cut: Smoothing Threshold	PRM.LTRX1.PP_TD.ESSMTH		0.5	999.9	0.0	3	1	x	x	x	x
	Noise Cut: Smoothing Processing	PRM.LTRX1.PP_TD.ESSMEN	OFF ON	0 1			1	0	x	x	x	x
	Spike Noise Cut: Enable Spike Noise Cut	PRM.LTRX1.PP_TD.SNC_EN					1	0	x	x	x	x
	Spike Noise Cut: Spike Noise Cut	PRM.LTRX1.PP_TD.FLTR_SP					1	0	x	x	x	x
	Spike Noise Cut: Cut Size	PRM.LTRX1.PP_TD.FLTR_SP.CSZ		4	30	2	2	0	x	x	x	x
	Spike Noise Cut: Cut Threshold	PRM.LTRX1.PP_TD.FLTR_SP.CTH		0.05	99.999	0	2	3	x	x	x	x
	Spike Noise Cut: Cut Target	PRM.LTRX1.PP_TD.FLTR_SP.CDR	Upper Lower Both	0 1 2			1	0	x	x	x	x
	Spike Noise Cut: Enable Processing Direction Specification	PRM.LTRX1.PP_TD.FLTR_SP.CPDEN					1	0	x	x	x	x
	Spike Noise Cut: Processing Direction	PRM.LTRX1.PP_TD.FLTR_SP.CPD	X Y XY individual	0 1 2			1	0	x	x	x	x
	Spike Noise Cut: X Direction Cut Size	PRM.LTRX1.PP_TD.FLTR_SP.CSZ_X		4	30	2	2	1	x	x	x	x
	Spike Noise Cut: Y Direction Cut Size	PRM.LTRX1.PP_TD.FLTR_SP.CSZ_Y		4	30	2	2	1	x	x	x	x
	Invalid Pixel Suppression: Enable Invalid Pixel Suppression	PRM.LTRX1.PP_TD.FV_EN					1	0	x	x	x	x
	Invalid Pixel Suppression: Invalid Pixel Suppression	PRM.LTRX1.PP_TD.FLTR_FV					1	0	x	x	x	x
	Invalid Pixel Suppression: Level	PRM.LTRX1.PP_TD.FLTR_FV.IPO_DG		1	19	1	1	0	x	x	x	x
	Invalid Pixel Suppression: Outline Interpolation Suppression	PRM.LTRX1.PP_TD.FLTR_FV.IPO_CCF	OFF ON	0 1			1	0	x	x	x	x
3d Capture Mode Settings 2		PRM.CAM2.*** PRM.LTRX2.***										
3d Capture Mode Settings 3		PRM.CAM3.*** PRM.LTRX3.***										
3d Capture Mode Settings 4		PRM.CAM4.*** PRM.LTRX4.***										

List of setting parameters

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Outline Capture Mode Settings	Capture Mode Settings: Track Moving Object	PRM.LTRX1.PP_OL.MENB	Disabled Enabled	0 1				1	0.5	x	x	x	x
	Capture Mode Settings: Ambient Light Cut	PRM.LTRX1.PP_OL.ABM	Disabled Enabled	0 1				1	0.5	x	x	x	x
	Track Moving Object Parameters: Angle Range (°)	PRM.LTRX1.PP_OL.ARG		0	90	0	2	3	0	o	o	x	x
	Track Moving Object Parameters: Search Sensitivity	PRM.LTRX1.PP_OL.SNS	Lowest Lower Low Normal High Higher Highest Highest+	-3 -2 -1 0 1 2 3 4			1	0	o	o	x	x	
	Track Moving Object Parameters: Search Accuracy	PRM.LTRX1.PP_OL.PRC	Lowest Lower Low Normal High Higher Highest	-3 -2 -1 0 1 2 3			1	0	o	o	x	x	
	Track Moving Object Parameters: Minimum Match %	PRM.LTRX1.PP_OL.DLV		60	99.999	0	2	3	0	o	o	x	x
	Track Moving Object Parameters: Fine Feature Search	PRM.LTRX1.PP_OL.TFENB	Disabled Enabled	0 1				1	0	o	o	x	x
	Track Moving Object Parameters: Vibration Correction	PRM.LTRX1.PP_OL.OENB	Disabled Enabled	0 1				1	0	o	o	x	x
	Registered Pattern Center: Registered Pattern Center XY	PRM.LTRX1.PP_OL.PTSTXY					5	3	x	x	x	x	
	Registered Pattern Center: Registered Pattern Center X	PRM.LTRX1.PP_OL.PTSTX		0	99999.999	-99999.999	5	3	x	x	x	x	
	Registered Pattern Center: Registered Pattern Center Y	PRM.LTRX1.PP_OL.PTSTY		0	99999.999	-99999.999	5	3	x	x	x	x	
	Lighting Parameters: Lighting Width	PRM.LTRX1.PP_OL.LPW	Standard Narrow	0 1			1	0	o	o	x	x	
	Lighting Parameters: Volume (For Texture/ Outline)	PRM.LTRX1.PP_OL.LVFCE		512	1023	0	4	0	x	x	x	x	
	Outline Image: Extraction Mode	PRM.LTRX1.PP_OL.EXMD	Standard Hole Outline Accentuation	0 1 1 2 2 3			1	0	o	o	x	x	
	Outline Image: Extraction Level	PRM.LTRX1.PP_OL.EXLV		30	99	1	2	0	o	o	x	x	

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Outline Capture Mode Settings 1 (continued)	Outline Image: Outline Change Suppression	PRM.LTRX1.PP_OL.CHSPLV	Weak	0				1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Slightly Weak	1						<input type="radio"/>	<input type="radio"/>		
			Medium	2						<input type="radio"/>	<input type="radio"/>		
			Slightly Strong	3						<input type="radio"/>	<input type="radio"/>		
			Strong	4						<input type="radio"/>	<input type="radio"/>		
	Outline Image: Segment Size	PRM.LTRX1.PP_OL.OLGSZ	1x1	0				1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			2x2	1						<input type="radio"/>	<input type="radio"/>		
	Outline Image: Noise Cut	PRM.LTRX1.PP_OL.NCLV	Weak	3				1	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Slightly Weak	4						<input type="radio"/>	<input type="radio"/>		
			Normal	0						<input type="radio"/>	<input type="radio"/>		
			Slightly Strong	1						<input type="radio"/>	<input type="radio"/>		
			Strong	2						<input type="radio"/>	<input type="radio"/>		
Outline Capture Mode Settings 2	Outline Image: Extraction Strength	PRM.LTRX1.PP_OL.DNCLV		1	99	0	2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Search Region (Rectangle): Upper Left XY	PRM.LTRX1.PP_OL.RGN.LUXY					5	0	<input checked="" type="checkbox"/>				
	Search Region (Rectangle): Upper Left X	PRM.LTRX1.PP_OL.RGN.LUX			16383	0	5	0	<input checked="" type="checkbox"/>				
	Search Region (Rectangle): Upper Left Y	PRM.LTRX1.PP_OL.RGN.LUY			16383	0	5	0	<input checked="" type="checkbox"/>				
	Search Region (Rectangle): Lower Right XY	PRM.LTRX1.PP_OL.RGN.RDXY					5	0	<input checked="" type="checkbox"/>				
	Search Region (Rectangle): Lower Right X	PRM.LTRX1.PP_OL.RGN.RDX			16383	0	5	0	<input checked="" type="checkbox"/>				
	Search Region (Rectangle): Lower Right Y	PRM.LTRX1.PP_OL.RGN.RDY			16383	0	5	0	<input checked="" type="checkbox"/>				
	Pattern Region (Rectangle): Upper Left XY	PRM.LTRX1.PP_OL.PTRN.LUXY					5	0	<input checked="" type="checkbox"/>				
	Pattern Region (Rectangle): Upper Left X	PRM.LTRX1.PP_OL.PTRN.LUX			16383	0	5	0	<input checked="" type="checkbox"/>				
	Pattern Region (Rectangle): Upper Left Y	PRM.LTRX1.PP_OL.PTRN.LUY			16383	0	5	0	<input checked="" type="checkbox"/>				
Outline Capture Mode Settings 3	Pattern Region (Rectangle): Lower Right XY	PRM.LTRX1.PP_OL.PTRN.RDXY					5	0	<input checked="" type="checkbox"/>				
	Pattern Region (Rectangle): Lower Right X	PRM.LTRX1.PP_OL.PTRN.RDX			16383	0	5	0	<input checked="" type="checkbox"/>				
	Pattern Region (Rectangle): Lower Right Y	PRM.LTRX1.PP_OL.PTRN.RDY			16383	0	5	0	<input checked="" type="checkbox"/>				
	Outline Capture Mode Settings 4	PRM.LTRX2.***											
Outline Capture Mode Settings 3	Outline Capture Mode Settings 3	PRM.LTRX3.***											
	Outline Capture Mode Settings 4	PRM.LTRX4.***											

Area Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Detection condition	Detect	PRM.DTL.DC	White	255						O	O	X	O
			Black	0									
Parameters	Origin XY	PRM.DTL.OGXY						4	3	X	X	X	O
	Origin X	PRM.DTL.OGX			0.000	9600.000	-9600.000	4	3	X	X	X	O
	Origin Y	PRM.DTL.OGY			0.000	7200.000	-7200.000	4	3	X	X	X	O
Coordinate value	PRM.DTL.CRD		After position adjustment	0						X	X	X	O
			Before position adjustment	1									
Limits	Area: Upper limit	PRM.DTL.AR:HL		-	99999999	0		8	0	O	O	X	O
	Area: Lower limit	PRM.DTL.AR:LL		-	99999999	0		8	0	O	O	X	O

Pattern Search Unit

Category	Setting item	Name	Selection			Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value	No. of integer digits No. of decimal places				User variable	System variable	
Image setting	Image variable assignment	PRM.DTL.UPIR	Enable	1	3 3	0.000	180.000	0.000	X	X	X O
			Disable	0							
	Reference variable	PRM.DTL.PIV							X	X	X O
Detection condition	Angle: + range	PRM.DTL.ARG:HL		0.000	180.000	0.000	3	3	O	O	X O
	Angle: - range	PRM.DTL.ARG:LL		0.000	0.000	-179.999	3	3	O	O	X O
	Count	PRM.DTL.MXN		1	99	1	2	0	X	X	X O
	Search sensitivity	PRM.DTL.SNS		0	4	-3	1	0	O	O	X O
	Search accuracy	PRM.DTL.PRC		0	3	-3	1	0	O	O	X O
	Minimum match %	PRM.DTL.DLV		60.000	99.999	0.000	2	3	O	O	X O
	Detection order	PRM.DTL.LOD	Y>X: Ascend	5					O	O	X O
			X>Y: Ascend	6							
			X:Ascend	1							
			X:Descend	2							
Parameters	Starting angle	PRM.DTL.STA		0.000	359.999	0.000	3	3	O	O	X O
	Origin XY	PRM.DTL.OGXY					4	3	X	X	X O
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	X	X	X O
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	X	X	X O
	Detection point offset XY	PRM.DTL.DTXY					4	3	O	X	X O
	Detection point offset X	PRM.DTL.DTX		0.000	9600.000	-9600.000	4	3	O	O	X O
	Detection point offset Y	PRM.DTL.DTY		0.000	7200.000	-7200.000	4	3	O	O	X O
	Pattern base XY	PRM.DTL.PTSTXY					5	3	X	X	X X
	Pattern base X	PRM.DTL.PTSTX		0.000	99999.999	-99999.999	5	3	X	X	X X
	Pattern base Y	PRM.DTL.PTSTY		0.000	99999.999	-99999.999	5	3	X	X	X X
Large area search mode	PRM.DTL.PTLAM	Disable	0						X	X	X O
		Mode 1	1								
		Mode 2	2								
	Coordinate value	PRM.DTL.CRD	After position adjustment	0					X	X	X O
			Before position adjustment	1							
Primary target	PRM.DTL.LLB		0	98	0	2	0	X	X	X	O
Registered image update	PRM.DTL.PHSM	Fixed (fast)	1						X	X	X O
		Update each process (slow)	0								
		User updated (fast)	2								

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits	Count: Upper limit	PRM.DTL.N:HL		-	99	0	2	0	O	O	X	O
	Count: Lower limit	PRM.DTL.N:LL		-	99	0	2	0	O	O	X	O
	Position X: Upper limit	PRM.DTL.X:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position X: Lower limit	PRM.DTL.X:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y: Upper limit	PRM.DTL.Y:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y: Lower limit	PRM.DTL.Y:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Angle: Upper limit	PRM.DTL.T:HL		-	999.999	-999.999	3	3	O	O	X	O
	Angle: Lower limit	PRM.DTL.T:LL		-	999.999	-999.999	3	3	O	O	X	O
	Match %: Upper limit	PRM.DTL.C:HL		-	99.999	0.000	2	3	O	O	X	O
	Match %: Lower limit	PRM.DTL.C:LL		-	99.999	0.000	2	3	O	O	X	O

ShapeTrax3A Unit

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits No. of decimal places	Numerical value format	Referencing	Unit properties
			Label	Value	Initial value						
Image Settings	Use Variable for Registered Image	PRM.DTL.UPIR	Enable	1						X X X	O
			Disable	0							
Feature Extraction Condition	Reference Variable	PRM.DTL.PIV		0	0	0				X X X	O
	Feature Extraction Settings	PRM.DTL.EFMD	Automatic	1						X X X	O
			Automatic (Low Contrast)	2							
Fine Feature Detection	Fine Feature: Registered: Minimum Intensity	PRM.DTL.REFLV		30	255	1		3	0 O O X O		
	Coarse Feature: Registered: Minimum Intensity	PRM.DTL.RECLV		30	255	1		3	0 O O X O		
	Fine Feature: Current: Minimum Intensity	PRM.DTL.IEFLV		30	255	1		3	0 O O X O		
	Coarse Feature: Current: Minimum Intensity	PRM.DTL.IECLV		30	255	1		3	0 O O X O		
	Sensitivity	PRM.DTL.RRM	Fast	4						O O X O	
Coarse Feature Search	Image Reduction	PRM.DTL.FFRR	Standard	5							
			Detailed	6							
			Custom	1							
				0	10	0		2	0 O O X O		
Large Area Search	PRM.DTL.CFRR			4	10	0		2	0 O O X O		
				4	10	0		2	0 O O X O		
				4	10	0		2	0 O O X O		
Feat. Densification	PRM.DTL.MPDMD	PRM.DTL.STLAM	Disable	0						X X X	O
			Enable	1							
Draw Feature	Feature Drawing Tool	PRM.DTL.MGM_EN	None	0						O O X O	
			Weak	1							
			Moderate	2							
			Strong	3							
			Automatic	4							
Condition	Angle : + Range	PRM.DTL.ARG:HL		30.000	180.000	0.000		3	3 O O X O		
	Angle : - Range	PRM.DTL.ARG:LL		-30.000	0.000	-179.999		3	3 O O X O		
Scale: Upper Limit	PRM.DTL.SRG:HL			1.000	2.000	1.000		1	3 O O X O		
				1.000	1.000	0.500		1	3 O O X O		
Scale: Lower Limit	PRM.DTL.SRG:LL			1	2000	1		4	0 X X X O		
				1	2000	1		4	0 X X X O		
Count	PRM.DTL.MXN			1	2000	1		4	0 X X X O		
				1	2000	1		4	0 X X X O		
Reverse Detection	PRM.DTL.FEK		OFF	0						O O X O	
			ON	1							
Detection Region Expansion	PRM.DTL.EDR		ON	1						X X X	O
			OFF (Long Side)	2							
Min. Match%	PRM.DTL.DLV		OFF (Short Side)	0							
				60.000	99.999	0.000		2	3 O O X O		

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Condition (continued)	Detection Order	PRM.DTL.LOD	X:Ascend	1						<input type="radio"/>
			X:Descend	2						<input type="radio"/>
			Y:Ascend	3						<input type="radio"/>
			Y:Descend	4						<input type="radio"/>
			Match%:Ascend	12						<input type="radio"/>
			Match%:Descend	11						<input type="radio"/>
			Feature Pixel	49						<input type="radio"/>
			Count 1:Ascend							<input checked="" type="checkbox"/>
			Feature Pixel	48						<input type="radio"/>
			Count 1:Descend							<input type="radio"/>
			Feature Pixel	51						<input type="radio"/>
			Count 2:Ascend							<input type="radio"/>
			Feature Pixel	50						<input type="radio"/>
			Count 2:Descend							<input type="radio"/>
			Clockwise	9						<input type="radio"/>
			Counterclockwise	10						<input type="radio"/>
			Scale:Ascend	32						<input type="radio"/>
			Scale:Descend	33						<input type="radio"/>
			Scale Disjunction:	34						<input type="radio"/>
			Ascend							<input type="radio"/>
			Scale Disjunction:	35						<input type="radio"/>
			Descend							<input type="radio"/>
	Detection Order	PRM.DTL.LOD	From Upper Left	5						<input type="radio"/>
			(Rightward)							<input type="radio"/>
			From Upper Left	6						<input type="radio"/>
			(Downward)							<input type="radio"/>
			From Upper Right	42						<input type="radio"/>
			(Leftward)							<input type="radio"/>
			From Upper Right	46						<input type="radio"/>
			(Downward)							<input type="radio"/>
			From Lower Left	43						<input type="radio"/>
			(Rightward)							<input type="radio"/>
			From Lower Left	45						<input type="radio"/>
			(Upward)							<input type="radio"/>
			From Lower Right	44						<input type="radio"/>
			(Leftward)							<input type="radio"/>
			From Lower Right	47						<input type="radio"/>
			(Upward)							<input type="radio"/>
Starting Angle	PRM.DTL.STA		0.000	359.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
Fine Search Accuracy	PRM.DTL.PRCM		Detailed	0				<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
			Fast	1				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grouping Method	PRM.DTL.LGTYP		PatternLength	0						<input type="radio"/>
			(Long Side)							<input type="radio"/>
			PatternLength	1						<input type="radio"/>
			(XY Individual)							<input type="radio"/>
			Specified Value	2						<input type="radio"/>
Grouping Range	PRM.DTL.LGLEN		20	9999	1	4	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allowable Distortion	PRM.DTL.ELARG		0	50	0	2	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
Adjacent Processing: Minimum Distance	PRM.DTL.EXD		30	999	0	3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
Adjacent Processing: Angle	PRM.DTL.EXA		30	180	0	3	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing	Unit properties
			Label	Value								
Condition (continued)	Adjacent Processing: PRM.DTL.EASAN Starting Angle		0 degree	1							<input type="radio"/>	<input type="radio"/>
			0/180 degree	2							<input type="radio"/>	<input type="radio"/>
			0/120/240 degree	3							<input type="radio"/>	<input type="radio"/>
			0/90/180/270 degree	4							<input type="radio"/>	<input type="radio"/>
	Adjacent Processing: PRM.DTL.EXS Minimum Scale				10	100	0	3	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Overlap Elimination	PRM.DTL.OR_EN	Disable	0							<input type="radio"/>	<input type="radio"/>
			Enable	1							<input type="radio"/>	<input type="radio"/>
	Elimination Target	PRM.DTL.ORMD	Other Than Best Match	0							<input type="radio"/>	<input type="radio"/>
			All	1							<input type="radio"/>	<input type="radio"/>
	Overlap Area (%)	PRM.DTL.ORAR			30	100	0	3	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rotation Direction- Added Search	Line Rotation Correction Direction- Added Search	PRM.DTL.AFS_EN	Disable	0							<input type="radio"/>	<input type="radio"/>
			Enable	1							<input type="radio"/>	<input type="radio"/>
	Rot. Feat. Densification	PRM.DTL.AFS_DMD	ON	1							<input type="radio"/>	<input type="radio"/>
			OFF	0							<input type="radio"/>	<input type="radio"/>
	Rotation Center Reference Selection	PRM.DTL.AFS_RTC	specified point	0							<input type="radio"/>	<input type="radio"/>
			center of gravity	1							<input type="radio"/>	<input type="radio"/>
	Rotation Center Offset XY	PRM.DTL.AFS_XY						4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Rotation Center Offset X	PRM.DTL.AFS_X		0.000	9600.000	-9600.000	4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Rotation Center Offset Y	PRM.DTL.AFS_Y		0.000	7200.000	-7200.000	4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Rotation Center Reference Point XY	PRM.DTL.AFS_SXY						5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rotation Feature Region 0	Rotation Center Reference Point X	PRM.DTL.AFS_SX		0.000	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Rotation Center Reference Point Y	PRM.DTL.AFS_SY		0.000	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Concentricity Margin Range	PRM.DTL.AFS_ECCRG		0	50	0	2	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Rotation Condition	PRM.DTL.AFS_WT	Whole Circum.	0							<input type="radio"/>	<input type="radio"/>
			180° Rotation	1							<input type="radio"/>	<input type="radio"/>
			Polygon	2							<input type="radio"/>	<input type="radio"/>
	Follow Angle Range in Detection Conditions	PRM.DTL.AFCAP	ON	1							<input type="radio"/>	<input type="radio"/>
			OFF	0							<input type="radio"/>	<input type="radio"/>
	Rotation Condition Vertex Count	PRM.DTL.AFS_VN		6	16	3	2	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
											<input type="radio"/>	<input type="radio"/>
	Enabled	PRM.DTL.AFS_RGN[0].RGNEN	Enable	1							<input type="radio"/>	<input type="radio"/>
			Disable	0							<input type="radio"/>	<input type="radio"/>
	Shape Settings	PRM.DTL.AFS_RGN[0].SHP	None	0							<input type="radio"/>	<input type="radio"/>
			Rectangle	1							<input type="radio"/>	<input type="radio"/>
			Rotated Rectangle	3							<input type="radio"/>	<input type="radio"/>
			Circle	4							<input type="radio"/>	<input type="radio"/>
			Oval	5							<input type="radio"/>	<input type="radio"/>
			Ring	6							<input type="radio"/>	<input type="radio"/>
			Arc	7							<input type="radio"/>	<input type="radio"/>
	Use as Mask	PRM.DTL.AFS_RGN[0].MSKEN	Enable	1							<input type="radio"/>	<input type="radio"/>
			Disable	0							<input type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
								No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Rotation Feature Region 0: Rectangle	Upper Left XY	PRM.DTL.AFS_RGN[0].LUXY						5	0	O	O	X	O
	Upper Left X	PRM.DTL.AFS_RGN[0].LUX			16383	0		5	0	O	O	X	O
	Upper Left Y	PRM.DTL.AFS_RGN[0].LUY			16383	0		5	0	O	O	X	O
	Lower Right XY	PRM.DTL.AFS_RGN[0].RDXY						5	0	O	O	X	O
	Lower Right X	PRM.DTL.AFS_RGN[0].RDX			16383	0		5	0	O	O	X	O
	Lower Right Y	PRM.DTL.AFS_RGN[0].RDY			16383	0		5	0	O	O	X	O
Rotation Feature Region 0: Rotated Rectangle	Width	PRM.DTL.AFS_RGN[0].WI			16383	1		5	0	O	O	X	O
	Height	PRM.DTL.AFS_RGN[0].HI			16383	1		5	0	O	O	X	O
	Center XY	PRM.DTL.AFS_RGN[0].RCXY						5	0	O	O	X	O
	Center X	PRM.DTL.AFS_RGN[0].RCX			16382	0		5	0	O	O	X	O
	Center Y	PRM.DTL.AFS_RGN[0].RCY			16382	0		5	0	O	O	X	O
	Angle	PRM.DTL.AFS_RGN[0].T			359.9	0		3	1	O	O	X	O
Rotation Feature Region 0: Circle	Center XY	PRM.DTL.AFS_RGN[0].CXY						5	0	O	O	X	O
	Center X	PRM.DTL.AFS_RGN[0].CX			16383	-16383		5	0	O	O	X	O
	Center Y	PRM.DTL.AFS_RGN[0].CY			16383	-16383		5	0	O	O	X	O
	Radius	PRM.DTL.AFS_RGN[0].CR			9600	0		4	0	O	O	X	O
Rotation Feature Region 0: Oval	Center XY	PRM.DTL.AFS_RGN[0].CXY						5	0	O	O	X	O
	Center X	PRM.DTL.AFS_RGN[0].CX			16383	-16383		5	0	O	O	X	O
	Center Y	PRM.DTL.AFS_RGN[0].CY			16383	-16383		5	0	O	O	X	O
	Radius 1	PRM.DTL.AFS_RGN[0].CR1			2580	8		4	0	O	O	X	O
	Radius 2	PRM.DTL.AFS_RGN[0].CR2			2580	8		4	0	O	O	X	O
	Angle	PRM.DTL.AFS_RGN[0].T			359.9	0		3	1	O	O	X	O
Rotation Feature Region 0: Ring	Center XY	PRM.DTL.AFS_RGN[0].CXY						5	0	O	O	X	O
	Center X	PRM.DTL.AFS_RGN[0].CX			16383	-16383		5	0	O	O	X	O
	Center Y	PRM.DTL.AFS_RGN[0].CY			16383	-16383		5	0	O	O	X	O
	Radius 1	PRM.DTL.AFS_RGN[0].CR1			9600	0		4	0	O	O	X	O
	Radius 2	PRM.DTL.AFS_RGN[0].CR2			9600	0		4	0	O	O	X	O
Rotation Feature Region 0: Arc	Center XY	PRM.DTL.AFS_RGN[0].CXY						5	0	O	O	X	O
	Center X	PRM.DTL.AFS_RGN[0].CX			16383	-16383		5	0	O	O	X	O
	Center Y	PRM.DTL.AFS_RGN[0].CY			16383	-16383		5	0	O	O	X	O
	Radius 1	PRM.DTL.AFS_RGN[0].CR1			9600	0		4	0	O	O	X	O
	Radius 2	PRM.DTL.AFS_RGN[0].CR2			9600	0		4	0	O	O	X	O
	Starting Angle	PRM.DTL.AFS_RGN[0].STA			359.9	0		3	1	O	O	X	O
	End Angle	PRM.DTL.AFS_RGN[0].ENA			359.9	0		3	1	O	O	X	O
Rotation Direction-Added Search: Rotation Feature Region 1		PRM.DTL.AFS_RGN[1].***											
Rotation Direction-Added Search: Rotation Feature Region 2		PRM.DTL.AFS_RGN[2].***											
Rotation Direction-Added Search: Rotation Feature Region 3		PRM.DTL.AFS_RGN[3].***											
Detect. Target Selection Conditions	Display All Candidates Overlay Display	PRM.DTL.QDS PRM.DTL.QOV	ON OFF ON OFF	1 0 1 0						O	O	X	O
	(Condition 1) Feature Extraction Settings	PRM.DTL.QZ1_ELA	Link w/ Current Feat. Specify Value	0 1						X	X	X	O
	(Condition 2) Feature Extraction Settings	PRM.DTL.QZ2_ELA	Link w/ Current Feat. Specify Value	0 1						X	X	X	O

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing	Unit properties
			Label	Value								
Detect. Target Selection	(Condition 1) Enable Condition	PRM.DTL.QZ1M	Disable	0							X	X
			Enable	1							X	X
Conditions (continued)	(Condition 1) Feature Min. Intensity	PRM.DTL.QZ1_LLV			10	255	1	3	0	O	O	X
	(Condition 1) Feature Pixel Ratio Mode	PRM.DTL.QZ1_THM	Or Less are Retained	1						O	O	X
			Or More are Retained	0								O
	(Condition 1) Feature Pixel Count	PRM.DTL.QZ1_TH			0	999999	0	6	0	O	O	X
	(Condition 2) Enable Condition	PRM.DTL.QZ2M	Disable	0							X	X
			Enable	1							X	X
	(Condition 2) Feature Min. Intensity	PRM.DTL.QZ2_LLV			10	255	0	3	0	O	O	X
	(Condition 2) Feature Pixel Ratio Mode	PRM.DTL.QZ2_THM	Or Less are Retained	1						O	O	X
			Or More are Retained	0								O
	(Condition 2) Feature Pixel Count	PRM.DTL.QZ2_TH			0	999999	0	6	0	O	O	X
Detection Target Selection	Enabled	PRM.DTL.QZ1_RGN[0].RGNEN	Enable	1							X	X
			Disable	0							X	X
Region 1-0	Shape Settings	PRM.DTL.QZ1_RGN[0].SHP	None	0							X	X
			Rectangle	1							X	X
			Rotated Rectangle	3							X	X
			Circle	4								O
			Oval	5								O
			Ring	6								O
			Arc	7								O
	Use as Mask	PRM.DTL.QZ1_RGN[0].MSKEN	Enable	1							X	X
			Disable	0							X	X
Detection Target Selection	Upper Left XY	PRM.DTL.QZ1_RGN[0].LUXY						5	0	O	O	X
	Upper Left X	PRM.DTL.QZ1_RGN[0].LUX			16383	0		5	0	O	O	X
Region 1-0: Rectangle	Upper Left Y	PRM.DTL.QZ1_RGN[0].LUY			16383	0		5	0	O	O	X
	Lower Right XY	PRM.DTL.QZ1_RGN[0].RDXY						5	0	O	O	X
	Lower Right X	PRM.DTL.QZ1_RGN[0].RDX			16383	0		5	0	O	O	X
	Lower Right Y	PRM.DTL.QZ1_RGN[0].RDY			16383	0		5	0	O	O	X
Detection Target Selection	Width	PRM.DTL.QZ1_RGN[0].WI			16383	1		5	0	O	O	X
	Height	PRM.DTL.QZ1_RGN[0].HI			16383	1		5	0	O	O	X
Region 1-0: Rotated Rect	Center XY	PRM.DTL.QZ1_RGN[0].RCXY						5	0	O	O	X
	Center X	PRM.DTL.QZ1_RGN[0].RCX			16382	0		5	0	O	O	X
	Center Y	PRM.DTL.QZ1_RGN[0].RCY			16382	0		5	0	O	O	X
	Angle	PRM.DTL.QZ1_RGN[0].T			359.9	0		3	1	O	O	X
Detection Target Selection	Center XY	PRM.DTL.QZ1_RGN[0].CXY						5	0	O	O	X
	Center X	PRM.DTL.QZ1_RGN[0].CX			16383	-16383		5	0	O	O	X
Region 1-0: Circle	Center Y	PRM.DTL.QZ1_RGN[0].CY			16383	-16383		5	0	O	O	X
	Radius	PRM.DTL.QZ1_RGN[0].CR			9600	0		4	0	O	O	X

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
								No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Detection	Center XY	PRM.DTL.QZ1_RGN[0].CXY						5	0	O	O	X	O
Target	Center X	PRM.DTL.QZ1_RGN[0].CX			16383	-16383		5	0	O	O	X	O
Selection	Center Y	PRM.DTL.QZ1_RGN[0].CY			16383	-16383		5	0	O	O	X	O
Oval	Radius 1	PRM.DTL.QZ1_RGN[0].CR1			2580	8		4	0	O	O	X	O
	Radius 2	PRM.DTL.QZ1_RGN[0].CR2			2580	8		4	0	O	O	X	O
	Angle	PRM.DTL.QZ1_RGN[0].T			359.9	0		3	1	O	O	X	O
Detection	Center XY	PRM.DTL.QZ1_RGN[0].CXY						5	0	O	O	X	O
Target	Center X	PRM.DTL.QZ1_RGN[0].CX			16383	-16383		5	0	O	O	X	O
Selection	Center Y	PRM.DTL.QZ1_RGN[0].CY			16383	-16383		5	0	O	O	X	O
Ring	Radius 1	PRM.DTL.QZ1_RGN[0].CR1			9600	0		4	0	O	O	X	O
	Radius 2	PRM.DTL.QZ1_RGN[0].CR2			9600	0		4	0	O	O	X	O
	Starting Angle	PRM.DTL.QZ1_RGN[0].STA			359.9	0		3	1	O	O	X	O
Arc	End Angle	PRM.DTL.QZ1_RGN[0].ENA			359.9	0		3	1	O	O	X	O
	Center XY	PRM.DTL.QZ1_RGN[0].CXY						5	0	O	O	X	O
	Center X	PRM.DTL.QZ1_RGN[0].CX			16383	-16383		5	0	O	O	X	O
Region 1-0:	Center Y	PRM.DTL.QZ1_RGN[0].CY			16383	-16383		5	0	O	O	X	O
	Radius 1	PRM.DTL.QZ1_RGN[0].CR1			9600	0		4	0	O	O	X	O
	Radius 2	PRM.DTL.QZ1_RGN[0].CR2			9600	0		4	0	O	O	X	O
Region 1-1	Starting Angle	PRM.DTL.QZ1_RGN[0].STA			359.9	0		3	1	O	O	X	O
	End Angle	PRM.DTL.QZ1_RGN[0].ENA			359.9	0		3	1	O	O	X	O
	PRM.DTL.QZ1_RGN[1].***												
Region 1-2	PRM.DTL.QZ1_RGN[2].***												
	PRM.DTL.QZ1_RGN[3].***												
	PRM.DTL.QZ2_RGN[*].***												
Detection	Registered Image	PRM.DTL.PHSM			Fixed (fast) 1						X	X	X
					Updated each 0 process (slow)								
					User updated 2 (fast)								
Primary Target Pattern No.	PRM.DTL.LLB				0	1999	0	4	0	X	X	X	O
Timeout Time	PRM.DTL.TIO				5.0	60.0	0.5	2	1	X	X	X	O
Coordinate System	PRM.DTL.CRD		After position adjust	0							X	X	X
					Before 1 position adjust								
Origin Point XY	PRM.DTL.OGXY							4	3	X	X	X	O
Origin Point X	PRM.DTL.OGX			0.000	9600.000	-9600.000		4	3	X	X	X	O
Origin Point Y	PRM.DTL.OGY			0.000	7200.000	-7200.000		4	3	X	X	X	O
Detection Point Offset Option	PRM.DTL.DTC		specified point 0 center of gravity 1	0							X	X	X
Detection Point Offset XY	PRM.DTL.DTXY							4	3	O	O	X	O
Detection Point Offset X	PRM.DTL.DTX			0.000	9600.000	-9600.000		4	3	O	O	X	O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			Unit properties
				Value	Initial value	Upper limit			User variable	System variable	Result data	
Parameters (Continued)	Detection Point Offset Y	PRM.DTL.DTY		0.000	7200.000	-7200.000	4	3	O	O	X	O
	Registered Pattern Center XY	PRM.DTL.PTSTXY					5	3	X	X	X	X
	Registered Pattern Center X	PRM.DTL.PTSTX		0.000	99999.999	-99999.999	5	3	X	X	X	X
	Registered Pattern Center Y	PRM.DTL.PTSTY		0.000	99999.999	-99999.999	5	3	X	X	X	X
Limits	Number of Patterns: Upper Limit	PRM.DTL.N:HL		9999	0		4	0	O	O	X	O
	Number of Patterns: Lower Limit	PRM.DTL.N:LL		9999	0		4	0	O	O	X	O
	X Position of Pattern: Upper Limit	PRM.DTL.X:HL		99999.999	-99999.999		5	3	O	O	X	O
	X Position of Pattern: Lower Limit	PRM.DTL.X:LL		99999.999	-99999.999		5	3	O	O	X	O
	Y Position of Pattern: Upper Limit	PRM.DTL.Y:HL		99999.999	-99999.999		5	3	O	O	X	O
	Y Position of Pattern: Lower Limit	PRM.DTL.Y:LL		99999.999	-99999.999		5	3	O	O	X	O
	Angle of Pattern: Upper Limit	PRM.DTL.T:HL		999.999	-999.999		3	3	O	O	X	O
	Angle of Pattern: Lower Limit	PRM.DTL.T:LL		999.999	-999.999		3	3	O	O	X	O
	% Match of Pattern: Upper Limit	PRM.DTL.C:HL		99.999	0		2	3	O	O	X	O
	% Match of Pattern: Lower Limit	PRM.DTL.C:LL		99.999	0		2	3	O	O	X	O
	Scale of Pattern: Upper Limit	PRM.DTL.S:HL		9.999	0		1	3	O	O	X	O
	Scale of Pattern: Lower Limit	PRM.DTL.S:LL		9.999	0		1	3	O	O	X	O
	Feature Pixel Count 1: Upper Limit	PRM.DTL.QZ1:HL		999999	0		6	0	O	O	X	O
	Feature Pixel Count 1: Lower Limit	PRM.DTL.QZ1:LL		999999	0		6	0	O	O	X	O
	Feature Pixel Count 2: Upper Limit	PRM.DTL.QZ2:HL		999999	0		6	0	O	O	X	O
	Feature Pixel Count 2: Lower Limit	PRM.DTL.QZ2:LL		999999	0		6	0	O	O	X	O

PatternTrax Unit

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data
Image Settings	Use Variable for Registered Image	PRM.DTL.UPIR	Enable	1				1	0	X	X	O
			Disable	0								
Feature Extraction Condition	Sensitivity	PRM.DTL.RRM	Low	4				1	0	X	X	O
			Normal	5								
			High	6								
			Custom	1								
Fine Feature Search: Image Reduction		PRM.DTL.FFRR		4	16	0		2	0	O	O	X
Coarse Feature Search: Image Reduction		PRM.DTL.CFRR		8	16	0		2	0	O	O	X
Accuracy	PRM.DTL.PRCM	Low	1					1	0	O	O	X
		Normal	2									
		High	0									
		Highest	3									
Large Area Search	PRM.DTL.STLAM	OFF	0					1	0	X	X	X
		ON	1									
Noise Cut	PRM.DTL.FNE		10	255	0			3	0	O	O	X
Gain	PRM.DTL.FGN		2.0	20.0	1.0			2	1	O	O	X
Feature Extraction Size	PRM.DTL.FES		2	2000	2			4	0	O	O	X
Deformity Margin (%)	PRM.DTL.DFTO		0	100	0			3	0	O	O	X
Angle Sensitivity	PRM.DTL.ANSM	Low	1					1	0	X	X	X
		Normal	2									
		High	3									
		Custom	0									
Angle Step Width (times)	PRM.DTL.ANSR		1.0	9.9	0.1			1	1	O	O	X
Display Feature	PRM.DTL.DMD	Fine	0					1	0	O	O	X
		Coarse	1									
Detection Conditions	Angle Range (0 - +180)	PRM.DTL.ARG:HL		30.000	180.000	0.000		3	3	O	O	X
	Angle Range (0 - -179.99)	PRM.DTL.ARG:LL		-30.000	0.000	-179.999		3	3	O	O	X
Maximum Number of Possible Patterns	PRM.DTL.MXN		1	2000	1			4	0	X	X	X
Reverse Detection	PRM.DTL.FEK	OFF	0					1	0	O	O	X
		ON	1									
Detection Outside of Search Region	PRM.DTL.FRE	OFF	1					1	0	X	X	X
		ON	0									
Minimum Match %	PRM.DTL.DLV		60.000	99.999	0.000			2	3	O	O	X

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection Conditions (Continued)	Detection Order	PRM.DTL.LOD	X:Ascend	1				2	0	<input type="radio"/>
			X:Descend	2						
			Y:Ascend	3						
			Y:Descend	4						
			Match%:Ascend	12						
			Match%:Descend	11						
			Clockwise	9						
			Counterclockwise	10						
			From Upper Left (Rightward)	5						
			From Upper Left (Downward)	6						
			From Upper Right (Leftward)	42						
			From Upper Right (Downward)	46						
			From Lower Left (Rightward)	43						
			From Lower Left (Upward)	45						
			From Lower Right (Leftward)	44						
			From Lower Right (Upward)	47						
Starting Angle	PRM.DTL.STA				0.000	359.999	0.000	3	3	<input type="radio"/> <input type="radio"/>
			OFF	0				1	0	<input type="radio"/> <input type="radio"/>
Detection Region Expansion	PRM.DTL.EDR		ON	1						<input type="radio"/> <input type="radio"/>
Parameters	Grouping Method	PRM.DTL.LGTYP	Pattern Length (Long Side)	0				1	0	<input type="radio"/> <input type="radio"/>
			Pattern Length (XY Individual)	1						
			Specified Value	2						
Grouping Range	PRM.DTL.LGLEN				20	9999	1	4	0	<input type="radio"/> <input type="radio"/>
			Fixed (fast)	1				1	0	<input type="radio"/> <input type="radio"/>
Registered Image	PRM.DTL.PHSM		Updated each process (slow)	0						
			User updated (fast)	2						
Primary Target Pattern No.	PRM.DTL.LLB				0	1999	0	4	0	<input type="radio"/> <input type="radio"/>
Adjacent Processing: Minimum Distance	PRM.DTL.EXD				30	999	0	3	0	<input type="radio"/> <input type="radio"/>
Adjacent Processing: Angle	PRM.DTL.EXA				180	180	0	3	0	<input type="radio"/> <input type="radio"/>

List of setting parameters

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Parameters	Adjacent Processing:	PRM.DTL.EASAN	0 degree	1				1	0	O	O	X	O
(Continued)	Starting Angle		0/180 degrees	2									
			0/120/240 degrees	3									
			0/90/180/270 degrees	4									
	Timeout Time	PRM.DTL.TIO		5.0	60.0	0.5		2	1	X	X	X	O
Coordinate System		PRM.DTL.CRD	After position adjust	0				1	0	X	X	X	O
			Before position adjust	1									
Origin Point XY		PRM.DTL.OGXY						4	3	X	X	X	O
Origin Point X		PRM.DTL.OGX	0.000	9600.000	-9600.000			4	3	X	X	X	O
Origin Point Y		PRM.DTL.OGY	0.000	7200.000	-7200.000			4	3	X	X	X	O
Detection Point Offset Option	Detection Point Offset	PRM.DTL.DTC	specified point center of gravity	0 1				1	0	X	X	X	O
Detection Point Offset XY		PRM.DTL.DTXY						4	3	O	O	X	O
Detection Point Offset X		PRM.DTL.DTX	0.000	9600.000	-9600.000			4	3	O	O	X	O
Detection Point Offset Y		PRM.DTL.DTY	0.000	7200.000	-7200.000			4	3	O	O	X	O
Registered Pattern Center XY		PRM.DTL.PTSTXY						5	3	O	X	X	X
Registered Pattern Center X		PRM.DTL.PTSTX	0.0	99999.999	-99999.999			5	3	O	X	X	X
Registered Pattern Center Y		PRM.DTL.PTSTY	0.0	99999.999	-99999.999			5	3	O	X	X	X
Limits	Number of Patterns: Upper Limit	PRM.DTL.N:HL		9999	0			4	0	O	O	X	O
	Number of Patterns: Lower Limit	PRM.DTL.N:LL		9999	0			4	0	O	O	X	O
	X Position of Pattern: Upper Limit	PRM.DTL.X:HL		99999.999	-99999.999			5	3	O	O	X	O
	X Position of Pattern: Lower Limit	PRM.DTL.X:LL		99999.999	-99999.999			5	3	O	O	X	O
	Y Position of Pattern: Upper Limit	PRM.DTL.Y:HL		99999.999	-99999.999			5	3	O	O	X	O
	Y Position of Pattern: Lower Limit	PRM.DTL.Y:LL		99999.999	-99999.999			5	3	O	O	X	O
	Angle of Pattern: Upper Limit	PRM.DTL.T:HL		999.999	-999.999			3	3	O	O	X	O
	Angle of Pattern: Lower Limit	PRM.DTL.T:LL		999.999	-999.999			3	3	O	O	X	O
	% Match of Pattern: Upper Limit	PRM.DTL.C:HL		99.999	0.000			2	3	O	O	X	O
	% Match of Pattern: Lower Limit	PRM.DTL.C:LL		99.999	0.000			2	3	O	O	X	O
Display options	Shape Settings	PRM.DTL.DTMK.SHP	None	0				1	0	X	X	X	O
			Rotated	1									
			Rectangle	2									
			Circle	3									
			Cross										

Edge Position Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection condition	Scan direction	PRM.DTL.PRD	↓	7				0	0	X O
			↑	6						
			→	5						
			←	4						
			Forward	5						
			Reverse	4						
			Clockwise	8						
			Counterclockwise	9						
Edge direction	PRM.DTL.EGD	Both	3					O	O X O	
		Light to dark	1							
		Dark to light	2							
Start angle	PRM.DTL.STA		0.000	359.999	0.000			3	3 O O X O	
Edge sensitivity	PRM.DTL.SEN		30	100	0			3	0 O O X O	
Edge detection width	PRM.DTL.FLW		5	100	0			3	0 O O X O	
Upper edge intensity	PRM.DTL.EI:HL		255.000	255.000	0.000			3	3 O O X O	
Lower edge intensity	PRM.DTL.EI:LL		5.000	255.000	0.000			3	3 O O X O	
Primary target	PRM.DTL.LLB		0	3599	0			4	0 X X X O	
Count limit	PRM.DTL.MXN		1	3600	1			4	0 X X X O	
Angled edge detection	PRM.DTL.WPR	OFF	0					O	O X O	
		ON	1							
Parameters	Origin XY	PRM.DTL.OGXY						4	3 X X X O	
	Origin X	PRM.DTL.OGX	0.000	9600.000	-9600.000			4	3 X X X O	
	Origin Y	PRM.DTL.OGY	0.000	7200.000	-7200.000			4	3 X X X O	
	Coordinate value	PRM.DTL.CRD	After position adjustment	0				X	X X O	
			Before position adjustment	1						
Limits	Out of image	PRM.DTL.OSM	Normal	0				O	O X O	
			Fast	1						
Edge count: Upper limit	PRM.DTL.N:HL		-	9999	0			4	0 O O X O	
Edge count: Lower limit	PRM.DTL.N:LL		-	9999	0			4	0 O O X O	
Position X: Upper limit	PRM.DTL.X:HL		-	99999.999	-99999.999			5	3 O O X O	
Position X: Lower limit	PRM.DTL.X:LL		-	99999.999	-99999.999			5	3 O O X O	
Position Y: Upper limit	PRM.DTL.Y:HL		-	99999.999	-99999.999			5	3 O O X O	
Position Y: Lower limit	PRM.DTL.Y:LL		-	99999.999	-99999.999			5	3 O O X O	
Angle: Upper limit	PRM.DTL.T:HL		-	999.999	-999.999			3	3 O O X O	
Angle: Lower limit	PRM.DTL.T:LL		-	999.999	-999.999			3	3 O O X O	

Edge Width Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection condition	Measurement mode	PRM.DTL.FTYP	Outer gap	4						X X X O
			Inner gap	5						
			Specified edge	6						
Scan direction	PRM.DTL.PRD		↓	7						O O X O
			↑	6						
			→	5						
			←	4						
			Forward	5						
			Reverse	4						
			Clockwise	8						
			Counterclockwise	9						
			Both	3						O O X O
Edge direction	PRM.DTL.EGD		Light to dark	1						
			Dark to light	2						
			Start angle	PRM.DTL.STA	0.000	359.999	0.000	3	3	O O X O
Parameters	Specified edge 1	PRM.DTL.RID1			0	3599	-3600	4	0	O O X O
			Specified edge 2	PRM.DTL.RID2	-1	3599	-3600	4	0	O O X O
Edge sensitivity	PRM.DTL.SEN				30	100	0	3	0	O O X O
			Edge detection width	PRM.DTL.FLW	5	100	0	3	0	O O X O
Upper edge intensity	PRM.DTL.EI:HL				255.000	255.000	0.000	3	3	O O X O
			Lower edge intensity	PRM.DTL.EI:LL	5.000	255.000	0.000	3	3	O O X O
Angled edge detection	PRM.DTL.WPR		OFF	0						O O X O
			ON	1						
Parameters	Origin XY	PRM.DTL.OGXY						4	3	X X X O
			Origin X	PRM.DTL.OGX	0.000	9600.000	-9600.000	4	3	X X X O
			Origin Y	PRM.DTL.OGY	0.000	7200.000	-7200.000	4	3	X X X O
Coordinate value	PRM.DTL.CRD		After position adjustment		0					X X X O
			Before position adjustment		1					
			Out of image	PRM.DTL.OSM	Normal	0				O O X O
Limits	Edge width: Upper limit	PRM.DTL.W:HL			-	99999.999	0.000	5	3	O O X O
			Edge width: Lower limit	PRM.DTL.W:LL	-	99999.999	0.000	5	3	O O X O

Edge Pitch Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection condition	Measurement mode	PRM.DTL.FTYP	Gap pitch	10				X	X	X
			Center pitch	9						
Scan direction	PRM.DTL.PRD		↓	7				O	O	X
			↑	6						
			→	5						
			←	4						
			Forward	5						
			Reverse	4						
			Clockwise	8						
			Counterclockwise	9						
			Both	3				O	O	X
Edge direction	PRM.DTL.EGD		Light to dark	1						
			Dark to light	2						
			Both	0				O	O	X
First edge	PRM.DTL.BED		Light to dark	1						
			Dark to light	2						
			Both	0						
Start angle	PRM.DTL.STA		0.000	359.999	0.000	3	3	O	O	X
Edge sensitivity	PRM.DTL.SEN		30	100	0	3	0	O	O	X
Edge detection width	PRM.DTL.FLW		5	100	0	3	0	O	O	X
Upper edge intensity	PRM.DTL.EI:HL		255.000	255.000	0.000	3	3	O	O	X
Lower edge intensity	PRM.DTL.EI:LL		5.000	255.000	0.000	3	3	O	O	X
Count limit	PRM.DTL.MXN		30	1800	1	4	0	X	X	X
Angled edge detection	PRM.DTL.WPR		OFF	0				O	O	X
			ON	1						
Parameters	Origin XY	PRM.DTL.OGXY						4	3	X
	Origin X	PRM.DTL.OGX	0.000	9600.000	-9600.000	4	3	X	X	X
	Origin Y	PRM.DTL.OGY	0.000	7200.000	-7200.000	4	3	X	X	X
Coordinate value	PRM.DTL.CRD		After position adjustment	0				X	X	X
			Before position adjustment	1						
Out of image	PRM.DTL.OSM		Normal	0				O	O	X
			Fast	1						
Limits	Pitch count: Upper limit	PRM.DTL.N:HL	-	9999	0	4	0	O	O	X
	Pitch count: Lower limit	PRM.DTL.N:LL	-	9999	0	4	0	O	O	X
	Pitch: Upper limit	PRM.DTL.W:HL	-	99999.999	0.000	5	3	O	O	X
	Pitch: Lower limit	PRM.DTL.W:LL	-	99999.999	0.000	5	3	O	O	X

Edge Angle Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Detection condition	Edge setting	PRM.DTL.FTYP	Individual	1						X	X	X	O
			Common	0									
	Scan direction 1	PRM.DTL.PRD	Forward	5						O	O	X	O
			Reverse	4									
	Edge direction 1	PRM.DTL.EGD	Both	3						O	O	X	O
			Light to dark	1									
			Dark to light	2									
	Specified edge 1	PRM.DTL.RID		0	3599	-3600	4	0	0	O	O	X	O
	Edge sensitivity 1	PRM.DTL.SEN		30	100	0	3	0	0	O	O	X	O
	Edge detection width 1	PRM.DTL.FLW		5	100	0	3	0	0	O	O	X	O
	Upper edge intensity 1	PRM.DTL.EI:HL		255.000	255.000	0.000	3	3	0	O	O	X	O
	Lower edge intensity 1	PRM.DTL.EI:LL		5.000	255.000	0.000	3	3	0	O	O	X	O
	Scan direction 2	PRM.DTL.PRD2	Forward	5						O	O	X	O
			Reverse	4									
	Edge direction 2	PRM.DTL.EGD2	Both	3						O	O	X	O
			Light to dark	1									
			Dark to light	2									
	Specified edge 2	PRM.DTL.RID2		0	3599	-3600	4	0	0	O	O	X	O
	Edge sensitivity 2	PRM.DTL.SEN2		30	100	0	3	0	0	O	O	X	O
	Edge detection width 2	PRM.DTL.FLW2		5	100	0	3	0	0	O	O	X	O
	Upper edge intensity 2	PRM.DTL.EI2:HL		255.000	255.000	0.000	3	3	0	O	O	X	O
	Lower edge intensity 2	PRM.DTL.EI2:LL		5.000	255.000	0.000	3	3	0	O	O	X	O
	Angled edge detection	PRM.DTL.WPR	OFF	0						O	O	X	O
			ON	1									
Parameters	Origin XY	PRM.DTL.OGXY						4	3	X	X	X	O
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	X	X	X	O	
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	X	X	X	O	
	Coordinate value	PRM.DTL.CRD	After position adjustment	0						X	X	X	O
			Before position adjustment	1									
	Out of image	PRM.DTL.OSM	Normal	0						O	O	X	O
			Fast	1									
Limit	Angle: Upper limit	PRM.DTL.T:HL		-	999.999	-999.999	3	3	0	O	O	X	O
	Angle: Lower limit	PRM.DTL.T:LL		-	999.999	-999.999	3	3	0	O	O	X	O
	Edge count: Upper limit	PRM.DTL.N:HL		-	0	9999	3	0	0	O	O	X	O
	Edge count: Lower limit	PRM.DTL.N:LL		-	0	9999	3	0	0	O	O	X	O

Edge Pairs Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection condition	Measurement mode	PRM.DTL.FTYP	Gap pitch	10				X	X	X
			Center pitch	9						O
	Scan direction 1	PRM.DTL.PRD	↓	7				O	O	X
			↑	6						O
			→	5						
			←	4						
			Forward	5						
			Reverse	4						
			Clockwise	8						
			Counterclockwise	9						
	Edge direction 1	PRM.DTL.EGD	Both	3				O	O	X
			Light to dark	1						
			Dark to light	2						O
	Start angle 1	PRM.DTL.STA		0.000	359.999	0.000	3	3	O	X
	Edge sensitivity 1	PRM.DTL.SEN		30	100	0	3	0	O	X
	Edge detection width 1	PRM.DTL.FLW		5	100	0	3	0	O	X
	Upper edge intensity 1	PRM.DTL.EI:HL		255.000	255.000	0.000	3	3	O	X
	Lower edge intensity 1	PRM.DTL.EI:LL		5.000	255.000	0.000	3	3	O	X
	Skip edges 1	PRM.DTL.SK1		0	3600	0	4	0	O	X
	Scan direction 2	PRM.DTL.PRD2	↓	7				O	O	X
			↑	6						
			→	5						
			←	4						
			Forward	5						
			Reverse	4						
			Clockwise	8						
			Counterclockwise	9						
	Edge direction 2	PRM.DTL.EGD2	Both	3				O	O	X
			Light to dark	1						
			Dark to light	2						O
	Start angle 2	PRM.DTL.STA2		0.000	359.999	0.000	3	3	O	X
	Edge sensitivity 2	PRM.DTL.SEN2		30	100	0	3	0	O	X
	Edge detection width 2	PRM.DTL.FLW2		5	100	0	3	0	O	X
	Upper edge intensity 2	PRM.DTL.EI2:HL		255.000	255.000	0.000	3	3	O	X
	Lower edge intensity 2	PRM.DTL.EI2:LL		5.000	255.000	0.000	3	3	O	X
	Skip edges 2	PRM.DTL.SK2		0	3600	0	4	0	O	X
	Maximum edge gap	PRM.DTL.WH		99999.999	99999.999	0.000	5	3	O	X
	Minimum edge gap	PRM.DTL.WL		5.000	99999.999	0.000	5	3	O	X
	Primary target specification	PRM.DTL.LB	All	0				X	X	X
			Specified	1						O
	Primary target	PRM.DTL.LLB		0	3599	0	4	0	X	X
	Count limit	PRM.DTL.MXN		30	3600	1	4	0	X	X
	Angled edge detection	PRM.DTL.WPR	OFF	0				O	O	X
			ON	1						O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Numerical value format			Referencing
				Value	Initial value	Upper limit			User variable	System variable	Result data	
Parameters	Origin XY	PRM.DTL.OGXY					4	3	X	X	X	O
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	X	X	X	O
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	X	X	X	O
	Coordinate value	PRM.DTL.CRD	After position adjustment	0					X	X	X	O
			Before position adjustment	1								
Out of image	PRM.DTL.OSM	Normal	0						O	O	X	O
		Fast	1									
Limits	Pair count: Upper limit	PRM.DTL.N:HL		-	9999	0	4	0	O	O	X	O
	Pair count: Lower limit	PRM.DTL.N:LL		-	9999	0	4	0	O	O	X	O
	Pair width: Upper limit	PRM.DTL.W:HL		-	99999.999	0.0	5	3	O	O	X	O
	Pair width: Lower limit	PRM.DTL.W:LL		-	99999.999	0.0	5	3	O	O	X	O

Defect Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection condition	Detection direction	PRM.DTL.PRD	X	1				X	X	X O
			Y	2						
			XY	3						
			Ring	8						
			Radius	10						
Individual setting	PRM.DTL.IND		OFF	0				X	X X	O
			ON	1						
High speed mode	PRM.DTL.HSM		ON	1				X	X X	O
			OFF	0						
Defect level	PRM.DTL.SLV:LL			10	254	0	3	0	0 O O X O	
Element size: X/ Radius	PRM.DTL.SEGX			16	256	1	3	0	0 O O X O	
Element size: Y/ Ring	PRM.DTL.SEGY			16	256	1	3	0	0 O O X O	
Comparison setting	PRM.DTL.CGM		Auto	1				X	X X	O
			Manual	0						
Element shift: X/ Radius	PRM.DTL.CGPX			4	2432	1	4	0	0 O O X O	
Element shift: Y/ Ring	PRM.DTL.CGPY			4	2432	1	4	0	0 O O X O	
Compare element: X/ Radius	PRM.DTL.COFX			1	2432	1	4	0	0 O O X O	
Compare element: Y/ Ring	PRM.DTL.COFY			1	2432	1	4	0	0 O O X O	
Gain	PRM.DTL.ST_GN			1.0	99.0	1.0	2	1	0 O X O	
Ignore intensity	PRM.DTL.USIN		ON	0				O	O X O	
			OFF	1						
Grouping	PRM.DTL.SGR		OFF	0				X	X X	O
			ON	1						
Additional group result	PRM.DTL.EGR_EN		Disable	0				X	X X	O
			Enable	1						
Count	PRM.DTL.MXN			1	99	1	2	0	X X X O	
Upper defect	PRM.DTL.SVL:HL			99999999	99999999	1	8	0	O O X O	
Lower defect	PRM.DTL.SVL:LL			1	99999999	1	8	0	O O X O	
Roundness filter	PRM.DTL.CIR_EN		Disable	0				O	O X O	
			Enable	1						
Major axis filter	PRM.DTL.MAA_EN		Disable	0				O	O X O	
			Enable	1						
Axes ratio filter	PRM.DTL.RTO_EN		Disable	0				O	O X O	
			Enable	1						
Distributed oval filter	PRM.DTL.MAA2_EN		Disable	0				O	O X O	
			Enable	1						
Aspect ratio filter	PRM.DTL.RTO2_EN		Disable	0				O	O X O	
			Enable	1						
Roundness filter: Maximum	PRM.DTL.CIR_THRES:HL			1.000	1.000	0.000	1	3	O O X O	
Roundness filter: Minimum	PRM.DTL.CIR_THRES:LL			0.000	1.000	0.000	1	3	O O X O	
Major axis filter: Maximum	PRM.DTL.MAA_THRES:HL			99999.999	99999.999	0.000	5	3	O O X O	
Major axis filter: Minimum	PRM.DTL.MAA_THRES:LL			0.000	99999.999	0.000	5	3	O O X O	
Axes ratio filter: Maximum	PRM.DTL.RTO_THRES:HL			99999.999	99999.999	0.000	5	3	O O X O	

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Detection condition (continued)	Axes ratio filter: Minimum	PRM.DTL.RTO_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Distributed oval filter: Maximum	PRM.DTL.MAA2_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Distributed oval filter: Minimum	PRM.DTL.MAA2_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio filter: Maximum	PRM.DTL.RTO2_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio filter: Minimum	PRM.DTL.RTO2_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Fill holes	PRM.DTL.FILL	OFF ON	0 1					O	O	X	O
	Active border	PRM.DTL.CAN	OFF ON	0 1					O	O	X	O
	Detection order	PRM.DTL.LOD	Y>X: Ascend X>Y: Ascend X:Ascend X:Descend Y:Ascend Y:Descend Area:Ascend Area:Descend Clockwise Counterclockwise Out → Center Center → Out	5 6 1 2 3 4 14 13 9 10 20 21					O	O	X	O
Parameters	Origin XY	PRM.DTL.OGXY					4	3	X	X	X	O
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	X	X	X	O
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	X	X	X	O
	Coordinate value	PRM.DTL.CRD	After position adjustment Before position adjustment	0 1					X	X	X	O
	Primary target	PRM.DTL.LLB		0	98	0	2	0	X	X	X	O
Limits	Total defect area: Upper limit	PRM.DTL.TSA:HL		-	99999999	0	8	0	O	O	X	O
	Total defect area: Lower limit	PRM.DTL.TSA:LL		-	99999999	0	8	0	O	O	X	O
	Group count: Upper limit	PRM.DTL.N:HL		-	99	0	2	0	O	O	X	O
	Group count: Lower limit	PRM.DTL.N:LL		-	99	0	2	0	O	O	X	O
	Defect area: Upper limit	PRM.DTL.GSA:HL		-	99999999	0	8	0	O	O	X	O
	Defect area: Lower limit	PRM.DTL.GSA:LL		-	99999999	0	8	0	O	O	X	O
	Group center X: Upper limit	PRM.DTL.GX:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Group center X: Lower limit	PRM.DTL.GX:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Group center Y: Upper limit	PRM.DTL.GY:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Group center Y: Lower limit	PRM.DTL.GY:LL		-	99999.999	-99999.999	5	3	O	O	X	O
Target Classification	Target classification type 00 setting	PRM.DTL.CLSN[0]		0	1	0	1	0	X	X	X	O
	⋮											
	Target classification type 19 setting	PRM.DTL.CLSN[19]		0	1	0	1	0	X	X	X	O

Blob Unit

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Initial value	Upper limit	Lower limit			User variable	System variable	Result data	Unit properties
Detection condition	Detect	PRM.DTL.DC	White	255								
			Black	0								
	Count	PRM.DTL.MXN		30	9999	1	4	0	X	X	X	O
	Fill holes	PRM.DTL.FILL	OFF	0								
			ON	1								
	Active border	PRM.DTL.CAN	OFF	0								
			ON	1								
	Detection order	PRM.DTL.LOD	Y>X: Ascend	5								
			X>Y: Ascend	6								
			X:Ascend	1								
Starting angle			X:Descend	2								
			Y:Ascend	3								
			Y:Descend	4								
			Area:Ascend	14								
			Area:Descend	13								
			Roundness: Ascend	16								
			Roundness: Descend	15								
			Clockwise	9								
			Counterclockwise	10								
	Angle range	PRM.DTL.STA		0.000	359.999	0.000	3	3	O	O	X	O
Primary target specification	Angle range	PRM.DTL.EXT_AX	OFF	2								
			180°	0								
			360°	1								
	Primary target specification	PRM.DTL.LB	All	0								
			Specified	1								
	Primary target	PRM.DTL.LLB		0	9998	0	4	0	X	X	X	O
	Area filter: Maximum	PRM.DTL.ARI_THRES:HL		99999999	99999999	0	8	0	O	O	X	O
	Area filter: Minimum	PRM.DTL.ARI_THRES:LL		100	99999999	0	8	0	O	O	X	O
	Roundness filter: Maximum	PRM.DTL.CIR_THRES:HL		1.000	1.000	0.000	1	3	O	O	X	O
	Roundness filter: Minimum	PRM.DTL.CIR_THRES:LL		0.000	1.000	0.000	1	3	O	O	X	O
Major axis filter	Major axis filter: Maximum	PRM.DTL.MAA_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Major axis filter: Minimum	PRM.DTL.MAA_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Axes ratio filter: Maximum	PRM.DTL.RTO_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Axes ratio filter: Minimum	PRM.DTL.RTO_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Distributed oval filter: Maximum	PRM.DTL.MAA2_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Distributed oval filter: Minimum	PRM.DTL.MAA2_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio filter: Maximum	PRM.DTL.RTO2_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio filter: Minimum	PRM.DTL.RTO2_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Major / minor axis detection	PRM.DTL.R2_EN	Disable	0								
			Enable	1								
Minimum bounding rectangle measurement detection	Minimum bounding rectangle measurement detection	PRMDTLMBR_EN	Disable	0								
			Enable	1								
Distributed oval detection	Distributed oval detection	PRM.DTL.ELP_EN	Disable	0								
			Enable	1								

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	Numerical value format		Referencing	
				Value	Initial value	No. of integer digits No. of decimal places			User variable	System variable		
Parameters	Origin XY	PRM.DTL.OGXY							4	3	X	X
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000			4	3	X	X
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000			4	3	X	X
	Coordinate value	PRM.DTL.CRD	After position adjustment	0							X	X
Limits			Before position adjustment	1								
	Count: Upper limit	PRM.DTL.N:HL		-	9999	0			4	0	O	O
	Count: Lower limit	PRM.DTL.N:LL		-	9999	0			4	0	O	O
	Position X: Upper limit	PRM.DTL.X:HL		-	99999.999	-99999.999			5	3	O	O
	Position X: Lower limit	PRM.DTL.X:LL		-	99999.999	-99999.999			5	3	O	O
	Position Y: Upper limit	PRM.DTL.Y:HL		-	99999.999	-99999.999			5	3	O	O
	Position Y: Lower limit	PRM.DTL.Y:LL		-	99999.999	-99999.999			5	3	O	O
	Angle: Upper limit	PRM.DTL.T:HL		-	999.999	-999.999			3	3	O	O
	Angle: Lower limit	PRM.DTL.T:LL		-	999.999	-999.999			3	3	O	O
	Area: Upper limit	PRM.DTL.AR:HL		-	99999999	0			8	0	O	O
	Area: Lower limit	PRM.DTL.AR:LL		-	99999999	0			8	0	O	O
	Feret diameter X: Upper limit	PRM.DTL.FX:HL		-	99999.999	0.000			5	3	O	O
	Feret diameter X: Lower limit	PRM.DTL.FX:LL		-	99999.999	0.000			5	3	O	O
	Feret diameter Y: Upper limit	PRM.DTL.FY:HL		-	99999.999	0.000			5	3	O	O
	Feret diameter Y: Lower limit	PRM.DTL.FY:LL		-	99999.999	0.000			5	3	O	O
	Perimeter: Upper limit	PRM.DTL.CL:HL		-	99999999	0			8	0	O	O
	Perimeter: Lower limit	PRM.DTL.CL:LL		-	99999999	0			8	0	O	O
	Roundness: Upper limit	PRM.DTL.CD:HL		-	9.999	0.000			1	3	O	O
	Roundness: Lower limit	PRM.DTL.CD:LL		-	9.999	0.000			1	3	O	O
	Major axis: Upper limit	PRM.DTL.MAA:HL		-	99999.999	0.000			5	3	O	O
	Major axis: Lower limit	PRM.DTL.MAA:LL		-	99999.999	0.000			5	3	O	O
	Minor axis: Upper limit	PRM.DTL.MIA:HL		-	99999.999	0.000			5	3	O	O
	Minor axis: Lower limit	PRM.DTL.MIA:LL		-	99999.999	0.000			5	3	O	O
	Axes ratio: Upper limit	PRM.DTL.RTO:HL		-	99999.999	0.000			5	3	O	O
	Axes ratio: Lower limit	PRM.DTL.RTO:LL		-	99999.999	0.000			5	3	O	O
Target Classification	Distributed oval, major axis: Upper limit	PRM.DTL.MAA2:HL		-	99999.999	0.000			5	3	O	O
	Distributed oval, major axis: Lower limit	PRM.DTL.MAA2:LL		-	99999.999	0.000			5	3	O	O
	Distributed oval, minor axis: Upper limit	PRM.DTL.MIA2:HL		-	99999.999	0.000			5	3	O	O
	Distributed oval, minor axis: Lower limit	PRM.DTL.MIA2:LL		-	99999.999	0.000			5	3	O	O
	Aspect ratio: Upper limit	PRM.DTL.RTO2:HL		-	99999.999	0.000			5	3	O	O
	Aspect ratio: Lower limit	PRM.DTL.RTO2:LL		-	99999.999	0.000			5	3	O	O
	Target classification type 00 setting	PRM.DTL.CLSEN[0]		0	1	0			1	0	X	X
	⋮											
Target Classification	Target classification type 19 setting	PRM.DTL.CLSEN[19]		0	1	0			1	0	X	X

Grayscale Blob Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection condition	Detection target	PRM.DTL.DBC	Bright	0				X	X	
			Dark	1						
			Bright & Dark	2						
			Individual	3						
Base intensity type	PRM.DTL.DILT	Average value	0					X	X	X
		Median value	1							
		Specified value	2							
		Mode	3							
Base intensity specified value	PRM.DTL.IIL		128		255	0	3	0	0	X
Bright detection level	PRM.DTL.DI_THRES:HL		10		254	0	3	0	0	X
Dark detection level	PRM.DTL.DI_THRES:LL		10		254	0	3	0	0	X
Bright / dark individual setting	PRM.DTL.IND	OFF	0					X	X	X
		ON	1							
High speed mode	PRM.DTL.HSM	ON	1					X	X	X
		OFF	0							
Element Size: X/Radius	PRM.DTL.SEGX		16		256	1	3	0	0	X
Element Size: Y/Ring	PRM.DTL.SEGY		16		256	1	3	0	0	X
Element Interval setting	PRM.DTL.CGM	Auto	1					X	X	X
		Manual	0							
Element shift: X	PRM.DTL.CGPX		4		2432	1	4	0	0	X
Element shift: Y	PRM.DTL.CGPY		4		2432	1	4	0	0	X
Count	PRM.DTL.MXN		10		9999	1	4	0	X	X
Fill holes	PRM.DTL.FILL	OFF	0					O	O	X
		ON	1							
Active border	PRM.DTL.CAN	OFF	0					O	O	X
		ON	1							

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing			
			Label	Value						User variable	System variable	Result data	Unit properties
Detection condition (continued)	Detection order	PRM.DTL.LOD	Y>X: Ascend	5						<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
			X>Y: Ascend	6						<input type="radio"/>	<input type="radio"/>		
			X:Ascend	1									
			X:Descend	2									
			Y:Ascend	3									
			Y:Descend	4									
			Area:Ascend	14									
			Area:Descend	13									
			Roundness: Ascend	16									
			Roundness: Descend	15									
			Clockwise	9									
			Counterclockwise	10									
			Volume: Ascend	37									
			Volume: Descend	36									
			Average intensity difference: Ascend	39									
			Average intensity difference: Descend	38									
			Maximum intensity difference: Ascend	41									
			Maximum intensity difference: Descend	40									
Starting angle	PRM.DTL.STA		0.000	359.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>		
Angle range	PRM.DTL.EXT_AX		OFF	2						<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
			180°	0									
			360°	1									
Primary target specification	PRM.DTL.LB		All	0						X	X	X	<input type="radio"/>
			Specified	1									
Primary target	PRM.DTL.LLB		0	9998	0	4	0	X	X	X	<input type="radio"/>		
Volume detection	PRM.DTL.VOL_EN		Disable	0						X	X	X	<input type="radio"/>
			Enable	1									
Major / minor axis detection	PRM.DTL.R2_EN		Disable	0						X	X	X	<input type="radio"/>
			Enable	1									
Distributed oval detection	PRM.DTL.ELP_EN		Disable	0						X	X	X	<input type="radio"/>
			Enable	1									
Area filter: Upper Limit	PRM.DTL.ARI_THRES:HL		99999999	99999999	0	8	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>		
Area filter: Lower Limit	PRM.DTL.ARI_THRES:LL		100	99999999	0	8	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>		
Volume filter: Upper Limit	PRM.DTL.VOL_THRES:HL		9999999999	9999999999	0	11	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>		
Volume filter: Lower Limit	PRM.DTL.VOL_THRES:LL		0	9999999999	0	11	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>		
Average intensity level filter: Upper Limit	PRM.DTL.AVI_THRES:HL		255	255	0	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>		

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Detection condition (continued)	Average intensity level filter: Lower Limit	PRM.DTL.AVI_THRES:LL		0	255	0	3	0	O	O	X	O
	Maximum intensity level filter: Upper Limit	PRM.DTL.MXI_THRES:HL		255	255	0	3	0	O	O	X	O
	Maximum intensity level filter: Lower Limit	PRM.DTL.MXI_THRES:LL		0	255	0	3	0	O	O	X	O
	Roundness filter: Upper limit	PRM.DTL.CIR_THRES:HL		1.000	1.000	0.000	1	3	O	O	X	O
	Roundness filter: Lower limit	PRM.DTL.CIR_THRES:LL		0.000	1.000	0.000	1	3	O	O	X	O
	Major axis filter: Upper limit	PRM.DTL.MAA_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Major axis filter: Lower limit	PRM.DTL.MAA_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Axes ratio filter: Upper limit	PRM.DTL.RTO_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Axes ratio filter: Lower limit	PRM.DTL.RTO_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Distributed oval filter: Upper Limit	PRM.DTL.MAA2_THRES: HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Distributed oval filter: Lower Limit	PRM.DTL.MAA2_THRES: LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio filter: Upper Limit	PRM.DTL.RTO2_THRES: HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio filter: Lower Limit	PRM.DTL.RTO2_THRES: LL		0.000	99999.999	0.000	5	3	O	O	X	O
Parameters	Coordinate value	PRM.DTL.CRD		After position adjustment	0					X	X	X
				Before position adjustment	1							
	Origin XY	PRM.DTL.OGXY					4	3	X	X	X	O
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	X	X	X	O
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	X	X	X	O
Limits	Total area: Upper limit	PRM.DTL.TAR:HL		-	99999999	0	8	0	O	O	X	O
	Total area: Lower limit	PRM.DTL.TAR:LL		-	99999999	0	8	0	O	O	X	O
	Count: Upper limit	PRM.DTL.N:HL		-	9999	0	4	0	O	O	X	O
	Count: Lower limit	PRM.DTL.N:LL		-	9999	0	4	0	O	O	X	O
	Position X: Upper limit	PRM.DTL.X:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position X: Lower limit	PRM.DTL.X:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y: Upper limit	PRM.DTL.Y:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y: Lower limit	PRM.DTL.Y:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Angle: Upper limit	PRM.DTL.T:HL		-	999.999	-999.999	3	3	O	O	X	O
	Angle: Lower limit	PRM.DTL.T:LL		-	999.999	-999.999	3	3	O	O	X	O
	Area: Upper limit	PRM.DTL.AR:HL		-	99999999	0	8	0	O	O	X	O
	Area: Lower limit	PRM.DTL.AR:LL		-	99999999	0	8	0	O	O	X	O
	Volume: Upper limit	PRM.DTL.VOL:HL		-	9999999999	0	11	0	O	O	X	O
	Volume: Lower limit	PRM.DTL.VOL:LL		-	9999999999	0	11	0	O	O	X	O
	Average intensity difference: Upper limit	PRM.DTL.AVI:HL		-	999	0	3	0	O	O	X	O
	Average intensity difference: Lower limit	PRM.DTL.AVI:LL		-	999	0	3	0	O	O	X	O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Maximum intensity difference: Upper limit	PRM.DTL.MXI:HL		-	999	0	3	0	O	O	X	O
	Maximum intensity difference: Lower limit	PRM.DTL.MXI:LL		-	999	0	3	0	O	O	X	O
	Feret diameter X: Upper limit	PRM.DTL.FX:HL		-	99999.999	0.0	5	3	O	O	X	O
	Feret diameter X: Lower limit	PRM.DTL.FX:LL		-	99999.999	0.0	5	3	O	O	X	O
	Feret diameter Y: Upper limit	PRM.DTL.FY:HL		-	99999.999	0.0	5	3	O	O	X	O
	Feret diameter Y: Lower limit	PRM.DTL.FY:LL		-	99999.999	0.0	5	3	O	O	X	O
	Perimeter: Upper limit	PRM.DTL.CL:HL		-	99999999	0	8	0	O	O	X	O
	Perimeter: Lower limit	PRM.DTL.CL:LL		-	99999999	0	8	0	O	O	X	O
	Roundness: Upper limit	PRM.DTL.CD:HL		-	9.999	0.000	1	3	O	O	X	O
	Roundness: Lower limit	PRM.DTL.CD:LL		-	9.999	0.000	1	3	O	O	X	O
	Major axis: Upper limit	PRM.DTL.MAA:HL		-	99999.999	0.000	5	3	O	O	X	O
	Major axis: Lower limit	PRM.DTL.MAA:LL		-	99999.999	0.000	5	3	O	O	X	O
	Minor axis: Upper limit	PRM.DTL.MIA:HL		-	99999.999	0.000	5	3	O	O	X	O
	Minor axis: Lower limit	PRM.DTL.MIA:LL		-	99999.999	0.000	5	3	O	O	X	O
	Axes ratio: Upper limit	PRM.DTL.RTO:HL		-	99999.999	0.000	5	3	O	O	X	O
	Axes ratio: Lower limit	PRM.DTL.RTO:LL		-	99999.999	0.000	5	3	O	O	X	O
	Distributed oval, major axis: Upper limit	PRM.DTL.MAA2:HL		-	99999.999	0.000	5	3	O	O	X	O
	Distributed oval, major axis: Lower limit	PRM.DTL.MAA2:LL		-	99999.999	0.000	5	3	O	O	X	O
	Distributed oval, minor axis: Upper limit	PRM.DTL.MIA2:HL		-	99999.999	0.000	5	3	O	O	X	O
	Distributed oval, minor axis: Lower limit	PRM.DTL.MIA2:LL		-	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio: Upper limit	PRM.DTL.RTO2:HL		-	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio: Lower limit	PRM.DTL.RTO2:LL		-	99999.999	0.000	5	3	O	O	X	O
Target Classification	Target classification type 00 setting	PRM.DTL.CLSEN[0]		0	1	0	1	0	X	X	X	O
	:											
	Target classification type 19 setting	PRM.DTL.CLSEN[19]		0	1	0	1	0	X	X	X	O

Profile Position Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits No. of decimal places	Numerical value format	Referencing
			Label	Value						
Detection condition	Trend direction	PRM.DTL.TRD	↓	7				X	X	X O
			→	5						
			Clockwise	8						
Scan direction	PRM.DTL.PRD		→	5				O	O	X O
			←	4						
			↓	7						
			↑	6						
			Forward	5						
			Reverse	4						
			Center →	11						
			Out							
			Out →	10						
			Center							
Edge direction	PRM.DTL.EGD		Both	3				O	O	X O
			Light to dark	1						
			Dark to light	2						
Specified edge	PRM.DTL.RID		0	3599	-3600	4	0	O O X O		
Edge sensitivity	PRM.DTL.SEN		30	100	0	3	0	O O X O		
Edge detection width	PRM.DTL.FLW		5	100	0	3	0	O O X O		
Upper edge intensity	PRM.DTL.EI:HL		255.000	255.000	0.000	3	3	O O X O		
Lower edge intensity	PRM.DTL.EI:LL		5.000	255.000	0.000	3	3	O O X O		
Segment size (Ring)	PRM.DTL.SGSA		10.00	359.99	0.01	3	2	O O X O		
Segment shift (Ring)	PRM.DTL.MVSA		5.00	359.99	0.01	3	2	O O X O		
Start angle (Ring)	PRM.DTL.STA		0.00	359.99	0.00	3	2	O O X O		
Segment size (Arc)	PRM.DTL.SGSA		10.00	359.99	0.01	3	2	O O X O		
Segment shift (Arc)	PRM.DTL.MVSA		5.00	359.99	0.01	3	2	O O X O		
Segment offset (Arc)	PRM.DTL.STOFA		0.00	359.99	0.00	3	2	O O X O		
Segment size (Other)	PRM.DTL.SGSR		10	9999	1	4	0	O O X O		
Segment shift (Other)	PRM.DTL.MVSR		5.00	9999.99	0.01	4	2	O O X O		
Segment offset (Other)	PRM.DTL.STOFR		0	9999	0	4	0	O O X O		
Primary target specification	PRM.DTL.LB		Maximum	4				X X X O		
			Minimum	5						
			Specified	1						
Primary target	PRM.DTL.LLB		0	4999	0	4	0	X X X O		
Angled edge detection	PRM.DTL.WPR		OFF	0				O O X O		
			ON	1						
Segment count	PRM.DTL.MXN		100	5000	1	4	0	X X X O		
Circle/line detection	PRM.DTL.DEC		OFF	0				X X X O		
			Circle	1						
			Line	2						
Best fit correction	PRM.DTL.REA		OFF	0				O O X O		
			ON	1						
Acceptable abnormal gap	PRM.DTL.ASR		5.0	999.9	0.0	3	1	O O X O		
Maximum abnormal size	PRM.DTL.ASL		25	100	0	3	0	O O X O		

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Parameters	Origin XY	PRM.DTL.OGXY						4	3	X	X	O
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	X	X	O	
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	X	X	O	
	Coordinate value	PRM.DTL.CRD	After position adjustment Before position adjustment	0 1					X	X	X	O
Limits	Out of image	PRM.DTL.OSM	Normal Fast	0 1					O	O	X	O
	Detected segments: Upper limit	PRM.DTL.DSGN:HL		-	9999	0	4	0	O	O	X	O
Limits	Detected segments: Lower limit	PRM.DTL.DSGN:LL		-	9999	0	4	0	O	O	X	O
	Position X (Max): Upper limit	PRM.DTL.XHI:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position X (Max): Lower limit	PRM.DTL.XHI:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position X (Min): Upper limit	PRM.DTL.XLO:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position X (Min): Lower limit	PRM.DTL.XLO:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position X: Upper limit	PRM.DTL.X:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position X: Lower limit	PRM.DTL.X:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y (Max): Upper limit	PRM.DTL.YHI:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y (Max): Lower limit	PRM.DTL.YHI:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y (Min): Upper limit	PRM.DTL.YLO:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y (Min): Lower limit	PRM.DTL.YLO:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y: Upper limit	PRM.DTL.Y:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Position Y: Lower limit	PRM.DTL.Y:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Distance (Max): Upper limit	PRM.DTL.PHI:HL		-	99999.999	0.000	5	3	O	O	X	O
	Distance (Max): Lower limit	PRM.DTL.PHI:LL		-	99999.999	0.000	5	3	O	O	X	O
	Distance (Min): Upper limit	PRM.DTL.PLO:HL		-	99999.999	0.000	5	3	O	O	X	O
	Distance (Min): Lower limit	PRM.DTL.PLO:LL		-	99999.999	0.000	5	3	O	O	X	O
	Distance: Upper limit	PRM.DTL.P:HL		-	99999.999	0.000	5	3	O	O	X	O
	Distance: Lower limit	PRM.DTL.P:LL		-	99999.999	0.000	5	3	O	O	X	O
	Radius (Max): Upper limit	PRM.DTL.RWHI:HL		-	99999.999	0.000	5	3	O	O	X	O
	Radius (Max): Lower limit	PRM.DTL.RWHI:LL		-	99999.999	0.000	5	3	O	O	X	O
	Radius (Min): Upper limit	PRM.DTL.RWLO:HL		-	99999.999	0.000	5	3	O	O	X	O
	Radius (Min): Lower limit	PRM.DTL.RWLO:LL		-	99999.999	0.000	5	3	O	O	X	O
	Radius: Upper limit	PRM.DTL.RW:HL		-	99999.999	0.000	5	3	O	O	X	O
	Radius: Lower limit	PRM.DTL.RW:LL		-	99999.999	0.000	5	3	O	O	X	O

Profile Width Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits No. of decimal places	Numerical value format	Referencing
			Label	Value						
Detection condition	Measurement mode	PRM.DTL.FTYP	Outer gap	4						X X X O
			Inner gap	5						
			Outer diameter	7						
			Inner diameter	8						
Trend direction	PRM.DTL.TRD		↓	7						X X X O
			→	5						
			Clockwise	8						
Scan direction	PRM.DTL.PRD		→	5						O O X O
			←	4						
			↓	7						
			↑	6						
			Forward	5						
			Reverse	4						
			Center→ Out	11						
			Out → Center	10						
			Both	3						
Edge direction	PRM.DTL.EGD		Light to dark	1						O O X O
			Dark to light	2						
Edge sensitivity	PRM.DTL.SEN		30	100	0	3	0	0	0	X O
Edge detection width	PRM.DTL.FLW		5	100	0	3	0	0	0	X O
Upper edge intensity	PRM.DTL.EI:HL		255.000	255.000	0.000	3	3	0	0	X O
Lower edge intensity	PRM.DTL.EI:LL		5.000	255.000	0.000	3	3	0	0	X O
Upper edge width	PRM.DTL.WHI		99999.999	99999.999	0.000	5	3	0	0	X O
Lower edge width	PRM.DTL.WLO		1.000	99999.999	0.000	5	3	0	0	X O
Segment size (Ring)	PRM.DTL.SGSA		10.00	359.99	0.01	3	2	0	0	X O
Segment shift (Ring)	PRM.DTL.MVSA		5.00	359.99	0.01	3	2	0	0	X O
Start angle (Ring)	PRM.DTL.STA		0.00	359.99	0.00	3	2	0	0	X O
Segment size (Arc)	PRM.DTL.SGSA		10.00	359.99	0.01	3	2	0	0	X O
Segment shift (Arc)	PRM.DTL.MVSA		5.00	359.99	0.01	3	2	0	0	X O
Segment offset (Arc)	PRM.DTL.STOFA		0.00	359.99	0.00	3	2	0	0	X O
Segment size (Other)	PRM.DTL.SGSR		10	9999	1	4	0	0	0	X O
Segment shift (Other)	PRM.DTL.MVSR		5.00	9999.99	0.01	4	2	0	0	X O
Segment offset (Other)	PRM.DTL.STOFR		0	9999	0	4	0	0	0	X O
Primary target specification	PRM.DTL.LB		Maximum	4						X X X O
			Minimum	5						
			Specified	1						
Primary target	PRM.DTL.LLB		0	4999	0	4	0	X	X X X O	
Angled edge detection	PRM.DTL.WPR		OFF	0						O O X O
			ON	1						
Segment count	PRM.DTL.MXN		100	5000	1	4	0	X	X X X O	

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Numerical value format			Referencing
				Value	Initial value	Upper limit			User variable	System variable	Result data	
Parameters	Origin XY	PRM.DTL.OGXY						4	3	X	X	X
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	X	X	X	O
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	X	X	X	O
	Coordinate value	PRM.DTL.CRD	After position adjustment	0					X	X	X	O
			Before position adjustment	1								
	Out of image	PRM.DTL.OSM	Normal	0					O	O	X	O
			Fast	1								
Limits	Detected segments: Upper limit	PRM.DTL.DSGN:HL		-	9999	0	4	0	O	O	X	O
	Detected segments: Lower limit	PRM.DTL.DSGN:LL		-	9999	0	4	0	O	O	X	O
	Edge width (Max): Upper limit	PRM.DTL.WHI:HL		-	99999.999	0.000	5	3	O	O	X	O
	Edge width (Max): Lower limit	PRM.DTL.WHI:LL		-	99999.999	0.000	5	3	O	O	X	O
	Edge width (Min): Upper limit	PRM.DTL.WLO:HL		-	99999.999	0.000	5	3	O	O	X	O
	Edge width (Min): Lower limit	PRM.DTL.WLO:LL		-	99999.999	0.000	5	3	O	O	X	O
	Edge width: Upper limit	PRM.DTL.W:HL		-	99999.999	0.000	5	3	O	O	X	O
	Edge width: Lower limit	PRM.DTL.W:LL		-	99999.999	0.000	5	3	O	O	X	O

Profile Defect Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits No. of decimal places	Referencing			
			Label	Value					User variable	System variable	Result data	Unit properties
Edge detection condition	Trend direction	PRM.DTL.TRD	↓	7					X	X	X	O
			→	5								
			Clockwise	8								
Edge detection condition	Scan direction	PRM.DTL.PRD	→	5					O	O	X	O
			←	4								
			↓	7								
			↑	6								
			Forward	5								
			Reverse	4								
			Center → Out	11								
			Out → Center	10								
Edge detection condition	Edge direction	PRM.DTL.EGD	Both	3					O	O	X	O
			Light to dark	1								
			Dark to light	2								
Specified edge	Specified edge	PRM.DTL.RID	0	3599	-3600	4	0	O	O	X	O	
Edge sensitivity	Edge sensitivity	PRM.DTL.SEN	30	100	0	3	0	O	O	X	O	
Edge detection width	Edge detection width	PRM.DTL.FLW	5	100	0	3	0	O	O	X	O	
Upper edge intensity	Upper edge intensity	PRM.DTL.EI:HL	255.000	255.000	0.000	3	3	O	O	X	O	
Lower edge intensity	Lower edge intensity	PRM.DTL.EI:LL	5.000	255.000	0.000	3	3	O	O	X	O	
Segment size (Ring)	Segment size (Ring)	PRM.DTL.SGSA	5.00	359.99	0.01	3	2	O	O	X	O	
Segment shift (Ring)	Segment shift (Ring)	PRM.DTL.MVSA	3.00	359.99	0.01	3	2	O	O	X	O	
Start angle (Ring)	Start angle (Ring)	PRM.DTL.STA	0.00	359.99	0.00	3	2	O	O	X	O	
Segment size (Arc)	Segment size (Arc)	PRM.DTL.SGSA	5.00	359.99	0.01	3	2	O	O	X	O	
Segment shift (Arc)	Segment shift (Arc)	PRM.DTL.MVSA	3.00	359.99	0.01	3	2	O	O	X	O	
Segment offset (Arc)	Segment offset (Arc)	PRM.DTL.STOFA	0.00	359.99	0.00	3	2	O	O	X	O	
Segment size (Other)	Segment size (Other)	PRM.DTL.SGSR	5	9999	1	4	0	O	O	X	O	
Segment shift (Other)	Segment shift (Other)	PRM.DTL.MVSR	3.00	9999.99	0.01	4	2	O	O	X	O	
Segment offset (Other)	Segment offset (Other)	PRM.DTL.STOFR	0	9999	0	4	0	O	O	X	O	
Angled edge detection	Angled edge detection	PRM.DTL.WPR	OFF	0					O	O	X	O
			ON	1								
Defect detection condition	Segment count	PRM.DTL.MXN		200	5000	1	4	0	X	X	X	O
Target shape	Target shape	PRM.DTL.BML	Line	2					X	X	X	O
			Circle	1								
			Oval	3								
			Free curve	4								
Smoothing range	Smoothing range	PRM.DTL.SMR		15	100	1	3	0	O	O	X	O
Detection direction	Detection direction	PRM.DTL.SDTD	+	0					X	X	X	O
			-	1								
			+/-	2								
			+/- (individual)	3								

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing			
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Defect detection condition (continued)	Detection threshold (+)	PRM.DTL.SDTP		3.00	9999.99	0.00		4	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Detection threshold (-)	PRM.DTL.SDTM		3.00	9999.99	0.00		4	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect level filter (+): Maximum	PRM.DTL.SLTP:HL		9999.99	9999.99	0.00		4	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect level filter (+): Minimum	PRM.DTL.SLTP:LL		0.00	9999.99	0.00		4	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect level filter (-): Maximum	PRM.DTL.SLTM:HL		9999.99	9999.99	0.00		4	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect level filter (-): Minimum	PRM.DTL.SLTM:LL		0.00	9999.99	0.00		4	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect width filter (+): Maximum	PRM.DTL.SWTP:HL		9999	9999	0		4	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect width filter (+): Minimum	PRM.DTL.SWTP:LL		0	9999	0		4	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect width filter (-): Maximum	PRM.DTL.SWTM:HL		9999	9999	0		4	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect width filter (-): Minimum	PRM.DTL.SWTM:LL		0	9999	0		4	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect size filter (+): Maximum	PRM.DTL.SGTP:HL		9999999.99	9999999.99	0.00		7	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect size filter (+): Minimum	PRM.DTL.SGTP:LL		0.00	9999999.99	0.00		7	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect size filter (-): Maximum	PRM.DTL.SGTM:HL		9999999.99	9999999.99	0.00		7	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Defect size filter (-): Minimum	PRM.DTL.SGTM:LL		0.00	9999999.99	0.00		7	2	<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
	Count	PRM.DTL.MXSN		30	5000	1		4	0	X	X	X	<input checked="" type="radio"/>
	Detection order	PRM.DTL.LOD	Segment: Ascend	24						<input checked="" type="radio"/>	<input checked="" type="radio"/>	X	<input checked="" type="radio"/>
			Segment: Descend	25									
			X:Ascend	1									
			X:Descend	2									
			Y:Ascend	3									
			Y:Descend	4									
			Defect level: Ascend	26									
			Defect level: Descend	27									
			Defect width: Ascend	28									
			Defect width: Descend	29									
			Defect size: Ascend	30									
			Defect size: Descend	31									
	Primary target specification	PRM.DTL.LB	All	0						X	X	X	<input checked="" type="radio"/>
			Specified	1									
	Primary target	PRM.DTL.LLB		0	4999	0		4	0	X	X	X	<input checked="" type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			Unit properties
				Value	Initial value	Upper limit			User variable	System variable	Result data	
Parameters	Origin XY	PRM.DTL.OGXY					4	3	X	X	X	O
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	X	X	X	O
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	X	X	X	O
	Coordinate value	PRM.DTL.CRD	After position adjustment	0					X	X	X	O
			Before position adjustment	1								
	Out of image	PRM.DTL.OSM	Normal	0					O	O	X	O
			Fast	1								
	Target selection	PRM.DTL.THM	Auto	0					O	O	X	O
			Manual	1								
	Selection rate (Auto)	PRM.DTL.THRA		50.00	99.99	0.00	2	2	X	X	X	X
Limits	Selection rate (Manual)	PRM.DTL.THRM		50.00	99.99	0.00	2	2	O	O	X	O
	Undetected point	PRM.DTL.UPT	Ignore	0					O	O	X	O
			Maximize	1								
			Minimize	2								
			Fill	3								
	Defect size calculation	PRM.DTL.CGFT	Total difference from model line	0					O	O	X	O
			Total difference from threshold	1								
	Detected segments: Upper limit	PRM.DTL.DSGN:HL		-	9999	0	4	0	O	O	X	O
	Detected segments: Lower limit	PRM.DTL.DSGN:LL		-	9999	0	4	0	O	O	X	O
	Defect count: Upper limit	PRM.DTL.STN:HL		-	9999	0	4	0	O	O	X	O
	Defect count: Lower limit	PRM.DTL.STN:LL		-	9999	0	4	0	O	O	X	O
	Total defect size: Upper limit	PRM.DTL.TSTG:HL		-	9999999.999	0.000	7	3	O	O	X	O
	Total defect size: Lower limit	PRM.DTL.TSTG:LL		-	9999999.999	0.000	7	3	O	O	X	O
	Defect size: Upper limit	PRM.DTL.STG:HL		-	9999999.999	0.000	7	3	O	O	X	O
	Defect size: Lower limit	PRM.DTL.STG:LL		-	9999999.999	0.000	7	3	O	O	X	O
	Defect position X: Upper limit	PRM.DTL.STX:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Defect position X: Lower limit	PRM.DTL.STX:LL		-	99999.999	-99999.999	5	3	O	O	X	O
	Defect position Y: Upper limit	PRM.DTL.STY:HL		-	99999.999	-99999.999	5	3	O	O	X	O
	Defect position Y: Lower limit	PRM.DTL.STY:LL		-	99999.999	-99999.999	5	3	O	O	X	O

Multi-Profile Defect Unit

Category	Setting item	Name	Selection			Numerical value format		Referencing						
			Label	Value		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System Variable	Result data	Unit properties
Image Settings	Optimize The Detection Conditions (Dedicated for Profile Images)	PRM.DTL.SETCC				0	1	0	1	0	x	x	x	○
Detection Condition	Detection Condition 0: (Edge Detection) Enable Detection Condition	PRM.DTL.DCEN[0]				0	1	0	1	0	x	x	x	○
	Detection Condition 0: (Edge Detection) Edge Sensitivity	PRM.DTL.SEN[0]				30	100	0	3	0	○	○	x	○
	Detection Condition 0: (Edge Detection) Edge Detection Width	PRM.DTL.FLW[0]				5	100	0	3	0	○	○	x	○
	Detection Condition 0: (Edge Detection) Edge intensity lower limit	PRM.DTL.EI[0]:LL				5.000	255.000	0.000	3	3	○	○	x	○
	Detection Condition 0: (Edge Detection) Segment Size (Pixels)	PRM.DTL.SGSA[0]				5	9999	1	4	0	x	x	x	○
	Detection Condition 0: (Edge Detection) Segment Shift (Pixels)	PRM.DTL.MVSA[0]				3.00	9999.99	0.01	4	2	x	x	x	○
	Detection Condition 0: (Defect Detection) Defect Direction	PRM.DTL.SDTD[0]	+ 0	- 1	+/- 2	+/- (individual) 3								
	Detection Condition 0: (Defect Detection) Detection threshold plus side	PRM.DTL.SDTP[0]				3.00	9999.99	0.00	4	2	○	○	x	○
	Detection Condition 0: (Defect Detection) Detection threshold minus side	PRM.DTL.SDTM[0]				3.00	9999.99	0.00	4	2	○	○	x	○
	Detection Condition 0: (Defect Detection) Defect level filter plus side upper limit	PRM.DTL.SLTP[0]:HL				9999.99	9999.99	0.00	4	2	○	○	x	○
	Detection Condition 0: (Defect Detection) Defect level filter plus side lower limit	PRM.DTL.SLTP[0]:LL				0.00	9999.99	0.00	4	2	○	○	x	○
	Detection Condition 0: (Defect Detection) Defect level filter minus side upper limit	PRM.DTL.SLTM[0]:HL				9999.99	9999.99	0.00	4	2	○	○	x	○
	Detection Condition 0: (Defect Detection) Defect level filter minus side lower limit	PRM.DTL.SLTM[0]:LL				0.00	9999.99	0.00	4	2	○	○	x	○
	Detection Condition 0: (Defect Detection) Defect Width filter plus side upper limit	PRM.DTL.SWTP[0]:HL				9999	9999	0	4	0	○	○	x	○
	Detection Condition 0: (Defect Detection) Defect Width filter plus side lower limit	PRM.DTL.SWTP[0]:LL				0	9999	0	4	0	○	○	x	○
	Detection Condition 0: (Defect Detection) Defect Width filter minus side upper limit	PRM.DTL.SWTM[0]:HL				9999	9999	0	4	0	○	○	x	○
	Detection Condition 0: (Defect Detection) Defect Width filter minus side lower limit	PRM.DTL.SWTM[0]:LL				0	9999	0	4	0	○	○	x	○

Category	Setting item	Name	Selection			Initial value	Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	No. of integer digits				No. of decimal places	User variable	System variable	Result data	Unit properties
Detection Condition (continued)	Detection Condition 0: PRM.DTL.SGTP[0]:HL (Defect Detection) Defect Size filter plus side upper limit			9999999.99	9999999.99	0.00	7	2	O	O	x	O	
	Detection Condition 0: PRM.DTL.SGTP[0]:LL (Defect Detection) Defect Size filter plus side lower limit			0.00	9999999.99	0.00	7	2	O	O	x	O	
	Detection Condition 0: PRM.DTL.SGTM[0]:HL (Defect Detection) Defect Size filter minus side upper limit			9999999.99	9999999.99	0.00	7	2	O	O	x	O	
	Detection Condition 0: PRM.DTL.SGTM[0]:LL (Defect Detection) Defect Size filter minus side lower limit			0.00	9999999.99	0.00	7	2	O	O	x	O	
	Detection Condition 1 PRM.DTL.***[1]												
	:	:											
	Detection Condition 4 PRM.DTL.***[4]												
Defect Detection Condition: Detection Count (Overall)	PRM.DTL.MXSN			30	5000	1	4	0	x	x	x	O	
Defect Detection Condition: Detection Count (Each Region)	PRM.DTL.MXSNR			30	5000	1	4	0	x	x	x	O	
Defect Detection Condition: Label order	PRM.DTL.LOD	Segment Ascend	24							O	O	x	O
		Segment Descend	25										
		X Ascend	1										
		X Descend	2										
		Y Ascend	3										
		Y Descend	4										
		Defect level Ascend	26										
		Defect level Descend	27										
		Defect Width Ascend	28										
		Defect Width Descend	29										
		Defect Size Ascend	30										
		Defect Size Descend	31										
Defect Detection Condition: Type of Primary Target	PRM.DTL.LB	All	0							x	x	x	O
		Number-specified	1										
Defect Detection Condition: Primary Target No.	PRM.DTL.LLB			0	4999	0	4	0	x	x	x	O	
Intersection Details	Intersection Setting 0: PRM.DTL.CRS_EN[0] Enable Intersection			0	1	0	1	0	x	x	x	O	
	Intersection Setting 0: PRM.DTL.CRS_EXT[0] Region Extension	OFF	0										
		ON	1										
	Intersection Setting 0: PRM.DTL.CRS_SRG[0] Intersection Search Range (Pixels)			100	200	1	3	0	x	x	x	O	
	Intersection Setting 0: PRM.DTL.CRS_OVR[0] Offset (Pixels)			5	200	0	3	0	x	x	x	O	
	Intersection Setting 0: PRM.DTL.CRS_INS[0] Corner Inspection	OFF	0						x	x	x	O	
		ON	1										
	Intersection Setting 0: PRM.DTL.CRS_PRD[0] Detection Direction	Outward	5						x	x	x	O	
		Inward	4										

Category	Setting item	Name	Selection			Initial value	Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	No. of integer digits	No. of decimal places	User variable	System Variable	Result data	Unit properties			
Intersection Details (continued)	Intersection Setting 0: Edge Direction	PRM.DTL.CRS_EGD[0]	Both	3					x	x	x	O	
			Brighter→	1									
			Darker										
			Darker→	2									
			Brighter										
	Intersection Setting 0: Corner Detection Condition	PRM.DTL.CRS_DTN0[0]		0	4	0	1	0	x	x	x	O	
	Intersection Setting 0: Corner Inspection Width (Pixels)	PRM.DTL.CRS_WDT[0]		50	500	10	3	0	x	x	x	O	
	Intersection Setting 0: Burr Inspection Range (Pixels)	PRM.DTL.CRS_OHT[0]		50	200	0	3	0	x	x	x	O	
	Intersection Setting 0: Array No. of region 0 constituting the intersection	PRM.DTL.CRS_ARIDO[0]	-		127	0	5	0	x	x	x	O	
	Intersection Setting 0: Array No. of region 1 constituting the intersection	PRM.DTL.CRS_ARID1[0]	-		127	0	5	0	x	x	x	O	
	Intersection Setting 0: End of region 0 constituting the intersection	PRM.DTL.CRS_TERMO[0]		0	1	0	1	0	x	x	x	O	
	Intersection Setting 0: End of region 1 constituting the intersection	PRM.DTL.CRS_TERM1[0]		0	1	0	1	0	x	x	x	O	
	Intersection Setting 1	PRM.DTL.CRS_***[1]	:	:									
	Intersection Setting 127	PRM.DTL.CRS_***[127]											
	Corner Detection Condition 0: (Edge Detection) Enable detection condition	PRM.DTL.CRS_DCEN[0]		0	1	0	1	0	x	x	x	O	
	Corner Detection Condition 0: (Edge Detection) Edge sensitivity	PRM.DTL.CRS_SEN[0]		30	100	0	3	0	O	O	x	O	
	Corner Detection Condition 0: (Edge Detection) Edge Detection Width	PRM.DTL.CRS_FLW[0]		5	100	0	3	0	O	O	x	O	
	Corner Detection Condition 0: (Edge Detection) Edge intensity lower limit	PRM.DTL.CRS_EI[0]:LL		5.000	255.000	0.000	3	3	O	O	x	O	
	Corner Detection Condition 0: (Edge Detection) Segment Size (Pixels)	PRM.DTL.CRS_SGSA[0]		5	9999	1	4	0	x	x	x	O	
	Corner Detection Condition 0: (Edge Detection) Segment Shift (Pixels)	PRM.DTL.CRS_MVSA[0]		3.00	9999.99	0.01	4	2	x	x	x	O	
	Corner Detection Condition 0: (Defect Detection Condition) Corner area filter upper limit	PRM.DTL.CRS_CGT[0]:HL		9999999.99	9999999.99	0000000.00	7	2	O	O	x	O	
	Corner Detection Condition 0: (Defect Detection Condition) Corner area filter lower limit	PRM.DTL.CRS_CGT[0]:LL		9999999.99	9999999.99	0000000.00	7	2	O	O	x	O	

Category	Setting item	Name	Selection			No. of integer places	No. of decimal places	Referencing				
			Label	Value				User variable	System variable	Result data	Unit properties	
Intersection Details (continued)	Corner Detection Condition 0: (Defect Detection Condition) Corner distance filter upper limit	PRM.DTL.CRS_CDT[0]:HL		99999.99	99999.99	-99999.99	5	2	O	O	x	O
	Corner Detection Condition 0: (Defect Detection Condition) Corner distance filter lower limit	PRM.DTL.CRS_CDT[0]:LL		99999.99	99999.99	-99999.99	5	2	O	O	x	O
	Corner Detection Condition 1	PRM.DTL.CRS_***[1]										
	⋮	⋮										
	Corner Detection Condition 4	PRM.DTL.CRS_***[4]										
	Corner Detection Condition: (Defect Detection) Label order	PRM.DTL.CRS_LOD	Intersection No.: Descend	54					O	O	x	O
			Intersection No.: Ascend	55								
			Corner Area: Descend	56								
			Corner Area: Ascend	57								
			Corner Distance: Descend	58								
			Corner Distance: Ascend	59								
	Corner Detection Condition: (Defect Detection) Type of Primary Target	PRM.DTL.CRS_LB	All	0					x	x	x	O
			Number-specified	1								
	Corner Detection Condition: (Defect Detection) Primary Target	PRM.DTL.CRS_LL		0	127	0	3	0	x	x	x	O
Details	Origin Point XY	PRM.DTL.OGXY										
	Origin Point X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	x	x	x	O
	Origin Point Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	x	x	x	O
	Selection	PRM.DTL.THM	Auto	0					O	O	x	O
			Manual	1								
	Selection Settings (manual)	PRM.DTL.THRM		50.00	99.99	0.00	2	2	O	O	x	O
	Undetected Points	PRM.DTL.UPT	Disregard	0					x	x	x	O
			Maximize	1								
			Minimize	2								
			Interpolate	3								
	Selection Rate	PRM.DTL.CGFT	Total Diff. From Model Line	0					O	O	x	O
			Total Diff. From Threshold	1								
	Apply Also to Model Line Calculation	PRM.DTL.UUP		0	1	0	1	0	x	x	x	O
	Store Edge Position of All Segments to Memory	PRM.DTL.OEP		1	1	0	1	0	x	x	x	O
Judgment conditions	Total detected segments: Upper limit	PRM.DTL.TDSGN:HL	-	99999	0	6	0	O	O	x	O	
	Total detected segments: Lower limit	PRM.DTL.TDSGN:LL	-	99999	0	6	0	O	O	x	O	
	No. of detected segments (min.): Upper limit	PRM.DTL.DSGNL:HL	-	99999	0	6	0	O	O	x	O	
	No. of detected segments (min.): Lower limit	PRM.DTL.DSGNL:LL	-	99999	0	6	0	O	O	x	O	

Category	Setting item	Name	Selection			No. of integer digits	No. of decimal places	Referencing			
			Label	Value				User variable	System variable	Result data	Unit properties
Judgment conditions (continued)	Total Defect Count: Upper limit	PRM.DTL.TSTN:HL	-	9999	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Total Defect Count: Lower limit	PRM.DTL.TSTN:LL	-	9999	0	4	0	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Total Size: Upper limit	PRM.DTL.TSTG:HL	-	9999999.999	0.000	7	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Total Size: Lower limit	PRM.DTL.TSTG:LL	-	9999999.999	0.000	7	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Defect Size: Upper limit	PRM.DTL.STG:HL	-	9999999.999	0.000	7	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Defect Size: Lower limit	PRM.DTL.STG:LL	-	9999999.999	0.000	7	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Defect Position X: Upper limit	PRM.DTL.STX:HL	-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Defect Position X: Lower limit	PRM.DTL.STX:LL	-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Defect Position Y: Upper limit	PRM.DTL.STY:HL	-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Defect Position Y: Lower limit	PRM.DTL.STY:LL	-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Corner area: Upper limit	PRM.DTL.CGL:HL	-	9999999.99	0.00	7	2	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Corner area: Lower limit	PRM.DTL.CGL:LL	-	9999999.99	0.00	7	2	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Corner distance: Upper limit	PRM.DTL.CDSL:HL	-	99999.99	-99999.99	5	2	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Corner distance: Lower limit	PRM.DTL.CDSL:LL	-	99999.99	-99999.99	5	2	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>

Intensity Unit

Category	Setting item	Name	Selection			No. of integer digits	No. of decimal places	Referencing			
			Label	Value				User variable	System variable	Result data	Unit properties
Parameters	Origin XY	PRM.DTL.OGXY				4	3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Coordinate value	PRM.DTL.CRD	After position adjustment	0					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			Before position adjustment	1					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Limits	Average intensity: Upper limit	PRM.DTL.DA:HL	-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
	Average intensity: Lower limit	PRM.DTL.DA:LL	-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Intensity deviation: Upper limit	PRM.DTL.DD:HL	-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Intensity deviation: Lower limit	PRM.DTL.DD:LL	-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Intensity: Upper limit	PRM.DTL.D:HL	-	999	0	3	0	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>
	Intensity: Lower limit	PRM.DTL.D:LL	-	999	0	3	0	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>

Color Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection condition	Colorspace	PRM.DTL.PRA	RGB	0				X	X	X
			HSB	3						
			MultiSpectrum mode	4						O
Parameters	Origin XY	PRM.DTL.OGXY						4	3	X X X O
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000		4	3	X X X O
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000		4	3	X X X O
	Coordinate value	PRM.DTL.CRD	After position adjustment	0						X X X O
			Before position adjustment	1						
Limits	Average intensity R: Upper limit	PRM.DTL.RA:HL		-	999.999	0.000	3	3	O O X O	
	Average intensity R: Lower limit	PRM.DTL.RA:LL		-	999.999	0.000	3	3	O O X O	
	Average intensity G: Upper limit	PRM.DTL.GA:HL		-	999.999	0.000	3	3	O O X O	
	Average intensity G: Lower limit	PRM.DTL.GA:LL		-	999.999	0.000	3	3	O O X O	
	Average intensity B: Upper limit	PRM.DTL.BA:HL		-	999.999	0.000	3	3	O O X O	
	Average intensity B: Lower limit	PRM.DTL.BA:LL		-	999.999	0.000	3	3	O O X O	
	Intensity deviation R: Upper limit	PRM.DTL.RD:HL		-	999.999	0.000	3	3	O O X O	
	Intensity deviation R: Lower limit	PRM.DTL.RD:LL		-	999.999	0.000	3	3	O O X O	
	Intensity deviation G: Upper limit	PRM.DTL.GD:HL		-	999.999	0.000	3	3	O O X O	
	Intensity deviation G: Lower limit	PRM.DTL.GD:LL		-	999.999	0.000	3	3	O O X O	
	Intensity deviation B: Upper limit	PRM.DTL.BD:HL		-	999.999	0.000	3	3	O O X O	
	Intensity deviation B: Lower limit	PRM.DTL.BD:LL		-	999.999	0.000	3	3	O O X O	
	Intensity R: Upper limit	PRM.DTL.R:HL		-	999	0	3	0	O O X O	
	Intensity R: Lower limit	PRM.DTL.R:LL		-	999	0	3	0	O O X O	
	Intensity G: Upper limit	PRM.DTL.G:HL		-	999	0	3	0	O O X O	
	Intensity G: Lower limit	PRM.DTL.G:LL		-	999	0	3	0	O O X O	
	Intensity B: Upper limit	PRM.DTL.B:HL		-	999	0	3	0	O O X O	
	Intensity B: Lower limit	PRM.DTL.B:LL		-	999	0	3	0	O O X O	
	Average intensity H: Upper limit	PRM.DTL.HUA:HL		-	999.999	0.000	3	3	O O X O	
	Average intensity H: Lower limit	PRM.DTL.HUA:LL		-	999.999	0.000	3	3	O O X O	
	Average intensity S: Upper limit	PRM.DTL.SAA:HL		-	999.999	0.000	3	3	O O X O	
	Average intensity S: Lower limit	PRM.DTL.SAA:LL		-	999.999	0.000	3	3	O O X O	
	Average intensity V: Upper limit	PRM.DTL.VAA:HL		-	999.999	0.000	3	3	O O X O	
	Average intensity V: Lower limit	PRM.DTL.VAA:LL		-	999.999	0.000	3	3	O O X O	
	Intensity deviation H: Upper limit	PRM.DTL.HUD:HL		-	999.999	0.000	3	3	O O X O	

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	User variable	System variable	Result data	Referencing
				Value	Initial value	Upper limit						
Limits (continued)	Intensity deviation H: Lower limit	PRM.DTL.HUD:LL		-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity deviation S: Upper limit	PRM.DTL.SAD:HL		-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity deviation S: Lower limit	PRM.DTL.SAD:LL		-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity deviation V: Upper limit	PRM.DTL.VAD:HL		-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity deviation V: Lower limit	PRM.DTL.VAD:LL		-	999.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity H: Upper limit	PRM.DTL.HUE:HL		-	999	0	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity H: Lower limit	PRM.DTL.HUE:LL		-	999	0	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity S: Upper limit	PRM.DTL.SAT:HL		-	999	0	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity S: Lower limit	PRM.DTL.SAT:LL		-	999	0	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity V: Upper limit	PRM.DTL.VAL:HL		-	999	0	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Intensity V: Lower limit	PRM.DTL.VAL:LL		-	999	0	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Judgment Conditions (MultiSpectrum Mode)	Gray Intensity Ave. for UV: Upper limit	PRM.DTL.MC_UVA:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for UV: Lower limit	PRM.DTL.MC_UVA:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for B: Upper limit	PRM.DTL.MC_BA:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for B: Lower limit	PRM.DTL.MC_BA:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for G: Upper limit	PRM.DTL.MC_GA:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for G: Lower limit	PRM.DTL.MC_GA:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for AM: Upper limit	PRM.DTL.MC_AMA:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for AM: Lower limit	PRM.DTL.MC_AMA:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for R: Upper limit	PRM.DTL.MC_RA:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for R: Lower limit	PRM.DTL.MC_RA:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for FR: Upper limit	PRM.DTL.MC_FRA:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for FR: Lower limit	PRM.DTL.MC_FRA:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for IR: Upper limit	PRM.DTL.MC_IRA:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for IR: Lower limit	PRM.DTL.MC_IRA:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for W: Upper Limit	PRM.DTL.MC_WA:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Ave. for W: Lower limit	PRM.DTL.MC_WA:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Deviation for UV: Upper limit	PRM.DTL.MC_UVD:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Deviation for UV: Lower limit	PRM.DTL.MC_UVD:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Deviation for B: Upper limit	PRM.DTL.MC_BD:HL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Gray Intensity Deviation for B: Lower limit	PRM.DTL.MC_BD:LL		-	999.999	0.0	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits No. of decimal places	Numerical value format	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Judgment Conditions (MultiSpectrum Mode) (continued)	Gray Intensity Deviation for G: Upper limit	PRM.DTL.MC_GD:HL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for G: Lower limit	PRM.DTL.MC_GD:LL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for AM: Upper limit	PRM.DTL.MC_AMD:HL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for AM: Lower limit	PRM.DTL.MC_AMD:LL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for R: Upper limit	PRM.DTL.MC_RD:HL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for R: Lower limit	PRM.DTL.MC_RD:LL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for FR: Upper limit	PRM.DTL.MC_FRD:HL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for FR: Lower limit	PRM.DTL.MC_FRD:LL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for IR: Upper limit	PRM.DTL.MC_IRD:HL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for IR: Lower limit	PRM.DTL.MC_IRD:LL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for W: Upper limit	PRM.DTL.MC_WD:HL		-	999.999	0.0	3	3	O	O	x	O
	Gray Intensity Deviation for W: Lower limit	PRM.DTL.MC_WD:LL		-	999.999	0.0	3	3	O	O	x	O
	Intensity of UV: Upper limit	PRM.DTL.MC_UV:HL		-	999	0	3	0	O	O	x	O
	Intensity of UV: Lower limit	PRM.DTL.MC_UV:LL		-	999	0	3	0	O	O	x	O
	Intensity of B: Upper limit	PRM.DTL.MC_B:HL		-	999	0	3	0	O	O	x	O
	Intensity of B: Lower limit	PRM.DTL.MC_B:LL		-	999	0	3	0	O	O	x	O
	Intensity of G: Upper limit	PRM.DTL.MC_G:HL		-	999	0	3	0	O	O	x	O
	Intensity of G: Lower limit	PRM.DTL.MC_G:LL		-	999	0	3	0	O	O	x	O
	Intensity of AM: Upper limit	PRM.DTL.MC_AM:HL		-	999	0	3	0	O	O	x	O
	Intensity of R: Upper limit	PRM.DTL.MC_R:HL		-	999	0	3	0	O	O	x	O
	Intensity of R: Lower limit	PRM.DTL.MC_R:LL		-	999	0	3	0	O	O	x	O
	Intensity of FR: Upper limit	PRM.DTL.MC_FR:HL		-	999	0	3	0	O	O	x	O
	Intensity of FR: Lower limit	PRM.DTL.MC_FR:LL		-	999	0	3	0	O	O	x	O
	Intensity of IR: Upper limit	PRM.DTL.MC_IR:HL		-	999	0	3	0	O	O	x	O
	Intensity of IR: Lower limit	PRM.DTL.MC_IR:LL		-	999	0	3	0	O	O	x	O
	Intensity of W: Upper limit	PRM.DTL.MC_W:HL		-	999	0	3	0	O	O	x	O
	Intensity of W: Lower limit	PRM.DTL.MC_W:LL		-	999	0	3	0	O	O	x	O

Color Grouping Unit

Category	Setting item	Name	Label	Selection			Numerical value format			Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data
Color group 0	Enable/Disable color group	PRM.CGRP.GRP[0].EN		1	1	0	1	1	0	x	x	x
	Group name	PRM.CGRP.GRP[0].GRNM						x	x	x	x	o
	(Extraction color 0) Enable/Disable	PRM.CGRP.GRP[0].CI[0].EN		1	1	0	1	0	x	x	x	o
	(Extraction color 0) Color range	PRM.CGRP.GRP[0].CI[0].CHROM		1	999.999	0.001	3	3	x	x	x	o
	(Extraction color 0) Brightness range	PRM.CGRP.GRP[0].CI[0].BRIGHT		0	0	50	2	1	x	x	x	o
	(Extraction color 0) Mean value of each color (UV)	PRM.CGRP.GRP[0].CI[0].AVCUV		-	999.999	0	3	3	x	x	x	o
	(Extraction color 0) Mean value of each color (B)	PRM.CGRP.GRP[0].CI[0].AVCB		-	999.999	0	3	3	x	x	x	o
	(Extraction color 0) Mean value of each color (G)	PRM.CGRP.GRP[0].CI[0].AVCG		-	999.999	0	3	3	x	x	x	o
	(Extraction color 0) Mean value of each color (AM)	PRM.CGRP.GRP[0].CI[0].AVCAM		-	999.999	0	3	3	x	x	x	o
	(Extraction color 0) Mean value of each color (R)	PRM.CGRP.GRP[0].CI[0].AVCR		-	999.999	0	3	3	x	x	x	o
	(Extraction color 0) Mean value of each color (FR)	PRM.CGRP.GRP[0].CI[0].AVCFR		-	999.999	0	3	3	x	x	x	o
	(Extraction color 0) Mean value of each color (IR)	PRM.CGRP.GRP[0].CI[0].AVCIR		-	999.999	0	3	3	x	x	x	o
	(Extraction color 0) Mean value of each color (W)	PRM.CGRP.GRP[0].CI[0].AVCW		-	999.999	0	3	3	x	x	x	o
	(Extraction color 0) Color distribution information	PRM.CGRP.GRP[0].CI[0].CDIST[s]		-	-99999.999	99999.999	5	3	x	x	x	o
	(Extraction color 1)	PRM.CGRP.GRP[0].CI[1].***		:	:							
	(Extraction color 15)	PRM.CGRP.GRP[0].CI[15].***										
Color group 1		PRM.CGRP.GRP[1].***										
:		:										
Color group 15		PRM.CGRP.GRP[15].***										

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Numerical value format			Referencing
				Value	Initial value	Upper limit			User variable	System variable	Result data	
Excluded Colors	(Excluded Color 0) Enable/Disable	PRM.CGRP.CBG.CI[0].EN		1	1	0	1	0	x	x	x	O
	(Excluded Color 0) Color range	PRM.CGRP.CBG.CI[0].CHROM		1	999.999	0.001	3	3	x	x	x	O
	(Excluded Color 0) Brightness range	PRM.CGRP.CBG.CI[0].BRIGHT		0	0	50	2	1	x	x	x	O
	(Excluded Color 0) Mean value of each color (UV)	PRM.CGRP.CBG.CI[0].AVCUV		-	999.999	0	3	3	x	x	x	O
	(Excluded Color 0) Mean value of each color (B)	PRM.CGRP.CBG.CI[0].AVCB		-	999.999	0	3	3	x	x	x	O
	(Excluded Color 0) Mean value of each color (G)	PRM.CGRP.CBG.CI[0].AVCG		-	999.999	0	3	3	x	x	x	O
	(Excluded Color 0) Mean value of each color (AM)	PRM.CGRP.CBG.CI[0].AVCAM		-	999.999	0	3	3	x	x	x	O
	(Excluded Color 0) Mean value of each color (R)	PRM.CGRP.CBG.CI[0].AVCR		-	999.999	0	3	3	x	x	x	O
	(Excluded Color 0) Mean value of each color (FR)	PRM.CGRP.CBG.CI[0].AVCFR		-	999.999	0	3	3	x	x	x	O
	(Excluded Color 0) Mean value of each color (IR)	PRM.CGRP.CBG.CI[0].AVCIR		-	999.999	0	3	3	x	x	x	O
	(Excluded Color 0) Mean value of each color (W)	PRM.CGRP.CBG.CI[0].AVCW		-	999.999	0	3	3	x	x	x	O
	(Excluded Color 0) Color distribution information	PRM.CGRP.CBG.CI[0].CDIST[s]		-	-99999.999	99999.999	5	3	x	x	x	O
	(Excluded Color 1) PRM.CGRP.CBG.CI[1].***											
	:											
	(Excluded Color 15) PRM.CGRP.CBG.CI[15].***											
Color extraction settings	Refer to Other Unit	PRM.DTL.REF_EN		0	1	0	1	0	x	x	x	O
	Reference Unit	PRM.DTL.RUID		-1	999	-1	8	0	x	x	x	O

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data
Individual setting	(Averaging) Size	PRM.CGRP.FKSZ		7	63	3		3	0	x	x	x
	(Averaging) Enable/ Disable	PRM.CGRP.SMENB		1	1	0		1	0	x	x	x
	(Averaging) No. of times	PRM.CGRP.PTMS		1	9	1		1	0	x	x	x
	Measurement method	PRM.DTL.ARRT		1	1	0		1	0	x	x	x
	Proportion Calculation Target	PRM.DTL.ARGN_EN		0	1	0		1	0	x	x	x
	Origin coordinate X	PRM.DTL.OGX		0.000	9600.000	-9600.000	4	3	x	x	x	x
	Origin coordinate Y	PRM.DTL.OGY		0.000	7200.000	-7200.000	4	3	x	x	x	x
	Select coordinate axis system	PRM.DTL.CRD		0	256	0	3	0	x	x	x	x
	Select origin coordinate system	PRM.DTL.ORG		0	256	0	3	0	x	x	x	x
	Error If Primary Candidate Is Not Found	PRM.DTL.PCFE_EN		0	1	0	1	0	x	x	x	x
Judgment conditions	Primary Candidate (Group No.)	PRM.DTL.MXARGID[0]		0	1	0	1	0	○	○	○	x
	Primary Candidate (Area) (%)											
	Area: Upper limit	PRM.DTL.MXAR:HL		-	99999999	0	8	0	○	○	x	○
	Area: Lower limit	PRM.DTL.MXAR:LL		-	99999999	0	8	0	○	○	x	○
	Area (%): Upper limit	PRM.DTL.MXRT:HL		-	100.0	0.0	3	1	○	○	x	○
	Area (%): Lower limit	PRM.DTL.MXRT:LL		-	100.0	0.0	3	1	○	○	x	○
	Area of all groups											
	Area: Upper limit	PRM.DTL.ESAR:HL		-	99999999	0	8	0	○	○	x	○
	Area: Lower limit	PRM.DTL.ESAR:LL		-	99999999	0	8	0	○	○	x	○
	Individual Area (Area) (%) (Group 0)											
	Area: Upper limit	PRM.DTL.GAR[0]:HL		-	99999999	0	8	0	○	○	x	○
	Area: Lower limit	PRM.DTL.GAR[0]:LL		-	99999999	0	8	0	○	○	x	○
	Area (%): Upper limit	PRM.DTL.GRT[0]:HL		-	100.0	0.0	3	1	○	○	x	○
	Area (%): Lower limit	PRM.DTL.GRT[0]:LL		-	100.0	0.0	3	1	○	○	x	○
	Individual Area (Area) (%) (Group 1)	PRM.DTL.***[1]:**										
	:	:										
	Individual Area (Area) (%) (Group 15)	PRM.DTL.***[15]:**										

OCR Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Block setting	Character color	PRM.DTL.CCL	White	255				○	○	○
			Black	0						
Block mode	PRM.DTL.COM	Auto	0					X	X	X ○
Character reading direction	PRM.DTL.STDR	→	5					○	○	○ ○ ○ ○
Number of lines	PRM.DTL.SLCT		1					1	0	X X X ○
Detection direction	PRM.DTL.SCOD	Forward	7					○	○	○ ○ ○ ○
Line rotation correction	PRM.DTL.SERO	Size	13					○	○	○ ○ ○ ○
Detection method	PRM.DTL.SCOM	OFF	0					○	○	○ ○ ○ ○
Ratio setup: Start position	PRM.DTL.SSHG01		0.00		100.00	0.00	3	2	○ ○ ○ ○	○ ○ ○ ○
Ratio setup: Height	PRM.DTL.SSHG02		50.00		100.00	0.00	3	2	○ ○ ○ ○	○ ○ ○ ○
Ratio setup: End position	PRM.DTL.SSHGE		100.00		100.00	0.00	3	2	○ ○ ○ ○	○ ○ ○ ○
Smoothing filter	PRM.DTL.SWEC		0		99	0	2	0	○ ○ ○ ○	○ ○ ○ ○
Maximum line ratio	PRM.DTL.MRW		1.000		1.000	0.100	1	3	○ ○ ○ ○	○ ○ ○ ○
Line detection	PRM.DTL.SCOT		40		255	0	3	0	○ ○ ○ ○	○ ○ ○ ○
Minimum line height	PRM.DTL.SNWD		10		255	0	3	0	○ ○ ○ ○	○ ○ ○ ○
Line extraction	PRM.DTL.SNHG		25		255	0	3	0	○ ○ ○ ○	○ ○ ○ ○
Line 1: Number of characters	PRM.DTL.CCCT1		10		20	1	2	0	X X X X	○ ○ ○ ○
Line 1: Detection direction	PRM.DTL.CCOD1	Forward	7					○	○	○ ○ ○ ○
Line 1: Character tilt correction	PRM.DTL.CESP1	OFF	0					○	○	○ ○ ○ ○
Line 1: Detection method	PRM.DTL.CCOM1	Waveform	0					X	X X X X	○ ○ ○ ○
Line 1: Ratio setup: Start position	PRM.DTL.CCW01_1		0.00		100.00	0.00	3	2	○ ○ ○ ○	○ ○ ○ ○
Line 1: Ratio setup: Height (1-2)	PRM.DTL.CCW02_1		0.00		100.00	0.00	3	2	○ ○ ○ ○	○ ○ ○ ○
Line 1: Ratio setup: Height (2-3)	PRM.DTL.CCW03_1		0.00		100.00	0.00	3	2	○ ○ ○ ○	○ ○ ○ ○
Line 1: Ratio setup: Height (3-4)	PRM.DTL.CCW04_1		0.00		100.00	0.00	3	2	○ ○ ○ ○	○ ○ ○ ○
Line 1: Ratio setup: Height (4-5)	PRM.DTL.CCW05_1		0.00		100.00	0.00	3	2	○ ○ ○ ○	○ ○ ○ ○

List of setting parameters

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing			
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Block setting (continued)	Line 1: Ratio setup: Height (5-6)	PRM.DTL.CCW06_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (6-7)	PRM.DTL.CCW07_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (7-8)	PRM.DTL.CCW08_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (8-9)	PRM.DTL.CCW09_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (9-10)	PRM.DTL.CCW10_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (10-11)	PRM.DTL.CCW11_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (11-12)	PRM.DTL.CCW12_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (12-13)	PRM.DTL.CCW13_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (13-14)	PRM.DTL.CCW14_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (14-15)	PRM.DTL.CCW15_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (15-16)	PRM.DTL.CCW16_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (16-17)	PRM.DTL.CCW17_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (17-18)	PRM.DTL.CCW18_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (18-19)	PRM.DTL.CCW19_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup: Height (19-20)	PRM.DTL.CCW20_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Ratio setup End position	PRM.DTL.CCWE_1		0.00	100.00	0.00		3	2	O	O	X	O
	Line 1: Smoothing filter	PRM.DTL.CWEC1		0	99	0		2	0	O	O	X	O
	Line 1: Max. Width / Height Ratio	PRM.DTL.CART1		1.000	9.999	0.100		1	3	O	O	X	O
	Line 1: Character detection	PRM.DTL.CCOT1		40	255	0		3	0	O	O	X	O
	Line 1: Minimum Character Width	PRM.DTL.CNWD1		5	255	0		3	0	O	O	X	O
	Line 1: Character extraction	PRM.DTL.CNHG1		25	255	0		3	0	O	O	X	O
	Line 1: Fine adjustment	PRM.DTL.CEFA1	OFF ON	0 1						X	X	X	O
	Line 2: Number of characters	PRM.DTL.CCCT2		10	20	1		2	0	X	X	X	O

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing			
			Label	Value							User variable	System variable	Result data	Unit properties
Block setting (continued)	Line 2: Detection direction	PRM.DTL.CCOD2	Forward	7							<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
			Reverse	6										
			Size	13										
Line 2: Character tilt correction	Line 2: Character tilt correction	PRM.DTL.CESP2	OFF	0							<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
			ON	1										
Line 2: Detection method	Line 2: Detection method	PRM.DTL.CCOM2	Waveform	0							X	X	X	<input type="radio"/>
			Specify ratio	1										
Line 2: Ratio setup Start position	Line 2: Ratio setup: Start position	PRM.DTL.CCW01_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (1-2)	Line 2:	PRM.DTL.CCW02_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (2-3)	Line 2:	PRM.DTL.CCW03_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (3-4)	Line 2:	PRM.DTL.CCW04_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (4-5)	Line 2:	PRM.DTL.CCW05_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (5-6)	Line 2:	PRM.DTL.CCW06_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (6-7)	Line 2:	PRM.DTL.CCW07_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (7-8)	Line 2:	PRM.DTL.CCW08_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (8-9)	Line 2:	PRM.DTL.CCW09_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (9-10)	Line 2:	PRM.DTL.CCW10_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (10-11)	Line 2:	PRM.DTL.CCW11_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (11-12)	Line 2:	PRM.DTL.CCW12_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (12-13)	Line 2:	PRM.DTL.CCW13_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (13-14)	Line 2:	PRM.DTL.CCW14_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (14-15)	Line 2:	PRM.DTL.CCW15_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (15-16)	Line 2:	PRM.DTL.CCW16_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (16-17)	Line 2:	PRM.DTL.CCW17_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (17-18)	Line 2:	PRM.DTL.CCW18_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	
Line 2: Ratio setup: Height (18-19)	Line 2:	PRM.DTL.CCW19_2		0.00	100.00	0.00		3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>	

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data
Block setting (continued)	Line 2: Ratio setup: Height (19-20)	PRM.DTL.CCW0_2		0.00	100.00	0.00		3	2	O	O	X
	Line 2: Ratio setup End position	PRM.DTL.CCWE_2		0.00	100.00	0.00		3	2	O	O	X
	Line 2: Smoothing filter	PRM.DTL.CWEC2		0	99	0		2	0	O	O	X
	Line 2: Max. Width / Height Ratio	PRM.DTL.CART2		1.000	9.999	0.100		1	3	O	O	X
	Line 2: Character detection	PRM.DTL.CCOT2		40	255	0		3	0	O	O	X
	Line 2: Minimum Character Width	PRM.DTL.CNWD2		5	255	0		3	0	O	O	X
	Line 2: Character extraction	PRM.DTL.CNHG2		25	255	0		3	0	O	O	X
	Line 2: Fine adjustment	PRM.DTL.CEFA2	OFF ON	0 1	1	0				X	X	X
	Fixed block: Number of characters	PRM.DTL.FRН		0	20	0		2	0	X	X	X
Fixed block: Rotated rectangle 0	Width	PRM.DTL.WI[0]		81	2432	1		4	0	O	O	X
	Height	PRM.DTL.HI[0]		121	2432	1		4	0	O	O	X
	Center XY	PRM.DTL.RCXY[0]						5	0	O	X	X
	Center X	PRM.DTL.RCX[0]		256	16382	0		5	0	O	O	X
	Center Y	PRM.DTL.RCY[0]		240	16382	0		5	0	O	O	X
	Rotation angle	PRM.DTL.T[0]		0.0	359.9	0.0		3	1	O	O	X
Fixed block: Rotated rectangle 1		PRM.DTL.***[1]								O		
:		:								O		
Fixed block: Rotated rectangle 19		PRM.DTL.***[19]								O		
Fixed block: Rotated rectangle (common)	Fine adjustment	PRM.DTL.EFAF	OFF ON	0 1						X	X	X

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			Unit properties
				Value	No. of integer digits				No. of decimal places	User variable	System variable	Result data		
Parameters	Origin XY	PRM.DTL.OGXY							4 3	X X X O				
	Origin X	PRM.DTL.OGX		0.000	9600.000	-9600.000			4 3	X X X O				
	Origin Y	PRM.DTL.OGY		0.000	7200.000	-7200.000			4 3	X X X O				
	Coordinate value	PRM.DTL.CRD	After position adjustment	0							X X X O			
			Before position adjustment	1										
	Zero suppression	PRM.DTL.CAZS	OFF	0							X X X O			
			Space forward	1										
			Space backward	2										
			Remove zeros	3										
	Calculation result conversion: N-adic number	PRM.DTL.COC		10	36	10			2 0	X X X O				
Calendar Settings	Calculation result conversion: No. of digits	PRM.DTL.PLN		1	6	1			1 0	X X X O				
	Mirror inversion	PRM.DTL.ENMR	OFF	0							X X X O			
			ON	1										
	Character contrast lower limit	PRM.DTL.GDLL		10	255	0			3 0	X X X O				
	Noise cancellation	PRM.DTL.ACAB	OFF	0							X X X O			
			ON	1										
	Primary target	PRM.DTL.LLB		0	39	0			2 0	X X X O				
	Offset: Year	PRM.DTL.OFYR		0	10	-10			2 0	O O X O				
	Offset: Month	PRM.DTL.OFMN		0	12	-12			2 0	O O X O				
	Offset: Day	PRM.DTL.OFDY		0	1999	-1999			4 0	O O X O				
	Offset: Time	PRM.DTL.OFTM		0	24	-24			2 0	O O X O				
Allowable error: +	Allowable error: +	PRM.DTL.SLH		0	3599	0			4 0	O O X O				
	Allowable error: -	PRM.DTL.SLL		0	3599	0			4 0	O O X O				

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Limits	Line 1: Registered string: 1st character	PRM.DTL.JIDA1[0]	0	0				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			1	1				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			2	2				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			3	3				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			4	4				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			5	5				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			6	6				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			7	7				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			8	8				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			9	9				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			A	10				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			B	11				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			C	12				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			D	13				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			E	14				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			F	15				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			G	16				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			H	17				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			I	18				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			J	19				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			K	20				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			L	21				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			M	22				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			N	23				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			O	24				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			P	25				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Q	26				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			R	27				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			S	28				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			T	29				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			U	30				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			V	31				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			W	32				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			X	33				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Y	34				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Z	35				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			-	36				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			.	37				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			:	38				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			/	39				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			①	40				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			②	41				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			③	42				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			④	43				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			⑤	44				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			⑥	45				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			⑦	46				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			⑧	47				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			⑨	48				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			⑩	49				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			⑪	50				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing			
			Label	Value							User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Registered string: 1st character (continued)	PRM.DTL.JIDA1[0]	⑫	51							<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
			⑬	52										
			⑭	53										
			⑮	54										
			⑯	55										
			⑰	56										
			⑱	57										
			⑲	58										
			⑳	59										
		SPACE	61											
		*	62											
		#	63											
		Year4	64											
		Year2	65											
		Month	66											
		Day	67											
		Hour	68											
		REG	70											
		eYear(0)	71											
		:	:											
		eYear(9)	80											
		eMonth(0)	81											
		:	:											
		eMonth(9)	90											
		eDay(0)	91											
		:	:											
		eDay(9)	100											
		eHour(0)	101											
		:	:											
		eHour(9)	110											
		eMinute(0)	111											
		:	:											
		eMinute(9)	120											
		Shift(0)	121											
		:	:											
		Shift(9)	130											
	Line 1: Registered string: 2nd character	PRM.DTL.JIDA1[1]	Registered string: Same as those for JIDA1[0]								<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
		:	:											
	Line 1: Registered string: 20th character	PRM.DTL.JIDA1[19]	Registered string: Same as those for JIDA1[0]								<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Line 2: Registered string: 1st character	PRM.DTL.JIDA2[0]	Registered string: Same as those for JIDA1[0]								<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
		:	:											
	Line 2: Registered string: 20th character	PRM.DTL.JIDA2[19]	Registered string: Same as those for JIDA1[0]								<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

List of setting parameters

Category	Setting item	Name	Label	Selection				No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit	Lower limit			User variable	System variable	Result data	Unit properties
Library setting	Library index	PRM.DTL.DCI		0	999	0		3	0	X	X	X	O
	Library block mode	PRM.DTL.UDC	Same as Area	0						X	X	X	X
			New setting	1									
	Character color	PRM.DTL.DCCL	White	255						O	O	X	X
			Black	0									
	Block mode	PRM.DTL.SCOM	Auto	0						X	X	X	X
			Fixed	1									
	Character reading direction	PRM.DTL.DSTDTR	→	5						O	O	X	X
			←	4									
			↑	6									
			↓	7									
	Number of lines	PRM.DTL.DSLCT		1	2	1		1	0	X	X	X	X
	Detection direction	PRM.DTL.DSCOD	Forward	7						O	O	X	X
			Reverse	6									
			Size	13									
	Line rotation correction	PRM.DTL.DSERO	OFF	0						O	O	X	X
			ON	1									
	Detection method	PRM.DTL.DSCOM	Waveform	0						X	X	X	X
			Specify ratio	1									
	Ratio setup: Start position	PRM.DTL.DSSHG01		0.00	100.00	0.00		3	2	O	O	X	X
	Ratio setup: Height	PRM.DTL.DSSHG02		50.00	100.00	0.00		3	2	O	O	X	X
	Ratio setup: End position	PRM.DTL.DSSHGE		100.00	100.00	0.00		3	2	O	O	X	X
	Smoothing filter	PRM.DTL.DSWEC		0	99	0		2	0	O	O	X	X
	Maximum line ratio	PRM.DTL.DMRW		1.000	1.000	0.100		1	3	O	O	X	X
	Line detection	PRM.DTL.DSCOT		40	255	0		3	0	O	O	X	X
	Minimum line height	PRM.DTL.DSNWD		10	255	0		3	0	O	O	X	X
	Line extraction	PRM.DTL.DSNHG		25	255	0		3	0	O	O	X	X
	Line 1: Number Of Characters	PRM.DTL.DCCCT1		10	20	1		2	0	X	X	X	X
	Line 1: Detection Direction	PRM.DTL.DCCOD1	Forward	7						O	O	X	X
			Reverse	6									
			Size	13									
	Line 1: Character tilt correction	PRM.DTL.DCESP1	OFF	0						O	O	X	X
			ON	1									
	Line 1: Detection method	PRM.DTL.DCCOM1	Waveform	0						X	X	X	X
			Specify ratio	1									
	Line 1: Ratio setup Start position	PRM.DTL.DCCW01_1		0.00	100.00	0.00		3	2	O	O	X	X
	Line 1: Ratio setup: Height (1-2)	PRM.DTL.DCCW02_1		0.00	100.00	0.00		3	2	O	O	X	X
	Line 1: Ratio setup: Height (2-3)	PRM.DTL.DCCW03_1		0.00	100.00	0.00		3	2	O	O	X	X
	Line 1: Ratio setup: Height (3-4)	PRM.DTL.DCCW04_1		0.00	100.00	0.00		3	2	O	O	X	X
	Line 1: Ratio setup: Height (4-5)	PRM.DTL.DCCW05_1		0.00	100.00	0.00		3	2	O	O	X	X

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Library setting (continued)	Line 1: Ratio setup: Height (5-6)	PRM.DTL.DCCW06_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (6-7)	PRM.DTL.DCCW07_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (7-8)	PRM.DTL.DCCW08_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (8-9)	PRM.DTL.DCCW09_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (9-10)	PRM.DTL.DCCW10_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (10-11)	PRM.DTL.DCCW11_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (11-12)	PRM.DTL.DCCW12_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (12-13)	PRM.DTL.DCCW13_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (13-14)	PRM.DTL.DCCW14_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (14-15)	PRM.DTL.DCCW15_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (15-16)	PRM.DTL.DCCW16_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (16-17)	PRM.DTL.DCCW17_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (17-18)	PRM.DTL.DCCW18_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (18-19)	PRM.DTL.DCCW19_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup: Height (19-20)	PRM.DTL.DCCW20_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Ratio setup End position	PRM.DTL.DCCWE_1		0.00	100.00	0.00	3	2	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Smoothing filter	PRM.DTL.DCWE1		0	99	0	2	0	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Max. width / Height ratio	PRM.DTL.DCART1		1.000	9.999	0.100	1	3	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Character detection	PRM.DTL.DCCOT1		40	255	0	3	0	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Minimum Character Width	PRM.DTL.DCNWD1		5	255	0	3	0	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Character extraction	PRM.DTL.DCNHG1		25	255	0	3	0	<input type="radio"/>	<input type="radio"/>	X	X
	Line 1: Fine adjustment	PRM.DTL.DCEFA1	OFF ON	0 1							X	X
	Line 2: Number of characters	PRM.DTL.DCCCT2		10	20	1	2	0	X	X	X	X
	Line 2: Detection direction	PRM.DTL.DCCOD2	Forward Reverse Size	7 6 13					<input type="radio"/>	<input type="radio"/>	X	X

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Library setting (continued)	Line 2: Character tilt correction	PRM.DTL.DCESP2	OFF	0						O	O	X	X
			ON	1									
	Line 2: Detection method	PRM.DTL.DCCOM2	Waveform	0						X	X	X	X
			Specify ratio	1									
	Line 2: ratio setup Start position	PRM.DTL.DCCW01_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (1-2)	PRM.DTL.DCCW02_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (2-3)	PRM.DTL.DCCW03_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (3-4)	PRM.DTL.DCCW04_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (4-5)	PRM.DTL.DCCW05_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (5-6)	PRM.DTL.DCCW06_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (6-7)	PRM.DTL.DCCW07_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (7-8)	PRM.DTL.DCCW08_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (8-9)	PRM.DTL.DCCW09_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (9-10)	PRM.DTL.DCCW10_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (10-11)	PRM.DTL.DCCW11_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (11-12)	PRM.DTL.DCCW12_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (12-13)	PRM.DTL.DCCW13_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (13-14)	PRM.DTL.DCCW14_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (14-15)	PRM.DTL.DCCW15_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (15-16)	PRM.DTL.DCCW16_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (16-17)	PRM.DTL.DCCW17_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (17-18)	PRM.DTL.DCCW18_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (18-19)	PRM.DTL.DCCW19_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup: Height (19-20)	PRM.DTL.DCCW20_2		0.00	100.00	0.00		3	2	O	O	X	X
	Line 2: Ratio setup End position	PRM.DTL.DCCWE_2		0.00	100.00	0.00		3	2	O	O	X	X

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Numerical value format	Referencing	Unit properties
				Value	Initial value	Upper limit					
Library setting (continued)	Line 2: Smoothing filter	PRM.DTL.DCWEC2		0	99	0	2	0	O	O	X X
	Line 2: Max. width / Height ratio	PRM.DTL.DCART2		1.000	9.999	0.100	1	3	O	O	X X
	Line 2: Character detection	PRM.DTL.DCCOT2		40	255	0	3	0	O	O	X X
	Line 2: Minimum Character width	PRM.DTL.DCNWD2		5	255	0	3	0	O	O	X X
	Line 2: Character extraction	PRM.DTL.DCNHG2		25	255	0	3	0	O	O	X X
	Line 2: Fine adjustment	PRM.DTL.DCEFA2	OFF ON	0 1						X X	X X
Library setting: Fixed block: Rotated rectangle (common)	Fixed block: Number of characters	PRM.DTL.DFRN		0	20	0	2	0	X	X	X X
Library setting: Fixed block: Rotated rectangle 0	Width	PRM.DTL.D_WI[0]		81	2432	1	4	0	O	O	X X
	Height	PRM.DTL.D_HI[0]		121	2432	1	4	0	O	O	X X
	Center XY	PRM.DTL.D_RCXY[0]					5	0	O	X	X X
	Center X	PRM.DTL.D_RCX[0]		256	16382	0	5	0	O	O	X X
	Center Y	PRM.DTL.D_RCY[0]		240	16382	0	5	0	O	O	X X
	Rotation angle	PRM.DTL.D_T[0]		0.0	359.9	0.0	3	1	O	O	X X
Library setting: Fixed block: Rotated rectangle 1		PRM.DTL.D_***[1]									
		:	:								
Library setting: Fixed block: Rotated rectangle 19		PRM.DTL.D_***[19]									
Library setting: Fixed block: Rotated rectangle (common)	Fine adjustment	PRM.DTL.DEFAF	OFF ON	0 1						X X	X X

Category	Setting item	Name	Selection			Initial value	Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	No. of integer digits				No. of decimal places	User variable	System variable	Result data	Unit properties
Limits	Line 1: Reference character: All	PRM.DTL.LTS1	All characters	0						<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
			Character groups	1									
			Specified order	2									
			Specified character	3									
	Line 1: Specified character: All "0"	PRM.DTL.LTSC1[0]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "1"	PRM.DTL.LTSC1[1]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "2"	PRM.DTL.LTSC1[2]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "3"	PRM.DTL.LTSC1[3]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "4"	PRM.DTL.LTSC1[4]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "5"	PRM.DTL.LTSC1[5]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "6"	PRM.DTL.LTSC1[6]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "7"	PRM.DTL.LTSC1[7]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "8"	PRM.DTL.LTSC1[8]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "9"	PRM.DTL.LTSC1[9]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "A"	PRM.DTL.LTSC1[10]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "B"	PRM.DTL.LTSC1[11]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "C"	PRM.DTL.LTSC1[12]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "D"	PRM.DTL.LTSC1[13]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "E"	PRM.DTL.LTSC1[14]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "F"	PRM.DTL.LTSC1[15]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "G"	PRM.DTL.LTSC1[16]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "H"	PRM.DTL.LTSC1[17]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "I"	PRM.DTL.LTSC1[18]		0	1	0		1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "J"	PRM.DTL.LTSC1[19]		0	1	0		1	0	X	X	X	<input type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Numerical value format	Referencing		
				Value	Initial value	Upper limit				User variable	System variable	Result data
Limits (continued)	Line 1: Specified character: All "K"	PRM.DTL.LTSC1[20]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "L"	PRM.DTL.LTSC1[21]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "M"	PRM.DTL.LTSC1[22]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "N"	PRM.DTL.LTSC1[23]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "O"	PRM.DTL.LTSC1[24]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "P"	PRM.DTL.LTSC1[25]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "Q"	PRM.DTL.LTSC1[26]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "R"	PRM.DTL.LTSC1[27]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "S"	PRM.DTL.LTSC1[28]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "T"	PRM.DTL.LTSC1[29]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "U"	PRM.DTL.LTSC1[30]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "V"	PRM.DTL.LTSC1[31]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "W"	PRM.DTL.LTSC1[32]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "X"	PRM.DTL.LTSC1[33]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "Y"	PRM.DTL.LTSC1[34]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "Z"	PRM.DTL.LTSC1[35]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "-"	PRM.DTL.LTSC1[36]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "	PRM.DTL.LTSC1[37]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All ":"	PRM.DTL.LTSC1[38]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "/"	PRM.DTL.LTSC1[39]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "①"	PRM.DTL.LTSC1[40]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "②"	PRM.DTL.LTSC1[41]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "③"	PRM.DTL.LTSC1[42]		0	1	0	1	0	X	X	X	O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Specified character: All "④"	PRM.DTL.LTSC1[43]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑤"	PRM.DTL.LTSC1[44]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑥"	PRM.DTL.LTSC1[45]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑦"	PRM.DTL.LTSC1[46]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑧"	PRM.DTL.LTSC1[47]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑨"	PRM.DTL.LTSC1[48]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑩"	PRM.DTL.LTSC1[49]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑪"	PRM.DTL.LTSC1[50]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑫"	PRM.DTL.LTSC1[51]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑬"	PRM.DTL.LTSC1[52]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑭"	PRM.DTL.LTSC1[53]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑮"	PRM.DTL.LTSC1[54]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑯"	PRM.DTL.LTSC1[55]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑰"	PRM.DTL.LTSC1[56]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑱"	PRM.DTL.LTSC1[57]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑲"	PRM.DTL.LTSC1[58]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑳"	PRM.DTL.LTSC1[59]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 1st character	PRM.DTL.CTS01_1	- All characters Character groups Specified order Specified character	-1 0 1 2 3					X	X	X	O
	Line 1: Specified character: 1st character **	PRM.DTL.CTSC01_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 2nd character	PRM.DTL.CTS02_1	Reference character: Same as those for CTS01_1						X	X	X	O

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing		
				Value	Initial value						User variable	System variable	Result data
Limits (continued)	Line 1: Specified character: 2nd character ***	PRM.DTL.CTSC02_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 3rd character	PRM.DTL.CTS03_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 3rd character ***	PRM.DTL.CTSC03_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 4th character	PRM.DTL.CTS04_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 4th character ***	PRM.DTL.CTSC04_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 5th character	PRM.DTL.CTS05_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 5th character ***	PRM.DTL.CTSC05_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 6th character	PRM.DTL.CTS06_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 6th character ***	PRM.DTL.CTSC06_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 7th character	PRM.DTL.CTS07_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 7th character ***	PRM.DTL.CTSC07_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 8th character	PRM.DTL.CTS08_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 8th character ***	PRM.DTL.CTSC08_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 9th character	PRM.DTL.CTS09_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 9th character ***	PRM.DTL.CTSC09_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 10th character	PRM.DTL.CTS10_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 10th character ***	PRM.DTL.CTSC10_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 11th character	PRM.DTL.CTS11_1	Reference character: Same as those for CTS01_1								X	X	X
	Line 1: Specified character: 11th character ***	PRM.DTL.CTSC11_1[*]		0	1		0		1	0	X	X	X
	Line 1: Reference character: 12th character	PRM.DTL.CTS12_1	Reference character: Same as those for CTS01_1								X	X	X

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing			
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Specified character: 12th character **	PRM.DTL.CTSC12_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 13th character	PRM.DTL.CTS13_1	Reference character: Same as those for CTS01_1							X	X	X	O
	Line 1: Specified character: 13th character **	PRM.DTL.CTSC13_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 14th character	PRM.DTL.CTS14_1	Reference character: Same as those for CTS01_1							X	X	X	O
	Line 1: Specified character: 14th character **	PRM.DTL.CTSC14_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 15th character	PRM.DTL.CTS15_1	Reference character: Same as those for CTS01_1							X	X	X	O
	Line 1: Specified character: 15th character **	PRM.DTL.CTSC15_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 16th character	PRM.DTL.CTS16_1	Reference character: Same as those for CTS01_1							X	X	X	O
	Line 1: Specified character: 16th character **	PRM.DTL.CTSC16_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 17th character	PRM.DTL.CTS17_1	Reference character: Same as those for CTS01_1							X	X	X	O
	Line 1: Specified character: 17th character **	PRM.DTL.CTSC17_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 18th character	PRM.DTL.CTS18_1	Reference character: Same as those for CTS01_1							X	X	X	O
	Line 1: Specified character: 18th character **	PRM.DTL.CTSC18_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 19th character	PRM.DTL.CTS19_1	Reference character: Same as those for CTS01_1							X	X	X	O
	Line 1: Specified character: 19th character **	PRM.DTL.CTSC19_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 20th character	PRM.DTL.CTS20_1	Reference character: Same as those for CTS01_1							X	X	X	O
	Line 1: Specified character: 20th character **	PRM.DTL.CTSC20_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Correlation: Minimum	PRM.DTL.L1CRR1:LL	-	99	0		2	0	0	O	O	X	O
	Line 1: Stability: Minimum	PRM.DTL.L1STBL:LL	-	99	0		2	0	0	O	O	X	O

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Limits (continued)	Line 2: Reference character: All	PRM.DTL.LTS2	All characters	0						<input type="radio"/> User variable
			Character groups	1						<input type="radio"/> System variable
			Specified order	2						<input checked="" type="radio"/> Result data
			Specified character	3						<input type="radio"/> Unit properties
	Line 2: Specified character: All ***	PRM.DTL.LTSC2[*]		0	1	0		1	0	X X X O
	Line 2: Reference character: 1st character	PRM.DTL.CTS01_2	-	-1						X X X O
			All characters	0						
			Character groups	1						
			Specified order	2						
			Specified character	3						
	Line 2: Specified character: 1st character ***	PRM.DTL.CTSC01_2[*]		0	1	0		1	0	X X X O
	Line 2: Reference character: 2nd character	PRM.DTL.CTS02_2	Reference character: Same as those for CTS01_2							X X X O
	Line 2: Specified character: 2nd character ***	PRM.DTL.CTSC02_2[*]		0	1	0		1	0	X X X O
	Line 2: Reference character: 3rd character	PRM.DTL.CTS03_2	Reference character: Same as those for CTS01_2							X X X O
	Line 2: Specified character: 3rd character ***	PRM.DTL.CTSC03_2[*]		0	1	0		1	0	X X X O
	Line 2: Reference character: 4th character	PRM.DTL.CTS04_2	Reference character: Same as those for CTS01_2							X X X O
	Line 2: Specified character: 4th character ***	PRM.DTL.CTSC04_2[*]		0	1	0		1	0	X X X O
	Line 2: Reference character: 5th character	PRM.DTL.CTS05_2	Reference character: Same as those for CTS01_2							X X X O
	Line 2: Specified character: 5th character ***	PRM.DTL.CTSC05_2[*]		0	1	0		1	0	X X X O
	Line 2: Reference character: 6th character	PRM.DTL.CTS06_2	Reference character: Same as those for CTS01_2							X X X O
	Line 2: Specified character: 6th character ***	PRM.DTL.CTSC06_2[*]		0	1	0		1	0	X X X O
	Line 2: Reference character: 7th character	PRM.DTL.CTS07_2	Reference character: Same as those for CTS01_2							X X X O
	Line 2: Specified character: 7th character ***	PRM.DTL.CTSC07_2[*]		0	1	0		1	0	X X X O

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing		
				Initial value	Upper limit	Lower limit	No. of integer digits No. of decimal places	User variable	System variable	Result data	Unit properties	
Limits (continued)	Line 2: Reference character: 8th character	PRM.DTL.CTS08_2	Reference character: Same as those for CTS01_2				1 0	X	X	X	O	
	Line 2: Specified character: 8th character **	PRM.DTL.CTSC08_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 9th character	PRM.DTL.CTS09_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 9th character **	PRM.DTL.CTSC09_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 10th character	PRM.DTL.CTS10_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 10th character **	PRM.DTL.CTSC10_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 11th character	PRM.DTL.CTS11_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 11th character **	PRM.DTL.CTSC11_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 12th character	PRM.DTL.CTS12_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 12th character **	PRM.DTL.CTSC12_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 13th character	PRM.DTL.CTS13_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 13th character **	PRM.DTL.CTSC13_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 14th character	PRM.DTL.CTS14_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 14th character **	PRM.DTL.CTSC14_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 15th character	PRM.DTL.CTS15_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 15th character **	PRM.DTL.CTSC15_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 16th character	PRM.DTL.CTS16_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 16th character **	PRM.DTL.CTSC16_2[*]		0	1	0	1 0	X	X	X	O	
	Line 2: Reference character: 17th character	PRM.DTL.CTS17_2	Reference character: Same as those for CTS01_2					X	X	X	O	
	Line 2: Specified character: 17th character **	PRM.DTL.CTSC17_2[*]		0	1	0	1 0	X	X	X	O	

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Line 2: Reference character: 18th character	PRM.DTL.CTS18_2	Reference character: Same as those for CTS01_2						X	X	X	O
	Line 2: Specified character: 18th character ***	PRM.DTL.CTSC18_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 19th character	PRM.DTL.CTS19_2	Reference character: Same as those for CTS01_2						X	X	X	O
	Line 2: Specified character: 19th character ***	PRM.DTL.CTSC19_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 20th character	PRM.DTL.CTS20_2	Reference character: Same as those for CTS01_2						X	X	X	O
	Line 2: Specified character: 20th character ***	PRM.DTL.CTSC20_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Correlation: Minimum	PRM.DTL.L2CRR1:LL		-	99	0	2	0	O	O	X	O
	Line 2: Stability: Minimum	PRM.DTL.L2STBL:LL		-	99	0	2	0	O	O	X	O

OCR2 Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Block setting	Character color	PRM.DTL.CCL	White	255						O	O	X	O
			Black	0									
Block setting (Auto/ Recognition)	Block mode	PRM.DTL.COM	Auto	0						X	X	X	O
			Fixed	1									
			Recognition	2									
	Character reading direction	PRM.DTL.STDR	→	5						O	O	X	O
			←	4									
			↓	6									
			↑	7									
	Number of lines (When Auto)	PRM.DTL.SLCT			1	2	1	1	0	X	X	X	O
	(When Recognition)					1	1	1	1	0	X	X	X
Detection direction	Detection direction	PRM.DTL.SCOD	Forward	7						O	O	X	O
			Reverse	6									
			Size	13									
Line rotation correction	Line rotation correction	PRM.DTL.SERO	OFF	0						O	O	X	O
			ON	1									
Detection method	Detection method	PRM.DTL.SCOM	Waveform	0						X	X	X	O
			Specify ratio	1									
Ratio setup: Start position	Ratio setup: Start position	PRM.DTL.SSHG01		0	100	0		3	2	O	O	X	O
Ratio setup: Height	Ratio setup: Height	PRM.DTL.SSHG02		50	100	0		3	2	O	O	X	O
Ratio setup: End position	Ratio setup: End position	PRM.DTL.SSHGE		100	100	0		3	2	O	O	X	O
Smoothing filter	PRM.DTL.SWEC			0	99	0		2	0	O	O	X	O
Maximum line ratio	PRM.DTL.MRW			1	1	0.1		1	3	O	O	X	O
Line detection	PRM.DTL.SCOT			40	255	0		3	0	O	O	X	O
Minimum line height (When Auto)	PRM.DTL.SNWD			10	255	0		3	0	O	O	X	O
Upper Noise Height (When Recognition)	PRM.DTL.SNWD			5	255	0		3	0	O	O	X	O
Line extraction	PRM.DTL.SNHG			25	255	0		3	0	O	O	X	O
Line 1: Number of characters (When Auto)	Line 1: Number of characters (When Auto)	PRM.DTL.CCCT1											
				10									
				40									
Line 1: Detection direction	Line 1: Detection direction	PRM.DTL.CCOD1	Forward	7						O	O	X	O
			Reverse	6									
			Size	13									
Line 1: Character tilt correction	Line 1: Character tilt correction	PRM.DTL.CESP1	OFF	0						O	O	X	O
			ON	1									
Line 1: Detection method	Line 1: Detection method	PRM.DTL.CCOM1	Waveform	0						X	X	X	O
			Specify ratio	1									
Line 1: Ratio setup: Start position	PRM.DTL.CCW01_1			0	100	0		3	2	O	O	X	O
Line 1: Ratio setup: Height (1-2)	PRM.DTL.CCW02_1			0	100	0		3	2	O	O	X	O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Block setting (Auto/ Recognition) (continued)	Line 1: Ratio setup: Height (2-3)	PRM.DTL.CCW03_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (3-4)	PRM.DTL.CCW04_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (4-5)	PRM.DTL.CCW05_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (5-6)	PRM.DTL.CCW06_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (6-7)	PRM.DTL.CCW07_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (7-8)	PRM.DTL.CCW08_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (8-9)	PRM.DTL.CCW09_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (9-10)	PRM.DTL.CCW10_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (10-11)	PRM.DTL.CCW11_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (11-12)	PRM.DTL.CCW12_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (12-13)	PRM.DTL.CCW13_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (13-14)	PRM.DTL.CCW14_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (14-15)	PRM.DTL.CCW15_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (15-16)	PRM.DTL.CCW16_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (16-17)	PRM.DTL.CCW17_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (17-18)	PRM.DTL.CCW18_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (18-19)	PRM.DTL.CCW19_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup: Height (19-20)	PRM.DTL.CCW20_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Ratio setup End position	PRM.DTL.CCWE_1		0	100	0	3	2	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Smoothing filter	PRM.DTL.CWEC1		0	99	0	2	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Max. Width / Height Ratio	PRM.DTL.CART1		1	9.999	0.1	1	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Line 1: Character detection	PRM.DTL.CCOT1		40	255	0	3	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Block setting (Auto/Recognition) (continued)	Line 1: Minimum Character Width (When Auto)	PRM.DTL.CNWD1		5	255	0	3	0	O	O	X	O
	Line 1: Upper Noise Width (When Recognition)	PRM.DTL.CNWD1		5	255	0	3	0	O	O	X	O
	Line 1: Character extraction	PRM.DTL.CNHG1		25	255	0	3	0	O	O	X	O
	Line 1: Fine adjustment	PRM.DTL.CEFA1	OFF ON	0 1						X	X	X
	Line 2: Number of characters	PRM.DTL.CCCT2		10	20	1	2	0	X	X	X	O
	Line 2: Detection direction	PRM.DTL.CCOD2	Forward Reverse Size	7 6 13						O	O	X
	Line 2: Character tilt correction	PRM.DTL.CESP2	OFF ON	0 1						O	O	X
	Line 2: Detection method	PRM.DTL.CCOM2	Waveform Specify ratio	0 1						X	X	X
	Line 2: Ratio setup: Start position	PRM.DTL.CCW01_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (1-2)	PRM.DTL.CCW02_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (2-3)	PRM.DTL.CCW03_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (3-4)	PRM.DTL.CCW04_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (4-5)	PRM.DTL.CCW05_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (5-6)	PRM.DTL.CCW06_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (6-7)	PRM.DTL.CCW07_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (7-8)	PRM.DTL.CCW08_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (8-9)	PRM.DTL.CCW09_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (9-10)	PRM.DTL.CCW10_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (10-11)	PRM.DTL.CCW11_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (11-12)	PRM.DTL.CCW12_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (12-13)	PRM.DTL.CCW13_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (13-14)	PRM.DTL.CCW14_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (14-15)	PRM.DTL.CCW15_2		0	100	0	3	2	O	O	X	O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Block setting (Auto/ Recognition) (continued)	Line 2: Ratio setup: Height (15-16)	PRM.DTL.CCW16_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (16-17)	PRM.DTL.CCW17_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (17-18)	PRM.DTL.CCW18_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (18-19)	PRM.DTL.CCW19_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup: Height (19-20)	PRM.DTL.CCW20_2		0	100	0	3	2	O	O	X	O
	Line 2: Ratio setup End position	PRM.DTL.CCWE_2		0	100	0	3	2	O	O	X	O
	Line 2: Smoothing filter	PRM.DTL.CWEC2		0	99	0	2	0	O	O	X	O
	Line 2: Max. Width / Height Ratio	PRM.DTL.CART2		1	9.999	0.1	1	3	O	O	X	O
	Line 2: Character detection	PRM.DTL.CCOT2		40	255	0	3	0	O	O	X	O
	Line 2: Minimum Character Width (When Auto)	PRM.DTL.CNWD2		5	255	0	3	0	O	O	X	O
	Line 2: Upper Noise Width (When Recognition)	PRM.DTL.CNWD2		5	255	0	3	0	O	O	X	O
	Line 2: Character extraction	PRM.DTL.CNHG2		25	255	0	3	0	O	O	X	O
	Line 2: Fine adjustment	PRM.DTL.CEFA2	OFF ON	0 1					X	X	X	O
Block setting (Fixed)	Fixed block: Number of characters	PRM.DTL.FRН		0	20	0	2	0	X	X	X	O
Block setting (Fixed block: Rotated rectangle 0)	Width	PRM.DTL.WI[0]		81	2432	1	4	0	O	O	X	O
	Height	PRM.DTL.HI[0]		121	2432	1	4	0	O	O	X	O
	Center XY	PRM.DTL.RCXY[0]					5	0	O	X	X	O
	Center X	PRM.DTL.RCX[0]		256	16382	0	5	0	O	O	X	O
	Center Y	PRM.DTL.RCY[0]		240	16382	0	5	0	O	O	X	O
	Rotation angle	PRM.DTL.T[0]		0	359.9	0	3	1	O	O	X	O
Block setting (Fixed block: Rotated rectangle 1)		PRM.DTL.***[1]										
	⋮	⋮										
Block setting (Fixed block: Rotated rectangle 19)		PRM.DTL.***[19]										
Block setting (Fixed block: Rotated rectangle (common))	Fine adjustment	PRM.DTL.EFAF	OFF ON	0 1					X	X	X	O

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing			
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Block setting (Recognition)	Shading level	PRM.DTL.BINTH		20	255	0		3	0	O	O	X	O
	X direction interpolation (pixel)	PRM.DTL.ITPX		0	255	0		3	0	O	O	X	O
	Y direction interpolation (pixel)	PRM.DTL.ITPY		0	255	0		3	0	O	O	X	O
	Character reading direction	PRM.DTL.PDIR	Clockwise	8						O	O	X	O
			Counter-clockwise	9									
	Upper period height (Line height ratio)	PRM.DTL.PRDHL		0.4	1	0		1	3	O	O	X	O
	Tuning Target: Number of Characters	PRM.DTL.TT_CCCT1	OFF	0						X	X	X	O
			ON	1									
	Tuning Target: Shading level	PRM.DTL.TT_BINTH	OFF	0						X	X	X	O
			ON	1									
Parameters	Tuning Target: Upper character width	PRM.DTL.TT_CART1	OFF	0						X	X	X	O
			ON	1									
	Tuning Target: Upper noise width	PRM.DTL.TT_CNWD1	OFF	0						X	X	X	O
			ON	1									
	Tuning Target: Upper noise height	PRM.DTL.TT_SNWD	OFF	0						X	X	X	O
			ON	1									
	Tuning Target: X-direction interpolation	PRM.DTL.TT_ITPX	OFF	0						X	X	X	O
			ON	1									
	Tuning Target: Y-direction interpolation	PRM.DTL.TT_IYPY	OFF	0						X	X	X	O
			ON	1									
Library setting	(Number of Characters) Follow Zero Suppress	PRM.DTL.FZSCN	OFF	0						X	X	X	O
			ON	1									
Library setting	Library classification	PRM.DTL.DICTYP	Built-in Library	0						X	X	X	O
			Library No.	1									
Parameters	Library number	PRM.DTL.DCI		-	999	0		3	0	X	X	X	O
	Origin XY	PRM.DTL.OGXY						4	3	X	X	X	O
	Origin X	PRM.DTL.OGX		0	9600.000	-9600.000		4	3	X	X	X	O
Parameters	Origin Y	PRM.DTL.OGY		0	7200.000	-7200.000		4	3	X	X	X	O
	Coordinate value	PRM.DTL.CRD	After position adjustment	0						X	X	X	O
			Before position adjustment	1									
Calculation result conversion: N-adic number	Calculation result conversion: N-adic number	PRM.DTL.COC		10	36	10		2	0	X	X	X	O
Calculation result conversion: No. of digits	Calculation result conversion: No. of digits	PRM.DTL.PLN		1	6	1		1	0	X	X	X	O
Mirror inversion	Mirror inversion	PRM.DTL.ENMR	OFF	0						X	X	X	O
			ON	1									

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing
				Value	Initial value							
Parameters (continued)	Character contrast lower limit (When Auto/ Fixed)	PRM.DTL.GDLL		10	255	0			3	0	X	X
	Border Exclusion (When Auto/ Fixed)	PRM.DTL.ACB	OFF ON	0 1							X	X
	Border Exclusion (When Recognition)	PRM.DTL.CAN	OFF ON	0 1							X	X
	Primary target	PRM.DTL.LLB		0	39	0	2	0	X	X	X	O
	Large Area Mode	PRM.DTL.CDLAM	Disable Enable	0 1							X	X
Calendar Settings	Offset: Year	PRM.DTL.OFYR		0	10	-10	2	0	O	O	X	O
	Offset: Month	PRM.DTL.OFMN		0	12	-12	2	0	O	O	X	O
	Offset: Day	PRM.DTL.OFDY		0	1999	-1999	4	0	O	O	X	O
	Offset: Hour	PRM.DTL.OFTM		0	24	-24	2	0	O	O	X	O
	Offset Calculation Order	PRM.DTL.CAOFST	Y ⇒ M ⇒ D ⇒ H	0					O	O	X	O
			H ⇒ D ⇒ M ⇒ Y	1								
	Overflow Handling	PRM.DTL.CAOVFL	Carry Over Fix to Month End Fix to Month Start	0 1 2					O	O	X	O
	Zero Suppress	PRM.DTL.CAZS	None Space forward Space backward Remove zeros	0 1 2 3					X	X	X	O
	Allowable error: +	PRM.DTL.SLHI		0	3599	0	4	0	O	O	X	O
Limits	Allowable error: -	PRM.DTL.SLLI		0	99999	0	5	0	O	O	X	O
	Line 1: Registered string: 1st character	PRM.DTL.JIDA1[0]	0 1 2 3 4 5 6 7 8 9 A B C D E F G H	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17					O	O	X	O

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing			
			Label	Value							User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Registered string: 1st character (continued)	PRM.DTL.JIDA1[0]	I	18							<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
			J	19										
			K	20										
			L	21										
			M	22										
			N	23										
			O	24										
			P	25										
			Q	26										
			R	27										
			S	28										
			T	29										
			U	30										
			V	31										
			W	32										
			X	33										
			Y	34										
			Z	35										
			-	36										
			.	37										
			:	38										
			/	39										
			①/a	40										
			②/b	41										
			③/c	42										
			④/d	43										
			⑤/e	44										
			⑥/f	45										
			⑦/g	46										
			⑧/h	47										
			⑨/i	48										
			⑩/j	49										
			⑪/k	50										
			⑫/l	51										
			⑬/m	52										
			⑭/n	53										
			⑮/o	54										
			⑯/p	55										
			⑰/q	56										
			⑱/r	57										
			⑲/s	58										
			⑳/t	59										
			SPACE	61										
			*	62										
			#	63										
			Year4	64										
			Year2	65										
			Month	66										
			Day	67										
			Hour	68										

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing			
			Label	Value							User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Registered string: 1st character (continued)	PRM.DTL.JIDA1[0]	REG	70							<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
			eYear(0)	71										
			eYear(1)	72										
			:	:										
			eYear(8)	79										
			eYear(9)	80										
			eMonth(0)	81										
			eMonth(1)	82										
			:	:										
			eMonth(8)	89										
			eMonth(9)	90										
			eDay(0)	91										
			eDay(1)	92										
			:	:										
			eDay(8)	99										
			eDay(9)	100										
			eHour(0)	101										
			eHour(1)	102										
			:	:										
			eHour(8)	109										
			eHour(9)	110										
			eMinute(0)	111										
			eMinute(1)	112										
			:	:										
			eMinute(8)	119										
			eMinute(9)	120										
			Shift(0)	121										
			Shift(1)	122										
			:	:										
			Shift(8)	129										
			Shift(9)	130										
			(131										
)	132										
			+	133										
			u	134										
			v	135										
			w	136										
			x	137										
			y	138										
			z	139										
			Minute	155										
	Line 1: Registered string: 2nd character	PRM.DTL.JIDA1[1]	Registered string: Same as those for JIDA1[0]								<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	:	:												
	Line 1: Registered string: 20th character	PRM.DTL.JIDA1[19]	Registered string: Same as those for JIDA1[0]								<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Line 2: Registered string: 1st character	PRM.DTL.JIDA2[0]	Registered string: Same as those for JIDA1[0]								<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	:	:												
	Line 2: Registered string: 20th character	PRM.DTL.JIDA2[19]	Registered string: Same as those for JIDA1[0]								<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Selection			Lower limit	No. of integer digits	No. of decimal places	Referencing			
			Label	Value	Initial value				User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Reference character: All	PRM.DTL.LTS1	All characters	0					<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
			Character groups	1								
			Specified order	2								
			Specified character	3								
			All numbers	4								
			All letters/All Upper Case	5								
			All symbols	7								
			All special characters/ All Lower Case	6								
	Line 1: Specified character: All "0"	PRM.DTL.LTSC1[0]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "1"	PRM.DTL.LTSC1[1]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "2"	PRM.DTL.LTSC1[2]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "3"	PRM.DTL.LTSC1[3]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "4"	PRM.DTL.LTSC1[4]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "5"	PRM.DTL.LTSC1[5]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "6"	PRM.DTL.LTSC1[6]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "7"	PRM.DTL.LTSC1[7]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "8"	PRM.DTL.LTSC1[8]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "9"	PRM.DTL.LTSC1[9]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "A"	PRM.DTL.LTSC1[10]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "B"	PRM.DTL.LTSC1[11]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "C"	PRM.DTL.LTSC1[12]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "D"	PRM.DTL.LTSC1[13]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "E"	PRM.DTL.LTSC1[14]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "F"	PRM.DTL.LTSC1[15]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 1: Specified character: All "G"	PRM.DTL.LTSC1[16]		0	1	0	1	0	X	X	X	<input type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Specified character: All "H"	PRM.DTL.LTSC1[17]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "I"	PRM.DTL.LTSC1[18]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "J"	PRM.DTL.LTSC1[19]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "K"	PRM.DTL.LTSC1[20]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "L"	PRM.DTL.LTSC1[21]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "M"	PRM.DTL.LTSC1[22]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "N"	PRM.DTL.LTSC1[23]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "O"	PRM.DTL.LTSC1[24]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "P"	PRM.DTL.LTSC1[25]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "Q"	PRM.DTL.LTSC1[26]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "R"	PRM.DTL.LTSC1[27]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "S"	PRM.DTL.LTSC1[28]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "T"	PRM.DTL.LTSC1[29]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "U"	PRM.DTL.LTSC1[30]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "V"	PRM.DTL.LTSC1[31]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "W"	PRM.DTL.LTSC1[32]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "X"	PRM.DTL.LTSC1[33]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "Y"	PRM.DTL.LTSC1[34]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "Z"	PRM.DTL.LTSC1[35]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All ":"	PRM.DTL.LTSC1[36]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All ";"	PRM.DTL.LTSC1[37]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All ":"	PRM.DTL.LTSC1[38]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "/"	PRM.DTL.LTSC1[39]		0	1	0	1	0	X	X	X	O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Specified character: All "①"	PRM.DTL.LTSC1[40]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "②"	PRM.DTL.LTSC1[41]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "③"	PRM.DTL.LTSC1[42]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "④"	PRM.DTL.LTSC1[43]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑤"	PRM.DTL.LTSC1[44]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑥"	PRM.DTL.LTSC1[45]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑦"	PRM.DTL.LTSC1[46]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑧"	PRM.DTL.LTSC1[47]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑨"	PRM.DTL.LTSC1[48]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑩"	PRM.DTL.LTSC1[49]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑪"	PRM.DTL.LTSC1[50]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑫"	PRM.DTL.LTSC1[51]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑬"	PRM.DTL.LTSC1[52]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑭"	PRM.DTL.LTSC1[53]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑮"	PRM.DTL.LTSC1[54]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑯"	PRM.DTL.LTSC1[55]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑰"	PRM.DTL.LTSC1[56]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑱"	PRM.DTL.LTSC1[57]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑲"	PRM.DTL.LTSC1[58]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "⑳"	PRM.DTL.LTSC1[59]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "㉑"	PRM.DTL.LTSC1[60]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "㉒"	PRM.DTL.LTSC1[61]		0	1	0	1	0	X	X	X	O
	Line 1: Specified character: All "㉓"	PRM.DTL.LTSC1[62]		0	1	0	1	0	X	X	X	O

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value						User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Specified character: All "space"	PRM.DTL.LTSC1[63]		0	1		0		1	0	X	X	X	O
	Line 1: Specified character: All "u"	PRM.DTL.LTSC1[64]		0	1		0		1	0	X	X	X	O
	Line 1: Specified character: All "v"	PRM.DTL.LTSC1[65]		0	1		0		1	0	X	X	X	O
	Line 1: Specified character: All "w"	PRM.DTL.LTSC1[66]		0	1		0		1	0	X	X	X	O
	Line 1: Specified character: All "x"	PRM.DTL.LTSC1[67]		0	1		0		1	0	X	X	X	O
	Line 1: Specified character: All "y"	PRM.DTL.LTSC1[68]		0	1		0		1	0	X	X	X	O
	Line 1: Specified character: All "z"	PRM.DTL.LTSC1[69]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 1st character	PRM.DTL.CTS01_1	-	-1							X	X	X	O
			All characters	0										
			Character groups	1										
			Specified order	2										
			Specified character	3										
			All numbers	4										
			All letters/All Upper Case	5										
			All symbols	7										
			All special characters/ All Lower Case	6										
	Line 1: Specified character: 1st character ***	PRM.DTL.CTSC01_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 2nd character	PRM.DTL.CTS02_1	Reference character:	Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 2nd character ***	PRM.DTL.CTSC02_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 3rd character	PRM.DTL.CTS03_1	Reference character:	Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 3rd character ***	PRM.DTL.CTSC03_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 4th character	PRM.DTL.CTS04_1	Reference character:	Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 4th character ***	PRM.DTL.CTSC04_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 5th character	PRM.DTL.CTS05_1	Reference character:	Same as those for CTSC01_1							X	X	X	O

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing			
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Specified character: 5th character ***	PRM.DTL.CTSC05_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 6th character	PRM.DTL.CTS06_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 6th character ***	PRM.DTL.CTSC06_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 7th character	PRM.DTL.CTS07_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 7th character ***	PRM.DTL.CTSC07_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 8th character	PRM.DTL.CTS08_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 8th character ***	PRM.DTL.CTSC08_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 9th character	PRM.DTL.CTS09_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 9th character ***	PRM.DTL.CTSC09_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 10th character	PRM.DTL.CTS10_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 10th character ***	PRM.DTL.CTSC10_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 11th character	PRM.DTL.CTS11_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 11th character ***	PRM.DTL.CTSC11_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 12th character	PRM.DTL.CTS12_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 12th character ***	PRM.DTL.CTSC12_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 13th character	PRM.DTL.CTS13_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 13th character ***	PRM.DTL.CTSC13_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 14th character	PRM.DTL.CTS14_1	Reference character: Same as those for CTSC01_1							X	X	X	O
	Line 1: Specified character: 14th character ***	PRM.DTL.CTSC14_1[*]		0	1	0		1	0	X	X	X	O
	Line 1: Reference character: 15th character	PRM.DTL.CTS15_1	Reference character: Same as those for CTSC01_1							X	X	X	O

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value						User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Specified character: 15th character ***	PRM.DTL.CTSC15_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 16th character	PRM.DTL.CTS16_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 16th character ***	PRM.DTL.CTSC16_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 17th character	PRM.DTL.CTS17_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 17th character ***	PRM.DTL.CTSC17_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 18th character	PRM.DTL.CTS18_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 18th character ***	PRM.DTL.CTSC18_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 19th character	PRM.DTL.CTS19_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 19th character ***	PRM.DTL.CTSC19_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 20th character	PRM.DTL.CTS20_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 20th character ***	PRM.DTL.CTSC20_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 21st character	PRM.DTL.CTS21_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 21st character ***	PRM.DTL.CTSC21_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 22nd character	PRM.DTL.CTS22_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 22nd character**	PRM.DTL.CTSC22_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 23rd character	PRM.DTL.CTS23_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 23rd character**	PRM.DTL.CTSC23_1[*]		0	1		0		1	0	X	X	X	O
	Line 1: Reference character: 24th character	PRM.DTL.CTS24_1	Reference character: Same as those for CTSC01_1								X	X	X	O
	Line 1: Specified character: 24th character**	PRM.DTL.CTSC24_1[*]		0	1		0		1	0	X	X	X	O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Line 1: Reference character: 25th character	PRM.DTL.CTS25_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 25th character***	PRM.DTL.CTSC25_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 26th character	PRM.DTL.CTS26_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 26th character***	PRM.DTL.CTSC26_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 27th character	PRM.DTL.CTS27_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 27th character***	PRM.DTL.CTSC27_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 28th character	PRM.DTL.CTS28_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 28th character***	PRM.DTL.CTSC28_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 29th character	PRM.DTL.CTS29_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 29th character***	PRM.DTL.CTSC29_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 30th character	PRM.DTL.CTS30_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 30th character***	PRM.DTL.CTSC30_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 31st character	PRM.DTL.CTS31_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 31st character***	PRM.DTL.CTSC31_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 32nd character	PRM.DTL.CTS32_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 32nd character***	PRM.DTL.CTSC32_1[*]		0	1	0	1	0	X	X	X	O
	Line 1: Reference character: 33rd character	PRM.DTL.CTS33_1	Reference character: Same as those for CTSC01_1						X	X	X	O
	Line 1: Specified character: 33rd character***	PRM.DTL.CTSC33_1[*]		0	1	0	1	0	X	X	X	O

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
								No. of integer digits	No. of decimal places		
Limits (continued)	Line 1: Reference character: 34th character	PRM.DTL.CTS34_1	Reference character: Same as those for CTSC01_1					X	X	X	O
	Line 1: Specified character: 34th character**	PRM.DTL.CTSC34_1[*]		0	1	0		1	0	X	X
	Line 1: Reference character: 35th character	PRM.DTL.CTS35_1	Reference character: Same as those for CTSC01_1					X	X	X	O
	Line 1: Specified character: 35th character**	PRM.DTL.CTSC35_1[*]		0	1	0		1	0	X	X
	Line 1: Reference character: 36th character	PRM.DTL.CTS36_1	Reference character: Same as those for CTSC01_1					X	X	X	O
	Line 1: Specified character: 36th character**	PRM.DTL.CTSC36_1[*]		0	1	0		1	0	X	X
	Line 1: Reference character: 37th character	PRM.DTL.CTS37_1	Reference character: Same as those for CTSC01_1					X	X	X	O
	Line 1: Specified character: 37th character**	PRM.DTL.CTSC37_1[*]		0	1	0		1	0	X	X
	Line 1: Reference character: 38th character	PRM.DTL.CTS38_1	Reference character: Same as those for CTSC01_1					X	X	X	O
	Line 1: Specified character: 38th character**	PRM.DTL.CTSC38_1[*]		0	1	0		1	0	X	X
	Line 1: Reference character: 39th character	PRM.DTL.CTS39_1	Reference character: Same as those for CTSC01_1					X	X	X	O
	Line 1: Specified character: 39th character**	PRM.DTL.CTSC39_1[*]		0	1	0		1	0	X	X
	Line 1: Reference character: 40th character	PRM.DTL.CTS40_1	Reference character: Same as those for CTSC01_1					X	X	X	O
	Line 1: Specified character: 40th character**	PRM.DTL.CTSC40_1[*]		0	1	0		1	0	X	X
	Line 1: Correlation: Minimum	PRM.DTL.L1CRR1:LL		-	99	0		2	0	O	O
	Line 1: Stability: Minimum	PRM.DTL.L1STBL:LL		-	99	0		2	0	O	X
	No. of characters in line 1: Upper limit (When Auto/Fixed)	PRM.DTL.COQN1:HL		-	20	0		2	0	O	X
	(When Recognition)			-	40	0		2	0	O	O
	No. of characters in line 1: Lower limit (When Auto/Fixed)	PRM.DTL.COQN1:LL		-	20	0		2	0	O	X
	(When Recognition)			-	40	0		2	0	O	O

Category	Setting item	Name	Selection			Lower limit	No. of integer digits	No. of decimal places	Referencing			
			Label	Value	Initial value				User variable	System variable	Result data	Unit properties
Limits (continued)	Line 2: Reference character: All	PRM.DTL.LTS2	All characters	0					<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
			Character groups	1								
			Specified order	2								
			Specified character	3								
			All numbers	4								
			All letters/All Upper Case	5								
			All symbols	7								
			All special characters/ All Lower Case	6								
	Line 2: Specified character: All "0"	PRM.DTL.LTSC2[0]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "1"	PRM.DTL.LTSC2[1]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "2"	PRM.DTL.LTSC2[2]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "3"	PRM.DTL.LTSC2[3]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "4"	PRM.DTL.LTSC2[4]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "5"	PRM.DTL.LTSC2[5]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "6"	PRM.DTL.LTSC2[6]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "7"	PRM.DTL.LTSC2[7]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "8"	PRM.DTL.LTSC2[8]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "9"	PRM.DTL.LTSC2[9]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "A"	PRM.DTL.LTSC2[10]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "B"	PRM.DTL.LTSC2[11]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "C"	PRM.DTL.LTSC2[12]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "D"	PRM.DTL.LTSC2[13]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "E"	PRM.DTL.LTSC2[14]		0	1	0	1	0	X	X	X	<input type="radio"/>
	Line 2: Specified character: All "F"	PRM.DTL.LTSC2[15]		0	1	0	1	0	X	X	X	<input type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Line 2: Specified character: All "G"	PRM.DTL.LTSC2[16]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "H"	PRM.DTL.LTSC2[17]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "I"	PRM.DTL.LTSC2[18]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "J"	PRM.DTL.LTSC2[19]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "K"	PRM.DTL.LTSC2[20]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "L"	PRM.DTL.LTSC2[21]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "M"	PRM.DTL.LTSC2[22]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "N"	PRM.DTL.LTSC2[23]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "O"	PRM.DTL.LTSC2[24]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "P"	PRM.DTL.LTSC2[25]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "Q"	PRM.DTL.LTSC2[26]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "R"	PRM.DTL.LTSC2[27]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "S"	PRM.DTL.LTSC2[28]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "T"	PRM.DTL.LTSC2[29]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "U"	PRM.DTL.LTSC2[30]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "V"	PRM.DTL.LTSC2[31]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "W"	PRM.DTL.LTSC2[32]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "X"	PRM.DTL.LTSC2[33]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "Y"	PRM.DTL.LTSC2[34]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "Z"	PRM.DTL.LTSC2[35]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All "-"	PRM.DTL.LTSC2[36]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All ":"	PRM.DTL.LTSC2[37]		0	1	0	1	0	X	X	X	O
	Line 2: Specified character: All ";"	PRM.DTL.LTSC2[38]		0	1	0	1	0	X	X	X	O

Category	Setting item	Name	Label	Selection			Numerical value format		Referencing				
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Limits (continued)	Line 2: Specified character: All "1"	PRM.DTL.LTSC2[39]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "①"	PRM.DTL.LTSC2[40]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "②"	PRM.DTL.LTSC2[41]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "③"	PRM.DTL.LTSC2[42]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "④"	PRM.DTL.LTSC2[43]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑤"	PRM.DTL.LTSC2[44]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑥"	PRM.DTL.LTSC2[45]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑦"	PRM.DTL.LTSC2[46]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑧"	PRM.DTL.LTSC2[47]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑨"	PRM.DTL.LTSC2[48]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑩"	PRM.DTL.LTSC2[49]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑪"	PRM.DTL.LTSC2[50]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑫"	PRM.DTL.LTSC2[51]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑬"	PRM.DTL.LTSC2[52]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑭"	PRM.DTL.LTSC2[53]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑮"	PRM.DTL.LTSC2[54]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑯"	PRM.DTL.LTSC2[55]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑰"	PRM.DTL.LTSC2[56]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑱"	PRM.DTL.LTSC2[57]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑲"	PRM.DTL.LTSC2[58]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "⑳"	PRM.DTL.LTSC2[59]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "㉑"	PRM.DTL.LTSC2[60]		0	1	0		1	0	X	X	X	O
	Line 2: Specified character: All "㉒"	PRM.DTL.LTSC2[61]		0	1	0		1	0	X	X	X	O

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing		
				Value	Initial value						User variable	System variable	Result data
Limits (continued)	Line 2: Specified character: All "+"	PRM.DTL.LTSC2[62]		0	1		0		1	0	X	X	X
	Line 2: Specified character: All "(space)"	PRM.DTL.LTSC2[63]		0	1		0		1	0	X	X	X
	Line 2: Specified character: All "u"	PRM.DTL.LTSC2[64]		0	1		0		1	0	X	X	X
	Line 2: Specified character: All "v"	PRM.DTL.LTSC2[65]		0	1		0		1	0	X	X	X
	Line 2: Specified character: All "w"	PRM.DTL.LTSC2[66]		0	1		0		1	0	X	X	X
	Line 2: Specified character: All "x"	PRM.DTL.LTSC2[67]		0	1		0		1	0	X	X	X
	Line 2: Specified character: All "y"	PRM.DTL.LTSC2[68]		0	1		0		1	0	X	X	X
	Line 2: Specified character: All "z"	PRM.DTL.LTSC2[69]		0	1		0		1	0	X	X	X
	Line 2: Reference character: 1st character	PRM.DTL.CTS01_2	-	-1							X	X	X
			All characters	0									
			Character groups	1									
			Specified order	2									
			Specified character	3									
			All numbers	4									
			All letters/All Upper Case	5									
			All symbols	7									
			All special characters/ All Lower Case	6									
	Line 2: Specified character: 1st character **	PRM.DTL.CTSC01_2[*]		0	1		0		1	0	X	X	X
	Line 2: Reference character: 2nd character	PRM.DTL.CTS02_2	Reference character:	Same as those for CTSC01_2							X	X	X
	Line 2: Specified character: 2nd character **	PRM.DTL.CTSC02_2[*]		0	1		0		1	0	X	X	X
	Line 2: Reference character: 3rd character	PRM.DTL.CTS03_2	Reference character:	Same as those for CTSC01_2							X	X	X
	Line 2: Specified character: 3rd character **	PRM.DTL.CTSC03_2[*]		0	1		0		1	0	X	X	X
	Line 2: Reference character: 4th character	PRM.DTL.CTS04_2	Reference character:	Same as those for CTSC01_2							X	X	X
	Line 2: Specified character: 4th character **	PRM.DTL.CTSC04_2[*]		0	1		0		1	0	X	X	X

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Initial value	Upper limit	Lower limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Line 2: Reference character: 5th character	PRM.DTL.CTS05_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 5th character **	PRM.DTL.CTSC05_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 6th character	PRM.DTL.CTS06_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 6th character **	PRM.DTL.CTSC06_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 7th character	PRM.DTL.CTS07_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 7th character **	PRM.DTL.CTSC07_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 8th character	PRM.DTL.CTS08_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 8th character **	PRM.DTL.CTSC08_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 9th character	PRM.DTL.CTS09_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 9th character **	PRM.DTL.CTSC09_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 10th character	PRM.DTL.CTS10_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 10th character **	PRM.DTL.CTSC10_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 11th character	PRM.DTL.CTS11_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 11th character **	PRM.DTL.CTSC11_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 12th character	PRM.DTL.CTS12_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 12th character **	PRM.DTL.CTSC12_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 13th character	PRM.DTL.CTS13_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 13th character **	PRM.DTL.CTSC13_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 14th character	PRM.DTL.CTS14_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 14th character **	PRM.DTL.CTSC14_2[*]		0	1	0	1	0	X	X	X	O

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Limits (continued)	Line 2: Reference character: 15th character	PRM.DTL.CTS15_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 15th character ***	PRM.DTL.CTSC15_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 16th character	PRM.DTL.CTS16_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 16th character ***	PRM.DTL.CTSC16_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 17th character	PRM.DTL.CTS17_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 17th character ***	PRM.DTL.CTSC17_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 18th character	PRM.DTL.CTS18_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 18th character ***	PRM.DTL.CTSC18_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 19th character	PRM.DTL.CTS19_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 19th character ***	PRM.DTL.CTSC19_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Reference character: 20th character	PRM.DTL.CTS20_2	Reference character: Same as those for CTSC01_2						X	X	X	O
	Line 2: Specified character: 20th character ***	PRM.DTL.CTSC20_2[*]		0	1	0	1	0	X	X	X	O
	Line 2: Correlation: Minimum	PRM.DTL.L2CRR1:LL		-	99	0	2	0	O	O	X	O
	Line 2: Stability:	PRM.DTL.L2STBL:LL		-	99	0	2	0	O	O	X	O
	Line 2: Number of Characters: Upper limit	PRM.DTL.COQN2:HL		-	20	0	2	0	O	O	X	O
	Line 2: Number of Characters: Lower limit	PRM.DTL.COQN2:LL		-	20	0	2	0	O	O	X	O
(Detected Character Count Setting) Follow Zero Suppress	PRM.DTL.FZSCL	OFF ON	0 1						O	O	X	O
(Character Detection Restriction Setting) Follow Zero Suppress	PRM.DTL.FZSCT	OFF ON	0 1						O	O	X	O

2D code reader Unit

Category	Setting item	Mnemonic string String following !U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format	Referencing			
			Label	Value					User variable	System variable	Result data	Unit properties
Detection condition	Code type	PRM.DTL.CDTYP	QR	0					X	X	X	O
			Micro QR	1								
			Data Matrix	2								
			Rectangle	3								
			data Matrix									
			PDF417	4								
			MicroPDF417	5								
			Composite Code	6								
	Auto tuning: cell size (pixels)	PRM.DTL.E_CSIZE	Manual	0					X	X	X	O
			Automatic	1								
	Auto tuning: Contrast level	PRM.DTL.E_EIT	Manual	0					X	X	X	O
			Automatic	1								
	Auto tuning: No. of cells	PRM.DTL.E_CNUM	Manual	0					X	X	X	O
			Automatic	1								
	Auto tuning: Cell color	PRM.DTL.E_CCLR	Manual	0					X	X	X	O
			Automatic	1								
	Auto tuning: Mirror reading	PRM.DTL.E_MRI	Manual	0					X	X	X	O
			Automatic	1								
	Auto tuning: Base angle	PRM.DTL.E_STDA	Manual	0					X	X	X	O
			Automatic	1								
	1 cell size *1 (pixels)	PRM.DTL.CSIZE			0.00	200.00	0.00	3	2	O	X	O
Contrast level	PRM.DTL.EIT	Highest (2)	2						O	X	X	O
		High (1)	1									
		Normal (0)	0									
		Low (-1)	-1									
		Lowest (-2)	-2									
No. of cells	PRM.DTL.CNUM	Any	0						O	X	X	O
		21x21	1									
		25x25	2									
		29x29	3									
		33x33	4									
		37x37	5									
		41x41	6									
		45x45	7									
		49x49	8									
		53x53	9									
		57x57	10									
		61x61	11									
		65x65	12									
		69x69	13									
		73x73	14									
		77x77	15									
		81x81	16									
		85x85	17									
		89x89	18									
		93x93	19									
		97x97	20									
		101x101	21									

Category	Setting item	Mnemonic string String following :U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format	Referencing
			Label	Value					
Detection condition	No. of cells (continued)	PRM.DTL.CNUM (continued)	105x105	22					
			109x109	23					
			113x113	24					
			117x117	25					
			121x121	26					
			125x125	27					
			129x129	28					
			133x133	29					
			137x137	30					
			141x141	31					
			145x145	32					
			149x149	33					
			153x153	34					
			157x157	35					
			161x161	36					
			165x165	37					
			169x169	38					
			173x173	39					
			177x177	40					
			Any	0					
			11x11	1					
			13x13	2					
			15x15	3					
			17x17	4					
			Any	0					
			10x10	1					
			12x12	2					
			14x14	3					
			16x16	4					
			18x18	5					
			20x20	6					
			22x22	7					
			24x24	8					
			26x26	9					
			32x32	10					
			36x36	11					
			40x40	12					
			44x44	13					
			48x48	14					
			52x52	15					
			64x64	16					
			72x72	17					
			80x80	18					
			88x88	19					
			96x96	20					
			104x104	21					
			120x120	22					
			132x132	23					
			144x144	24					
			Any	0					
			8x18	1					

Category	Setting item	Mnemonic string String following U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format	Referencing			
			Label	Value					Integer	Decimal point	User variable	System variable
Detection condition (continued)	No. of cells (continued)	PRM.DTL.CNUM (continued)	8x32	2					O	X	X	O
			12x26	3								
			12x36	4								
			16x36	5								
			16x48	6								
Cell color		PRM.DTL.CCLR	Both	0					O	X	X	O
			Black on white background	1								
			White on black background	2								
Mirror reading		PRM.DTL.MRI	Both	0					O	X	X	O
			Without inversion	1								
			With inversion	2								
Base angle	PRM.DTL.STDA		0.000	180.000	-179.999	3	3	O	X	X	O	
Angle Range	PRM.DTL.ANGR		180.000	180.000	0.000	3	3	O	O	X	O	
Size variation		PRM.DTL.SVA	Small	0					O	O	X	O
			Medium	1								
			Large	2								
			Unlimited	3								
Distortion correction		PRM.DTL.DTO	None	0					O	O	X	O
			Linear	1								
Fine search		PRM.DTL.DM	OFF	0					O	O	X	O
			ON	1								
Code Type		PRM.DTL.CDTYP	QR	0				1	0	X	X	O
			Micro QR	1								
			DataMatrix	2								
			Rectangle	3								
			DataMatrix									
			PDF417	4								
			MicroPDF417	5								
			Composite	6								
			Code									
Auto Tune Enabled :	PRM.DTL.E_DCT							1	0	X	X	O
Code Detail												
Auto Tune Enabled :	PRM.DTL.E_BCT							1	0	X	X	O
1D Code Type												
Auto Tune Enabled :	PRM.DTL.E_BDCT							1	0	X	X	O
1D Code Detail												
Auto Tune Enabled :	PRM.DTL.E_LENMX							1	0	X	X	O
Code Length (Max)												
Auto Tune Enabled :	PRM.DTL.E_LENMN							1	0	X	X	O
Code Length (Min)												
Auto Tune Enabled :	PRM.DTL.E_MSIZE							1	0	X	X	O
Min. Bar Width												
Code Detail	PRM.DTL.DCT	None	0					1	0	X	X	O
		CC-A	1									
		CC-B	2									
		CC-C	3									

Category	Setting item	Mnemonic string String following :U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				Integer	Decimal point	
Detection condition (continued)	1D Code Type	PRM.DTL.BCT	None	0				1	0	X
			EAN/JAN/	3						X
			UPC							X
			GS1	4						
			Databar							
			GS1 128	2						O
1D Code Detail	PRM.DTL.BDCT		None	0				2	0	X
			EAN-13,	1						X
			UPC-A							X
			EAN-13,	7						X
			UPC-A & 2-digit							
			EAN-13,	4						
			UPC-A & 5-digit							
			EAN-8	2						
			EAN-8 & 2-digit	8						
			EAN-8 & 5-digit	5						
			UPC-E	3						
			UPC-E & 2-digit	9						
			Limited							
			Databar	10						
			Databar	11						
			Stacked							
			Databar	12						
			Expanded	13						
Code Length (Max)	PRM.DTL.LEN_MX			128	128	1		3	0	X
Code Length (Min)	PRM.DTL.LEN_MN			1	128	1		3	0	X
Min. Bar Width (pixels)	PRM.DTL.MSIZE			0.00	200.00	0.00		3	2	X

Category	Setting item	Mnemonic string String following U[n].	Selection			Upper limit	Lower limit	Numerical value format	Referencing		
			Label	Value	Initial value				Integer	Decimal point	User variable
Parameters	Coordinate value	PRM.DTL.CRD	After position adjustment	0				X	X	X	O
			Before position adjustment	1							
Origin XY	PRM.DTL.OGXY							4	3	X	X
Origin X	PRM.DTL.OGX			0.000	9600.000	-9600.000					O
Origin Y	PRM.DTL.OGY			0.000	7200.000	-7200.000					
Symbol identifier	PRM.DTL.SID	None	0					X	X	X	O
		Output	1								
ECI (Expansion channel interpretation)	PRM.DTL.ECI	Ignore	0					X	X	X	O
		Output	1								
Start digit	PRM.DTL.SDG		1	9999	1			4	0	O	X
Data Length	PRM.DTL.DLEN		100	512	1			3	0	X	X
Timeout	PRM.DTL.TOUT		3	60	0.01			2	2	O	X
Data split	PRM.DTL.DSPL	OFF	0					X	X	X	O
		ON	1								
Data split 1											
Enable	PRM.DTL.ESPL[0]	Disable	0					X	X	X	O
		Enable	1								
Start digit	PRM.DTL.SDGS[0]		1	512	1			3	0	X	X
Length	PRM.DTL.DLENS[0]		1	512	1			3	0	X	X
Data split 2	PRM.DTL.***[1]										
									
Data split 8	PRM.DTL.***[7]										
Fixed length output	PRM.DTL.FLO	OFF	0					X	X	X	O
		ON	1								
Fill character	PRM.DTL.FCH		" "					X	X	X	O
Error output	PRM.DTL.ECO	OFF	0					X	X	X	O
		ON	1								
Error code (1 to 16 characters)	PRM.DTL.ECD		"error"		Character string up to 16 bytes			X	X	X	O
Verification	PRM.DTL.VRF	OFF	0					X	X	X	O
		ISO/IEC	1								
		15415									
		AIM DPM-1- 2006									
		SAE	3								
		AS9132									
Large Area Mode	PRM.DTL.CDLAM	Disable	0					X	X	X	O
		Enable	1								
Limits	Multi-reference	PRM.DTL.MCND	Off	0				X	X	X	O
		On	1								
No. of match conditions	PRM.DTL.MNUM		0	16	0			2	0	X	X

Category	Setting item	Mnemonic string String following :U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	
			Label	Value				Integer	Decimal point		
Limits (continued)	Match condition 1	PRM.DTL.***[0]						X	X	X	O
	Match range	PRM.DTL.MRNG[0]	All data (DATA)	0 0	8	0					
			Data Range 1 (DATA1)								
			Data Range 2 (DATA2)								
			Data Range 3 (DATA3)								
			Data range 4 (DATA4)								
			Data range 5 (DATA5)								
			Data range 6 (DATA6)								
			Data range 7 (DATA7)								
			Data range 8 (DATA8)								
	Use in unit pass / fail results	PRM.DTL.IUJ[0]	Included	0				X	X	X	O
			Not included	1							
	Calculation result conversion: N-adic number	PRM.DTL.COC2[0]		10	36	10		2	0	0	X O
	Calculation result conversion: No. of characters	PRM.DTL.PLN2[0]		1	6	1		1	0	0	X O
	Calculation result conversion: Zero suppression	PRM.DTL.CAZS_C[0]	OFF	0				O	O	X	O
			Space forward	1							
			Space	2							
			backward								
			Remove zeros	3							
	Date & time conversion: Offset: Year	PRM.DTL.OFYR[0]		0	10	-10		2	0	0	X O
	Date & time conversion: Offset: Month	PRM.DTL.OFMN[0]		0	12	-12		2	0	0	X O
	Date & time conversion: Offset: Day	PRM.DTL.OFDY[0]		0	1999	-1999		4	0	0	X O
	Date & time conversion: Offset: Hour	PRM.DTL.OFTM[0]		0	24	-24		2	0	0	X O
	Date conversion: Allowable error: (second) +	PRM.DTL.SLH[0]		0	3599	0		4	0	0	X O
	Date conversion: Allowable error: (second) -	PRM.DTL.SLL[0]		0	3599	0		4	0	0	X O
	Date conversion: Zero suppression	PRM.DTL.CAZS_Y[0]	OFF	0				O	O	X	O
			Space forward	1							
			Space	2							
			backward								
			Remove zeros	3							
"#", "**" and "!" processing	PRM.DTL.UOS[0]	Special characters	0					O	O	X	O
		Normal characters	1								

Category	Setting item	Mnemonic string String following U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format	Referencing		
			Label	Value					User variable	System variable	Result data
Limits (continued)	Match condition 2	PRM.DTL.***[1]									
										
	Match condition 16	PRM.DTL.***[15]									
	Match pattern 1										
	Match pattern 1: PRM.DTL.MPTN1[0]	Year4	320		32767	0		5	0	○	○
	1st digit	Year2	321								
		Month	322								
		Day	323								
		Hour	324								
		REG	326								
	Others:										
	Character code										
	(1 byte)										
	Match pattern 1: PRM.DTL.MPTN1[1]	Same as Match pattern 1:									
	2nd digit	PRM.DTL.MPTN1[0]									
										
	Match pattern 1: PRM.DTL.MPTN1[31]	Same as Match pattern 1:									
	32nd digit	PRM.DTL.MPTN1[0]									
	Match pattern 2										
	Match pattern 2: PRM.DTL.MPTN2[0]	Same as Match pattern 1:									
	1st digit	PRM.DTL.MPTN1[0]									
										
	Match pattern 2: PRM.DTL.MPTN2[31]	Same as Match pattern 1:									
	32nd digit	PRM.DTL.MPTN1[0]									
										
	Match pattern 16										
	Match pattern 16: PRM.DTL.MPTN16[0]	Same as Match pattern 1:									
	1st digit	PRM.DTL.MPTN1[0]									
										
	Match pattern 16: PRM.DTL.MPTN16[31]	Same as Match pattern 1:									
	32nd digit	PRM.DTL.MPTN1[0]									
	Read data length:	PRM.DTL.ID_LEN:HL			999	0		3	0	○	○
	Upper limit										
	Read data length:	PRM.DTL.ID_LEN:LL			999	0		3	0	○	○
	Lower limit										
	Position X: Upper limit	PRM.DTL.X:HL			99999.999	-99999.999		5	3	○	○
	Position X: Lower limit	PRM.DTL.X:LL			99999.999	-99999.999		5	3	○	○
	Position Y: Upper limit	PRM.DTL.Y:HL			99999.999	-99999.999		5	3	○	○
	Position Y: Lower limit	PRM.DTL.Y:LL			99999.999	-99999.999		5	3	○	○
	Detection angle:	PRM.DTL.T:HL			999.999	-999.999		3	3	○	○
	Upper limit										
	Detection angle:	PRM.DTL.T:LL			999.999	-999.999		3	3	○	○
	Lower limit										

Category	Setting item	Mnemonic string String following :U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				Integer	Decimal point	User variable	System variable	Result data	Unit properties
Limits (continued)	Overall Symbol Grade Condition: Decode	PRM.DTL.ISO_E_DEC		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Symbol Contrast	PRM.DTL.ISO_E_SC		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Modulation	PRM.DTL.ISO_E_MOD		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Reflect. Margin	PRM.DTL.ISO_E_RM		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Fixed Pat.Dmg.	PRM.DTL.ISO_E_FPD		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Axial N-uniform.	PRM.DTL.ISO_E_AN		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Grid N-uniform.	PRM.DTL.ISO_E_GN		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Unused Err.Crr.	PRM.DTL.ISO_E_UEC		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Form.Info.Dmg.	PRM.DTL.ISO_E_FID		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Vers.Info.Dmg.	PRM.DTL.ISO_E_VID		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Print Growth H.	PRM.DTL.ISO_E_PGH		0	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Print Growth V.	PRM.DTL.ISO_E_PGV		0	1	0		1	0	X	X	X	O
	Overall Symbol Grade: Lower Limit	PRM.DTL.ISO_ALL:LL			4	0		1	0	O	O	X	O
	Decode: Lower Limit	PRM.DTL.ISO_DEC:LL			4	0		1	0	O	O	X	O
	Symbol Contrast: Lower Limit	PRM.DTL.ISO_SC:LL			4	0		1	0	O	O	X	O
	Modulation: Lower Limit	PRM.DTL.ISO_MOD:LL			4	0		1	0	O	O	X	O
	Reflect. Margin: Lower Limit	PRM.DTL.ISO_RM:LL			4	0		1	0	O	O	X	O
	Fixed Pat.Dmg.: Lower Limit	PRM.DTL.ISO_FPD:LL			4	0		1	0	O	O	X	O
	Axial N-uniform.: Lower Limit	PRM.DTL.ISO_AN:LL			4	0		1	0	O	O	X	O
	Grid N-uniform.: Lower Limit	PRM.DTL.ISO_GN:LL			4	0		1	0	O	O	X	O
	Unused Err.Crr.: Lower Limit	PRM.DTL.ISO_UEC:LL			4	0		1	0	O	O	X	O
	Form.Info.Dmg.: Lower Limit	PRM.DTL.ISO_FID:LL			4	0		1	0	O	O	X	O
	Vers.Info.Dmg.: Lower Limit	PRM.DTL.ISO_VID:LL			4	0		1	0	O	O	X	O
	Print Growth H.: Lower Limit	PRM.DTL.ISO_PGH:LL			4	0		1	0	O	O	X	O

Category	Setting item	Mnemonic string String following U[n].	Selection			Upper limit	Lower limit	Integer	Decimal point	Numerical value format	Referencing		
			Label	Value	Initial value						User variable	System variable	Result data
Limits (continued)	Print Growth V.: Lower Limit	PRM.DTL.ISO_PGV:LL			4	0		1	0	O	O	X	O
	Overall Symbol Grade Condition: Decode	PRM.DTL.AIM_E_DEC		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Cell Contrast	PRM.DTL.AIM_E_CC		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Cell Modulation	PRM.DTL.AIM_E_CM		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Reflect. Margin	PRM.DTL.AIM_E_RM		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Fixed Pat.Dmg.	PRM.DTL.AIM_E_FPD		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Axial N-uniform.	PRM.DTL.AIM_E_AN		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Grid N-uniform.	PRM.DTL.AIM_E_GN		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Unused Err.Crr.	PRM.DTL.AIM_E_UEC		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Form.Info.Dmg.	PRM.DTL.AIM_E_FID		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Vers.Info.Dmg.	PRM.DTL.AIM_E_VID		1	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Print Growth H.	PRM.DTL.AIM_E_PGH		0	1	0		1	0	X	X	X	O
	Overall Symbol Grade Condition: Print Growth V.	PRM.DTL.AIM_E_PGV		0	1	0		1	0	X	X	X	O
	Overall Symbol Grade: Lower Limit	PRM.DTL.AIM_ALL:LL			4	0		1	0	O	O	X	O
	Decode: Lower Limit	PRM.DTL.AIM_DEC:LL			4	0		1	0	O	O	X	O
	Cell Contrast: Lower Limit	PRM.DTL.AIM_CC:LL			4	0		1	0	O	O	X	O
	Cell Modulation: Lower Limit	PRM.DTL.AIM_CM:LL			4	0		1	0	O	O	X	O
	Reflect. Margin: Lower Limit	PRM.DTL.AIM_RM:LL			4	0		1	0	O	O	X	O
	Fixed Pat.Dmg.: Lower Limit	PRM.DTL.AIM_FPD:LL			4	0		1	0	O	O	X	O
	Axial N-uniform.: Lower Limit	PRM.DTL.AIM_AN:LL			4	0		1	0	O	O	X	O
	Grid N-uniform.: Lower Limit	PRM.DTL.AIM_GN:LL			4	0		1	0	O	O	X	O
	Unused Err.Crr.: Lower Limit	PRM.DTL.AIM_UEC:LL			4	0		1	0	O	O	X	O
	Form.Info.Dmg.: Lower Limit	PRM.DTL.AIM_FID:LL			4	0		1	0	O	O	X	O
	Vers.Info.Dmg.: Lower Limit	PRM.DTL.AIM_VID:LL			4	0		1	0	O	O	X	O

Category	Setting item	Mnemonic string String following :U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				Integer	Decimal point	User variable	System variable	Result data	Unit properties
Limits (continued)	Print Growth H.: Lower Limit	PRM.DTL.AIM_PGH:LL		4	0			1	0	○	○	X	○
	Print Growth V.: Lower Limit	PRM.DTL.AIM_PGV:LL		4	0			1	0	○	○	X	○
	Overall Symbol Grade Condition: Quiet Zone	PRM.DTL.SAE_E_QZ	1	1	0			1	0	X	X	X	○
	Overall Symbol Grade Condition: Symbol Contrast	PRM.DTL.SAE_E_SC	1	1	0			1	0	X	X	X	○
	Overall Symbol Grade Condition: Angular Dist.	PRM.DTL.SAE_E_AD	1	1	0			1	0	X	X	X	○
	Overall Symbol Grade Condition: Module Fill	PRM.DTL.SAE_E_MF	1	1	0			1	0	X	X	X	○
	Overall Symbol Grade: Lower Limit	PRM.DTL.SAE_ALL:LL		4	0			1	0	○	○	X	○
	Quiet Zone: Lower Limit	PRM.DTL.SAE_QZ:LL		4	0			1	0	○	○	X	○
	Symbol Contrast: Lower Limit	PRM.DTL.SAE_SC:LL		4	0			1	0	○	○	X	○
	Angular Dist.: Lower Limit	PRM.DTL.SAE_AD:LL		4	0			1	0	○	○	X	○
	Module Fill: Lower Limit	PRM.DTL.SAE_MF:LL		4	0			1	0	○	○	X	○
	Overall Symbol Grade Condition: Decode	PRM.DTL.ST_E_DEC	1	1	0			1	0	X	X	X	○
	Overall Symbol Grade Condition: Edge Determination	PRM.DTL.ST_E_EDG	1	1	0			1	0	X	X	X	○
	Overall Symbol Grade Condition: Symbol Contrast	PRM.DTL.ST_E_SC	1	1	0			1	0	X	X	X	○
	Overall Symbol Grade Condition: Minimum Reflectance	PRM.DTL.ST_E_MINR						1	1	X	X	X	○
	Overall Symbol Grade Condition: Minimum Edge Contrast	PRM.DTL.ST_E_MINE						1	1	X	X	X	○
	Overall Symbol Grade Condition: Modulation	PRM.DTL.ST_E_MOD						1	1	X	X	X	○
	Overall Symbol Grade Condition: Minimum Quiet Zone	PRM.DTL.ST_E_QZ						1	1	X	X	X	○
	Overall Symbol Grade Condition: Decodability	PRM.DTL.ST_E_DCD						1	1	X	X	X	○
	Overall Symbol Grade Condition: Defects	PRM.DTL.ST_E_DEF						1	1	X	X	X	○
	Overall Symbol Grade Condition: Codeword Yield	PRM.DTL.ST_E_CY						1	1	X	X	X	○
	Overall Symbol Grade Condition: Codeword Print Quality	PRM.DTL.ST_E_CPO						1	1	X	X	X	○
	Overall Symbol Grade Condition: Unused Error Correction	PRM.DTL.ST_E_UEC						1	1	X	X	X	○
	Overall Symbol Grade Condition: Decode	PRM.DTL.BC_E_DEC						1	1	X	X	X	○

Category	Setting item	Mnemonic string String following U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format	Referencing			
			Label	Value					User variable	System variable	Result data	Unit properties
Limits (continued)	Overall Symbol Grade Condition: Edge Determination	PRM.DTL.BC_E_EDG						1	1	x	x	o
	Overall Symbol Grade Condition: Symbol Contrast	PRM.DTL.BC_E_SC						1	1	x	x	o
	Overall Symbol Grade Condition: Minimum Reflectance	PRM.DTL.BC_E_MINR						1	1	x	x	o
	Overall Symbol Grade Condition: Minimum Edge Contrast	PRM.DTL.BC_E_MINE						1	1	x	x	o
	Overall Symbol Grade Condition: Modulation	PRM.DTL.BC_E_MOD						1	1	x	x	o
	Overall Symbol Grade Condition: Minimum Quiet Zone	PRM.DTL.BC_E_QZ						1	1	x	x	o
	Overall Symbol Grade Condition: Decodability	PRM.DTL.BC_E_DCD						1	1	x	x	o
	Overall Symbol Grade Condition: Defects	PRM.DTL.BC_E_DEF						1	1	x	x	o
	Overall Symbol Grade: Lower Limit	PRM.DTL.ST_ALL:LL			4.0	0.0		1	1	o	o	x

*1 The lower limit of "Cell Size (pixels)" is 1.00 unless "Size variation" is set to [Unlimited].

1D Code Reader Unit

Category	Setting item	Mnemonic string String following !U[m].	Selection		Initial value	Upper limit	Lower limit	Numerical value format	Referencing			
			Label	Value					User variable	System	Result data	Unit properties
Condition	Code type	PRM.DTL.CDTYP	CODE39	1					X	X	X	O
			CODE128	2								
			EAN/JAN/ UPC	3								
			GS1	4								
			Databar									
			ITF	5								
			Codabar/ NW-7	6								
			Pharmacode	7								
Auto Tune Enabled:	PRM.DTL.E_DCDTYP	Disabled	0						X	X	X	O
Code Detail		Enabled	1									
Auto Tune Enabled:	PRM.DTL.E_MSIZE	Disabled	0						X	X	X	O
Min. Bar Width		Enabled	1									
Auto Tune Enabled:	PRM.DTL.E_EIT	Disabled	0						X	X	X	O
Contrast Level		Enabled	1									
Auto Tune Enabled: Enabled:Bar Color	PRM.DTL.E_CCLR	Disabled	0						X	X	X	O
Auto Tune Enabled: Code Length (Max)	PRM.DTL.E_LENMX	Disabled	0						X	X	X	O
		Enabled	1									
Auto Tune Enabled: Code Length (Min)	PRM.DTL.E_LENMN	Disabled	0						X	X	X	O
		Enabled	1									
Auto Tune Enabled:	PRM.DTL.E_STDA	Disabled	0						X	X	X	O
Base Angle		Enabled	1									
Code Detail	PRM.DTL.DCDTYP	None	0						X	X	X	X
		EAN-13, UPC-A	1									
		EAN-8	2									
		UPC-E	3									
		EAN-13, UPC-A & 5-digit	4									
		EAN-8 & 5-digit	5									
		UPC-E & 5-digit	6									
		EAN-13, UPC-A & 2-digit	7									
		EAN-8 & 2-digit	8									
		UPC-E & 2-digit	9									
		Databar	10									
		Databar Stacked	11									
		Databar Limited	12									
		Databar Expanded	13									

Category	Setting item	Mnemonic string String following U[n].	Selection		Initial value	Upper limit	Lower limit	Integer	Decimal point:	Numerical value format	Referencing
			Label	Value							
Condition (continued)	Min. Bar Width (pixels)	PRM.DTL.MSIZE		0.00	200.00	0.00	0.00	3	2	<input type="radio"/>	<input checked="" type="radio"/>
Contrast Level	PRM.DTL.EIT		Highest(2)	2						<input type="radio"/>	<input checked="" type="radio"/>
			High(1)	1						<input checked="" type="radio"/>	<input type="radio"/>
			Normal(0)	0						<input type="radio"/>	<input checked="" type="radio"/>
			Low(-1)	-1						<input type="radio"/>	<input checked="" type="radio"/>
			Lowest(-2)	-2						<input type="radio"/>	<input checked="" type="radio"/>
Bar Color	PRM.DTL.CCLR		Both	0						<input type="radio"/>	<input checked="" type="radio"/>
			Black	1						<input checked="" type="radio"/>	<input type="radio"/>
			White	2						<input type="radio"/>	<input checked="" type="radio"/>
Code Length (Max)	PRM.DTL.LEN_MX			128	128	1		3	0	<input type="radio"/>	<input checked="" type="radio"/>
Code Length (Min)	PRM.DTL.LEN_MN			1	128	1		3	0	<input checked="" type="radio"/>	<input type="radio"/>
Base Angle	PRM.DTL.STDA			0.000	180.000	-179.999		3	3	<input type="radio"/>	<input checked="" type="radio"/>
Check Digit	PRM.DTL.CHKDG		OFF	0						<input checked="" type="radio"/>	<input type="radio"/>
			ON	1						<input type="radio"/>	<input checked="" type="radio"/>
			Modulus 16	2						<input type="radio"/>	<input checked="" type="radio"/>
			Modulus 11	3						<input type="radio"/>	<input checked="" type="radio"/>
			Modulus 10/	4						<input type="radio"/>	<input checked="" type="radio"/>
			Weight 2							<input type="radio"/>	<input checked="" type="radio"/>
			Modulus 10/	5						<input type="radio"/>	<input checked="" type="radio"/>
			Weight 3							<input type="radio"/>	<input checked="" type="radio"/>
			7 Check DR	6						<input type="radio"/>	<input checked="" type="radio"/>
			Modulus 7							<input type="radio"/>	<input checked="" type="radio"/>
			11-A							<input type="radio"/>	<input checked="" type="radio"/>
			Lunes	8						<input type="radio"/>	<input checked="" type="radio"/>
Size Variation	PRM.DTL.SVA		Small	0						<input type="radio"/>	<input checked="" type="radio"/>
			Medium	1						<input checked="" type="radio"/>	<input type="radio"/>
			Large	2						<input type="radio"/>	<input checked="" type="radio"/>
			Unlimited	3						<input type="radio"/>	<input checked="" type="radio"/>
Read Direction	PRM.DTL.RDDR		→	5						<input type="radio"/>	<input checked="" type="radio"/>
			←	4						<input checked="" type="radio"/>	<input type="radio"/>
			↑	6						<input type="radio"/>	<input checked="" type="radio"/>
			↓	7						<input type="radio"/>	<input checked="" type="radio"/>
Parameters	Coordinate Value	PRM.DTL.CRD	After position adjust	0						<input checked="" type="radio"/>	<input type="radio"/>
			Before position adjust	1						<input type="radio"/>	<input checked="" type="radio"/>
Origin XY	PRM.DTL.OGXY							4	3	<input type="radio"/>	<input checked="" type="radio"/>
Origin X	PRM.DTL.OGX			0.000	9600.000	-9600.000				<input checked="" type="radio"/>	<input type="radio"/>
Origin Y	PRM.DTL.OGY			0.000	7200.000	-7200.000				<input type="radio"/>	<input checked="" type="radio"/>
Symbology Identifier	PRM.DTL.SID		None	0						<input checked="" type="radio"/>	<input type="radio"/>
			Output	1						<input type="radio"/>	<input checked="" type="radio"/>
Start Digit	PRM.DTL.SDG			1	128	1		4	0	<input type="radio"/>	<input checked="" type="radio"/>
Length	PRM.DTL.DLEN			100	128	1		3	0	<input checked="" type="radio"/>	<input type="radio"/>
Decoding Timeout	PRM.DTL.TOUT			3	60	0.01		2	2	<input type="radio"/>	<input checked="" type="radio"/>
Data Split Enable/Disable	PRM.DTL.DSPL		OFF	0						<input checked="" type="radio"/>	<input type="radio"/>
			ON	1						<input type="radio"/>	<input checked="" type="radio"/>

Category	Setting item	Mnemonic string String following :U[n].	Selection		Initial value	Upper limit	Lower limit	Integer	Decimal point	Numerical value format	Referencing			
			Label	Value							User variable	System	Result data	Unit properties
Parameters (continued)	Splits 1										X	X	X	O
	Enable	PRM.DTL.ESPL[0]	Disable	0										
			Enable	1										
	Start Digit	PRM.DTL.SDGS[0]			1	128	1		3	0	X	X	X	O
	Length	PRM.DTL.DLENS[0]			1	128	1		3	0	X	X	X	O
	Splits 2	PRM.DTL.***[1]												
												
	Splits 8	PRM.DTL.***[7]												
	Fixed Length	PRM.DTL.FLO	OFF	0							X	X	X	O
			ON	1										
	Fill Character	PRM.DTL.FCH		" "							X	X	X	O
	Error Output	PRM.DTL.ECO	OFF	0							X	X	X	O
			ON	1										
	Error Code (1 to 16 characters)	PRM.DTL.ECD		"error"		16-byte max string					X	X	X	O
	Verification	PRM.DTL.VRF	OFF	0					1	0	X	X	X	O
			ISO/IEC 15416	1										
	Large Area Mode	PRM.DTL.CDLAM	Disable	0							X	X	X	O
			Enable	1										
Limits	Multi Reference	PRM.DTL.MCND	OFF	0							X	X	X	O
			ON	1										
	Number of Multi References	PRM.DTL.MNUM		0	16	0			2	0	X	X	X	O
	Reference 1	PRM.DTL.MPTN1[0]							5	0	X	X	X	O
	Reference 2	PRM.DTL.MPTN2[0]							5	0	X	X	X	O
	Reference 3	PRM.DTL.MPTN3[0]							5	0	X	X	X	O
	Reference 4	PRM.DTL.MPTN4[0]							5	0	X	X	X	O
	Reference 5	PRM.DTL.MPTN5[0]							5	0	X	X	X	O
	Reference 6	PRM.DTL.MPTN6[0]							5	0	X	X	X	O
	Reference 7	PRM.DTL.MPTN7[0]							5	0	X	X	X	O
	Reference 8	PRM.DTL.MPTN8[0]							5	0	X	X	X	O
	Reference 9	PRM.DTL.MPTN9[0]							5	0	X	X	X	O
	Reference 10	PRM.DTL.MPTN10[0]							5	0	X	X	X	O
	Reference 11	PRM.DTL.MPTN11[0]							5	0	X	X	X	O
	Reference 12	PRM.DTL.MPTN12[0]							5	0	X	X	X	O
	Reference 13	PRM.DTL.MPTN13[0]							5	0	X	X	X	O
	Reference 14	PRM.DTL.MPTN14[0]							5	0	X	X	X	O
	Reference 15	PRM.DTL.MPTN15[0]							5	0	X	X	X	O
	Reference 16	PRM.DTL.MPTN16[0]							5	0	X	X	X	O

Category	Setting item	Mnemonic string String following U[n].	Selection			Upper limit	Lower limit	Numerical value format	Referencing				
			Label	Value	Initial value				User variable	System	Result data	Unit properties	
Limits (continued)	Reference 1 Setting	PRM.DTL.***[0]											
	Data Range	PRM.DTL.MRNG[0]	All	0	0	8	0		X	X	X	O	
			Split 1	1									
			Split 2	2									
			Split 3	3									
			Split 4	4									
			Split 5	5									
			Split 6	6									
			Split 7	7									
			Split 8	8									
	Use in unit pass / fail results	PRM.DTL.IUJ[0]	Disabled	0					X	X	X	O	
			Enabled	1									
	Calc Result Converted: N-adic number	PRM.DTL.COC2[0]		10	36	10		2	0	O	O	X	O
	Calc Result Converted: Number of characters	PRM.DTL.PLN2[0]		1	6	1		1	0	O	O	X	O
	Calc Result Converted: Zero Suppression	PRM.DTL.CAZS_C[0]	None	0					O	O	X	O	
			Space forward	1									
			Space backward	2									
			Remove zeros	3									
	Date & Time Offset: Year	PRM.DTL.OFYR[0]		0	10	-10		2	0	O	O	X	O
	Date & Time Offset: Month	PRM.DTL.OFMN[0]		0	12	-12		2	0	O	O	X	O
	Date & Time Offset: Day	PRM.DTL.OFDY[0]		0	1999	-1999		4	0	O	O	X	O
	Date & Time Offset: Hour	PRM.DTL.OFTM[0]		0	24	-24		2	0	O	O	X	O
	Date & Time Offset: Positive Allowable Error: Seconds	PRM.DTL.SLH[0]		0	3599	0		4	0	O	O	X	O
	Date & Time Offset: Negative Allowable Error: Seconds	PRM.DTL.SLL[0]		0	3599	0		4	0	O	O	X	O
	Date & Time Offset: Zero Suppression	PRM.DTL.CAZS_Y[0]	None	0					O	O	X	O	
			Space forward	1									
			Space backward	2									
			Remove zeros	3									
	Processing	PRM.DTL.UOS[0]	Special	0					O	O	X	O	
			Normal	1									
	Reference 2 Setting	PRM.DTL.***[1]											
												
	Reference 16 Setting	PRM.DTL.***[15]											

Category	Setting item	Mnemonic string String following :U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				Integer	Decimal point	User variable	System	Result data	Unit properties
Limits (continued)	Code Length : Upper Limit	PRM.DTL.ID_LEN:HL		999	0			3	0	○	○	X	○
	Code Length : Lower Limit	PRM.DTL.ID_LEN:LL		999	0			3	0	○	○	X	○
	X Position of Code: Upper Limit	PRM.DTL.X:HL		99999.999	-99999.999			5	3	○	○	X	○
	X Position of Code: Lower Limit	PRM.DTL.X:LL		99999.999	-99999.999			5	3	○	○	X	○
	Y Position of Code: Upper Limit	PRM.DTL.Y:HL		99999.999	-99999.999			5	3	○	○	X	○
	Y Position of Code: Lower Limit	PRM.DTL.Y:LL		99999.999	-99999.999			5	3	○	○	X	○
	Deviation Angle of Code: Upper Limit	PRM.DTL.T:HL		999.999	-999.999			3	3	○	○	X	○
	Deviation Angle of Code: Lower Limit	PRM.DTL.T:LL		999.999	-999.999			3	3	○	○	X	○
	Overall Symbol Grade Condition: Decode	PRM.DTL.BC_E_DEC						1	0	×	×	×	○
	Overall Symbol Grade Condition: Edge Determination	PRM.DTL.BC_E_EDG						1	0	×	×	×	○
	Overall Symbol Grade Condition: Symbol Contrast	PRM.DTL.BC_E_SC						1	0	×	×	×	○
	Overall Symbol Grade Condition: Minimum Reflectance	PRM.DTL.BC_E_MINR						1	0	×	×	×	○
	Overall Symbol Grade Condition: Minimum Edge Contrast	PRM.DTL.BC_E_MINE						1	0	×	×	×	○
	Overall Symbol Grade Condition: Modulation	PRM.DTL.BC_E_MOD						1	0	×	×	×	○
	Overall Symbol Grade Condition: Minimum Quiet Zone	PRM.DTL.BC_E_QZ						1	0	×	×	×	○
	Overall Symbol Grade Condition: Decodability	PRM.DTL.BC_E_DCD						1	0	×	×	×	○
	Overall Symbol Grade Condition: Defects	PRM.DTL.BC_E_DEF						1	0	×	×	×	○
	Overall Symbol Grade Condition: Wide to Narrow Ratio	PRM.DTL.BC_E_WNR						1	0	×	×	×	○
	Overall Symbol Grade Condition: Intercharacter Gap	PRM.DTL.BC_E_CGAP						1	0	×	×	×	○
	Overall Symbol Grade: Lower Limit	PRM.DTL.BC_ALL:LL		4.0	0.0			1	1	○	○	×	○

Height Extraction/Height Binarization

Category	Setting item	Mnemonic string String following !U[n].	Selection		Initial value	Upper limit	Lower limit	Integer	Numerical value format	Referencing
			Label	Value						
Height Extraction/ Height Binarization	Specification Method	PRM.HGTEXT.HGTEXT_TYPE	Height extraction	0						X X X O
			Height binarization	1						
Extraction Method	PRM.HGTEXT.HWAY	None	0							X X X O
		1 Point	1							
		3 Points (Plane)	2							
		Real-time	3							
Enable Height Extraction	PRM.HGTEXT.HEXTEN	Enable	1							X X X O
		Disable	0							
Extraction Size	PRM.HGTEXT.EW		16		99	1	2	0	X X X O	
Calc. Method	PRM.HGTEXT.HMTD	None	0							X X X O
		Ave. Height	1							
		Plane	2							
		Free-form	3							
Extract Height	PRM.HGTEXT.EH	Upper Part	0							X X X O
		Lower Part	1							
		Both	2							
Noise Cut	PRM.HGTEXT.HEN		0.0		9.999	0.0	1	3	O O X O	
Gain	PRM.HGTEXT.GN		13		4000	1	4	0	O O X O	
					(CA-DQP25X:6)					
Height Per Tone	PRM.HGTEXT.R_GN		0		9.9999	0.0001	1	4	X X X O	
Invalid Pixels	PRM.HGTEXT.HFM	Default	0							X X X O
		Background	1							
		Specified	2							
Invalid Pix. Value	PRM.HGTEXT:HFMV		0		255	0	3	0	O O X O	
Extract Size	PRM.HGTEXT.ESZ		32		1024	4	3	0	O O X O	
Border	PRM.HGTEXT.CFR	ON	0							O O X O
		OFF	1							
Plane Formula Info.	PRM.HGTEXT.PPABC						3	6	O O X O	
	XYZ									
X Slope	PRM.HGTEXT.PPA		0.0		1	-1	1	6	O O X O	
Y Slope	PRM.HGTEXT.PPB		0.0		1	-1	1	6	O O X O	
Z Intercept	PRM.HGTEXT.PPC		0.0		999.999	-999.999	3	3	O O X O	
Extract Direction	PRM.HGTEXT.PRD	X	1	3		3				
		Y		2						
		XY		3						
Z Offset	PRM.HGTEXT.ZOFFS		0.0		999.999	-999.999			O O X O	
Make Specified Height and Up Black	PRM.HGTEXT.XSB_SPUP								X X X O	
Offset from Section Plane Height	PRM.HGTEXT.XSB_OFFB		10		999.999	0	3	3	O O X O	

Category	Setting item	Mnemonic string String following U[n].	Selection		Initial value	Upper limit	Lower limit	Integer	Decimal point	Numerical value format	Referencing				
			Label	Value							User variable	System variable	Result data	Unit properties	
Height Extraction/ Height Binary Processing (continued)	Extract Height	PRM.HGTEXT.EH	Upper Part	0							<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>		
			Lower Part	1											
			Both	2											
			Cross Section	3											
Extract Region: Common	Use Region	PRM.HGTEXT.RGN.RGNEN	Enable	1							<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Disable	0											
Extract Region: Common	Shape Settings	PRM.HGTEXT.RGN.SHP	Same as Insp. Region	0							<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Rectangle	1											
			Rotated Rectangle	3											
			Circle	4											
			Oval	5											
			Ring	6											
			Arc	7											
			Polygon	8											
			Upper Left XY	PRM.HGTEXT.RGN.LUXY							5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
			Upper Left X	PRM.HGTEXT.RGN.LUX		160	16383	0	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
Extract Region: Rectangle			Upper Left Y	PRM.HGTEXT.RGN.LUY	160	16383	0	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Lower Right XY	PRM.HGTEXT.RGN.RDXY							5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
			Lower Right X	PRM.HGTEXT.RGN.RDX		360	16383	0	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
			Lower Right Y	PRM.HGTEXT.RGN.RDY		320	16383	0	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
			Width	PRM.HGTEXT.RGN.WI	201	16383	1	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Height	PRM.HGTEXT.RGN.HI	161	16383	1	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Extract Region: Rotated Rectangle			Center XY	PRM.HGTEXT.RGN.RCXY							5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
			Center X	PRM.HGTEXT.RGN.RCX		260	16382	0	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
			Center Y	PRM.HGTEXT.RGN.RCY		240	16382	0	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
			Angle	PRM.HGTEXT.RGN.T	0.0	359.9	0.0	3	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Center XY	PRM.HGTEXT.RGN.CXY							5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
			Center X	PRM.HGTEXT.RGN.CX		260	16383	-16383	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
Extract Region: Oval			Center Y	PRM.HGTEXT.RGN.CY	240	16383	-16383	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Radius 1	PRM.HGTEXT.RGN.CR1	120	2580	8	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Radius 2	PRM.HGTEXT.RGN.CR2	180	2580	8	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Angle	PRM.HGTEXT.RGN.T	0.0	359.9	0.0	3	1	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Center XY	PRM.HGTEXT.RGN.CXY							5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
			Center X	PRM.HGTEXT.RGN.CX		260	16383	-16383	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	
Extract Region: Ring			Center Y	PRM.HGTEXT.RGN.CY	240	16383	-16383	5	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Radius 1	PRM.HGTEXT.RGN.CR1	120	9600	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			Radius 2	PRM.HGTEXT.RGN.CR2	60	9600	0	4	0	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Category	Setting item	Mnemonic string String following :U[n].	Selection			Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value	Initial value			Integer	Decimal point	User variable	System variable	Result data	Unit properties
Extract Region: Arc	Center XY	PRM.HGTEXT.RGN.CXY						5	0	O	O	X	O
	Center X	PRM.HGTEXT.RGN.CX		260	16383	-16383		5	0	O	O	X	O
	Center Y	PRM.HGTEXT.RGN.CY		240	16383	-16383		5	0	O	O	X	O
	Radius 1	PRM.HGTEXT.RGN.CR1		120	9600	0		4	0	O	O	X	O
	Radius 2	PRM.HGTEXT.RGN.CR2		30	9600	0		4	0	O	O	X	O
	Starting Angle	PRM.HGTEXT.RGN.STA		45.0	359.9	0.0		3	1	O	O	X	O
	End Angle	PRM.HGTEXT.RGN.ENA		315.0	359.9	0.0		3	1	O	O	X	O
Extract Region: Polygon	Number of Nodes	PRM.HGTEXT.RGN.PN		0	12	0		2	0	X	X	X	O
	Max Number of Nodes	PRM.HGTEXT.RGN.MXPN		12	12	12		2	0	X	X	X	X
	XY Position	PRM.HGTEXT.RGN.PXY[*]						5	0	O	O	X	O
	X Position	PRM.HGTEXT.RGN.PX[*]		331	16383	0		5	0	O	O	X	O
	Y Position	PRM.HGTEXT.RGN.PY[*]		337	16383	0		5	0	O	O	X	O
Mask 0 Settings: Common	Enabled	PRM.HGTEXT.MSK[0].RGNEN	Enable	1						X	X	X	O
			Disable	0									
	Shape Settings	PRM.HGTEXT.MSK[0].SHP	None	0						X	X	X	O
			Rectangle	1									
			Rotated Rectangle	3									
			Circle	4									
			Oval	5									
			Ring	6									
			Arc	7									
			Polygon	8									
Mask 0 Settings: Rectangle	Upper Left XY	PRM.HGTEXT.MSK[0].LUXY						5	0	O	O	X	O
	Upper Left X	PRM.HGTEXT.MSK[0].LUX	200	16383	0			5	0	O	O	X	O
	Upper Left Y	PRM.HGTEXT.MSK[0].LUY	180	16383	0			5	0	O	O	X	O
	Lower Right XY	PRM.HGTEXT.MSK[0].RDXY						5	0	O	O	X	O
	Lower Right X	PRM.HGTEXT.MSK[0].RDX	320	16383	0			5	0	O	O	X	O
	Lower Right Y	PRM.HGTEXT.MSK[0].RDY	300	16383	0			5	0	O	O	X	O
Mask 0 Settings: Rotated Rectangle	Width	PRM.HGTEXT.MSK[0].WI	121	16383	1			5	0	O	O	X	O
	Height	PRM.HGTEXT.MSK[0].HI	121	16383	1			5	0	O	O	X	O
	Center XY	PRM.HGTEXT.MSK[0].RCXY						5	0	O	O	X	O
	Center X	PRM.HGTEXT.MSK[0].RCX	260	16382	0			5	0	O	O	X	O
	Center Y	PRM.HGTEXT.MSK[0].RCY	240	16382	0			5	0	O	O	X	O
	Angle	PRM.HGTEXT.MSK[0].T	0.0	359.9	0.0			3	1	O	O	X	O
Mask 0 Settings: Circle	Center XY	PRM.HGTEXT.MSK[0].CXY						5	0	O	O	X	O
	Center X	PRM.HGTEXT.MSK[0].CX	260	16383	-16383			5	0	O	O	X	O
	Center Y	PRM.HGTEXT.MSK[0].CY	240	16383	-16383			5	0	O	O	X	O
	Radius	PRM.HGTEXT.MSK[0].CR	60	9600	0			4	0	O	O	X	O
Mask 0 Settings: Oval	Center XY	PRM.HGTEXT.MSK[0].CXY						5	0	O	O	X	O
	Center X	PRM.HGTEXT.MSK[0].CX	260	16383	-16383			5	0	O	O	X	O
	Center Y	PRM.HGTEXT.MSK[0].CY	240	16383	-16383			5	0	O	O	X	O
	Radius 1	PRM.HGTEXT.MSK[0].CR1	60	2580	8			4	0	O	O	X	O
	Radius 2	PRM.HGTEXT.MSK[0].CR2	100	2580	8			4	0	O	O	X	O
	Angle	PRM.HGTEXT.MSK[0].T	0.0	359.9	0.0			3	1	O	O	X	O

Category	Setting item	Mnemonic string String following U[n].	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				Integer	Decimal point	User variable	System variable	Result data	Unit properties
Mask 0 Settings: Ring	Center XY	PRM.HGTEXT.MSK[0].CXY						5	0	○	○	X	○
	Center X	PRM.HGTEXT.MSK[0].CX	260	16383	-16383			5	0	○	○	X	○
	Center Y	PRM.HGTEXT.MSK[0].CY	240	16383	-16383			5	0	○	○	X	○
	Radius 1	PRM.HGTEXT.MSK[0].CR1	80	9600	0			4	0	○	○	X	○
	Radius 2	PRM.HGTEXT.MSK[0].CR2	40	9600	0			4	0	○	○	X	○
Mask 0 Settings: Arc	Center XY	PRM.HGTEXT.MSK[0].CXY						5	0	○	○	X	○
	Center X	PRM.HGTEXT.MSK[0].CX	260	16383	-16383			5	0	○	○	X	○
	Center Y	PRM.HGTEXT.MSK[0].CY	240	16383	-16383			5	0	○	○	X	○
	Radius 1	PRM.HGTEXT.MSK[0].CR1	200	9600	0			4	0	○	○	X	○
	Radius 2	PRM.HGTEXT.MSK[0].CR2	100	9600	0			4	0	○	○	X	○
	Starting Angle	PRM.HGTEXT.MSK[0].STA	45.0	359.9	0.0			3	1	○	○	X	○
Mask 0 Settings: Polygon	End Angle	PRM.HGTEXT.MSK[0].ENA	315.0	359.9	0.0			3	1	○	○	X	○
	Number of Nodes	PRM.HGTEXT.MSK[0].PN	0	12	0			2	0	X	X	X	○
	Max Number of Nodes	PRM.HGTEXT.MSK[0].MXPN	12	12	12			2	0	X	X	X	X
	XY Position	PRM.HGTEXT.MSK[0].PXY[*]						5	0	○	○	X	○
	X Position	PRM.HGTEXT.MSK[0].PX[*]	331	16383	0			5	0	○	○	X	○
Mask 1 Settings	Y Position	PRM.HGTEXT.MSK[0].PY[*]	337	16383	0			5	0	○	○	X	○
		PRM.HGTEXT.MSK[1].***											
		PRM.HGTEXT.MSK[2].***											
		PRM.HGTEXT.MSK[3].***											

Height Measurement Unit

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	User variable	Referencing
				Initial value	Upper limit	Lower limit				
Height Measurement	Maximum Number of Possible Heights	PRM.DTL.MXN		1	10000	1	5	0	X	X X X O
	Use Maximum Height	PRM.DTL.MXHP_EN	Disable	0					X	X X O
			Enable	1						
	Use Minimum Height	PRM.DTL.MNHP_EN	Disable	0					X	X X O
			Enable	1						
	Use Average Height	PRM.DTL.AVHP_EN	Disable	0					X	X X O
			Enable	1						
	Use Valid Pix. Count	PRM.DTL.EP_EN	Disable	0					X	X X O
			Enable	1						
	Use Concave/Convex Area	PRM.DTL.AR_EN	Disable	0					X	X X O
			Enable	1						
	Use Concave/Convex Volume	PRM.DTL.VOL_EN	Disable	0					X	X X O
			Enable	1						
	Use Standard Deviation	PRM.DTL.DVHP_EN	Disable	0					X	X X O
			Enable	1						
	Coordinate System	PRM.DTL.CRD	After position adjust	0					X	X X O
			Before position adjust	1						
	Origin Point XY	PRM.DTL.0GXY					4	3	X X X O	
	Origin Point X	PRM.DTL.0GX		0.000	9600.000	-9600.000	4	3	X X X O	
	Origin Point Y	PRM.DTL.0GY		0.000	7200.000	-7200.000	4	3	X X X O	
	Height Direction Unit	PRM.DTL.HOU	mm	0					X X X O	
			μm	1						
	Region Update Mode	PRM.DTL.RUM	Update Each Process	0					X X X O	
			Update By User	1						
	Result Display Region No.	PRM.DTL.LLB		0	9999	0	4	0	X X X O	
	Count: Upper Limit	PRM.DTL.N:HL		-	10000	0	5	0	O O X O	
	Count: Lower Limit	PRM.DTL.N:LL		-	10000	0	5	0	O O X O	
	Maximum Height X: Upper Limit	PRM.DTL.MXX:HL		-	99999.999	-99999.999	5	3	O O X O	
	Maximum Height X: Lower Limit	PRM.DTL.MXX:LL		-	99999.999	-99999.999	5	3	O O X O	
	Maximum Height Y: Upper Limit	PRM.DTL.MXY:HL		-	99999.999	-99999.999	5	3	O O X O	
	Maximum Height Y: Lower Limit	PRM.DTL.MXY:LL		-	99999.999	-99999.999	5	3	O O X O	
	Maximum Height Z: Upper Limit	PRM.DTL.MXZ:HL		-	99999.999	-99999.999	5	3	O O X O	
	Maximum Height Z: Lower Limit	PRM.DTL.MXZ:LL		-	99999.999	-99999.999	5	3	O O X O	
	Maximum Height H: Upper Limit	PRM.DTL.MXH:HL		-	99999.999	-99999.999	5	3	O O X O	

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Referencing			Unit properties
				Value	Initial value						System variable	Result data	Error codes	
Height Measurement (continued)	Maximum Height H: Lower Limit	PRM.DTL.MXH:LL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Minimum Height X: Upper Limit	PRM.DTL.MNX:HL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Minimum Height X: Lower Limit	PRM.DTL.MNX:LL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Minimum Height Y: Upper Limit	PRM.DTL.MNY:HL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Minimum Height Y: Lower Limit	PRM.DTL.MNY:LL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Minimum Height Z: Upper Limit	PRM.DTL.MNZ:HL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Minimum Height Z: Lower Limit	PRM.DTL.MNZ:LL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Minimum Height H: Upper Limit	PRM.DTL.MNH:HL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Minimum Height H: Lower Limit	PRM.DTL.MNH:LL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Average Height Z: Upper Limit	PRM.DTL.AVZ:HL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Average Height Z: Lower Limit	PRM.DTL.AVZ:LL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Average Height H: Upper Limit	PRM.DTL.AVH:HL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Average Height H: Lower Limit	PRM.DTL.AVH:LL	-	99999.999	-99999.999	5	3	○	○	X	○			
	Valid Pix. Count: Upper Limit	PRM.DTL.EPA:HL	-	99999999.0	0.0	8	0	○	○	X	○			
	Valid Pix. Count: Lower Limit	PRM.DTL.EPA:LL	-	99999999.0	0.0	8	0	○	○	X	○			
	Concave Area: Upper Limit	PRM.DTL.CONC_AR:HL	-	999999.999	0.0	6	3	○	○	X	○			
	Concave Area: Lower Limit	PRM.DTL.CONC_AR:LL	-	999999.999	0.0	6	3	○	○	X	○			
	Convex Area: Upper Limit	PRM.DTL.CONV_AR:HL	-	999999.999	0.0	6	3	○	○	X	○			
	Convex Area: Lower Limit	PRM.DTL.CONV_AR:LL	-	999999.999	0.0	6	3	○	○	X	○			
	Concave Volume: Upper Limit	PRM.DTL.CONC_VOL:HL	-	9999999.999	0.0	7	3	○	○	X	○			
	Concave Volume: Lower Limit	PRM.DTL.CONC_VOL:LL	-	9999999.999	0.0	7	3	○	○	X	○			
	Convex Volume: Upper Limit	PRM.DTL.CONV_VOL:HL	-	9999999.999	0.0	7	3	○	○	X	○			
	Convex Volume: Lower Limit	PRM.DTL.CONV_VOL:LL	-	9999999.999	0.0	7	3	○	○	X	○			
	Standard Deviation Z: Upper Limit	PRM.DTL.DVZ:HL	-99999.999	0.0	5	3	○	○	X	○				
	Standard Deviation Z: Lower Limit	PRM.DTL.DVZ:LL	-99999.999	0.0	5	3	○	○	X	○				
	Standard Deviation H: Upper Limit	PRM.DTL.DVH:HL	-99999.999	0.0	5	3	○	○	X	○				
	Standard Deviation H: Lower Limit	PRM.DTL.DVH:LL	-99999.999	0.0	5	3	○	○	X	○				

List of setting parameters

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Detection Conditions	Plane Detection	PRM.DTL.DPP_ENP	OFF	0				X	X	X
			ON	1						
	Correction	PRM.DTL.HREA	OFF	0				O	O	X
			ON	1						
	Reference Height	PRM.DTL.REF_H	Average	0				O	O	X
			Maximum	1						
	Z Offset	PRM.DTL.ZOFFS	Minimum	2	0.0	999.999	-999.999	3	3	O

Zero Plane Specification

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format			Referencing
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	
Zero Plane	Spec. Method	PRM.HRP.MTD	None	4				X	X	X	O
			Region (Best Fit)	0							
			Region (Ave. Height)	1							
			3 Points (Real-Time)	2							
			User Specified	3							
			Multiple Points (Real-Time)	5							
			Result Data Reference	6							
			Free-form Plane Reference	7							
Enable Zero Plane Specification	PRM.HRPHRPN	Enable	1					X	X	X	O
		Disable	0								
Selection Size	PRM.HRPPSZ			5	99	1		2	0	O	O
Enable Select Point0	PRM.HRPP_EN[0]	Enable	1					1	0	X	X
		Disable	0							X	O
⋮	⋮										
Enable Select Point31	PRM.HRPP_EN[31]										
Select Point Count	PRM.HRPPN			0	3	0		1	0	X	X
Select Point0 XY	PRM.HRPPXY[0]							5	0	O	O
Select Point0 X	PRM.HRPPX[0]			0	16383	0		5	0	O	O
Select Point0 Y	PRM.HRPPY[0]			0	16383	0		5	0	O	O
⋮	⋮										
Select Point31 XY	PRM.HRPPXY[31]										
Select Point31 X	PRM.HRPPX[31]										
Select Point31 Y	PRM.HRPPY[31]										
Plane Formula Info.	PRM.HRPPPABC XYZ							3	6	O	O
X Slope	PRM.HRPPPA		0.0	1	-1			1	6	O	O
Y Slope	PRM.HRPPPB		0.0	1	-1			1	6	O	O
Z Intercept	PRM.HRPPPC		0.0	999.999	-999.999			3	3	O	O
Noise Cut	PRM.HRHEN		0.005	999.999	0.0			3	3	O	O
Z Offset	PRM.HRPZOFFS		0	999.999	-999.999			3	3	O	O
Extraction Size	PRM.HRPESZ		32	256	4			3	0	O	O
Extraction Direction	PRM.HRPPRD	X	1						O	O	X
		Y	2								
		XY	3								
Border	PRM.HRCFR	ON	1					O	O	X	O
		OFF	0								

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value	Initial value			No. of integer digits	No. of decimal places	
Zero Plane	Use Region	PRM.HRP.RGN.RGNEN	Enable	1				X	X	X
Region: Common			Disable	0						
	Shape Settings	PRM.HRP.RGN.SHP	None	0				X	X	X
			Rectangle	1						
			Rotated Rectangle	3						
			Circle	4						
			Oval	5						
			Ring	6						
			Arc	7						
			Polygon	8						
Zero Plane	Upper Left XY	PRM.HRP.RGN.LUXY						5	0	O O X O
Region: Rectangle	Upper Left X	PRM.HRP.RGN.LUX		160	16383	0		5	0	O O X O
	Upper Left Y	PRM.HRP.RGN.LUY		160	16383	0		5	0	O O X O
	Lower Right XY	PRM.HRP.RGN.RDXY						5	0	O O X O
	Lower Right X	PRM.HRP.RGN.RDX		360	16383	0		5	0	O O X O
	Lower Right Y	PRM.HRP.RGN.RDY		320	16383	0		5	0	O O X O
Zero Plane	Width	PRM.HRP.RGN.WI		201	16383	1		5	0	O O X O
Region: Rotated Rectangle	Height	PRM.HRP.RGN.HI		161	16383	1		5	0	O O X O
	Center XY	PRM.HRP.RGN.RCXY						5	0	O O X O
	Center X	PRM.HRP.RGN.RCX		260	16382	0		5	0	O O X O
	Center Y	PRM.HRP.RGN.RCY		240	16382	0		5	0	O O X O
	Angle	PRM.HRP.RGN.T		0.0	359.9	0.0		3	1	O O X O
Zero Plane	Center XY	PRM.HRP.RGN.CXY						5	0	O O X O
Region: Circle	Center X	PRM.HRP.RGN.CX		260	16383	-16383		5	0	O O X O
	Center Y	PRM.HRP.RGN.CY		240	16383	-16383		5	0	O O X O
	Radius	PRM.HRP.RGN.CR		120	9600	0		4	0	O O X O
Zero Plane	Center XY	PRM.HRP.RGN.CXY						5	0	O O X O
Region: Oval	Center X	PRM.HRP.RGN.CX		260	16383	-16383		5	0	O O X O
	Center Y	PRM.HRP.RGN.CY		240	16383	-16383		5	0	O O X O
	Radius 1	PRM.HRP.RGN.CR1		120	2580	8		4	0	O O X O
	Radius 2	PRM.HRP.RGN.CR2		180	2580	8		4	0	O O X O
	Angle	PRM.HRP.RGN.T		0.0	359.9	0.0		3	1	O O X O
Zero Plane	Center XY	PRM.HRP.RGN.CXY						5	0	O O X O
Region: Ring	Center X	PRM.HRP.RGN.CX		260	16383	-16383		5	0	O O X O
	Center Y	PRM.HRP.RGN.CY		240	16383	-16383		5	0	O O X O
	Radius 1	PRM.HRP.RGN.CR1		120	9600	0		4	0	O O X O
	Radius 2	PRM.HRP.RGN.CR2		60	9600	0		4	0	O O X O
Zero Plane	Center XY	PRM.HRP.RGN.CXY						5	0	O O X O
Region: Arc	Center X	PRM.HRP.RGN.CX		260	16383	-16383		5	0	O O X O
	Center Y	PRM.HRP.RGN.CY		240	16383	-16383		5	0	O O X O
	Radius 1	PRM.HRP.RGN.CR1		120	9600	0		4	0	O O X O
	Radius 2	PRM.HRP.RGN.CR2		30	9600	0		4	0	O O X O
	Starting Angle	PRM.HRP.RGN.STA		45.0	359.9	0.0		3	1	O O X O
	End Angle	PRM.HRP.RGN.ENA		315.0	359.9	0.0		3	1	O O X O

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Referencing	System variable	Result data	Unit properties
				Value	Initial value									
Zero Plane	Number of Nodes	PRM.HRP.RGN.PN		0	12	0		2	0	X	X	X	O	
Region: Polygon	Max Number of Nodes	PRM.HRP.RGN.MXPN		12	12	12		2	0	X	X	X	X	
	XY Position	PRM.HRP.RGN.PXY[*]						5	0	O	O	X	O	
	X Position	PRM.HRP.RGN.PX[*]		331	16383	0		5	0	O	O	X	O	
	Y Position	PRM.HRP.RGN.PY[*]		337	16383	0		5	0	O	O	X	O	
Mask 0 Settings: Common	Enabled	PRM.HRP.MSK[0].RGNEN	Enable	1							X	X	X	O
			Disable	0										
	Shape Settings	PRM.HRP.MSK[0].SHP	None	0							X	X	X	O
			Rectangle	1										
			Rotated Rectangle	3										
			Circle	4										
			Oval	5										
			Ring	6										
			Arc	7										
			Polygon	8										
Mask 0 Settings: Rectangle	Upper Left XY	PRM.HRPMSK[0].LUXY						5	0	O	O	X	O	
	Upper Left X	PRM.HRP.MSK[0].LUX		200	16383	0		5	0	O	O	X	O	
	Upper Left Y	PRM.HRPMSK[0].LUY		180	16383	0		5	0	O	O	X	O	
	Lower Right XY	PRM.HRP.MSK[0].RDXY						5	0	O	O	X	O	
	Lower Right X	PRM.HRPMSK[0].RDX		320	16383	0		5	0	O	O	X	O	
	Lower Right Y	PRM.HRPMSK[0].RDY		300	16383	0		5	0	O	O	X	O	
Mask 0 Settings: Rotated Rectangle	Width	PRM.HRPMSK[0].WI		121	16383	1		5	0	O	O	X	O	
	Height	PRM.HRP.MSK[0].HI		121	16383	1		5	0	O	O	X	O	
	Center XY	PRM.HRPMSK[0].RCXY						5	0	O	O	X	O	
	Center X	PRM.HRP.MSK[0].RCX		260	16382	0		5	0	O	O	X	O	
	Center Y	PRM.HRPMSK[0].RCY		240	16382	0		5	0	O	O	X	O	
	Angle	PRM.HRP.MSK[0].T		0.0	359.9	0.0		3	1	O	O	X	O	
Mask 0 Settings: Circle	Center XY	PRM.HRPMSK[0].CXY						5	0	O	O	X	O	
	Center X	PRM.HRPMSK[0].CX		260	16383	-16383		5	0	O	O	X	O	
	Center Y	PRM.HRPMSK[0].CY		240	16383	-16383		5	0	O	O	X	O	
	Radius	PRM.HRPMSK[0].CR		60	9600	0		4	0	O	O	X	O	
Mask 0 Settings: Oval	Center XY	PRM.HRP.MSK[0].CXY						5	0	O	O	X	O	
	Center X	PRM.HRPMSK[0].CX		260	16383	-16383		5	0	O	O	X	O	
	Center Y	PRM.HRPMSK[0].CY		240	16383	-16383		5	0	O	O	X	O	
	Radius 1	PRM.HRPMSK[0].CR1		60	2580	8		4	0	O	O	X	O	
	Radius 2	PRM.HRP.MSK[0].CR2		100	2580	8		4	0	O	O	X	O	
	Angle	PRM.HRPMSK[0].T		0.0	359.9	0.0		3	1	O	O	X	O	
Mask 0 Settings: Ring	Center XY	PRM.HRP.MSK[0].CXY						5	0	O	O	X	O	
	Center X	PRM.HRPMSK[0].CX		260	16383	-16383		5	0	O	O	X	O	
	Center Y	PRM.HRP.MSK[0].CY		240	16383	-16383		5	0	O	O	X	O	
	Radius 1	PRM.HRPMSK[0].CR1		80	9600	0		4	0	O	O	X	O	
	Radius 2	PRM.HRP.MSK[0].CR2		40	9600	0		4	0	O	O	X	O	

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	Numerical value format		Referencing	
				Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable
Mask 0	Center XY	PRM.HRP.MSK[0].CXY						5	0	<input type="radio"/>	<input type="radio"/>
Settings:	Center X	PRM.HRPMSK[0].CX		260	16383	-16383		5	0	<input type="radio"/>	<input type="radio"/>
Arc	Center Y	PRM.HRPMSK[0].CY		240	16383	-16383		5	0	<input type="radio"/>	<input type="radio"/>
	Radius 1	PRM.HRP.MSK[0].CR1		200	9600	0		4	0	<input type="radio"/>	<input type="radio"/>
	Radius 2	PRM.HRPMSK[0].CR2		100	9600	0		4	0	<input type="radio"/>	<input type="radio"/>
	Starting Angle	PRM.HRPMSK[0].STA		45.0	359.9	0.0		3	1	<input type="radio"/>	<input type="radio"/>
	End Angle	PRM.HRPMSK[0].ENA		315.0	359.9	0.0		3	1	<input type="radio"/>	<input type="radio"/>
Mask 0	Number of Nodes	PRM.HRP.MSK[0].PN		0	12	0		2	0	<input type="radio"/>	<input type="radio"/>
Settings:	Max Number of Nodes	PRM.HRPMSK[0].MXPN		12	12	12		2	0	<input type="radio"/>	<input type="radio"/>
Polygon	XY Position	PRM.HRP.MSK[0].PXY[*]						5	0	<input type="radio"/>	<input type="radio"/>
	X Position	PRM.HRPMSK[0].PX[*]		331	16383	0		5	0	<input type="radio"/>	<input type="radio"/>
	Y Position	PRM.HRPMSK[0].PY[*]		337	16383	0		5	0	<input type="radio"/>	<input type="radio"/>
Mask 1		PRM.HRPMSK[1].***									
Settings											
Mask 2		PRM.HRPMSK[2].***									
Settings											
Mask 3		PRM.HRPMSK[3].***									
Settings											

Profile Measurement Unit

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format			Referencing
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	
Profile line settings	Profile calculation method	PRM.DTL.PRSEL	Average value stitching	0				X	X	X	O
			Maximum value stitching	1							
			Minimum value stitching	2							
Profile shape correction	PRM.DTL.SLPROC		Rotation + projection	1				O	O	X	O
			Rotation only	2							
			None	0							
Valid pixel border processing	PRM.DTL.VBPC		Extend up	1				O	O	X	O
			Extend down	2							
			None	0							
Profile line classification	PRM.PCRE.PCRE_LTYPE		None	0				X	X	X	O
			Two point specification	1							
			Circle	4							
Profile width			PRM.RGN.LLNUM	3	1023	1	3	0	O	O	O
Measurement target: Defect detection	Smoothing range (common)	PRM.DTL.DSMR		15	20	0	2	1	X	X	O
Measurement target: inflection Point	Inflection point Range	PRM.DTL.IRNG		20	10000	1	5	0	X	X	O
Judgment condition: Measurement 00	No. of Points	PRM.DTL.IFW		16	256	1	3	0	X	X	O
	Height: Upper limit	PRM.DTL.HGT[0]:HL		-	99999.999	-99999.999	5	3	O	O	O
	Height: Lower limit	PRM.DTL.HGT[0]:LL		-	99999.999	-99999.999	5	3	O	O	X
Level distance: Upper limit	Level distance:	PRM.DTL.DIFF[0]:HL		-	99999.999	-99999.999	5	3	O	O	X
	Level distance:	PRM.DTL.DIFF[0]:LL		-	99999.999	-99999.999	5	3	O	O	O
	Position: Upper limit	PRM.DTL.POS[0]:HL		-	99999.999	-99999.999	5	3	O	O	X
Position: Lower limit	Position: Lower limit	PRM.DTL.POS[0]:LL		-	99999.999	-99999.999	5	3	O	O	X
	Center position: Upper limit	PRM.DTL.CTR[0]:HL		-	99999.999	-99999.999	5	3	O	O	X
	Center position: Lower limit	PRM.DTL.CTR[0]:LL		-	99999.999	-99999.999	5	3	O	O	O
Width: Upper limit	Width: Upper limit	PRM.DTL.WID[0]:HL		-	99999.999	-99999.999	5	3	O	O	X
	Width: Lower limit	PRM.DTL.WID[0]:LL		-	99999.999	-99999.999	5	3	O	O	X
	Angle from the horizontal: Upper limit	PRM.DTL.HANG[0]:HL		-	180	-90	3	3	O	O	X
Angle from horizontal: Lower limit	Angle from horizontal: Lower limit	PRM.DTL.HANG[0]:LL		-	180	-90	3	3	O	O	X
	Angle formed by two lines: Upper limit	PRM.DTL.LLANG[0]:HL		-	180	-90	3	3	O	O	X
	Angle formed by two lines: Lower limit	PRM.DTL.LLANG[0]:LL		-	180	-90	3	3	O	O	O

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
								No. of integer digits	No. of decimal places				
Judgment condition:	Radius of circle: Upper limit	PRM.DTL.PRAD[0]:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
Measurement 00 (continued)	Radius of circle: Lower limit	PRM.DTL.PRAD[0]:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Cross-Section	PRM.DTL.ZAR[0]:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Cross-Section	PRM.DTL.ZAR[0]:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	1-line Cross-Section area: Upper limit	PRM.DTL.LAR[0]:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	1-line Cross-Section area: Lower limit	PRM.DTL.LAR[0]:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	2-line Cross-Section area: Upper limit	PRM.DTL.DLAR[0]:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	2-line Cross-Section area: Lower limit	PRM.DTL.DLAR[0]:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Points distance: Upper limit	PRM.DTL.PPDST[0]:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Points distance: Lower limit	PRM.DTL.PPDST[0]:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Point/line distance: Upper limit	PRM.DTL.LPDST[0]:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Point/line distance: Lower limit	PRM.DTL.LPDST[0]:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Count: Upper limit	PRM.DTL.PCNT[0]:HL		-	99999	0		5	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Count: Lower limit	PRM.DTL.PCNT[0]:LL		-	99999	0		5	0	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Defect detection: Upper limit	PRM.DTL.STG[0]:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Defect detection: Lower limit	PRM.DTL.STG[0]:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>

Category	Setting item	Name	Selection		Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value			No. of integer digits	No. of decimal places	
Measurement list:	Measurement: Enable/disable	PRM.PMSR[0].PREN	Enable	1			X	X	X
			Disable	0					O
Measurement 00	Measurement classification	PRM.PMSR[0].PRTYP	No measurement	0			X	X	O
			Height	1					
			Level distance	2					
			Position	3					
			Center position	4					
			Width	5					
			Angle from horizontal	6					
			Angle formed by two lines	7					
			Radius of circle	8					
			Cross-Section area	15					
			1-line Cross-Section area	9					
			2-line Cross-Section area	10					
			Points distance	11					
			Point/line distance	12					
			Count	13					
			Defect detection	16					
Measurement list:	Angle range	PRM.PMSR[0].ANGSPAN	0° to 180°	0			X	X	O
			-90° to 90°	1					
Measurement 00: Angle settings	Detection target	PRM.PMSR[0].DIMDIR	Indentation/projection	0			X	X	O
			Projection	1					
			Indentation	2					
			Integration	3					

Category	Setting item	Name	Selection				Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value	Initial value	No. of integer digits	No. of decimal places				
									X	X	
Measurement list:	Measurement target classification	PRM.PMSR[0].PTGT[0].PMSRTYP	No target	0							
Measurement 00: Common settings			Average	1							
			Peak	2							
			Bottom	3							
			Edge	4							
			Inflection point	5							
			Two lines intersection	6							
			Circle/Line intersection	7							
			Circle	8							
			Line	9							
			Cross-Section area	10							
			Center of circle	11							
			Difference to reference line	12							
			Inflection Point 2	13							
Region 1: Enable/disable	PRM.PMSR[0].PTGT[0].RGNENO[0]	Enable	1						X	X	
		Disable	0								O
Region 1: Reference method	PRM.PMSR[0].PTGT[0].REFMTD0[0]	User specified	0						X	X	
		Refer to position Meas.(1pt.)	1								O
		Refer to position Meas.(2pt.)	2								
Region 1: Start point X	PRM.PMSR[0].PTGT[0].XSO[0]	0	16383	0	5	0	X	X	X	O	
Region 1: End point X	PRM.PMSR[0].PTGT[0].XE0[0]	0	16383	0	5	0	X	X	X	O	
Region 1: Measurement item No.(Reference 1)	PRM.PMSR[0].PTGT[0].REFID0_0[0]	0	31	0	2	0	X	X	X	O	
Region 1: Measurement item No.(Reference 2)	PRM.PMSR[0].PTGT[0].REFID0_1[0]	0	31	0	2	0	X	X	X	O	
Region 1: Offset 1	PRM.PMSR[0].PTGT[0].RGNOFS0_0[0]	0	9999	-9999	4	0	O	O	X	O	
Region 1: Offset 2	PRM.PMSR[0].PTGT[0].RGNOFS0_1[0]	0	9999	-9999	4	0	O	O	X	O	
Region 1: Width	PRM.PMSR[0].PTGT[0].RGNW0[0]	120	9999	1	4	0	O	O	X	O	
Region 2: Enable/disable	PRM.PMSR[0].PTGT[0].RGNEN1[0]	Enable	1						X	X	
		Disable	0								O

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing	
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable
Measurement list: Measurement 00: Common settings (continued)	Region 2: Reference method	PRM.PMSR[0].PTGT[0].REFMTD1[0]	User specified	0				X	X	X	O
			Refer to position Meas.(1pt.)	1							
			Refer to position Meas.(2pt.)	2							
	Region 2: Start point X	PRM.PMSR[0].PTGT[0].XS1[0]		0	16383	0	5	0	X	X	X
	Region 2: End point X	PRM.PMSR[0].PTGT[0].XE1[0]		0	16383	0	5	0	X	X	X
	Region 2: Measurement item No.(Reference 1)	PRM.PMSR[0].PTGT[0].REFD1_0[0]		0	31	0	2	0	X	X	X
	Region 2: Measurement item No.(Reference 2)	PRM.PMSR[0].PTGT[0].REFD1_1[0]		0	31	0	2	0	X	X	X
	Region 2: Offset 1	PRM.PMSR[0].PTGT[0].RGNOFS1_0[0]		0	9999	-9999	4	0	O	O	X
	Region 2: Offset 2	PRM.PMSR[0].PTGT[0].RGNOFS1_1[0]		0	9999	-9999	4	0	O	O	X
	Region 2: Width	PRM.PMSR[0].PTGT[0].RGNW1[0]		120	9999	1	4	0	O	O	X
Measurement list: Measurement 00: Edge settings	Edge direction	PRM.PMSR[0].PTGT[0].EDGTYP	Rise	0						X	X
			Fall	1							
			Both directions	2							
	Scan direction	PRM.PMSR[0].PTGT[0].DTD	→	0						X	X
			←	1							
	Detection Target	PRM.PMSR[0].PTGT[0].DTN		0	10	0	2	0	O	O	X
	Detection height	PRM.PMSR[0].PTGT[0].DTHR		0	999.999	-999.999	3	3	O	O	X
	Inflection point shape	PRM.PMSR[0].PTGT[0].IFSHP	Peak	0						X	X
			Trough	1							
			Peak / Trough	2							
Measurement 00: Inflection point settings	Scan direction	PRM.PMSR[0].PTGT[0].DTD	→	0						X	X
			←	1							
	Detection Target	PRM.PMSR[0].PTGT[0].DTN		0	10	0	2	0	O	O	X
	Sensitivity	PRM.PMSR[0].PTGT[0].DSEN		50	100	0	3	0	O	O	X

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value	Initial value			No. of integer digits	No. of decimal places	
Measurement list: Measurement 0: Inflection point 2 settings	Scan direction	PRM.PMSR[0].PTGT[0].DTD	Upper right or lower right	0	Upper right or lower right			X	X	X
			Lower left or upper right	1						
			Upper right	2						
			Lower right	3						
			Upper left	4						
			Lower left	5						
Detection threshold	PRM.PMSR[0].PTGT[0].SDTP		*1	999.999	0	3	3	O	O	X
Detection method	PRM.PMSR[0].PTGT[0].DTMTD	Search from line	0	Search from line				X	X	X
		Search from opposite side	1							O
Number of filter points	PRM.PMSR[0].PTGT[0].IFW	1	1	1	33	1		X	X	X
		3	3							
		5	5							
		7	7							
		9	9							
		17	17							
		25	25							
		33	33							

*1.Detection threshold

The initial value is 000.000, but is updated as shown below according to the head.

Head/camera	mm	*Height range setting
LJ-X8020	0.035	±2.2mm
LJ-X8060	0.050	±7.3mm
LJ-X8080	0.080	±20.5mm
LJ-X8200	0.200	±34.0mm
LJ-X8300	0.300	±53.0mm
LJ-X8400	0.500	±60.0mm
LJ-X8900	1.000	±400.0mm
LJ-V7020	0.035	±2.6mm
LJ-V7020K	0.035	±2.6mm
LJ-V7060	0.060	±8.0mm
LJ-V7060K	0.060	±8.0mm
LJ-V7080	0.100	±23.0mm
LJ-V7200	0.200	±48.0mm
LJ-V7300	1.000	±145.0mm

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing
			Label	Value	Initial value			User variable	System variable	Result data	Unit properties
Measurement list: Measurement 00: Line settings	Correction	PRM.PMSR[0].PTGT[0].REA	Enable	1				X	X	X	O
			Disable	0							
Measurement list: Measurement 00: Center of circle settings	Correction	PRM.PMSR[0].PTGT[0].REA	Enable	1				X	X	X	O
			Disable	0							
Measurement list: Measurement 00: Intersection settings	Correction	PRM.PMSR[0].PTGT[0].REA	Enable	1				X	X	X	O
			Disable	0							
Measurement list: Measurement 00: Difference to reference line	Reference line	PRM.PMSR[0].PTGT[0].BML	Free curve line	4				X	X	X	O
			Line	2							
			Circle	1							
reference line	Detection direction	PRM.PMSR[0].PTGT[0].SDTD	+/-	2				X	X	X	O
			+	0							
			-	1							
Detection threshold	PRM.PMSR[0].PTGT[0].SDTP		0	999.999	0	3	3	O	O	X	O
Lowest detected width	PRM.PMSR[0].PTGT[0].SWDTP		0	999.999	0	3	3	O	O	X	O
Measurement list: Measurement 01		PRM.PMSR[1].***									
⋮	⋮										
Measurement list: Measurement 31		PRM.PMSR[31].***									
Measured value correction: Height (measurement 00)	Correction method	PRM.DTL.HGT[0].CRMD	1-point correction	0				X	X	X	O
			2-point correction	1							
Correction 1: Before correction	PRM.DTL.HGT[0].CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O
Correction 1: After correction	PRM.DTL.HGT[0].CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O
Correction 2: Before correction	PRM.DTL.HGT[0].CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O
Correction 2: After correction	PRM.DTL.HGT[0].CRPO2		0	99999.999	-99999.999	5	3	X	X	X	O
Correction coefficient: Offset	PRM.DTL.HGT[0].CRCO		0	99999.999	-99999.999	5	3	X	X	X	O
Correction coefficient: Coefficient A	PRM.DTL.HGT[0].CRCA		0	99999.999	-99999.999	5	3	X	X	X	O
Correction coefficient: Coefficient B	PRM.DTL.HGT[0].CRCB		0	99999.999	-99999.999	5	3	X	X	X	O

List of setting parameters

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Referencing		Unit properties
				Value	Initial value						System variable	Result data	
Measuredvalue correction: Height (measurement 01)		PRM.DTL.HGT[1]:***											
:	:												
Measuredvalue correction: Height (measurement 31)		PRM.DTL.HGT[31]:***											
Measuredvalue correction: Level distance (measurement 00)	Correction method	PRM.DTL.DIFF[0]:CRMD	1-point correction	0							X	X	X
			2-point correction	1									O
	Correction 1: Before correction	PRM.DTL.DIFF[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction 1: After correction	PRM.DTL.DIFF[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction 2: Before correction	PRM.DTL.DIFF[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction 2: After correction	PRM.DTL.DIFF[0]:CRPO2		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Offset	PRM.DTL.DIFF[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Coefficient A	PRM.DTL.DIFF[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Coefficient B	PRM.DTL.DIFF[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	X	O	
Measuredvalue correction: Level distance (measurement 01)		PRM.DTL.DIFF[1]:***											
:	:												
Measuredvalue correction: Level distance (measurement 31)		PRM.DTL.DIFF[31]:***											

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data
Measured value correction: Position (measurement 00)	Correction method	PRM.DTL.POS[0]:CRMD	1-point correction	0				X	X	X	X	O
			2-point correction	1								
	Correction 1: Before	PRM.DTL.POS[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 1: After	PRM.DTL.POS[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 2: Before	PRM.DTL.POS[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction coefficient:	PRM.DTL.POS[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	X	O
	Offset											
Measured value correction: Position (measurement 01)	Correction coefficient:	PRM.DTL.POS[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	X	O
	Coefficient A											
	Correction coefficient:	PRM.DTL.POS[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	X	O
	Coefficient B											
	Measured value correction:	PRM.DTL.POS[1]:**										
	Position (measurement 01)											
	⋮	⋮										
	Measured value correction:	PRM.DTL.POS[31]:**										
	Position (measurement 31)											
Measured value correction: Center position (measurement 00)	Correction method	PRM.DTL.CTR[0]:CRMD	1-point correction	0				X	X	X	X	O
			2-point correction	1								
	Correction 1: Before	PRM.DTL.CTR[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 1: After	PRM.DTL.CTR[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 2: Before	PRM.DTL.CTR[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 2: After	PRM.DTL.CTR[0]:CRPO2		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
Measured value correction: Center position (measurement 01)	Correction coefficient:	PRM.DTL.CTR[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	X	O
	Offset											
	Correction coefficient:	PRM.DTL.CTR[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	X	O
	Coefficient A											
	Correction coefficient:	PRM.DTL.CTR[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	X	O
	Coefficient B											

List of setting parameters

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Referencing		Unit properties
				Value	Initial value						System variable	Result data	
Measuredvalue correction: Center position (measurement 01)		PRM.DTL.CTR[1]:***											
:	:												
Measuredvalue correction: Center position (measurement 31)		PRM.DTL.CTR[31]:***											
Measuredvalue correction: Width (measurement 00)	Correction method	PRM.DTL.WID[0]:CRMD	1-point correction	0							X	X	X
			2-point correction	1									O
	Correction 1: Before correction	PRM.DTL.WID[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction 1: After correction	PRM.DTL.WID[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction 2: Before correction	PRM.DTL.WID[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction 2: After correction	PRM.DTL.WID[0]:CRPO2		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Offset	PRM.DTL.WID[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Coefficient A	PRM.DTL.WID[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Coefficient B	PRM.DTL.WID[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	X	O	
Measuredvalue correction: Width (measurement 01)		PRM.DTL.WID[1]:***											
:	:												
Measuredvalue correction: Width (measurement 31)		PRM.DTL.WID[31]:***											

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data
Measured value correction: Radius of circle (measurement 00)	Correction method	PRM.DTL.CRMD[0]:CRMD	1-point correction	0				X	X	X		O
			2-point correction	1								
	Correction 1: Before	PRM.DTL.CRMD[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 1: After	PRM.DTL.CRMD[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 2: Before	PRM.DTL.CRMD[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction coefficient:	PRM.DTL.CRMD[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	X	O
	Offset											
Measured value correction: Radius of circle (measurement 01)	Correction coefficient:	PRM.DTL.CRMD[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	X	O
	Coefficient A											
	Correction coefficient:	PRM.DTL.CRMD[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	X	O
	Coefficient B											
	Measured value correction:	PRM.DTL.CRMD[1]:***										
	Radius of circle (measurement 01)											
	⋮	⋮										
	Measured value correction:	PRM.DTL.CRMD[31]:***										
	Radius of circle (measurement 31)											
Measured value correction: Cross-Section area (measurement 00)	Correction method	PRM.DTL.ZAR[0]:CRMD	1-point correction	0				X	X	X		O
			2-point correction	1								
	Correction 1: Before	PRM.DTL.ZAR[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 1: After	PRM.DTL.ZAR[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 2: Before	PRM.DTL.ZAR[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
	Correction 2: After	PRM.DTL.ZAR[0]:CRPO2		0	99999.999	-99999.999	5	3	X	X	X	O
	correction											
Measured value correction: Cross-Section area (measurement 00)	Correction coefficient:	PRM.DTL.ZAR[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	X	O
	Offset											
	Correction coefficient:	PRM.DTL.ZAR[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	X	O
	Coefficient A											
	Correction coefficient:	PRM.DTL.ZAR[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	X	O
	Coefficient B											

List of setting parameters

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
				Value	Initial value			No. of integer digits	No. of decimal places		
Measuredvalue correction: Cross-Section area (measurement 01)		PRM.DTL.ZAR[1]:***									
:	:										
Measuredvalue correction: Cross-Section area (measurement 31)		PRM.DTL.ZAR[31]:***									
Measuredvalue correction: 1-line Cross- Section area (measurement 00)	Correction method	PRM.DTL.LAR[0]:CRMD	1-point correction	0						X X X O	
			2-point correction	1							
	Correction 1: Before correction	PRM.DTL.LAR[0]:CRPR1		0	99999.999	-99999.999	5 3	X X X O			
	Correction 1: After correction	PRM.DTL.LAR[0]:CRPO1		0	99999.999	-99999.999	5 3	X X X O			
	Correction 2: Before correction	PRM.DTL.LAR[0]:CRPR2		0	99999.999	-99999.999	5 3	X X X O			
	Correction 2: After correction	PRM.DTL.LAR[0]:CRPO2		0	99999.999	-99999.999	5 3	X X X O			
	Correction coefficient: Offset	PRM.DTL.LAR[0]:CRCO		0	99999.999	-99999.999	5 3	X X X O			
	Correction coefficient: Coefficient A	PRM.DTL.LAR[0]:CRCA		0	99999.999	-99999.999	5 3	X X X O			
	Correction coefficient: Coefficient B	PRM.DTL.LAR[0]:CRCB		0	99999.999	-99999.999	5 3	X X X O			
Measuredvalue correction: 1-line Cross- Section area (measurement 01)		PRM.DTL.LAR[1]:***									
:	:										
Measuredvalue correction: 1-line Cross- Section area (measurement 31)		PRM.DTL.LAR[31]:***									

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing	
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable
Measured value correction: 2-line Cross-Section area (measurement 00)	Correction method	PRM.DTL.DLAR[0]:CRMD	1-point correction	0				X	X	X	O
			2-point correction	1							
	Correction 1: Before	PRM.DTL.DLAR[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	O
	correction										
	Correction 1: After	PRM.DTL.DLAR[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	O
	correction										
	Correction 2: Before	PRM.DTL.DLAR[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	O
	correction										
	Correction coefficient:	PRM.DTL.DLAR[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	O
	Offset										
Measured value correction: 2-line Cross-Section area (measurement 01)	Correction coefficient: Coefficient A	PRM.DTL.DLAR[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	O
	Coefficient A										
Measured value correction: 2-line Cross-Section area (measurement 31)	Correction coefficient: Coefficient B	PRM.DTL.DLAR[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	O
	Coefficient B										
Measured value correction: 2-line Cross-Section area (measurement 01)		PRM.DTL.DLAR[1]:***									
:		:									
Measured value correction: 2-line Cross-Section area (measurement 31)		PRM.DTL.DLAR[31]:***									

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Measured value correction: Points distance (measurement 00)	Correction method	PRM.DTL.PPDST[0]:CRMD	1-point correction	0						X	X	X	O
			2-point correction	1									
	Correction 1: Before	PRM.DTL.PPDST[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O	
	correction												
	Correction 1: After	PRM.DTL.PPDST[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O	
	correction												
	Correction 2: Before	PRM.DTL.PPDST[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O	
	correction												
	Correction 2: After	PRM.DTL.PPDST[0]:CRPO2		0	99999.999	-99999.999	5	3	X	X	X	O	
	correction												
Measured value correction: Points distance (measurement 01)	Correction coefficient: Offset	PRM.DTL.PPDST[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Coefficient A	PRM.DTL.PPDST[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Coefficient B	PRM.DTL.PPDST[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	X	O	
	Measured value correction:	PRM.DTL.PPDST[1]:***											
	Points distance (measurement 01)												
	⋮	⋮											
	Measured value correction:	PRM.DTL.PPDST[31]:***											
	Points distance (measurement 31)												
Measured value correction: Point/line distance (measurement 00)	Correction method	PRM.DTL.LPDST[0]:CRMD	1-point correction	0						X	X	X	O
			2-point correction	1									
	Correction 1: Before	PRM.DTL.LPDST[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	X	O	
	correction												
	Correction 1: After	PRM.DTL.LPDST[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	X	O	
	correction												
	Correction 2: Before	PRM.DTL.LPDST[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	X	O	
	correction												
	Correction 2: After	PRM.DTL.LPDST[0]:CRPO2		0	99999.999	-99999.999	5	3	X	X	X	O	
	correction												
Measured value correction: Point/line distance (measurement 01)	Correction coefficient: Offset	PRM.DTL.LPDST[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Coefficient A	PRM.DTL.LPDST[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	X	O	
	Correction coefficient: Coefficient B	PRM.DTL.LPDST[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	X	O	

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	Numerical value format		Referencing	
				Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable
Measured value correction: Point/line distance (measurement 01)	PRM.DTL.LPDST[1]:***										
:	:										
Measured value correction: Point/line distance (measurement 31)	PRM.DTL.LPDST[31]:***										
Measured value correction: Defect detection (measurement 00)	Correction method	PRM.DTL.STG[0]:CRMD	1-point correction 2-point correction	0 1				X	X	X	O
	Correction 1: Before correction	PRM.DTL.STG[0]:CRPR1		0	99999.999	-99999.999	5	3	X	X	O
	Correction 1: After correction	PRM.DTL.STG[0]:CRPO1		0	99999.999	-99999.999	5	3	X	X	O
	Correction 2: Before correction	PRM.DTL.STG[0]:CRPR2		0	99999.999	-99999.999	5	3	X	X	O
	Correction 2: After correction	PRM.DTL.STG[0]:CRPO2		0	99999.999	-99999.999	5	3	X	X	O
	Correction coefficient: Offset	PRM.DTL.STG[0]:CRCO		0	99999.999	-99999.999	5	3	X	X	O
	Correction coefficient: Coefficient A	PRM.DTL.STG[0]:CRCA		0	99999.999	-99999.999	5	3	X	X	O
Measured value correction: Defect detection (measurement 01)	Correction coefficient: Coefficient B	PRM.DTL.STG[0]:CRCB		0	99999.999	-99999.999	5	3	X	X	O
	Measured value correction: Defect detection (measurement 31)	PRM.DTL.STG[1]:***									
:	:										

Continuous Profile Measurement Unit

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value	Initial value			No. of integer digits	No. of decimal places	
Detection condition	Scan direction	PRM.DTL.SCDIR	↓	7				x	x	x
			→	5						
			Clockwise	14						
Scan interval	Scan interval	PRM.DTL.SCINTV		10	4096	1		3	0	x
Start angle	Start angle	PRM.DTL.SCSTOF		0	359	0		3	0	x
Scan range	Scan range	PRM.DTL.SCCIR_MTD	180°	0				x	x	x
			360°	1						
Profile calculation method	Profile calculation method	PRM.DTL.MLPROF_TYP	Combinatorial	0				x	x	x
			Ave. Value							
			Combinatorial	1						
			Max. Value							
Profile width	Profile width	PRM.DTL.MLPROF_LNNM	Combinatorial	2				x	x	x
			Min. Value							
Maximum number of profiles	Maximum number of profiles	PRM.DTL.MXN		100	16384	1		5	0	x
Valid pixel border processing	Valid pixel border processing	PRM.DTL.VBPC	Extend upward	1				x	x	x
			Extend downward	2						
			None	0						
Profile shape correction	Profile shape correction	PRM.DTL.SLPROC	Rotation + projection	1				x	x	x
			Rotation only	2						
			None	0						
Profile number	Profile number	PRM.DTL.DPROF_UIDIDX		0	16383	0		5	0	x
Display condition 1	Display condition 1	PRM.DTL.DPROF_STYP1	NG Item Count: Desc.	1				x	x	x
			Measured Value: Desc.	2						
			Measured Value: Asc.	3						
			Equal Division: Desc.	4						
			Equal Division: Asc.	5						
			None	0						
	Display condition 1 measurement item No.	PRM.DTL.DPROF_ITEMID1		0	31	0		2	0	x

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value	Initial value			No. of integer digits	No. of decimal places	
Detection condition (continued)	Display condition 2	PRM.DTL.DPROF_STYP2	NG Item	1				x	x	○
			Count: Desc.							
			Measured	2						
			Value: Desc.							
			Measured	3						
			Value: Asc.							
			Equal Division:	4						
			Desc.							
			Equal Division:	5						
			Asc.							
			None	0						
	Display condition 2	PRM.DTL.DPROF_ITEMID2		0		31	0	2	0	x x x ○
		measurement item								
		No.								
	Display condition 3	PRM.DTL.DPROF_STYP3	NG Item	1				x	x x	○
			Count: Desc.							
			Measured	2						
			Value: Desc.							
			Measured	3						
			Value: Asc.							
			Equal Division:	4						
			Desc.							
			Equal Division:	5						
			Asc.							
			None	0						
	Display condition 3	PRM.DTL.DPROF_ITEMID3		0		31	0	2	0	x x x ○
		measurement item								
		No.								
	Display condition 4	PRM.DTL.DPROF_STYP4	NG Item	1				x	x x	○
			Count: Desc.							
			Measured	2						
			Value: Desc.							
			Measured	3						
			Value: Asc.							
			Equal Division:	4						
			Desc.							
			Equal Division:	5						
			Asc.							
			None	0						
	Display condition 4	PRM.DTL.DPROF_ITEMID4		0		31	0	2	0	x x x x ○
		measurement item								
		No.								
Max. Number of Pixels of Display	PRM.DTL.MXPROFPIX			1024		128		16384	5	x x x x ○
					(XG-X2900LJ4480)					
Best Fit Line 1 enable/disable	PRM.DTL.DLN1_EN	Enable	1					x	x x	○
		Disable	0							
Best Fit Line 1 measurement item	PRM.DTL.DLN1_ITEMID			0		31	0	2	0	○ ○ x ○
		No.								

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing	
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable
Detection condition (continued)	Best Fit Line 2 enable/disable	PRM.DTL.DLN2_EN	Enable	1						x	x
			Disable	0							
Best Fit Line 2 measurement item No.	Best Fit Line 2 measurement item No.	PRM.DTL.DLN2_ITEMID		0		31	0	2	0	○	○ x ○
Best Fit Line 3 measurement item No.	Best Fit Line 3 measurement item No.	PRM.DTL.DLN3_EN	Enable	1						x	x x ○
			Disable	0							
Best Fit Line 4 measurement item No.	Best Fit Line 4 measurement item No.	PRM.DTL.DLN4_EN	Enable	1						x	x x ○
			Disable	0							
Plane Type measurement item No.	Plane Type measurement item No.	PRM.DTL.DPP_TYP	OFF	0						x	x x ○
			Best Fit plane	5							
Plane Type measurement item No.	Plane Type measurement item No.	PRM.DTL.DPP_ITEMID		0		31	0	2	0	x x x	○
Measurement target: Defect detection	Smoothing range (common)	PRM.DTL.SMR		15		20	0	2	1	x x x	○
Measurement target: inflection Point	Inflection point Range	PRM.DTL.IRNG		60		10000	1	5	0	x x x	○
Judgment conditions	No. of Points	PRM.DTL.IFW		16		256	1	3	0	x x x	○
Continuous NG profiles: Upper limit	NG profiles: Upper limit	PRM.DTL.NPROFN:HL		-		99999	0	5	0	○ ○ x	○
	Valid profiles:Upper limit	PRM.DTL.CNPROFN:HL		-		99999	0	5	0	○ ○ x	○
Valid profiles:Lower limit	Valid profiles:Lower limit	PRM.DTL.VRPOFN:LL		-		99999	0	5	0	○ ○ x	○
	Height: Upper limit	PRM.DTL.HGT[0]:HL		-		99999.999	-99999.999	5	3	○ ○ x	○
Height: Lower limit	Height: Lower limit	PRM.DTL.HGT[0]:LL		-		99999.999	-99999.999	5	3	○ ○ x	○
	Level distance: Upper limit	PRM.DTL.DIFF[0]:HL		-		99999.999	-99999.999	5	3	○ ○ x	○
Level distance: Lower limit	Level distance: Lower limit	PRM.DTL.DIFF[0]:LL		-		99999.999	-99999.999	5	3	○ ○ x	○
	Position: Upper limit	PRM.DTL.POS[0]:HL		-		99999.999	-99999.999	5	3	○ ○ x	○
Position: Lower limit	Position: Lower limit	PRM.DTL.POS[0]:LL		-		99999.999	-99999.999	5	3	○ ○ x	○
	Center position: Upper limit	PRM.DTL.CTR[0]:HL		-		99999.999	-99999.999	5	3	○ ○ x	○

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format			Referencing
								No. of integer digits	No. of decimal places	User variable	
Judgment conditions (continued)	Center position: Lower limit	PRM.DTL.CTR[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
	Width: Upper limit	PRM.DTL.WID[0]:HL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Width: Lower limit	PRM.DTL.WID[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Angle from horizontal: Upper limit	PRM.DTL.HANG[0]:HL		-	180	-90	3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Angle from horizontal: Lower limit	PRM.DTL.HANG[0]:LL		-	180	-90	3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Angle formed by two lines: Upper limit	PRM.DTL.LLANG[0]:HL		-	180	-90	3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Angle formed by two lines: Lower limit	PRM.DTL.LLANG[0]:LL		-	180	-90	3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Radius of circle: Upper limit	PRM.DTL.PRAD[0]:HL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Radius of circle: Lower limit	PRM.DTL.PRAD[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Cross-Section area: Upper limit	PRM.DTL.ZAR[0]:HL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Cross-Section area: Lower limit	PRM.DTL.ZAR[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	1-line Cross-Section area: Upper limit	PRM.DTL.LAR[0]:HL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	1-line Cross-Section area: Lower limit	PRM.DTL.LAR[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	2-line Cross-Section area: Upper limit	PRM.DTL.DLAR[0]:HL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	2-line Cross-Section area: Lower limit	PRM.DTL.DLAR[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Points distance: Upper limit	PRM.DTL.PPDST[0]:HL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Points distance: Lower limit	PRM.DTL.PPDST[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Point/line distance: Upper limit	PRM.DTL.LPDST[0]:HL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Point/line distance: Lower limit	PRM.DTL.LPDST[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Count: Upper limit	PRM.DTL.PCNT[0]:HL		-	99999	0	5	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Count: Lower limit	PRM.DTL.PCNT[0]:LL		-	99999	0	5	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Defect detection: Upper limit	PRM.DTL.STG[0]:HL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Defect detection: Lower limit	PRM.DTL.STG[0]:LL		-	99999.999	-99999.999	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

List of setting parameters

Category	Setting item	Name	Selection		Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value			No. of integer digits	No. of decimal places	
Measurement list:	Measurement: Enable/disable	PRM.PMSR[0].PREN	Enable	1			x	x	x
			Disable	0					○
Measurement 00	Measurement classification	PRM.PMSR[0].PRTYP	No measurement	0			x	x	x
			Height	1					○
			Level distance	2					
			Position	3					
			Center position	4					
			Width	5					
			Angle from horizontal	6					
			Angle formed by two lines	7					
			Radius of circle	8					
			Cross-Section area	15					
			1-line Cross-Section area	10					
			2-line Cross-Section area	9					
			Points distance	11					
			Point/line distance	12					
			Count	13					
			Defect detection	16					
Measurement list:	Angle range	PRM.PMSR[0].ANGSPAN	0° to 180°	0			x	x	x
			-90° to 90°	1					○
Measurement 00: Angle settings	Detection target	PRM.PMSR[0].DIMDIR	Concave/Convex	0			x	x	x
			Convex part	1					○
			Concave part	2					
			Integration	3					

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing
			Label	Value	Initial value			User variable	System variable	Result data	Unit properties
Measurement list: Measurement 00: Common settings	Measurement target classification	PRM.PMSR[0].PTGT[0].PMSRTYP	No target	0				x	x	x	○
			Average	1							
			Peak	2							
			Bottom	3							
			Edge	4							
			Inflection point	5							
			Two lines intersection	6							
			Circle/Line intersection	7							
			Circle	8							
			Line	9							
			Cross-Section area	10							
			Center of circle	11							
			Difference from the model line	12							
			Inflection Point 2	13							
Region 1: Enable/disable	Region 1: Enable/disable	PRM.PMSR[0].PTGT[0].RGNENO[0]	Enable	1				x	x	x	○
			Disable	0							
		Region 1: Reference method	User specified	0				x	x	x	○
			Refer to position	1							
			Meas.(1pt.)								
			Refer to position	2							
			Meas.(2pt.)								
		Region 1: Start point X	PRM.PMSR[0].PTGT[0].XSO[0]	0	16383	0	5	0	x	x	○
		Region 1: End point X	PRM.PMSR[0].PTGT[0].XE0[0]	0	16383	0	5	0	x	x	○
		Region 1: Measurement item No.(Reference 1)	PRM.PMSR[0].PTGT[0].REFID0_0[0]	0	31	0	2	0	x	x	○
			Measurement item No.(Reference 2)								
Region 1: Offset 1	Region 1: Offset 1	PRM.PMSR[0].PTGT[0].RGNOFSO_0[0]	0	9999	-9999	4	0	○	○	x	○
		PRM.PMSR[0].PTGT[0].RGNOFSO_1[0]	0	9999	-9999	4	0	○	○	x	○
		Region 1: Width	PRM.PMSR[0].PTGT[0].RGNWO[0]	120	9999	1	4	0	○	○	x
		Region 2: Enable/disable	PRM.PMSR[0].PTGT[0].RGNEN1[0]	Enable	1			x	x	x	○
			Disable	0							

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing	
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable
Measurement list:	Region 2: Reference method	PRM.PMSR[0].PTGT[0].REFMTD1[0]	User specified	0				x	x	x	<input type="radio"/>
Measurement 00: Common settings (continued)			Refer to position Meas.(1pt.)	1							
			Refer to position Meas.(2pt.)	2							
Region 2: Start point X	PRM.PMSR[0].PTGT[0].XS1[0]		0	16383	0	5	0	x	x	x	<input type="radio"/>
Region 2: End point X	PRM.PMSR[0].PTGT[0].XE1[0]		0	16383	0	5	0	x	x	x	<input type="radio"/>
Region 2: Measurement item No.(Reference 1)	PRM.PMSR[0].PTGT[0].REFID1_0[0]		0	31	0	2	0	x	x	x	<input type="radio"/>
Region 2: Measurement item No.(Reference 2)	PRM.PMSR[0].PTGT[0].REFID1_1[0]		0	31	0	2	0	x	x	x	<input type="radio"/>
Region 2: Offset 1	PRM.PMSR[0].PTGT[0].RGNOFS1_0[0]		0	9999	-9999	4	0	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
Region 2: Offset 2	PRM.PMSR[0].PTGT[0].RGNOFS1_1[0]		0	9999	-9999	4	0	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
Region 2: Width	PRM.PMSR[0].PTGT[0].RGNW1[0]		120	9999	1	4	0	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
Measurement list:	Edge direction	PRM.PMSR[0].PTGT[0].EDGTYP	Rise	0				x	x	x	<input type="radio"/>
Measurement 00: Edge settings			Fall	1							
			Both directions	2							
Scan direction	PRM.PMSR[0].PTGT[0].DTD	→	0					x	x	x	<input type="radio"/>
		←	1								
Detection Target	PRM.PMSR[0].PTGT[0].DTN		0	10	0	2	0	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
Detection height	PRM.PMSR[0].PTGT[0].DTHR		0	999.999	-999.999	3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
Measurement list:	Inflection point shape	PRM.PMSR[0].PTGT[0].IFSHP	Peak	0				x	x	x	<input type="radio"/>
Measurement 00:			Trough	1							
Inflection point settings	Scan direction	PRM.PMSR[0].PTGT[0].DTD	Peak/Trough	2				x	x	x	<input type="radio"/>
		→	0								
		←	1								
Detection Target	PRM.PMSR[0].PTGT[0].DTN		0	10	0	2	0	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
Sensitivity	PRM.PMSR[0].PTGT[0].DSEN		50	100	0	3	0	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Referencing	Numerical value format	Unit properties
			Label	Value	Initial value								
Measurement list: Measurement 00: Inflection point 2 settings	Scan direction	PRM.PMSR[0].PTGT[0].DTD	Upper right or lower right	0	Upper right or lower right					X	X	X	O
			Lower left or upper right	1									
			Upper right	2									
			Lower right	3									
			Upper left	4									
			Lower left	5									
Detection threshold	PRM.PMSR[0].PTGT[0].SDTP			*1	999.999	0		3	3	O	O	X	O
Detection method	PRM.PMSR[0].PTGT[0].DTMTD	Search from line	0	Search from line						X	X	X	O
			1	Search from opposite side									
Number of filter points	PRM.PMSR[0].PTGT[0].IFW	1	1	1		33	1			X	X	X	O
		3	3										
		5	5										
		7	7										
		9	9										
		17	17										
		25	25										
		33	33										

*1.Detection threshold

The initial value is 000.000, but is updated as shown below according to the head.

Head/camera	mm	*Height range setting
LJ-X8020	0.035	±2.2mm
LJ-X8060	0.050	±7.3mm
LJ-X8080	0.080	±20.5mm
LJ-X8200	0.200	±34.0mm
LJ-X8300	0.300	±53.0mm
LJ-X8400	0.500	±60.0mm
LJ-X8900	1.000	±400.0mm
LJ-V7020	0.035	±2.6mm
LJ-V7020K	0.035	±2.6mm
LJ-V7060	0.060	±8.0mm
LJ-V7060K	0.060	±8.0mm
LJ-V7080	0.100	±23.0mm
LJ-V7200	0.200	±48.0mm
LJ-V7300	1.000	±145.0mm

List of setting parameters

Category	Setting item	Name	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Referencing		
			Label	Value	Initial value						System variable	Result data	Unit properties
Measurement list:	Correction	PRM.PMSR[0].PTGT[0].REA	Enable	1				x	x	x			<input type="radio"/>
Measurement 00: Line settings			Disable	0									
Measurement list:	Correction	PRM.PMSR[0].PTGT[0].REA	Enable	1				x	x	x			<input type="radio"/>
Measurement 00: Center of circle settings			Disable	0									
Measurement list:	Correction	PRM.PMSR[0].PTGT[0].REA	Enable	1				x	x	x			<input type="radio"/>
Measurement 00: Intersection settings			Disable	0									
Measurement list:	Reference line	PRM.PMSR[0].PTGT[0].BML	Free curve line	4				x	x	x			<input type="radio"/>
Measurement 00:			Line	2									
Difference to reference line	Detection direction	PRM.PMSR[0].PTGT[0].SDTD	+/-	2				x	x	x			<input type="radio"/>
			+	0									
			-	1									
Detection threshold	PRM.PMSR[0].PTGT[0].SDTP		0	999.999	0	3	3	<input type="radio"/>	<input type="radio"/>	x			<input type="radio"/>
Lowest detected width	PRM.PMSR[0].PTGT[0].SWDTP		0	999.999	0	3	3	<input type="radio"/>	<input type="radio"/>	x			<input type="radio"/>
Measurement list:	PRM.PMSR[1].***												
Measurement 01													
:	:												
Measurement list:	PRM.PMSR[31].***												
Measurement 31													

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Measured value correction: Height (measurement 00)	Correction method	PRM.DTL.HGT[0]:CRMD	1-point correction	0				x	x	○
			2-point correction	1						
	Correction 1: Before	PRM.DTL.HGT[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x
	correction									○
	Correction 1: After	PRM.DTL.HGT[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x
	correction									○
	Correction 2: Before	PRM.DTL.HGT[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x
	correction									○
	Correction 2: After	PRM.DTL.HGT[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x
	correction									○
Measured value correction: Height (measurement 01)	Correction coefficient: Offset	PRM.DTL.HGT[0]:CRCO		0	99999.999	-99999.999	5	3	x	x
	Coefficient A	PRM.DTL.HGT[0]:CRCA		0	99999.999	-99999.999	5	3	x	x
	Coefficient B	PRM.DTL.HGT[0]:CRCB		0	99999.999	-99999.999	5	3	x	x
		PRM.DTL.HGT[1]:***								
			:	:						
	Measured value correction: Height (measurement 31)	PRM.DTL.HGT[31]:***								
Measured value correction: Level distance (measurement 00)	Correction method	PRM.DTL.DIFF[0]:CRMD	1-point correction	0				x	x	x
			2-point correction	1						
	Correction 1: Before	PRM.DTL.DIFF[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x
	correction									○
	Correction 1: After	PRM.DTL.DIFF[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x
	correction									○
	Correction 2: Before	PRM.DTL.DIFF[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x
	correction									○
	Correction 2: After	PRM.DTL.DIFF[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x
	correction									○
Measured value coefficient: Coefficient A	Correction coefficient: Offset	PRM.DTL.DIFF[0]:CRCO		0	99999.999	-99999.999	5	3	x	x
	Coefficient A	PRM.DTL.DIFF[0]:CRCA		0	99999.999	-99999.999	5	3	x	x
	Coefficient B	PRM.DTL.DIFF[0]:CRCB		0	99999.999	-99999.999	5	3	x	x
	Coefficient B	PRM.DTL.DIFF[0]:CRCB		0	99999.999	-99999.999	5	3	x	x

List of setting parameters

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	Numerical value format		Referencing
				Value	Initial value			No. of integer digits	No. of decimal places	
Measured value correction: Level distance (measurement 01)	Measured value correction: Level distance (measurement 01)	PRM.DTL.DIFF[1]:***								
:	:									
Measured value correction: Level distance (measurement 31)	Measured value correction: Level distance (measurement 31)	PRM.DTL.DIFF[31]:***								
Measured value correction: Position (measurement 00)	Correction method	PRM.DTL.POS[0]:CRMD	1-point correction	0				x	x	x
			2-point correction	1						o
	Correction 1: Before correction	PRM.DTL.POS[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x
	Correction 1: After correction	PRM.DTL.POS[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x
	Correction 2: Before correction	PRM.DTL.POS[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x
	Correction 2: After correction	PRM.DTL.POS[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x
	Correction coefficient: Offset	PRM.DTL.POS[0]:CRCO		0	99999.999	-99999.999	5	3	x	x
	Correction coefficient: Coefficient A	PRM.DTL.POS[0]:CRCA		0	99999.999	-99999.999	5	3	x	x
	Correction coefficient: Coefficient B	PRM.DTL.POS[0]:CRCB		0	99999.999	-99999.999	5	3	x	x
Measured value correction: Position (measurement 01)	Measured value correction: Position (measurement 01)	PRM.DTL.POS[1]:***								
:	:									
Measured value correction: Position (measurement 31)	Measured value correction: Position (measurement 31)	PRM.DTL.POS[31]:***								

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Measured value correction: Center position (measurement 00)	Correction method	PRM.DTL.CTR[0]:CRMD	1-point correction	0				x	x	O
			2-point correction	1						
	Correction 1: Before	PRM.DTL.CTR[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x
	correction									O
	Correction 1: After	PRM.DTL.CTR[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x
	dimension									O
	Correction 2: Before	PRM.DTL.CTR[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x
	correction									O
	Correction 2: After	PRM.DTL.CTR[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x
	dimension									O
Measured value correction: Center position (measurement 01)	Correction coefficient:	PRM.DTL.CTR[0]:CRCO		0	99999.999	-99999.999	5	3	x	x
	Offset									O
	Correction coefficient:	PRM.DTL.CTR[0]:CRCA		0	99999.999	-99999.999	5	3	x	x
	Coefficient A									O
	Correction coefficient:	PRM.DTL.CTR[0]:CRCB		0	99999.999	-99999.999	5	3	x	x
	Coefficient B									O
	Measured value correction: Center position (measurement 01)	PRM.DTL.CTR[1]:***								
	⋮	⋮								
	Measured value correction: Center position (measurement 31)	PRM.DTL.CTR[31]:***								
	⋮	⋮								
Measured value correction: Width (measurement 00)	Correction method	PRM.DTL.WID[0]:CRMD	1-point correction	0				x	x	x
			2-point correction	1						
	Correction 1: Before	PRM.DTL.WID[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x
	correction									O
	Correction 1: After	PRM.DTL.WID[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x
	correction									O
	Correction 2: Before	PRM.DTL.WID[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x
	correction									O
	Correction 2: After	PRM.DTL.WID[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x
	correction									O
Measured value correction: Width (measurement 00)	Correction coefficient:	PRM.DTL.WID[0]:CRCO		0	99999.999	-99999.999	5	3	x	x
	Offset									O
	Correction coefficient:	PRM.DTL.WID[0]:CRCA		0	99999.999	-99999.999	5	3	x	x
	Coefficient A									O
	Correction coefficient:	PRM.DTL.WID[0]:CRCB		0	99999.999	-99999.999	5	3	x	x
	Coefficient B									O

List of setting parameters

Category	Setting item	Name	Label	Selection		Upper limit	Lower limit	Numerical value format		Referencing	
				Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable
Measured value correction: Width (measurement 01)		PRM.DTL.WID[1]:***									
		:	:								
Measured value correction: Width (measurement 31)		PRM.DTL.WID[31]:***									
Measured value correction: Radius of circle (measurement 00)	Correction method	PRM.DTL.CRMD[0]:CRMD	1-point correction	0				x	x	x	<input checked="" type="radio"/>
			2-point correction	1							
	Correction 1: Before correction	PRM.DTL.CRMD[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x	<input checked="" type="radio"/>
	Correction 1: After correction	PRM.DTL.CRMD[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x	<input checked="" type="radio"/>
	Correction 2: Before correction	PRM.DTL.CRMD[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x	<input checked="" type="radio"/>
	Correction 2: After correction	PRM.DTL.CRMD[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x	<input checked="" type="radio"/>
	Correction coefficient: Offset	PRM.DTL.CRMD[0]:CRCO		0	99999.999	-99999.999	5	3	x	x	<input checked="" type="radio"/>
	Correction coefficient: Coefficient A	PRM.DTL.CRMD[0]:CRCA		0	99999.999	-99999.999	5	3	x	x	<input checked="" type="radio"/>
	Correction coefficient: Coefficient B	PRM.DTL.CRMD[0]:CRCB		0	99999.999	-99999.999	5	3	x	x	<input checked="" type="radio"/>
Measured value correction: Radius of circle (measurement 01)		PRM.DTL.CRMD[1]:***									
		:	:								
Measured value correction: Radius of circle (measurement 31)		PRM.DTL.CRMD[31]:***									

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Measured value correction: Cross-Section area (measurement 00)	Correction method	PRM.DTL.ZAR[0]:CRMD	1-point correction	0				x	x	x
			2-point correction	1						o
	Correction 1: Before correction	PRM.DTL.ZAR[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x
	Correction 1: After correction	PRM.DTL.ZAR[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x
	Correction 2: Before correction	PRM.DTL.ZAR[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x
	Correction 2: After correction	PRM.DTL.ZAR[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x
	Correction coefficient: Offset	PRM.DTL.ZAR[0]:CRCO		0	99999.999	-99999.999	5	3	x	x
	Correction coefficient: Coefficient A	PRM.DTL.ZAR[0]:CRCA		0	99999.999	-99999.999	5	3	x	x
	Correction coefficient: Coefficient B	PRM.DTL.ZAR[0]:CRCB		0	99999.999	-99999.999	5	3	x	x
Measured value correction: Cross-Section area (measurement 01)		PRM.DTL.ZAR[1]:***								
:	:									
Measured value correction: Cross-Section area (measurement 31)		PRM.DTL.ZAR[31]:***								

List of setting parameters

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data
Measured value correction: 1-line Cross-Section area (measurement 00)	Correction method	PRM.DTL.LAR[0]:CRMD	1-point correction	0				x	x	x		○
			2-point correction	1								
	Correction 1: Before	PRM.DTL.LAR[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 1: After	PRM.DTL.LAR[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 2: Before	PRM.DTL.LAR[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 2: After	PRM.DTL.LAR[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction coefficient:	PRM.DTL.LAR[0]:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○
	Offset											
	Correction coefficient:	PRM.DTL.LAR[0]:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○
	Coefficient A											
	Correction coefficient:	PRM.DTL.LAR[0]:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○
	Coefficient B											
Measured value correction: 1-line Cross-Section area (measurement 01)		PRM.DTL.LAR[1]:***										
			⋮	⋮								
		PRM.DTL.LAR[31]:***										
Measured value correction: 2-line Cross-Section area (measurement 31)	Correction method	PRM.DTL.DLAR[0]:CRMD	1-point correction	0				x	x	x		○
			2-point correction	1								
	Correction 1: Before	PRM.DTL.DLAR[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 1: After	PRM.DTL.DLAR[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 2: Before	PRM.DTL.DLAR[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 2: After	PRM.DTL.DLAR[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction coefficient:	PRM.DTL.DLAR[0]:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○
	Offset											
	Correction coefficient:	PRM.DTL.DLAR[0]:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○
	Coefficient A											
	Correction coefficient:	PRM.DTL.DLAR[0]:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○
	Coefficient B											

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
				No. of integer digits	No. of decimal places				User variable	System variable	
Measured value correction: 2-line Cross-Section area (measurement 01)		PRM.DTL.DLAR[1]:***									
		⋮	⋮								
Measured value correction: 2-line Cross-Section area (measurement 31)		PRM.DTL.DLAR[31]:***									
Measured value correction: Points distance (measurement 00)	Correction method	PRM.DTL.PPDST[0]:CRMD	1-point correction 2-point correction	0 1					x	x	x
	Correction 1: Before correction	PRM.DTL.PPDST[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 1: After correction	PRM.DTL.PPDST[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2: Before correction	PRM.DTL.PPDST[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2: After correction	PRM.DTL.PPDST[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x	x
	Correction coefficient: Offset	PRM.DTL.PPDST[0]:CRCO		0	99999.999	-99999.999	5	3	x	x	x
	Correction coefficient: Coefficient A	PRM.DTL.PPDST[0]:CRCA		0	99999.999	-99999.999	5	3	x	x	x
	Correction coefficient: Coefficient B	PRM.DTL.PPDST[0]:CRCB		0	99999.999	-99999.999	5	3	x	x	x
Measured value correction: Points distance (measurement 01)		PRM.DTL.PPDST[1]:***									
		⋮	⋮								
Measured value correction: Points distance (measurement 31)		PRM.DTL.PPDST[31]:***									

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data
Measured value correction: Point/line distance (measurement 00)	Correction method	PRM.DTL.LPDST[0]:CRMD	1-point correction	0				x	x	x		○
			2-point correction	1								
	Correction 1: Before correction	PRM.DTL.LPDST[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 1: After correction	PRM.DTL.LPDST[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 2: Before correction	PRM.DTL.LPDST[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 2: After correction	PRM.DTL.LPDST[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction coefficient: Offset	PRM.DTL.LPDST[0]:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction coefficient: Coefficient A	PRM.DTL.LPDST[0]:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction coefficient: Coefficient B	PRM.DTL.LPDST[0]:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○
	Measured value correction: Point/line distance (measurement 01)	PRM.DTL.LPDST[1]:***										
⋮		⋮										
Measured value correction: Point/line distance (measurement 31)	Measured value correction: Defect detection (measurement 00)	PRM.DTL.LPDST[31]:***										
	Correction method	PRM.DTL.STG[0]:CRMD	1-point correction	0				x	x	x		○
			2-point correction	1								
	Correction 1: Before correction	PRM.DTL.STG[0]:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 1: After correction	PRM.DTL.STG[0]:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 2: Before correction	PRM.DTL.STG[0]:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction 2: After correction	PRM.DTL.STG[0]:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction coefficient: Offset	PRM.DTL.STG[0]:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction coefficient: Coefficient A	PRM.DTL.STG[0]:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○
	Correction coefficient: Coefficient B	PRM.DTL.STG[0]:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○

Category	Setting item	Name	Label	Selection	Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Numerical value format	Referencing	Unit properties
Measured value correction: Defect detection (measurement 01)		PRM.DTL.STG[1]:***												
Measured value correction: Defect detection (measurement 31)		PRM.DTL.STG[31]:***												
...		...												

3D Geometry Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				No. of integer digits	No. of decimal places	
Operation setting	Calculation Type	PRM.DTL.TGTYP	Distance	0				x	x	
			Angle	1				x	x	
			Point	2				x	x	
			Line	3						
			Plane	4						
			Sphere	5						
Measurement method		PRM.DTL.GCMTD	Points distance	0				x	x	x
			Point/line distance	1						
			Point/Plane distance	2						
			Lines distance	3						
			Line/Plane distance	4						
			Planes distance	5						
			Angle Between Two Lines	6						
			Angle Between Line and Plane	7						
			Angle Between Two Planes	8						
			Point	9						
			Intersection of Two Lines	10						
			Intersection of Line/Plane	11						
			Midpoint of Points	12						
			Point between point and line	13						
			Point between point and plane	14						
			Intersection of Point/Line	15						
			Intersection of Point/Plane	16						
			Line	17						

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value				No. of integer digits	No. of decimal places		
Operation setting (continued)	Calculation method	PRM.DTL.GCMTD	Line Defined by two points	18				x	x	x	○
			Center line between point and line	19							
			Line Projection onto Plane	20							
			Line Between Planes	21							
			Plane	22							
			Center plane between two points	23							
			Center plane between Point and Plane	24							
			Plane Determined by point and line	25							
			Plane Determined by Two Lines	26							
			Sphere	27							
Operation options	Plane 2 calculation condition	PRM.IN2.PPMTD	Least-squares method	0				x	x	x	○
			Average	1							
			Distance Min.	2							
			Distance Max.	3							
			Median	4							
(Lines)	Line 1 calculation condition	PRM.IN1.LMTD	Least-squares method	0				x	x	x	○
			Average	1							
			Distance Min.	2							
			Distance Max.	3							
			Median	4							
(Angle)	Angle type	PRM.DTL.LLPRL	ON	1				x	x	x	○
			OFF	0							
			Angle 1	0							
			Angle 2	1							
(Angle)	Invert angle display	PRM.DTL.ANGTYP	Angle 3	2				x	x	x	○
			Angle 4	3							
			ON	1							
			OFF	0							
(Angle)	Leveling lines	PRM.DTL.LLPLN	ON	1				x	x	x	○
			OFF	0							

Category	Setting item	Name	Selection				Numerical value format				Referencing		
			Label	Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Operation options (continued)	(Midpoint) Calculation point	PRM.DTL.RPTYP	Midpoint	0						x	x	x	<input type="radio"/>
			Point 1	1									
			Point 2	2									
	(Midpoint) Offset	PRM.DTL.RPOF		0	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
	(Center line) Offset	PRM.DTL.MLOF		0	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
	(Center plane) Offset	PRM.DTL.MSOF		0	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
	Distance: Upper limit	PRM.DTL.TDST:HL		-	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
	Distance: Lower limit	PRM.DTL.TDST:LL		-	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
	Angle: Upper limit	PRM.DTL.TANG:HL		-	360	0	3	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
	Angle: Lower limit	PRM.DTL.TANG:LL		-	360	0	3	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
Input element 1: Common	Radius of sphere: Upper limit	PRM.DTL.TRAD:HL		-	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
	Radius of sphere: Lower limit	PRM.DTL.TRAD:LL		-	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>
	Measurement setting	PRM.IN1.SMTD	Specify in 2D Image	0						x	x	x	<input type="radio"/>
			From Result Data	1									
			User Specified	2									
	Plane Type	PRM.IN1.PPTYP	Best Fit plane	0						x	x	x	<input type="radio"/>
			Tangential plane (Top)	1									
			Tangential plane (Bottom)	2									
	Correction	PRM.IN1.TREA	ON	1						x	x	x	<input type="radio"/>
			OFF	0									
Input element 1: 3D position coordinates	Coordinate Type	PRM.IN1.DPMTD[s]	Peak	0						x	x	x	<input type="radio"/>
			Bottom	1									
			Average value	2									
			Median	3									
			Edge (Top)	4									
			Edge (Bottom)	5									
			Corner (Top)	6									
			Corner (Bottom)	7									
	Outlier removal	PRM.IN1.DPROEN[s]	ON	1						x	x	x	<input type="radio"/>
			OFF	0									
Outlier upper	PRM.IN1.DPROU[s]		10	50	0	3	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Outlier lower	PRM.IN1.DPROL[s]	10	50	0	3	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value				No. of integer digits	No. of decimal places		
Input element 1: 3D position coordinates (continued)	Detection position margin	PRM.IN1.DPMGN[s]	Large	3						x	x
			Medium	2						x	x
			Small	1						x	x
			Auto	0						x	x
			None	4						x	x
Input element figure information	Point XYZ	PRM.IN1.TPXYZ						5	3	○	○
	Point X	PRM.IN1.TPX		0		99999.999	-99999.999	5	3	○	○
	Point Y	PRM.IN1.TPY		0		99999.999	-99999.999	5	3	○	○
	Point Z	PRM.IN1.TPZ		0		99999.999	-99999.999	5	3	○	○
	Line start position XYZ	PRM.IN1.LPXYZ				5	3	○	○		
	Start position X	PRM.IN1.LPX		0		99999.999	-99999.999	5	3	○	○
	Start position Y	PRM.IN1.LPY		0		99999.999	-99999.999	5	3	○	○
	Start position Z	PRM.IN1.LPZ		0		99999.999	-99999.999	5	3	○	○
	Line vector XYZ	PRM.IN1.LVXYZ				5	3	○	○		
	Vector X	PRM.IN1.LVX		0		99999.999	-99999.999	5	3	○	○
	Vector Y	PRM.IN1.LVY		0		99999.999	-99999.999	5	3	○	○
	Vector Z	PRM.IN1.LVZ		0		99999.999	-99999.999	5	3	○	○
	Plane XYZ	PRM.IN1.PPABC		0		99.999999	-99.999999	3	6	○	○
	X slope	PRM.IN1.PPA		0		9.999999	-9.999999	1	6	○	○
	Y slope	PRM.IN1.PPB		0		9.999999	-9.999999	1	6	○	○
	Z height	PRM.IN1.PPC		0		999.999	-999.999	3	3	○	○
	Plane offset	PRM.IN1.PPOF		0		99999.999	-99999.999	5	3	○	○
	Sphere center XYZ	PRM.IN1.TCXYZ				5	3	○	○		
	Center X	PRM.IN1.TCX		0		99999.999	-99999.999	5	3	○	○
	Center Y	PRM.IN1.TCY		0		99999.999	-99999.999	5	3	○	○
	Center Z	PRM.IN1.TCZ		0		99999.999	-99999.999	5	3	○	○
	Radius of sphere	PRM.IN1.TRAD		0		99999.999	0	5	3	○	○
Input element 2: Common	Measurement Setting	PRM.IN2.SMTD	Specify in 2D Image	0						x	x
			From Result Data	1						x	x
			User Specified	2						x	x
										x	x
Input element 2: Plane	Plane Type	PRM.IN2.PPTYP	Best Fit plane	0						x	x
			Tangential plane (Top)	1						x	x
			Tangential plane (Bottom)	2						x	x
Correction		PRM.IN2.TREA	ON	1						x	x
			OFF	0						x	x

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Input element 2: 3D position coordinates	Coordinate classification	PRM.IN2.DPMTD[s]	Peak	0						x	x	x	○
			Bottom	1									
			Average value	2									
			Median	3									
			Edge (Top)	4									
			Edge (Bottom)	5									
			Corner (Top)	6									
			Corner (Bottom)	7									
	Outlier removal	PRM.IN2.DPROEN[s]	ON	1						x	x	x	○
			OFF	0									
Input element figure information	Outlier upper limit	PRM.IN2.DPROU[s]		10	50	0		3	0	○	○	x	○
	Outlier lower limit	PRM.IN2.DPROL[s]		10	50	0		3	0	○	○	x	○
	Detection position margin	PRM.IN2.DPMGN[s]	Large	3						x	x	x	○
			Medium	2									
			Small	1									
			Auto	0									
			None	4									
	Point XYZ	PRM.IN2.TPXYZ						5	3	○	○	○	○
	Point X	PRM.IN2.TPX		0	99999.999	-99999.999		5	3	○	○	○	○
	Point Y	PRM.IN2.TPY		0	99999.999	-99999.999		5	3	○	○	○	○
	Point Z	PRM.IN2.TPZ		0	99999.999	-99999.999		5	3	○	○	○	○
	Line start position XYZ	PRM.IN2.LPXYZ						5	3	○	○	○	○
Input element figure information	Start position X	PRM.IN2.LPX		0	99999.999	-99999.999		5	3	○	○	○	○
	Start position Y	PRM.IN2.LPY		0	99999.999	-99999.999		5	3	○	○	○	○
	Start position Z	PRM.IN2.LPZ		0	99999.999	-99999.999		5	3	○	○	○	○
	Line vector XYZ	PRM.IN2.LVXYZ						5	3	○	○	○	○
	Vector X	PRM.IN2.LVX		0	99999.999	-99999.999		5	3	○	○	○	○
	Vector Y	PRM.IN2.LVY		0	99999.999	-99999.999		5	3	○	○	○	○
	Vector Z	PRM.IN2.LVZ		0	99999.999	-99999.999		5	3	○	○	○	○
	Plane XYZ	PRM.IN2.PPABC		0	99.999999	-99.999999		3	6	○	○	○	○
	X slope	PRM.IN2.PPA		0	9.999999	-9.999999		1	6	○	○	○	○
	Y slope	PRM.IN2.PPB		0	9.999999	-9.999999		1	6	○	○	○	○
Input element figure information	Z height	PRM.IN2.PPC		0	999.999	-999.999		3	3	○	○	○	○
	Plane offset	PRM.IN2.PPOF		0	99999.999	-99999.999		5	3	○	○	○	○
	Sphere center XYZ	PRM.IN2.TCXYZ						5	3	○	○	○	○
	Center X	PRM.IN2.TCX		0	99999.999	-99999.999		5	3	○	○	○	○
	Center Y	PRM.IN2.TCY		0	99999.999	-99999.999		5	3	○	○	○	○
Input element figure information	Center Z	PRM.IN2.TCZ		0	99999.999	-99999.999		5	3	○	○	○	○
	Radius of sphere	PRM.IN2.TRAD		0	99999.999	0		5	3	○	○	○	○

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value				No. of integer digits	No. of decimal places		
Measured value correction: Distance	Correction method	PRM.DTL.TDST:CRMD	1-point correction	0	99999.999	-99999.999	5 3	x	x	x	O
			2-point correction	1							
	Correction 1: Before	PRM.DTL.TDST:CRPR1		0				x	x	x	O
	correction										
	Correction 1: After	PRM.DTL.TDST:CRPO1		0				x	x	x	O
	correction										
	Correction 2: Before	PRM.DTL.TDST:CRPR2		0				x	x	x	O
	correction										
	Correction 2: After	PRM.DTL.TDST:CRPO2		0				x	x	x	O
	correction										
Measured value correction: Radius of sphere	Correction coefficient: Offset	PRM.DTL.TDST:CRCO		0	99999.999	-99999.999	5 3	x	x	x	O
	Correction coefficient: Coefficient A	PRM.DTL.TDST:CRCA		0				x	x	x	O
	Coefficient A										
	Correction coefficient: Coefficient B	PRM.DTL.TDST:CRCB		0				x	x	x	O
	Coefficient B										
	Correction method	PRM.DTL.TRAD:CRMD	1-point correction	0				x	x	x	O
			2-point correction	1							
	Correction 1: Before	PRM.DTL.TRAD:CRPR1		0				x	x	x	O
	correction										
	Correction 1: After	PRM.DTL.TRAD:CRPO1		0				x	x	x	O
	correction										
	Correction 2: Before	PRM.DTL.TRAD:CRPR2		0				x	x	x	O
	correction										
	Correction 2: After	PRM.DTL.TRAD:CRPO2		0				x	x	x	O
	correction										
	Correction coefficient: Offset	PRM.DTL.TRAD:CRCO		0				x	x	x	O
	Correction coefficient: Coefficient A	PRM.DTL.TRAD:CRCA		0				x	x	x	O
	Coefficient A										
	Correction coefficient: Coefficient B	PRM.DTL.TRAD:CRCB		0				x	x	x	O
	Coefficient B										

3D Comparison Unit

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data	
Subtraction Settings	Set by Direction	PRM.TDSUB.MGDIR	ON	1				x	x	x	x	○	
			OFF	0									
	XY Direction Allowable Range	PRM.TDSUB.XYMG		1.000	99.999	0.000	2	3	x	x	x	○	
	X Direction Allowable Range	PRM.TDSUB.XMG		0.200	99.999	0.000	2	3	x	x	x	○	
	Y Direction Allowable Range	PRM.TDSUB.YMG		0.200	99.999	0.000	2	3	x	x	x	○	
	Z Direction Allowable Range	PRM.TDSUB.ZMG		0.200	99.999	0.000	2	3	x	x	x	○	
	Scan Direction	PRM.TDSUB.SCDR	Concave/ Convex	0						x	x	x	○
			Concave	1									
			Convex	2									
	Make Invalid Pixels Detection Targets	PRM.TDSUB.CMIIP	ON	1						x	x	x	○
			OFF	0									
	Background Offset (mm)	PRM.TDSUB.MDRFC		0.0	999.999	-999.999	3	3	x	x	x	○	
	X Slope	PRM.TDSUB.MDRFA		0.000000	1.000000	-1.000000	1	6	x	x	x	○	
	Y Slope	PRM.TDSUB.MDRFB		0.000000	1.000000	-1.000000	1	6	x	x	x	○	
	X Slope/Y Slope/ Background Offset (mm)	PRM.TDSUB.MDRFABC		0.000000	0.000000	0.000000	3	6	x	x	x	○	
	Make Invalid Pixels Detection Targets	PRM.TDSUB.FIPWLL	ON	1						x	x	x	○
			OFF	0									
	Do Not Measure from Spec.Hgt.Onwards	PRM.TDSUB.SFUL	ON	1						x	x	x	○
			OFF	0									
	Offset from Background Plane (mm)	PRM.TDSUB.OFFB		10.000	999.999	0.000	3	3	x	x	x	○	
	Emphasize Projections	PRM.TDSUB.THEMPH	ON	1						x	x	x	○
			OFF	0									
	Lower Area Filter	PRM.TDSUB.EXDS		1	999999.999	0.000	6	3	x	x	x	○	
	Segment Size	PRM.TDSUB.SGSZ		2	16	1	2	0	x	x	x	○	
	Tilt Correction	PRM.TDSUB.ICM	Normal	0						x	x	x	○
			None	1									
			High Precision	2									
	Tilt Calculation Region	PRM.TDSUB.SHP	Same as insp. region	0						x	x	x	○
			Specify by a Rectangle	1									
	Upper Left XY	PRM.TDSUB.LUXY					5	x	x	x	○	x	
	Upper Left X	PRM.TDSUB.LUX		160	16383	0	5	x	x	x	○	x	
	Upper Left Y	PRM.TDSUB.LUY		160	16383	0	5	x	x	x	○	x	

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
								No. of integer digits	No. of decimal places		
Subtraction Settings (continued)	Lower Right XY	PRM.TDSUB.RDXY						5	x	x	x
	Lower Right X	PRM.TDSUB.RDX		360	16383	0		5	x	x	o
	Lower Right Y	PRM.TDSUB.RDY		320	16383	0		5	x	x	o
Correction Accuracy	PRM.TDSUB.SRAC	Low	0							x	x
		Normal	1							x	x
		High	2							x	x
	Expand Correction Range	PRM.TDSUB.ZPAE	ON	1						x	x
		OFF	0							x	o
Judg. Cond.	Match Degree: Upper Limit	PRM.DTL.TDSUB_MTC:HL	-	100	0			3	3	o	o
	Match Degree: Lower Limit	PRM.DTL.TDSUB_MTC:LL	-	100	0			3	3	o	o
	Total Area: Upper Limit	PRM.DTL.TDSUB_TA:HL	-	999999.999	0			6	3	o	o
	Total Area: Lower Limit	PRM.DTL.TDSUB_TA:LL	-	999999.999	0			6	3	o	o
	Total Volume: Upper Limit	PRM.DTL.TDSUB_TV:HL	-	9999999.999	0			7	3	o	o
	Total Volume: Lower Limit	PRM.DTL.TDSUB_TV:LL	-	9999999.999	0			7	3	o	o
	Maximum Area: Upper Limit	PRM.DTL.TDSUB_MXA:HL	-	999999.999	0			6	3	o	o
	Maximum Area: Lower Limit	PRM.DTL.TDSUB_MXA:LL	-	999999.999	0			6	3	o	o
	Maximum Volume: Upper Limit	PRM.DTL.TDSUB_MXV:HL	-	9999999.999	0			7	3	o	o
	Maximum Volume: Lower Limit	PRM.DTL.TDSUB_MXV:LL	-	9999999.999	0			7	3	o	o
	Concave Parts Total Area: Upper Limit	PRM.DTL.TDSUB_TCCA:H	-	999999.999	0			6	3	o	o
	Concave Parts Total Area: Lower Limit	PRM.DTL.TDSUB_TCCA:L	-	999999.999	0			6	3	o	o
	Concave Parts Total Volume: Upper Limit	PRM.DTL.TDSUB_TCCV:H	-	9999999.999	0			7	3	o	o
	Concave Parts Total Volume: Lower Limit	PRM.DTL.TDSUB_TCCV:L	-	9999999.999	0			7	3	o	o
	Convex Parts Total Area: Upper Limit	PRM.DTL.TDSUB_TCVA:H	-	999999.999	0			6	3	o	o
	Convex Parts Total Area: Lower Limit	PRM.DTL.TDSUB_TCVA:L	-	999999.999	0			6	3	o	o
	Convex Parts Total Volume: Upper Limit	PRM.DTL.TDSUB_TCVV:H	-	9999999.999	0			7	3	o	o
	Convex Parts Total Volume: Lower Limit	PRM.DTL.TDSUB_TCVV:L	-	9999999.999	0			7	3	o	o

3D blob Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data
Detection condition	Measurement of Position X	PRM.DTL.GRX_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Position Y	PRM.DTL.GRY_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Major Axis Angle	PRM.DTL.T_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Area	PRM.DTL.AR_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Feret X	PRM.DTL.FRDX_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Feret Y	PRM.DTL.FRY_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Perimeter	PRM.DTL.CL_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Roundness	PRM.DTL.CD_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Rectangularity	PRM.DTL.RTD_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Major Axis Bounding Box (Major Axis)	PRM.DTL.R2MJ_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Major Axis Bounding Box (Minor Axis)	PRM.DTL.R2MN_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Major Axis Bounding Box (Axes Ratio)	PRM.DTL.R2AX_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Minimum Bounding Rectangle (Long Side)	PRM.DTL.MBRL_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Minimum Bounding Rectangle (Short Side)	PRM.DTL.MBRS_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Minimum Bounding Rectangle (Axes Ratio)	PRM.DTL.MBRAX_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Equivalent Oval (Major Axis)	PRM.DTL.ELPMJ_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Equivalent Oval (Minor Axis)	PRM.DTL.ELPMN_EN	Enable	1				x	x	x		○
			Disable	0								
	Measurement of Equivalent Oval (Aspect Ratio)	PRM.DTL.ELPAX_EN	Enable	1				x	x	x		○
			Disable	0								

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing	Unit properties
			Label	Value								
Detection condition (continued)	Measurement of Max. Height (Position)	PRM.DTL.MX_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Max. Height Z		PRM.DTL.MXZ_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Max. Height H		PRM.DTL.MXH_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Min. Height (Position)		PRM.DTL.MN_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Min. Height Z		PRM.DTL.MNZ_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Min. Height H		PRM.DTL.MNH_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Ave. Height Z		PRM.DTL.AVZ_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Ave. Height H		PRM.DTL.AVH_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Valid Pix. Count		PRM.DTL.EPA_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Volume		PRM.DTL.VOL_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Concave/Convex Area		PRM.DTL.CONAR_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Concave/Convex Volume		PRM.DTL.CONVOL_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Standard Dev. Z		PRM.DTL.DVZ_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Standard Dev. H		PRM.DTL.DVH_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Best Fit Plane		PRM.DTL.DPP_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Plane Angle		PRM.DTL.DPPT_EN	Enable	1							x	x
			Disable	0							x	x
Measurement of Height		PRM.DTL.BLZ_EN	Enable	1							x	x
			Disable	0							x	x
Offset From Zero Plane (mm) (Upper Part)	PRM.DTL.SDTM			0.100	999.999	-999.999	3	3	○	○	x	○
Offset From Zero Plane (mm) (Lower Part)	PRM.DTL.SDTM2			0.100	999.999	-999.999	3	3	○	○	x	○
Scan Direction	PRM.DTL.PRD		Upper Part	1							x	x
			Lower Part	0								
Limit Range for Height Direction	PRM.DTL.HL_EN		ON	1							x	x
			OFF	0								
Range (mm)	PRM.DTL.HLH			1.000	999.999	0.001	3	3	○	○	x	○

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format	Referencing			
			Label	Value					User variable	System variable	Result data	Unit properties
Detection condition (continued)	Refer to Detected Part of Other Unit	PRM.DTL.BIMGEN	ON	1					x	x	x	○
			OFF	0								
	Filter Area Enabled	PRM.DTL.AR_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Position X Enabled	PRM.DTL.X_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Position Y Enabled	PRM.DTL.Y_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Perimeter Enabled	PRM.DTL.CL_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Feret X Enabled	PRM.DTL.FX_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Feret Y Enabled	PRM.DTL.FY_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Roundness Enabled	PRM.DTL.CD_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Rectangularity Enabled	PRM.DTL.RTD_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Major Axis Angle Enabled	PRM.DTL.T_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Major Axis Enabled	PRM.DTL.MAA_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Minor Axis Enabled	PRM.DTL.MIA_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Axes Ratio Enabled	PRM.DTL.RTO_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Oval Major Axis Enabled	PRM.DTL.MAA2_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Oval Minor Axis Enabled	PRM.DTL.MIA2_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Asp.Ratio Enabled	PRM.DTL.RTO2_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Long Side Enabled	PRM.DTL.MRLS_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Short Side Enabled	PRM.DTL.MRSS_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Minimum Bounding Rectangle (Axes Ratio) Enabled	PRM.DTL.MBRAX_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Max. Height X Enabled	PRM.DTL.MXX_F_EN	Enable	1					x	x	x	○
			Disable	0								
	Filter Max. Height Y Enabled	PRM.DTL.MXY_F_EN	Enable	1					x	x	x	○
			Disable	0								

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing	Unit properties
			Label	Value								
Detection condition (continued)	Filter Max. Height Z Enabled	PRM.DTL.MXZ_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Max. Height H Enabled	PRM.DTL.MXH_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Min. Height X Enabled	PRM.DTL.MNX_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Min. Height Y Enabled	PRM.DTL.MNY_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Min. Height Z Enabled	PRM.DTL.MNZ_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Min. Height H Enabled	PRM.DTL.MNH_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Ave. Height Z Enabled	PRM.DTL.AVHZ_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Ave. Height H Enabled	PRM.DTL.AVH_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Height Enabled	PRM.DTL.BLZ_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Standard Dev.Z Enabled	PRM.DTL.DVZ_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Standard Dev.H Enabled	PRM.DTL.DVH_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Volume Enabled	PRM.DTL.VOL_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Convex Volume Enabled	PRM.DTL.CONV_VOL_F_E_N	Enable	1							x	x
			Disable	0							x	x
	Filter Concave Volume Enabled	PRM.DTL.CONC_VOL_F_E_N	Enable	1							x	x
			Disable	0							x	x
	Filter Convex Area Enabled	PRM.DTL.CONV_AR_F_E_N	Enable	1							x	x
			Disable	0							x	x
	Filter Concave Area Enabled	PRM.DTL.CONC_AR_F_E_N	Enable	1							x	x
			Disable	0							x	x
	Filter Valid Pix. Count Enabled	PRM.DTL.EPA_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter X Slope Enabled	PRM.DTL.DPPA_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Y Slope Enabled	PRM.DTL.DPPB_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Z Intercept Enabled	PRM.DTL.DPPC_F_EN	Enable	1							x	x
			Disable	0							x	x
	Filter Plane Angle Enabled	PRM.DTL.DPPT_F_EN	Enable	1							x	x
			Disable	0							x	x
Filter Area: Upper Limit			PRM.DTL.AR_THRES HL		99999.9999	99999.9999	0.0000	5	4	O O x O		

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
								No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Detection condition (continued)	Filter Area: Lower Limit	PRM.DTL.AR_THRES:LL		0.0100	99999.9999	0.0000		5	4	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Position X: Upper Limit	PRM.DTL.X_THRES:HL		99999.999	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Position X: Lower Limit	PRM.DTL.X_THRES:LL		-99999.999	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Position Y: Upper Limit	PRM.DTL.Y_THRES:HL		99999.999	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Position Y: Lower Limit	PRM.DTL.Y_THRES:LL		-99999.999	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Perimeter: Upper Limit	PRM.DTL.CL_THRES:HL		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Perimeter: Lower Limit	PRM.DTL.CL_THRES:LL		0.000	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Feret X: Upper Limit	PRM.DTL.FX_THRES:HL		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Feret X: Lower Limit	PRM.DTL.FX_THRES:LL		0.000	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Feret Y: Upper Limit	PRM.DTL.FY_THRES:HL		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Feret Y: Lower Limit	PRM.DTL.FY_THRES:LL		0.000	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Roundness: Upper Limit	PRM.DTL.CD_THRES:HL		1.000	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Roundness: Lower Limit	PRM.DTL.CD_THRES:LL		0.000	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Rectangularity: Upper Limit	PRM.DTL.RTD_THRES:HL		1.000	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Rectangularity: Lower Limit	PRM.DTL.RTD_THRES:LL		0.000	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Major Axis Angle: Upper Limit	PRM.DTL.T_THRES:HL		180.000	180.000	-179.999		3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Major Axis Angle: Lower Limit	PRM.DTL.T_THRES:LL		-179.999	180.000	-179.999		3	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Major Axis: Upper Limit	PRM.DTL.MAA_THRES:HL		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Major Axis: Lower Limit	PRM.DTL.MAA_THRES:LL		0.000	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Minor Axis: Upper Limit	PRM.DTL.MIA_THRES:HL		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Minor Axis: Lower Limit	PRM.DTL.MIA_THRES:LL		0.000	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Axes Ratio: Upper Limit	PRM.DTL.RTO_THRES:HL		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Axes Ratio: Lower Limit	PRM.DTL.RTO_THRES:LL		0.000	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Oval Major Axis: Upper Limit	PRM.DTL.MAA2_THRES:H L		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Oval Major Axis: Lower Limit	PRM.DTL.MAA2_THRES:L L		0.000	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Filter Oval Minor Axis: Upper Limit	PRM.DTL.MIA2_THRES:H L		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>

Category	Setting item	Name	Label	Selection			Numerical value format	Referencing	Unit properties
				Value	Initial value	Upper limit			
Detection condition (continued)	Filter Oval Minor Axis: Lower Limit	PRM.DTL.MIA2_THRES:LL		0.000	99999.999	0.000	5	3	○ ○ × ○
	Filter Asp.Ratio: Upper Limit	PRM.DTL.RTO2_THRES:H_L		99999.999	99999.999	0.000	5	3	○ ○ × ○
	Filter Asp.Ratio: Lower Limit	PRM.DTL.RTO2_THRES:L_L		0.000	99999.999	0.000	5	3	○ ○ × ○
	Filter Long Side: Upper Limit	PRM.DTL.MRLS_THRES:H_L		99999.999	99999.999	0.000	5	3	○ ○ × ○
	Filter Long Side: Lower Limit	PRM.DTL.MRLS_THRES:L_L		0.000	99999.999	0.000	5	3	○ ○ × ○
	Filter Short Side: Upper Limit	PRM.DTL.MRSS_THRES:H_L		99999.999	99999.999	0.000	5	3	○ ○ × ○
	Filter Short Side: Lower Limit	PRM.DTL.MRSS_THRES:L_L		0.000	99999.999	0.000	5	3	○ ○ × ○
	Filter Minimum Bounding Rectangle (Axes Ratio): Upper Limit	PRM.DTL.MBRAX_THRES:HL		99999.999	99999.999	0.000	5	3	○ ○ × ○
	Filter Minimum Bounding Rectangle (Axes Ratio): Lower Limit	PRM.DTL.MBRAX_THRES:LL		0.000	99999.999	0.000	5	3	○ ○ × ○
	Filter Max. Height X: Upper Limit	PRM.DTL.MXX_THRES:HL		99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Max. Height X: Lower Limit	PRM.DTL.MXX_THRES:LL		-99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Max. Height Y: Upper Limit	PRM.DTL.MXY_THRES:HL		99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Max. Height Y: Lower Limit	PRM.DTL.MXY_THRES:LL		-99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Max. Height Z: Upper Limit	PRM.DTL.MXZ_THRES:HL		99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Max. Height Z: Lower Limit	PRM.DTL.MXZ_THRES:LL		-99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Max. Height H: Upper Limit	PRM.DTL.MXH_THRES:HL		99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Max. Height H: Lower Limit	PRM.DTL.MXH_THRES:LL		-99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Min. Height X: Upper Limit	PRM.DTL.MNX_THRES:HL		99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Min. Height X: Lower Limit	PRM.DTL.MNX_THRES:LL		-99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Min. Height Y: Upper Limit	PRM.DTL.MNY_THRES:HL		99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Min. Height Y: Lower Limit	PRM.DTL.MNY_THRES:LL		-99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Min. Height Z: Upper Limit	PRM.DTL.MNZ_THRES:HL		99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Min. Height Z: Lower Limit	PRM.DTL.MNZ_THRES:LL		-99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Min. Height H: Upper Limit	PRM.DTL.MNH_THRES:HL		99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Min. Height H: Lower Limit	PRM.DTL.MNH_THRES:LL		-99999.999	99999.999	-99999.999	5	3	○ ○ × ○
	Filter Ave. Height Z: Upper Limit	PRM.DTL.AVHZ_THRES:H_L		99999.999	99999.999	-99999.999	5	3	○ ○ × ○

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Detection condition (continued)	Filter Ave. Height Z: Lower Limit	PRM.DTL.AVHZ_THRES:L	L	-99999.999	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Ave. Height H: Upper Limit	PRM.DTL.AVH_THRES:HL		99999.999	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Ave. Height H: Lower Limit	PRM.DTL.AVH_THRES:LL		-99999.999	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Height: Upper Limit	PRM.DTL.BLZ_THRES:HL		99999.999	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Height: Lower Limit	PRM.DTL.BLZ_THRES:LL		-99999.999	99999.999	-99999.999	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Standard Dev.Z: Upper Limit	PRM.DTL.DVZ_THRES:HL		99999.999	99999.999	0.000	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Standard Dev.Z: Lower Limit	PRM.DTL.DVZ_THRES:LL		0.000	99999.999	0.000	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Standard Dev.H: Upper Limit	PRM.DTL.DVH_THRES:HL		99999.999	99999.999	0.000	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Standard Dev.H: Lower Limit	PRM.DTL.DVH_THRES:LL		0.000	99999.999	0.000	5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Volume: Upper Limit	PRM.DTL.VOL_THRES:HL		9999999.999 99	9999999.999 99	0.00000	7	5	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Volume: Lower Limit	PRM.DTL.VOL_THRES:LL		0.00000	9999999.999 99	0.00000	7	5	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Convex Volume: Upper Limit	PRM.DTL.CONV_VOL_TH RES:HL		9999999.999 99	9999999.999 99	0.00000	7	5	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Convex Volume: Lower Limit	PRM.DTL.CONV_VOL_TH RES:LL		0.00000 99	9999999.999 0.00000	0.00000	7	5	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Concave Volume: Upper Limit	PRM.DTL.CONC_VOL_TH RES:HL		9999999.999 99	9999999.999 99	0.00000	7	5	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Concave Volume: Lower Limit	PRM.DTL.CONC_VOL_TH RES:LL		0.00000 99	9999999.999 0.00000	0.00000	7	5	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Convex Area: Upper Limit	PRM.DTL.CONV_AR_THR ES:HL		99999.9999	99999.9999	0.0000	5	4	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Convex Area: Lower Limit	PRM.DTL.CONV_AR_THR ES:LL		0.0000	99999.9999	0.0000	5	4	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Concave Area: Upper Limit	PRM.DTL.CONC_AR_THR ES:HL		99999.9999	99999.9999	0.0000	5	4	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Concave Area: Lower Limit	PRM.DTL.CONC_AR_THR ES:LL		0.0000	99999.9999	0.0000	5	4	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Valid Pix. Count: Upper Limit	PRM.DTL.EPA_THRES:HL		999999	999999	0	7	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Valid Pix. Count: Lower Limit	PRM.DTL.EPA_THRES:LL		0	999999	0	7	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter X Slope: Upper Limit	PRM.DTL.DPPA_THRES:H L		99.999999	99.999999	-99.999999	2	6	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter X Slope: Lower Limit	PRM.DTL.DPPA_THRES:L L		-99.999999	99.999999	-99.999999	2	6	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Y Slope: Upper Limit	PRM.DTL.DPPB_THRES:H L		99.999999	99.999999	-99.999999	2	6	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Y Slope: Lower Limit	PRM.DTL.DPPB_THRES:L L		-99.999999	99.999999	-99.999999	2	6	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>
	Filter Z Intercept: Upper Limit	PRM.DTL.DPPC_THRES:H L		999.999	999.999	-999.999	3	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>	x	<input checked="" type="radio"/>

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value				No. of integer digits	No. of decimal places		
Detection condition (continued)	Filter Z Intercept: Lower Limit	PRM.DTL.DPPC_THRES:L		-999.999	999.999	-999.999	3	3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
	Filter Plane Angle: Upper Limit	PRM.DTL.DPPT_THRES:H		90.000	90.000	-90	2	3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
	Filter Plane Angle: Lower Limit	PRM.DTL.DPPT_THRES:L		-90.000	90.000	-90	2	3	<input type="radio"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
	Detection Count	PRM.DTL.MXN		3	9999	1	4	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Detection Order	PRM.DTL.LSF	From Upper Left (Rightward)	1001						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			From Upper Left (Downward)	1002						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			From Upper Right (Leftward)	1003						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			From Upper Right (Downward)	1004						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			From Lower Left (Rightward)	1005						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			From Lower Left (Upward)	1006						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			From Lower Right (Leftward)	1007						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			From Lower Right (Upward)	1008						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Clockwise	1009						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Countercloc kwise	1010						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Height	59						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Volume	48						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Area	0						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Feret X	5						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Feret Y	6						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Long Side	15						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Short Side	16						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Rectangle Axes Ratio	64						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Major Axis	9						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Minor Axis	10						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Axes Ratio	11						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Oval Maj. Axis	12						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Oval Min. Axis	13						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Asp. Ratio	14						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
			Perimeter	4						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing			
			Label	Value							User variable	System variable	Result data	Unit properties
Detection condition (continued)	Detection Order (continued)	PRM.DTL.LSF	Roundness	7							x	x	x	○
			Rectangularity	65										
			Center of Gravity X	2										
			Center of Gravity Y	3										
			Major Axis Angle	8										
			X Slope	55										
			Y Slope	56										
			Z Intercept	57										
			Valid Pix. Count	54										
			Max. Height X	36										
			Max. Height Y	37										
			Max. Height Z	38										
			Max. Height H	39										
			Ave. Height Z	44										
			Ave. Height H	45										
			Min. Height X	40										
			Min. Height Y	41										
			Min. Height Z	42										
			Min. Height H	43										
			Standard Dev. Z	46										
			Standard Dev. H	47										
			Plane Angle	53										
			Concave Volume	50										
			Convex Volume	49										
			Concave Area	52										
			Convex Area	51										
Detection Order Sort Order	PRM.DTL.LSD		Ascending	0							○	○	x	○
			Descending	1										
Grouping Method	PRM.DTL.LGTYP		Specified Value	2							x	x	x	○
			Feret (Long)	0										
			Feret (XY)	1										
Grouping Range	PRM.DTL.LGLEN				300	9999	1	4	0	○	○	x	○	

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value				No. of integer digits	No. of decimal places		
Detection condition (continued)	Fill Holes	PRM.DTL.FILL	ON	1						<input type="radio"/>	<input type="radio"/>
			OFF	0						<input type="radio"/>	<input type="radio"/>
	Active Border	PRM.DTL.CAN	ON	1						<input type="radio"/>	<input type="radio"/>
			OFF	0						<input type="radio"/>	<input type="radio"/>
	Base Angle	PRM.DTL.STA		0	359.999	0.000		3	3	<input type="radio"/>	<input type="radio"/>
	Major Axis Angle Range	PRM.DTL.EXT_AX	180°	0						<input type="radio"/>	<input type="radio"/>
			360°	1						<input type="radio"/>	<input type="radio"/>
	Primary Target Specification	PRM.DTL.LB	Specified	1						<input type="checkbox"/>	<input type="checkbox"/>
			All	0						<input type="checkbox"/>	<input type="radio"/>
	Primary Target	PRM.DTL.LLB		0	9998	0		4	0	<input type="checkbox"/>	<input type="checkbox"/>
	Plane Angle Direction	PRM.DTL.DPPT_DR	Maximum Slope	1						<input type="checkbox"/>	<input type="checkbox"/>
			Major Axis Direction	2						<input type="checkbox"/>	<input type="checkbox"/>
			Specified Value	3						<input type="checkbox"/>	<input type="radio"/>
	Plane Angle Direction: Angle	PRM.DTL.DPPT_T		0	180.000	-180.000		3	3	<input type="radio"/>	<input type="radio"/>
	2D Image Reference: Detection Color	PRM.DTL.DC	Black	0						<input type="radio"/>	<input type="radio"/>
			White	255						<input type="checkbox"/>	<input type="radio"/>
	2D Image Reference: Result Image	PRM.DTL.BIMG		NULL	9999999	0				<input type="checkbox"/>	<input type="checkbox"/>
Zero Plane Specification	Detection Reference	PRM.DTL.HRP_TYPE	Zero Plane Specification	0						<input type="checkbox"/>	<input type="checkbox"/>
			Subtraction Settings	1						<input type="checkbox"/>	<input type="radio"/>
Subtraction Settings	Background Offset (mm)	PRM.TDSUB.MDRFC		-4.096 (XT-024)/ -8.192 (XT-060)	999.999	-999.999		3	3	<input type="checkbox"/>	<input type="checkbox"/>
	Set by Direction	PRM.TDSUB.MGDIR	ON	1						<input type="checkbox"/>	<input type="checkbox"/>
			OFF	0						<input type="checkbox"/>	<input type="radio"/>
	XY Direction Tolerance Range	PRM.TDSUB.XYMG		1.000	99.999	0.000		2	3	<input type="checkbox"/>	<input type="checkbox"/>
	X Direction Tolerance Range	PRM.TDSUB.XMG		0.200	99.999	0.000		2	3	<input type="checkbox"/>	<input type="checkbox"/>
	Y Direction Tolerance Range	PRM.TDSUB.YMG		0.200	99.999	0.000		2	3	<input type="checkbox"/>	<input type="checkbox"/>
	Z Direction Tolerance Range	PRM.TDSUB.ZMG		0.200	99.999	0.000		2	3	<input type="checkbox"/>	<input type="checkbox"/>
	Scan Direction	PRM.TDSUB.SCDR	Concave/Convex	0						<input type="checkbox"/>	<input type="checkbox"/>
			Concave	1						<input type="checkbox"/>	<input type="radio"/>
			Convex	2						<input type="checkbox"/>	<input type="radio"/>
	X Slope	PRM.TDSUB.MDRFA		0.000000	1.000000	-1.000000		1	6	<input type="checkbox"/>	<input type="checkbox"/>
	Y Slope	PRM.TDSUB.MDRFB		0.000000	1.000000	-1.000000		1	6	<input type="checkbox"/>	<input type="checkbox"/>
	X Slope/Y Slope/Background Offset (mm)	PRM.TDSUB.MDRFABC		0.000000	0.000000	0.000000		3	6	<input type="checkbox"/>	<input type="checkbox"/>

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Subtraction Settings (continued)	Make Invalid Pixels Detection Targets	PRM.TDSUB.FIPWLL	ON	1						x	x	x	<input type="radio"/>
			OFF	0									
	Make Only Pixels Valid During Capture Detection Targets	PRM.TDSUB.USIPC	ON	1						x	x	x	<input type="radio"/>
			OFF	0									
	Do Not Measure From Spec. Hgt. Onwards	PRM.TDSUB.SFUL	ON	1						x	x	x	<input type="radio"/>
			OFF	0									
	Offset From Background Plane (mm)	PRM.TDSUB.OFFB			10.000	999.999	0.000	3	3	x	x	x	<input type="radio"/>
	Emphasize Projections	PRM.TDSUB.THEMPH	ON	1						x	x	x	<input type="radio"/>
			OFF	0									
	Segment Size	PRM.TDSUB.SGSZ			2	16	1	2	0	x	x	x	<input type="radio"/>
	Tilt Correction	PRM.TDSUB.ICM	Normal	0						x	x	x	<input type="radio"/>
			None	1									
			High Precision	2									
	Tilt Calculation Region	PRM.TDSUB.SHP	Same as Insp. Region	0						x	x	x	<input type="radio"/>
			Specified With a Rectangle	1									
	Upper Left XY	PRM.TDSUB.LUXY						5	0	x	x	x	<input type="radio"/>
	Upper Left X	PRM.TDSUB.LUX			160	16383	0	5	0	x	x	x	<input type="radio"/>
	Upper Left Y	PRM.TDSUB.LUY			160	16383	0	5	0	x	x	x	<input type="radio"/>
	Lower Right XY	PRM.TDSUB.RDXY						5	0	x	x	x	<input type="radio"/>
	Lower Right X	PRM.TDSUB.RDX			360	16383	0	5	0	x	x	x	<input type="radio"/>
	Lower Right Y	PRM.TDSUB.RDY			320	16383	0	5	0	x	x	x	<input type="radio"/>
	Correction Accuracy	PRM.TDSUB.SRAC	Low	0	-	-	-			x	x	x	<input type="radio"/>
			Normal	1									
			High	2									
	Expand Correction Range	PRM.TDSUB.ZPAE	ON	1						x	x	x	<input type="radio"/>
			OFF	0									
	Min. Match%	PRM.TDSUB.DLV			50.000	0.000	99.999	2	3	x	x	x	<input type="radio"/>
Detailed Settings	Origin XY	PRM.DTL.OGXY						4	3	x	x	x	<input type="radio"/>
	Origin X	PRM.DTL.OGX			0	9600.000	-9600.000	4	3	x	x	x	<input type="radio"/>
	Origin Y	PRM.DTL.OGY			0	7200.000	-7200.000	4	3	x	x	x	<input type="radio"/>
	Height Direction Unit	PRM.DTL.HOU	mm	0						x	x	x	<input type="radio"/>
			μm	1									
Judgment Conditions	Number of Labels: Upper Limit	PRM.DTL.N:HL			-	9999	0	4	0	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Number of Labels: Lower Limit	PRM.DTL.N:LL			-	9999	0	4	0	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Total Area: Upper Limit	PRM.DTL.TAR:HL			-	99999.9999	0.0000	5	4	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Total Area: Lower Limit	PRM.DTL.TAR:LL			-	99999.9999	0.0000	5	4	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
								No. of integer digits	No. of decimal places		
Judgment Conditions (continued)	Total Volume: Upper Limit	PRM.DTL.TVOL:HL		-	9999999.999 99	0.00000		7	5	<input type="radio"/>	<input type="radio"/>
	Total Volume: Lower Limit	PRM.DTL.TVOL:LL		-	9999999.999 99	0.00000		7	5	<input type="radio"/>	<input type="radio"/>
	Area: Upper Limit	PRM.DTL.AR:HL		-	99999.9999	0.0000		5	4	<input type="radio"/>	<input type="radio"/>
	Area: Lower Limit	PRM.DTL.AR:LL		-	99999.9999	0.0000		5	4	<input type="radio"/>	<input type="radio"/>
	Position X: Upper Limit	PRM.DTL.X:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>
	Position X: Lower Limit	PRM.DTL.X:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>
	Position Y: Upper Limit	PRM.DTL.Y:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>
	Position Y: Lower Limit	PRM.DTL.Y:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input type="radio"/>
	Perimeter: Upper Limit	PRM.DTL.CL:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Perimeter: Lower Limit	PRM.DTL.CL:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Feret X: Upper Limit	PRM.DTL.FX:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Feret X: Lower Limit	PRM.DTL.FX:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Feret Y: Upper Limit	PRM.DTL.FY:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Feret Y: Lower Limit	PRM.DTL.FY:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Roundness: Upper Limit	PRM.DTL.CD:HL		-	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>
	Roundness: Lower Limit	PRM.DTL.CD:LL		-	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>
	Rectangularity: Upper Limit	PRM.DTL.RTD:HL		-	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>
	Rectangularity: Lower Limit	PRM.DTL.RTD:LL		-	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>
	Major Axis Angle: Upper Limit	PRM.DTL.T:HL		-	180.000	-179.999		3	3	<input type="radio"/>	<input type="radio"/>
	Major Axis Angle: Lower Limit	PRM.DTL.T:LL		-	180.000	-179.999		3	3	<input type="radio"/>	<input type="radio"/>
	Major Axis: Upper Limit	PRM.DTL.MAA:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Major Axis: Lower Limit	PRM.DTL.MAA:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Minor Axis: Upper Limit	PRM.DTL.MIA:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Minor Axis: Lower Limit	PRM.DTL.MIA:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Axes Ratio: Upper Limit	PRM.DTL.RTO:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Axes Ratio: Lower Limit	PRM.DTL.RTO:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Oval Maj. Axis: Upper Limit	PRM.DTL.MAA2:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Oval Maj. Axis: Lower Limit	PRM.DTL.MAA2:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>
	Oval Min. Axis: Upper Limit	PRM.DTL.MIA2:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
								No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Judgment Conditions (continued)	Oval Min. Axis: Lower Limit	PRM.DTL.MIA2:LL		-	99999.999	0.000		5	3	<input checked="" type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
	Asp. Ratio: Upper Limit	PRM.DTL.RTO2:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Asp. Ratio: Lower Limit	PRM.DTL.RTO2:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Long Side: Upper Limit	PRM.DTL.MRLS:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Long Side: Lower Limit	PRM.DTL.MRLS:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Short Side: Upper Limit	PRM.DTL.MRSS:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Short Side: Lower Limit	PRM.DTL.MRSS:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Rectangle Axes Ratio: Upper Limit	PRM.DTL.MBRAx:HL		-	99999.999	0.000		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Rectangle Axes Ratio: Lower Limit	PRM.DTL.MBRAx:LL		-	99999.999	0.000		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Max. Height X: Upper Limit	PRM.DTL.MXX:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Max. Height X: Lower Limit	PRM.DTL.MXX:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Max. Height Y: Upper Limit	PRM.DTL.MXY:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Max. Height Y: Lower Limit	PRM.DTL.MXY:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Max. Height Z: Upper Limit	PRM.DTL.MXZ:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Max. Height Z: Lower Limit	PRM.DTL.MXZ:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Max. Height H: Upper Limit	PRM.DTL.MXH:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Max. Height H: Lower Limit	PRM.DTL.MXH:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Min. Height X: Upper Limit	PRM.DTL.MNX:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Min. Height X: Lower Limit	PRM.DTL.MNX:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Min. Height Y: Upper Limit	PRM.DTL.MNY:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Min. Height Y: Lower Limit	PRM.DTL.MNY:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Min. Height Z: Upper Limit	PRM.DTL.MNZ:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Min. Height Z: Lower Limit	PRM.DTL.MNZ:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Min. Height H: Upper Limit	PRM.DTL.MNH:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Min. Height H: Lower Limit	PRM.DTL.MNH:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Ave. Height Z: Upper Limit	PRM.DTL.AVHZ:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Ave. Height Z: Lower Limit	PRM.DTL.AVHZ:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Ave. Height H: Upper Limit	PRM.DTL.AVH:HL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>
	Ave. Height H: Lower Limit	PRM.DTL.AVH:LL		-	99999.999	-99999.999		5	3	<input type="radio"/>	<input checked="" type="radio"/>	x	<input type="radio"/>

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing			Unit properties
								No. of integer digits	No. of decimal places	User variable	System variable	Result data	
Judgment Conditions (continued)	Ave. Height H: Lower Limit	PRM.DTL.AVH:LL		-	99999.999	-99999.999	5	3	○ ○ x ○				
	Height: Upper Limit	PRM.DTL.BLZ:HL		-	99999.999	-99999.999	5	3	○ ○ x ○				
	Height: Lower Limit	PRM.DTL.BLZ:LL		-	99999.999	-99999.999	5	3	○ ○ x ○				
	Standard Dev. Z: Upper Limit	PRM.DTL.DVZ:HL		-	99999.999	0.000	5	3	○ ○ x ○				
	Standard Dev. Z: Lower Limit	PRM.DTL.DVZ:LL		-	99999.999	0.000	5	3	○ ○ x ○				
	Standard Dev. H: Upper Limit	PRM.DTL.DVH:HL		-	99999.999	0.000	5	3	○ ○ x ○				
	Standard Dev. H: Lower Limit	PRM.DTL.DVH:LL		-	99999.999	0.000	5	3	○ ○ x ○				
	Volume: Upper Limit	PRM.DTL.VOL:HL		-	9999999.999 99	0.00000	7	5	○ ○ x ○				
	Volume: Lower Limit	PRM.DTL.VOL:LL		-	9999999.999 99	0.00000	7	5	○ ○ x ○				
	Convex Volume: Upper Limit	PRM.DTL.CONV_VOL:HL		-	9999999.999 99	0.00000	7	5	○ ○ x ○				
	Convex Volume: Lower Limit	PRM.DTL.CONV_VOL:LL		-	9999999.999 99	0.00000	7	5	○ ○ x ○				
	Concave Volume: Upper Limit	PRM.DTL.CONC_VOL:HL		-	9999999.999 99	0.00000	7	5	○ ○ x ○				
	Concave Volume: Lower Limit	PRM.DTL.CONC_VOL:LL		-	9999999.999 99	0.00000	7	5	○ ○ x ○				
	Convex Area: Upper Limit	PRM.DTL.CONV_AR:HL		-	99999.9999	0.0000	5	4	○ ○ x ○				
	Convex Area: Lower Limit	PRM.DTL.CONV_AR:LL		-	99999.9999	0.0000	5	4	○ ○ x ○				
	Concave Area: Upper Limit	PRM.DTL.CONC_AR:HL		-	99999.9999	0.0000	5	4	○ ○ x ○				
	Concave Area: Lower Limit	PRM.DTL.CONC_AR:LL		-	99999.9999	0.0000	5	4	○ ○ x ○				
	Valid Pix. Count: Upper Limit	PRM.DTL.EPA:HL		-	9999999	0	7	0	○ ○ x ○				
	Valid Pix. Count: Lower Limit	PRM.DTL.EPA:LL		-	9999999	0	7	0	○ ○ x ○				
	X Slope: Upper Limit	PRM.DTL.DPPA:HL		-	99.999999	-99.999999	2	6	○ ○ x ○				
	X Slope: Lower Limit	PRM.DTL.DPPA:LL		-	99.999999	-99.999999	2	6	○ ○ x ○				
	Y Slope: Upper Limit	PRM.DTL.DPPB:HL		-	99.999999	-99.999999	2	6	○ ○ x ○				
	Y Slope: Lower Limit	PRM.DTL.DPPB:LL		-	99.999999	-99.999999	2	6	○ ○ x ○				
	Z Intercept: Upper Limit	PRM.DTL.DPPC:HL		-	999.999	-999.999	3	3	○ ○ x ○				
	Z Intercept: Lower Limit	PRM.DTL.DPPC:LL		-	999.999	-999.999	3	3	○ ○ x ○				
	Plane Angle: Upper Limit	PRM.DTL.DPPT:HL		-	90.000	-90.000	2	3	○ ○ x ○				
	Plane Angle: Lower Limit	PRM.DTL.DPPT:LL		-	90.000	-90.000	2	3	○ ○ x ○				

List of setting parameters

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Measured Value Correction: Height	Correction Method	PRM.DTL.BLZ:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.BLZ:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.BLZ:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.BLZ:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.BLZ:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Offset	PRM.DTL.BLZ:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Coefficient A	PRM.DTL.BLZ:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Coefficient B	PRM.DTL.BLZ:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○	
Measured Value Correction: Volume	Correction Method	PRM.DTL.VOL:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.VOL:CRPR1		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.VOL:CRPO1		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.VOL:CRPR2		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.VOL:CRPO2		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction Coefficient: Offset	PRM.DTL.VOL:CRCO		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction Coefficient: Coefficient A	PRM.DTL.VOL:CRCA		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction Coefficient: Coefficient B	PRM.DTL.VOL:CRCB		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
Measured Value Correction: Area	Correction Method	PRM.DTL.AR:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.AR:CRPR1		0	99999.9999	-99999.9999	5	4	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.AR:CRPO1		0	99999.9999	-99999.9999	5	4	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.AR:CRPR2		0	99999.9999	-99999.9999	5	4	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.AR:CRPO2		0	99999.9999	-99999.9999	5	4	x	x	x	○	
	Correction Coefficient: Offset	PRM.DTL.AR:CRCO		0	99999.9999	-99999.9999	5	4	x	x	x	○	

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing			Unit properties
				Value	Initial value						User variable	System variable	Result data	
Measured Value Correction: Area (continued)	Correction Coefficient: Coefficient A	PRM.DTL.AR:CRCA		0	99999.9999	-99999.9999			5	4	x	x	x	○
	Correction Coefficient: Coefficient B	PRM.DTL.AR:CRCB		0	99999.9999	-99999.9999	5	4	x	x	x	x		○
Measured Value Correction: Feret X	Correction Method	PRM.DTL.FX:CRMD	1-point Correction	0							x	x	x	○
			2-point Correction	1										
	Correction 1 Before Correction	PRM.DTL.FX:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction 1 After Correction	PRM.DTL.FX:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction 2 Before Correction	PRM.DTL.FX:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction 2 After Correction	PRM.DTL.FX:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction Coefficient: Offset	PRM.DTL.FX:CRCO		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction Coefficient: Coefficient A	PRM.DTL.FX:CRCA		0	99999.999	-99999.999	5	3	x	x	x	x		○
Measured Value Correction: Feret Y	Correction Coefficient: Coefficient B	PRM.DTL.FX:CRCB		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction Method	PRM.DTL.FY:CRMD	1-point Correction	0							x	x	x	○
			2-point Correction	1										
	Correction 1 Before Correction	PRM.DTL.FY:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction 1 After Correction	PRM.DTL.FY:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction 2 Before Correction	PRM.DTL.FY:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction 2 After Correction	PRM.DTL.FY:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction Coefficient: Offset	PRM.DTL.FY:CRCO		0	99999.999	-99999.999	5	3	x	x	x	x		○
Measured Value Correction: Long Side	Correction Coefficient: Coefficient A	PRM.DTL.FY:CRCA		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction Coefficient: Coefficient B	PRM.DTL.FY:CRCB		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction Method	PRM.DTL.MRLS:CRMD	1-point Correction	0							x	x	x	○
			2-point Correction	1										
	Correction 1 Before Correction	PRM.DTL.MRLS:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	x		○
Measured Value Correction: Short Side	Correction 1 After Correction	PRM.DTL.MRLS:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction 2 Before Correction	PRM.DTL.MRLS:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	x		○
	Correction 2 After Correction	PRM.DTL.MRLS:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	x		○

List of setting parameters

Category	Setting item	Name	Label	Selection			Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable
Measured Value Correction: Long Side (continued)	Correction 2 After Correction	PRM.DTL.MRLS:CRPO2		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Offset	PRM.DTL.MRLS:CRCO		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient A	PRM.DTL.MRLS:CRCA		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient B	PRM.DTL.MRLS:CRCB		0	99999.999	-99999.999	5	3	x	x	x
Measured Value Correction: Short Side	Correction Method	PRM.DTL.MRSS:CRMD	1-point Correction	0						x	x
			2-point Correction	1						x	x
	Correction 1 Before Correction	PRM.DTL.MRSS:CRPR1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 1 After Correction	PRM.DTL.MRSS:CRPO1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 Before Correction	PRM.DTL.MRSS:CRPR2		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 After Correction	PRM.DTL.MRSS:CRPO2		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Offset	PRM.DTL.MRSS:CRCO		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient A	PRM.DTL.MRSS:CRCA		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient B	PRM.DTL.MRSS:CRCB		0	99999.999	-99999.999	5	3	x	x	x
Measured Value Correction: Major Axis	Correction Method	PRM.DTL.MAA:CRMD	1-point Correction	0						x	x
			2-point Correction	1						x	x
	Correction 1 Before Correction	PRM.DTL.MAA:CRPR1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 1 After Correction	PRM.DTL.MAA:CRPO1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 Before Correction	PRM.DTL.MAA:CRPR2		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 After Correction	PRM.DTL.MAA:CRPO2		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Offset	PRM.DTL.MAA:CRCO		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient A	PRM.DTL.MAA:CRCA		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient B	PRM.DTL.MAA:CRCB		0	99999.999	-99999.999	5	3	x	x	x
Measured Value Correction: Minor Axis	Correction Method	PRM.DTL.MIA:CRMD	1-point Correction	0						x	x
			2-point Correction	1						x	x
	Correction 1 Before Correction	PRM.DTL.MIA:CRPR1		0	99999.999	-99999.999	5	3	x	x	x

Category	Setting item	Name	Label	Selection			Numerical value format	Referencing			Unit properties
				Value	Initial value	Upper limit		No. of integer digits	No. of decimal places	User variable	
Measured Value Correction: Minor Axis (continued)	Correction 1 After Correction	PRM.DTL.MIA:CRPO1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 Before Correction	PRM.DTL.MIA:CRPR2		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 After Correction	PRM.DTL.MIA:CRPO2		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Offset	PRM.DTL.MIA:CRCO		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient A	PRM.DTL.MIA:CRCA		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient B	PRM.DTL.MIA:CRCB		0	99999.999	-99999.999	5	3	x	x	x
Measured Value Correction: Equivalent Oval (Major Axis)	Correction Method	PRM.DTL.MAA2:CRMD	1-point Correction	0						x	x
			2-point Correction	1						x	x
	Correction 1 Before Correction	PRM.DTL.MAA2:CRPR1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 1 After Correction	PRM.DTL.MAA2:CRPO1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 Before Correction	PRM.DTL.MAA2:CRPR2		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 After Correction	PRM.DTL.MAA2:CRPO2		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Offset	PRM.DTL.MAA2:CRCO		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient A	PRM.DTL.MAA2:CRCA		0	99999.999	-99999.999	5	3	x	x	x
Measured Value Correction: Equivalent Oval (Minor Axis)	Correction Method	PRM.DTL.MIA2:CRMD	1-point Correction	0						x	x
			2-point Correction	1						x	x
	Correction 1 Before Correction	PRM.DTL.MIA2:CRPR1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 1 After Correction	PRM.DTL.MIA2:CRPO1		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 Before Correction	PRM.DTL.MIA2:CRPR2		0	99999.999	-99999.999	5	3	x	x	x
	Correction 2 After Correction	PRM.DTL.MIA2:CRPO2		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Offset	PRM.DTL.MIA2:CRCO		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient A	PRM.DTL.MIA2:CRCA		0	99999.999	-99999.999	5	3	x	x	x
	Correction Coefficient: Coefficient B	PRM.DTL.MIA2:CRCB		0	99999.999	-99999.999	5	3	x	x	x

List of setting parameters

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Measured Value Correction: Perimeter	Correction Method	PRM.DTL.CL:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.CL:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.CL:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.CL:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.CL:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Offset	PRM.DTL.CL:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Coefficient A	PRM.DTL.CL:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○	
Measured Value Correction: Position X	Correction Coefficient: Coefficient B	PRM.DTL.CL:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Method	PRM.DTL.X:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.X:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.X:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.X:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.X:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Offset	PRM.DTL.X:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○	
Measured Value Correction: Position Y	Correction Coefficient: Coefficient A	PRM.DTL.X:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Coefficient B	PRM.DTL.X:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Method	PRM.DTL.Y:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.Y:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.Y:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.Y:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.Y:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○	
Measured Value Correction: Position Z	Correction Coefficient: Offset	PRM.DTL.Y:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○	

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Referencing			Unit properties
				Value	Initial value						User variable	System variable	Result data	
Measured Value Correction: Position Y (continued)	Correction Coefficient: Coefficient A	PRM.DTL.Y:CRCA		0	99999.999	-99999.999			5	3	x	x	x	O
	Correction Coefficient: Coefficient B	PRM.DTL.Y:CRCB		0	99999.999	-99999.999			5	3	x	x	x	O
Measured Value Correction: Max. Height X	Correction Method	PRM.DTL.MXX:CRMD	1-point Correction	0							x	x	x	O
			2-point Correction	1										
	Correction 1 Before Correction	PRM.DTL.MXX:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction 1 After Correction	PRM.DTL.MXX:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction 2 Before Correction	PRM.DTL.MXX:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction 2 After Correction	PRM.DTL.MXX:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction Coefficient: Offset	PRM.DTL.MXX:CRCO		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction Coefficient: Coefficient A	PRM.DTL.MXX:CRCA		0	99999.999	-99999.999	5	3	x	x	x	x		O
Measured Value Correction: Max. Height Y	Correction Coefficient: Coefficient B	PRM.DTL.MXX:CRCB		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction Method	PRM.DTL.MXY:CRMD	1-point Correction	0							x	x	x	O
			2-point Correction	1										
	Correction 1 Before Correction	PRM.DTL.MXY:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction 1 After Correction	PRM.DTL.MXY:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction 2 Before Correction	PRM.DTL.MXY:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction 2 After Correction	PRM.DTL.MXY:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction Coefficient: Offset	PRM.DTL.MXY:CRCO		0	99999.999	-99999.999	5	3	x	x	x	x		O
Measured Value Correction: Max. Height Z	Correction Coefficient: Coefficient A	PRM.DTL.MXY:CRCA		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction Coefficient: Coefficient B	PRM.DTL.MXY:CRCB		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction Method	PRM.DTL.MXZ:CRMD	1-point Correction	0							x	x	x	O
			2-point Correction	1										
	Correction 1 Before Correction	PRM.DTL.MXZ:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	x		O
Measured Value Correction: Max. Height Z	Correction 1 After Correction	PRM.DTL.MXZ:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction 2 Before Correction	PRM.DTL.MXZ:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	x		O
	Correction 2 After Correction	PRM.DTL.MXZ:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	x		O

List of setting parameters

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Measured Value Correction: Max. Height Z (continued)	Correction 2 After Correction	PRM.DTL.MXZ:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Offset	PRM.DTL.MXZ:CRCO		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Coefficient A	PRM.DTL.MXZ:CRCA		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Coefficient B	PRM.DTL.MXZ:CRCB		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
Measured Value Correction: Max. Height H	Correction Method	PRM.DTL.MXH:CRMD	1-point Correction	0					x	x	x	<input type="radio"/>
			2-point Correction	1								
	Correction 1 Before Correction	PRM.DTL.MXH:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction 1 After Correction	PRM.DTL.MXH:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction 2 Before Correction	PRM.DTL.MXH:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction 2 After Correction	PRM.DTL.MXH:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Offset	PRM.DTL.MXH:CRCO		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Coefficient A	PRM.DTL.MXH:CRCA		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Coefficient B	PRM.DTL.MXH:CRCB		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
Measured Value Correction: Ave. Height Z	Correction Method	PRM.DTL.AVHZ:CRMD	1-point Correction	0					x	x	x	<input type="radio"/>
			2-point Correction	1								
	Correction 1 Before Correction	PRM.DTL.AVHZ:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction 1 After Correction	PRM.DTL.AVHZ:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction 2 Before Correction	PRM.DTL.AVHZ:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction 2 After Correction	PRM.DTL.AVHZ:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Offset	PRM.DTL.AVHZ:CRCO		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Coefficient A	PRM.DTL.AVHZ:CRCA		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
	Correction Coefficient: Coefficient B	PRM.DTL.AVHZ:CRCB		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>
Measured Value Correction: Ave. Height H	Correction Method	PRM.DTL.AVH:CRMD	1-point Correction	0					x	x	x	<input type="radio"/>
			2-point Correction	1								
	Correction 1 Before Correction	PRM.DTL.AVH:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	<input type="radio"/>

Category	Setting item	Name	Label	Selection			Numerical value format	Referencing	Unit properties
				Value	Initial value	Upper limit			
Measured Value Correction: Ave. Height H (continued)	Correction 1 After Correction	PRM.DTL.AVH:CRPO1		0	99999.999	-99999.999	5	3	x x x o
	Correction 2 Before Correction	PRM.DTL.AVH:CRPR2		0	99999.999	-99999.999	5	3	x x x o
	Correction 2 After Correction	PRM.DTL.AVH:CRPO2		0	99999.999	-99999.999	5	3	x x x o
	Correction Coefficient: Offset	PRM.DTL.AVH:CRCO		0	99999.999	-99999.999	5	3	x x x o
	Correction Coefficient: Coefficient A	PRM.DTL.AVH:CRCA		0	99999.999	-99999.999	5	3	x x x o
	Correction Coefficient: Coefficient B	PRM.DTL.AVH:CRCB		0	99999.999	-99999.999	5	3	x x x o
Measured Value Correction: Min. Height X	Correction Method	PRM.DTL.MNX:CRMD	1-point Correction	0				x x x o	
			2-point Correction	1					
	Correction 1 Before Correction	PRM.DTL.MNX:CRPR1		0	99999.999	-99999.999	5	3	x x x o
	Correction 1 After Correction	PRM.DTL.MNX:CRPO1		0	99999.999	-99999.999	5	3	x x x o
	Correction 2 Before Correction	PRM.DTL.MNX:CRPR2		0	99999.999	-99999.999	5	3	x x x o
	Correction 2 After Correction	PRM.DTL.MNX:CRPO2		0	99999.999	-99999.999	5	3	x x x o
	Correction Coefficient: Offset	PRM.DTL.MNX:CRCO		0	99999.999	-99999.999	5	3	x x x o
	Correction Coefficient: Coefficient A	PRM.DTL.MNX:CRCA		0	99999.999	-99999.999	5	3	x x x o
Measured Value Correction: Min. Height Y	Correction Method	PRM.DTL.MNY:CRMD	1-point Correction	0				x x x o	
			2-point Correction	1					
	Correction 1 Before Correction	PRM.DTL.MNY:CRPR1		0	99999.999	-99999.999	5	3	x x x o
	Correction 1 After Correction	PRM.DTL.MNY:CRPO1		0	99999.999	-99999.999	5	3	x x x o
	Correction 2 Before Correction	PRM.DTL.MNY:CRPR2		0	99999.999	-99999.999	5	3	x x x o
	Correction 2 After Correction	PRM.DTL.MNY:CRPO2		0	99999.999	-99999.999	5	3	x x x o
	Correction Coefficient: Offset	PRM.DTL.MNY:CRCO		0	99999.999	-99999.999	5	3	x x x o
	Correction Coefficient: Coefficient A	PRM.DTL.MNY:CRCA		0	99999.999	-99999.999	5	3	x x x o
	Correction Coefficient: Coefficient B	PRM.DTL.MNY:CRCB		0	99999.999	-99999.999	5	3	x x x o

List of setting parameters

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Measured Value Correction: Min. Height Z	Correction Method	PRM.DTL.MNZ:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.MNZ:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.MNZ:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.MNZ:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.MNZ:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Offset	PRM.DTL.MNZ:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Coefficient A	PRM.DTL.MNZ:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Coefficient B	PRM.DTL.MNZ:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○	
										x	x	x	○
Measured Value Correction: Min. Height H	Correction Method	PRM.DTL.MNH:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.MNH:CRPR1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.MNH:CRPO1		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.MNH:CRPR2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.MNH:CRPO2		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Offset	PRM.DTL.MNH:CRCO		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Coefficient A	PRM.DTL.MNH:CRCA		0	99999.999	-99999.999	5	3	x	x	x	○	
	Correction Coefficient: Coefficient B	PRM.DTL.MNH:CRCB		0	99999.999	-99999.999	5	3	x	x	x	○	
										x	x	x	○
Measured Value Correction: Concave Volume	Correction Method	PRM.DTL.CONC_VOL:CRMD	1-point Correction	0						x	x	x	○
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.CONC_VOL:CRPR1		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction 1 After Correction	PRM.DTL.CONC_VOL:CRPO1		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction 2 Before Correction	PRM.DTL.CONC_VOL:CRPR2		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction 2 After Correction	PRM.DTL.CONC_VOL:CRPO2		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	
	Correction Coefficient: Offset	PRM.DTL.CONC_VOL:CRCO		0	9999999.99999	-9999999.99999	7	5	x	x	x	○	

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing	Unit properties
				Value	Initial value								
Measured Value Correction: Concave Volume (continued)	Correction Coefficient: Coefficient A	PRM.DTL.CONC_VOL:CRCA		0	9999999.99999	-9999999.99999	7	5	x	x	x	O	
	Correction Coefficient: Coefficient B	PRM.DTL.CONC_VOL:CRCB		0	9999999.99999	-9999999.99999	7	5	x	x	x	O	
Measured Value Correction: Convex Volume	Correction Method	PRM.DTL.CONV_VOL:CRMD	1-point Correction	0							x	x	x
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.CONV_VOL:CRPR1		0	9999999.99999	-9999999.99999	7	5	x	x	x	O	
	Correction 1 After Correction	PRM.DTL.CONV_VOL:CRPO1		0	9999999.99999	-9999999.99999	7	5	x	x	x	O	
	Correction 2 Before Correction	PRM.DTL.CONV_VOL:CRPR2		0	9999999.99999	-9999999.99999	7	5	x	x	x	O	
	Correction 2 After Correction	PRM.DTL.CONV_VOL:CRPO2		0	9999999.99999	-9999999.99999	7	5	x	x	x	O	
	Correction Coefficient: Offset	PRM.DTL.CONV_VOL:CRCO		0	9999999.99999	-9999999.99999	7	5	x	x	x	O	
	Correction Coefficient: Coefficient A	PRM.DTL.CONV_VOL:CRCA		0	9999999.99999	-9999999.99999	7	5	x	x	x	O	
Measured Value Correction: Concave Area	Correction Method	PRM.DTL.CONC_AR:CRMD	1-point Correction	0							x	x	x
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.CONC_AR:CRPR1		0	9999.9999	-9999.9999	5	4	x	x	x	O	
	Correction 1 After Correction	PRM.DTL.CONC_AR:CRPO1		0	9999.9999	-9999.9999	5	4	x	x	x	O	
	Correction 2 Before Correction	PRM.DTL.CONC_AR:CRPR2		0	9999.9999	-9999.9999	5	4	x	x	x	O	
	Correction 2 After Correction	PRM.DTL.CONC_AR:CRPO2		0	9999.9999	-9999.9999	5	4	x	x	x	O	
	Correction Coefficient: Offset	PRM.DTL.CONC_AR:CRCO		0	9999.9999	-9999.9999	5	4	x	x	x	O	
	Correction Coefficient: Coefficient A	PRM.DTL.CONC_AR:CRCA		0	9999.9999	-9999.9999	5	4	x	x	x	O	
Measured Value Correction: Convex Area	Correction Method	PRM.DTL.CONV_AR:CRMD	1-point Correction	0							x	x	x
			2-point Correction	1									
	Correction 1 Before Correction	PRM.DTL.CONV_AR:CRPR1		0	9999.9999	-9999.9999	5	4	x	x	x	O	
	Correction 1 After Correction	PRM.DTL.CONV_AR:CRPO1		0	9999.9999	-9999.9999	5	4	x	x	x	O	
	Correction 2 Before Correction	PRM.DTL.CONV_AR:CRPR2		0	9999.9999	-9999.9999	5	4	x	x	x	O	

Category	Setting item	Name	Label	Selection			Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable
Measured Value	Correction 2 After Correction	PRM.DTL.CONV_AR:CRPO2		0	99999.9999	-99999.9999		5	4	x	x
Correction: Convex Area	Correction Coefficient: Offset	PRM.DTL.CONV_AR:CRCO		0	99999.9999	-99999.9999		5	4	x	x
(continued)	Correction Coefficient: Coefficient A	PRM.DTL.CONV_AR:CRCA		0	99999.9999	-99999.9999		5	4	x	x
	Correction Coefficient: Coefficient B	PRM.DTL.CONV_AR:CRCB		0	99999.9999	-99999.9999		5	4	x	x

Branch Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
				Value					No. of integer digits	No. of decimal places	
Branch setting	Reference value	PRM.DTL.EVAL		0.0		999999999.999	-999999999.999	9	3	<input type="radio"/>	<input type="radio"/>
	Forced branch execution	PRM.DTL.FSO	ON (Loop)	3					X	X	<input type="checkbox"/>
			ON (Fixed)	2							<input type="radio"/>
			ON (Fixed During Re-test Only)	1							<input type="radio"/>
			OFF	0							<input type="radio"/>
	Forced branch	PRM.DTL.FSN		1	64	1	2	0	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
	Number of branches	PRM.DTL.BN		2	64	2	2	0	X	X	<input type="checkbox"/>
	Condition	PRM.DTL.CASE[0]		100000000.000	999999999.999	-999999999.999	9	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Join Unit

There are no setting parameters specific to the Join unit.

Loop Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
				Value					No. of integer digits	No. of decimal places	
Condition setting	Number of loops to process	PRM.DTL.TMS		1		9999999	0	0	7	0	<input type="radio"/>

Loop End Unit

There are no setting parameters specific to the Loop End unit.

Break Unit

There are no setting parameters specific to the Break unit.

Start Unit

The are no setting parameters specific to the Start unit.

End Unit

There are no setting parameters specific to the End unit.

Calculation Unit

Category	Setting item	Name	Label	Value	Initial value	Upper limit	Lower limit	Numerical value format		Referencing
								No. of integer digits	No. of decimal places	
Calculation setting	Calculation script	PRM.DTL.MTX			Character string up to 5000 bytes				<input type="radio"/>	<input type="radio"/>
	Calculation result: Upper limit	PRM.DTL.ANS:HL		-	9999999.999	-9999999.999	7	3	<input type="radio"/>	<input type="radio"/>
	Calculation result: Lower limit	PRM.DTL.ANS:LL		-	9999999.999	-9999999.999	7	3	<input type="radio"/>	<input type="radio"/>
	Timeout period	PRM.DTL.MTO		1.0	600.0	1.0	3	1	<input checked="" type="radio"/>	<input type="radio"/>

Group Judgment Unit (Start)

There are no setting parameters specific to the Group Judgment Unit (Start).

Group Judgment Unit (End)

There are no setting parameters specific to the Group Judgment Unit (END).

Image Operation Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	No. of integer digits No. of decimal places	Numerical value format	Referencing			
				Value							User variable	System variable	Result data	Unit properties
Source image 1: Image setting	Image selection	PRM.IMGS1.URIMG	Registered image	1							X	X	X	O
			Current image	0										
	Use image array	PRM.IMGS1.UAIMG	Enable	1							X	X	X	O
			Disable	0										
	No. of images	PRM.IMGS1.IMGN		2		32	2	2	2 0	X X X O				
	Camera No.	PRM.IMGS1.CNO	1	1							X	X	X	O
			2	2										
			3	3										
			4	4										
	Registered image No.	PRM.IMGS1.RIMG		0		999	0	3	3 0	X X X O				
Operation setting	Assign variable for registered image No.	PRM.IMGS1.UVR	Enable	1							X	X	X	O
			Disable	0										
	Numerical variable	PRM.IMGS1.RIREF									O	O	X	O
	Process variable only when changing programs	PRM.IMGS1.UPEN	Enable	1							X	X	X	O
			Disable	0										
	Registered image type	PRM.IMGS1.RIMG_TYP	Gray	0							X	X	X	O
			Color	1										
			MultiSpectrum	2										
			Height	3										
	Use an image captured in MultiSpectrum mode	PRM.IMGS1.MSEXT_EN	Enable	1							X	X	X	O
			Disable	0										
Operation type	MultiSpectrum image setting	PRM.IMGS1.MSEXT_IMG												
	Image combination	PRM.DTL.USIMG	Source image 1, Source image 2	1							X	X	X	O
			Source Image 1	0										
			None	0							X	X	X	O
			Add	55										
			Subtract	56										
			Absolute Difference	57										
			Average	60										
			Multiply (with normalization)	67										
			Multiply (without normalization)	53										
			Maximum	58										
			Minimum	59										
			AND	61										
			OR	63										
			XOR	65										
			NAND	62										
			NOR	64										
			XNOR	66										

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Operation setting (continued)	Image array operation	PRM.DTL.CPSM	None	0	1.000	64.000	0.000	2	3	X	X	X	O
			Add	55									
			Average	60									
			Multiply (Normalized)	67									
			Multiply	53									
			Maximum	58									
			Minimum	59									
			AND	61									
			OR	63									
			XOR	65									
			NAND	62									
			NOR	64									
			XNOR	66									
	Gain	PRM.DTL.AOGN								O	O	X	O
	Shift	PRM.DTL.AOSH								O	O	X	O
Result image setting	Output image coordinates axis	PRM.DTL.PAIF	No position adjustment	0	0	510	-510	3	0	X	X	X	O
			Position adjusted (Source image 1)	1									
			Position adjusted (Source image 2)	2									
	Outside image region	PRM.DTL.BPTYP	Fill	0				0	O	O	O	X	O
			Extend image	1									
	Fill intensity	PRM.DTL.OVAL						3	0	O	O	X	O
	Image selection	PRM.IMGS2.URIMG	Registered image	1	0	255	0	3	0	X	X	X	O
			Current image	0									
	Use image array	PRM.IMGS2.UAIMG	Enable	1	1	2	3	0	X	X	X	X	O
			Disable	0									
Source image 2: Image setting	No. of images	PRM.IMGS2.IMGN			2	32	2	2	0	X	X	X	O
	Camera No.	PRM.IMGS2.CNO	1	1						X	X	X	O
			2	2	2	3	3	0	X				
			3	3									
			4	4									
	Registered image No.	PRM.IMGS2.RIMG			0	999	0	3	0	X	X	X	O
	Assign variable for registered image No.	PRM.IMGS2.UVR	Enable	1						X	X	X	O
			Disable	0	1	2	3	0	X				
	Numerical variable	PRM.IMGS2.RIREF								O	O	X	O
	Process variable only when changing programs	PRM.IMGS2.UOPEN	Enable	1	1	2	3	0	X	X	X	X	O
	Registered image type	PRM.IMGS2.RIMG_TYP	Gray	0						X	X	X	O
			Color	1	2	3	4	0	X				
			MultiSpectrum	2									
			Height	3									
MultiSpectrum image setting	Use an image captured in MultiSpectrum mode	PRM.IMGS2.MSEXT_EN	Enable	1	1	2	3	0	X	X	X	X	O
	MultiSpectrum image setting	PRM.IMGS2.MSEXT_IMG	Disable	0									

Image Conversion Setting (Image Operation Unit: Source Image 1)

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing		
				Value	No. of integer digits No. of decimal places				User variable	System variable	Result data	Unit properties	
Source image 1: Common to all conversion types	Position Adjustment ID	PRM.TRNS1.PUID	-	999	0				X	X	X	O	
Source image 1: Conversion 0	Conversion type	PRM.TRNS1[0].TTYP	None	0					X	X	X	O	
			Add	32									
			Subtract	33									
			Absolute Difference	34									
			Multiply	28									
			Rotate / Translate	43									
			Zoom	52									
			Trapezoid correction	17									
			Pixel value conversion	49									
			Blob	50									
			NOT	35									
			AND	36									
			OR	38									
			XOR	40									
			NAND	37									
			NOR	39									
			XNOR	41									
			Right bit shift	30									
			Left bit shift	31									
Source image 1: Conversion 0: Add	Parameter	PRM.TRNS1[0].TPRMI	0	255	0	3	0	0	0	X	O		
	Count	PRM.TRNS1[0].TTMS	1	1	0	1	0	0	0	X	O		
Source image 1: Conversion 0: Subtract	Parameter	PRM.TRNS1[0].TPRMI	0	255	0	3	0	0	0	X	O		
	Count	PRM.TRNS1[0].TTMS	1	1	0	1	0	0	0	X	O		
Source image 1: Conversion 0: Absolute Difference	Parameter	PRM.TRNS1[0].TPRMI	0	255	0	3	0	0	0	X	O		
	Count	PRM.TRNS1[0].TTMS	1	1	0	1	0	0	0	X	O		
Source image 1: Conversion 0: Multiply	Parameter	PRM.TRNS1[0].TPRMD	1.000	255.000	0.000	3	3	0	0	X	O		
	Count	PRM.TRNS1[0].TTMS	1	1	0	1	0	0	0	X	O		
Source image 1: Conversion 0: Rotate / Translate	Rotation center XY	PRM.TRNS1[0].AFCXY				5	0	0	X	X	O		
	Rotation center X	PRM.TRNS1[0].AFCX	0	16383	-16383	5	0	0	0	X	O		
	Rotation center Y	PRM.TRNS1[0].AFCY	0	16383	-16383	5	0	0	0	X	O		
	Rotation angle	PRM.TRNS1[0].AFT	0.000	359.999	0.000	3	3	0	0	X	O		
	Translation shift XY	PRM.TRNS1[0].AFSXY				4	3	0	X	X	O		
	Translation shift X	PRM.TRNS1[0].AFSX	0.000	9600.000	-9600.000	4	3	0	0	X	O		
	Translation shift Y	PRM.TRNS1[0].AFSY	0.000	7200.000	-7200.000	4	3	0	0	X	O		
	Use interpolation	PRM.TRNS1[0].AFIP	Enable	1						X	X	O	
			Disable	0									
Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	0	0	X	O		

Category	Setting item	Name	Label	Selection			Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable
Source image 1: Conversion 0: Zoom	Zoom ratio X	PRM.TRNS1[0].ZMMGX		100	2500	16		4	0	O	O
	Zoom ratio Y	PRM.TRNS1[0].ZMMGY		100	2500	16		4	0	O	O
	Zoom center XY	PRM.TRNS1[0].ZMCXY						4	0	O	X
	Zoom center X	PRM.TRNS1[0].ZMCX		0	9600	-9600		4	0	O	O
	Zoom center Y	PRM.TRNS1[0].ZMCY		0	7200	-7200		4	0	O	O
	Count	PRM.TRNS1[0].TTMS		1	1	0		1	0	O	X
Source image 1: Conversion 0: Trapezoid correction	Shape before adjustment	PRM.TRNS1[0].SRCSHP								X	X
	Enable region	PRM.TRNS1[0].SRGNEN								X	X
	When the shape before adjustment is "User set"										O
	Point XY	PRM.TRNS1[0].SRCPXY[*]						5	0	O	X
	Point X	PRM.TRNS1[0].SRCPX[*]		331	16383	-16383		5	0	O	X
	Point Y	PRM.TRNS1[0].SRCPY[*]		337	16383	-16383		5	0	O	X
	Shape after adjustment	PRM.TRNS1[0].DSTSHP								X	X
	Enable region	PRM.TRNS1[0].DRGNEN								X	X
	When the shape after adjustment is "Rectangle"										O
	Upper left XY	PRM.TRNS1[0].DSTLUXY						5	0	O	X
	Upper left X	PRM.TRNS1[0].DSTLUX		160	16383	0		5	0	O	X
	Upper left Y	PRM.TRNS1[0].DSTLUY		160	16383	0		5	0	O	X
	Lower right XY	PRM.TRNS1[0].DSTRDXY						5	0	O	X
	Lower right X	PRM.TRNS1[0].DSTRDX		360	16383	0		5	0	O	X
	Lower right Y	PRM.TRNS1[0].DSTRDY		320	16383	0		5	0	O	X
	When the shape after adjustment is "User set"										O
Source image 1: Conversion 0: Pixel Value Conversion	Point XY	PRM.TRNS1[0].DSTPXY[*]						5	0	O	X
	Point X	PRM.TRNS1[0].DSTPX[*]		331	16383	-16383		5	0	O	X
	Point Y	PRM.TRNS1[0].DSTPY[*]		337	16383	-16383		5	0	O	X
	Use interpolation	PRM.TRNS1[0].ENITP	Enable	1						X	X
			Disable	0							O
	Count	PRM.TRNS1[0].TTMS		1	1	0		1	0	O	X
	Target pixel maximum value	PRM.TRNS1[0].SPV:HL		0	255	0		3	0	O	X
	Target pixel minimum value	PRM.TRNS1[0].SPV:LL		0	255	0		3	0	O	X
	Conversion range	PRM.TRNS1[0].INVT	Within the limits	0						X	X
			Beyond the limits	1							O
Pixel value after conversion	Pixel value after conversion	PRM.TRNS1[0].DPV		0	255	0		3	0	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0		1	0	O	X

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data
Source image 1: Conversion 0: Blob	Detect	PRM.TRNS1[0].DC	White	255						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Black	0								
	Count	PRM.TRNS1[0].DBN		30	9999	1		4	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Fill holes	PRM.TRNS1[0].FILL	OFF	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			ON	1								
	Active border	PRM.TRNS1[0].CAN	OFF	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			ON	1								
	Primary target specification	PRM.TRNS1[0].LBS	All	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Specified	1								
	Primary target	PRM.TRNS1[0].LLBS		0	9998	0		4	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Detection order	Detection order	PRM.TRNS1[0].LOD	Y>X: Ascend	5						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			X>Y: Ascend	6								
			X:Ascend	1								
			X:Descend	2								
			Y:Ascend	3								
			Y:Descend	4								
			Area:Ascend	14								
			Area:Descend	13								
			Roundness:	16								
			Ascend									
Pixel value after conversion: Detected color	Starting angle	PRM.TRNS1[0].STA		0.000	359.999	0.000		3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					255	255	0	3	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Pixel value after conversion: Background color	PRM.TRNS1[0].COBC		0	255	0		3	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Count	PRM.TRNS1[0].TTMS		1	1	0		1	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Area filter	PRM.TRNS1[0].ARI_EN	Disable	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Enable	1								
	Roundness filter	PRM.TRNS1[0].CIR_EN	Disable	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Enable	1								
	Major axis filter	PRM.TRNS1[0].MAA_EN	Disable	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Enable	1								
Axes ratio filter	Axes ratio filter	PRM.TRNS1[0].RTO_EN	Disable	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Enable	1								
	Distributed oval filter	PRM.TRNS1[0].MAA2_EN	Disable	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Enable	1								
	Aspect ratio filter	PRM.TRNS1[0].RTO2_EN	Disable	0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
			Enable	1								
	Area filter: Maximum	PRM.TRNS1[0].ARI_THRE_S:HL		99999999	99999999	0		8	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
					100	99999999	0	8	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Roundness filter: Maximum	PRM.TRNS1[0].CIR_THRE_S:HL		1.000	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Roundness filter: Minimum	PRM.TRNS1[0].CIR_THRE_S:LL		0.000	1.000	0.000		1	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Major axis filter: Maximum	Major axis filter: Maximum	PRM.TRNS1[0].MAA_THR_ES:HL		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Major axis filter: Minimum	PRM.TRNS1[0].MAA_THR_ES:LL		0.000	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Axes ratio filter: Maximum	PRM.TRNS1[0].RTO_THR_ES:HL		99999.999	99999.999	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing		
				Value	Initial value	Upper limit			Numerical value format	User variable	System variable
Source image 1: Conversion 0: Blob (continued)	Axes ratio filter: Minimum	PRM.TRNS1[0].RTO_THR_ES:LL		0.000	99999.999	0.000	5	3	O	O	X
	Distributed oval filter: Maximum	PRM.TRNS1[0].MAA2_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	O
	Distributed oval filter: Minimum	PRM.TRNS1[0].MAA2_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X
	Aspect ratio filter: Maximum	PRM.TRNS1[0].RTO2_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X
	Aspect ratio filter: Minimum	PRM.TRNS1[0].RTO2_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X
Source image 1: Conversion 0: NOT	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 0: AND	Parameter	PRM.TRNS1[0].TPRMI		255	255	0	3	0	O	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 0: OR	Parameter	PRM.TRNS1[0].TPRMI		0	255	0	3	0	O	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 0: XOR	Parameter	PRM.TRNS1[0].TPRMI		0	255	0	3	0	O	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 0: NAND	Parameter	PRM.TRNS1[0].TPRMI		255	255	0	3	0	O	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 0: NOR	Parameter	PRM.TRNS1[0].TPRMI		0	255	0	3	0	O	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 0: XNOR	Parameter	PRM.TRNS1[0].TPRMI		255	255	0	3	0	O	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 0: Right bit shift	Parameter	PRM.TRNS1[0].TPRMI		0	8	0	1	0	O	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 0: Left bit shift	Parameter	PRM.TRNS1[0].TPRMI		0	8	0	1	0	O	O	X
	Count	PRM.TRNS1[0].TTMS		1	1	0	1	0	O	O	X
Source image 1: Conversion 1		PRM.TRNS1[1].***									
:		:									
Source image 1: Conversion 12		PRM.TRNS1[12].***									

Image Conversion Setting (Image Operation Unit: Source Image 2)

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing		
				Value	No. of integer digits No. of decimal places				User variable	System variable	Result data	Unit properties	
Source image 2: Common to all conversion types	Position Adjustment ID	PRM.TRNS2.PUID	-	999	0				X	X	X	O	
Source image 2: Conversion 0	Conversion type	PRM.TRNS2[0].TTYP	None	0					X	X	X	O	
			Add	32									
			Subtract	33									
			Absolute Difference	34									
			Multiply	28									
			Rotate / Translate	43									
			Zoom	52									
			Trapezoid correction	17									
			Pixel value conversion	49									
			Blob	50									
			NOT	35									
			AND	36									
			OR	38									
			XOR	40									
			NAND	37									
			NOR	39									
			XNOR	41									
			Right bit shift	30									
			Left bit shift	31									
Source image 2: Conversion 0: Add	Parameter	PRM.TRNS2[0].TPRMI	0	255	0	3	0	0	0	X	O		
	Count	PRM.TRNS2[0].TTMS	1	1	0	1	0	0	0	X	O		
Source image 2: Conversion 0: Subtract	Parameter	PRM.TRNS2[0].TPRMI	0	255	0	3	0	0	0	X	O		
	Count	PRM.TRNS2[0].TTMS	1	1	0	1	0	0	0	X	O		
Source image 2: Conversion 0: Absolute Difference	Parameter	PRM.TRNS2[0].TPRMI	0	255	0	3	0	0	0	X	O		
	Count	PRM.TRNS2[0].TTMS	1	1	0	1	0	0	0	X	O		
Source image 2: Conversion 0: Multiply	Parameter	PRM.TRNS2[0].TPRMD	1.000	255.000	0.000	3	3	0	0	X	O		
	Count	PRM.TRNS2[0].TTMS	1	1	0	1	0	0	0	X	O		
Source image 2: Conversion 0: Rotate / Translate	Rotation center XY	PRM.TRNS2[0].AFCXY				5	0	0	X	X	O		
	Rotation center X	PRM.TRNS2[0].AFCX	0	16383	-16383	5	0	0	0	X	O		
	Rotation center Y	PRM.TRNS2[0].AFCY	0	16383	-16383	5	0	0	0	X	O		
	Rotation angle	PRM.TRNS2[0].AFT	0.000	359.999	0.000	3	3	0	0	X	O		
	Translation shift XY	PRM.TRNS2[0].AFSXY				4	3	0	X	X	O		
	Translation shift X	PRM.TRNS2[0].AFSX	0.000	9600.000	-9600.000	4	3	0	0	X	O		
	Translation shift Y	PRM.TRNS2[0].AFSY	0.000	7200.000	-7200.000	4	3	0	0	X	O		
	Use interpolation	PRM.TRNS2[0].AFIP	Enable	1						X	X	O	
			Disable	0									
Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	0	0	X	O		

Category	Setting item	Name	Label	Selection			Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable
Source image 2: Conversion 0: Zoom	Zoom ratio X	PRM.TRNS2[0].ZMMGX		100	2500	16		4	0	O	O
	Zoom ratio Y	PRM.TRNS2[0].ZMMGY		100	2500	16		4	0	O	O
	Zoom center XY	PRM.TRNS2[0].ZMCXY						4	0	O	X
	Zoom center X	PRM.TRNS2[0].ZMCX		0	9600	-9600		4	0	O	O
	Zoom center Y	PRM.TRNS2[0].ZMCY		0	7200	-7200		4	0	O	O
	Count	PRM.TRNS2[0].TTMS		1	1	0		1	0	O	X
Source image 2: Conversion 0: Trapezoid correction	Shape before adjustment	PRM.TRNS2[0].SRCSHP								X	X
	Enable region	PRM.TRNS2[0].SRGNEN								X	X
	When the shape before adjustment is "User set"										O
	Point XY	PRM.TRNS2[0].SRCPXY[*]						5	0	O	X
	Point X	PRM.TRNS2[0].SRCPX[*]		331	16383	-16383		5	0	O	X
	Point Y	PRM.TRNS2[0].SRCPY[*]		337	16383	-16383		5	0	O	X
	Shape after adjustment	PRM.TRNS2[0].DSTSHP								X	X
	Enable region	PRM.TRNS2[0].DRGNEN								X	X
	When the shape after adjustment is "Rectangle"										O
	Upper left XY	PRM.TRNS2[0].DSTLUXY						5	0	O	X
	Upper left X	PRM.TRNS2[0].DSTLUX		160	16383	0		5	0	O	X
	Upper left Y	PRM.TRNS2[0].DSTLUY		160	16383	0		5	0	O	X
	Lower right XY	PRM.TRNS2[0].DSTRDXY						5	0	O	X
	Lower right X	PRM.TRNS2[0].DSTRDX		360	16383	0		5	0	O	X
	Lower right Y	PRM.TRNS2[0].DSTRDY		320	16383	0		5	0	O	X
Source image 2: Conversion 0: Pixel value conversion	When the shape after adjustment is "User set"										O
	Point XY	PRM.TRNS2[0].DSTPXY[*]						5	0	O	X
	Point X	PRM.TRNS2[0].DSTPX[*]		331	16383	-16383		5	0	O	X
	Point Y	PRM.TRNS2[0].DSTPY[*]		337	16383	-16383		5	0	O	X
	Use interpolation	PRM.TRNS2[0].ENITP	Enable	1						X	X
			Disable	0							O
	Count	PRM.TRNS2[0].TTMS		1	1	0		1	0	O	X
	Target pixel maximum value	PRM.TRNS2[0].SPV:HL		0	255	0		3	0	O	X
	Target pixel minimum value	PRM.TRNS2[0].SPV:LL		0	255	0		3	0	O	X
	Conversion range	PRM.TRNS2[0].INVT	Within the limits	0						X	X
Pixel value after conversion			Beyond the limits	1							O
	Pixel value after conversion	PRM.TRNS2[0].DPV		0	255	0		3	0	O	X
	Count	PRM.TRNS2[0].TTMS		1	1	0		1	0	O	X

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
				Value	No. of integer digits No. of decimal places				User variable	System variable	
Source image 2: Conversion 0: Blob	Detect	PRM.TRNS2[0].DC	White	255					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			Black	0							
	Count	PRM.TRNS2[0].DBN		30	9999	1	4	0	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Fill holes	PRM.TRNS2[0].FILL	OFF	0					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			ON	1							
	Active Border	PRM.TRNS2[0].CAN	OFF	0					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			ON	1							
	Primary target specification	PRM.TRNS2[0].LBS	All	0					X	X	X <input type="radio"/>
			Specified	1							
	Primary target	PRM.TRNS2[0].LLBS		0	9998	0	4	0	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Detection order	PRM.TRNS2[0].LOD	Y>X: Ascend	5					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			X>Y: Ascend	6							
			X:Ascend	1							
			X:Descend	2							
			Y:Ascend	3							
			Y:Descend	4							
			Area:Ascend	14							
			Area:Descend	13							
			Roundness:	16							
			Ascend								
			Roundness:	15							
			Descend								
			Clockwise	9							
			Counterclockwise	10							
	Starting angle	PRM.TRNS2[0].STA		0.000	359.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Pixel value after conversion: Detected color	PRM.TRNS2[0].CODEC		255	255	0	3	0	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Pixel value after conversion: Background color	PRM.TRNS2[0].COBC		0	255	0	3	0	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Area filter	PRM.TRNS2[0].ARI_EN	Disable	0					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			Enable	1							
	Roundness filter	PRM.TRNS2[0].CIR_EN	Disable	0					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			Enable	1							
	Major axis filter	PRM.TRNS2[0].MAA_EN	Disable	0					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			Enable	1							
	Axes ratio filter	PRM.TRNS2[0].RTO_EN	Disable	0					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			Enable	1							
	Distributed oval filter	PRM.TRNS2[0].MAA2_EN	Disable	0					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			Enable	1							
	Aspect ratio filter	PRM.TRNS2[0].RTO2_EN	Disable	0					<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
			Enable	1							
	Area filter: Maximum	PRM.TRNS2[0].ARI_THRE_S:HL		99999999	99999999	0	8	0	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Area filter: Minimum	PRM.TRNS2[0].ARI_THRE_S:LL		100	99999999	0	8	0	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Roundness filter: Maximum	PRM.TRNS2[0].CIR_THRE_S:HL		1.000	1.000	0.000	1	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Roundness filter: Minimum	PRM.TRNS2[0].CIR_THRE_S:LL		0.000	1.000	0.000	1	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Major axis filter: Maximum	PRM.TRNS2[0].MAA_THRE_ES:HL		99999.999	99999.999	0.000	5	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Source image 2: Conversion 0: Blob (continued)	Major axis filter: Minimum	PRM.TRNS2[0].MAA_THR_ES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Axes ratio filter: Maximum	PRM.TRNS2[0].RTO_THR_ES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Axis ratio filter: Minimum	PRM.TRNS2[0].RTO_THR_ES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Distributed oval filter: Maximum	PRM.TRNS2[0].MAA2_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Distributed oval filter: Minimum	PRM.TRNS2[0].MAA2_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio filter: Maximum	PRM.TRNS2[0].RTO2_THRES:HL		99999.999	99999.999	0.000	5	3	O	O	X	O
	Aspect ratio filter: Minimum	PRM.TRNS2[0].RTO2_THRES:LL		0.000	99999.999	0.000	5	3	O	O	X	O
Source image 2: Conversion 0: NOT	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	O	O	X	O
Source image 2: Conversion 0: AND	Parameter	PRM.TRNS2[0].TPRMI		255	255	0	3	0	O	O	X	O
	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	O	O	X	O
Source image 2: Conversion 0: OR	Parameter	PRM.TRNS2[0].TPRMI		0	255	0	3	0	O	O	X	O
	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	O	O	X	O
Source image 2: Conversion 0: XOR	Parameter	PRM.TRNS2[0].TPRMI		0	255	0	3	0	O	O	X	O
	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	O	O	X	O
Source image 2: Conversion 0: NAND	Parameter	PRM.TRNS2[0].TPRMI		255	255	0	3	0	O	O	X	O
	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	O	O	X	O
Source image 2: Conversion 0: NOR	Parameter	PRM.TRNS2[0].TPRMI		0	255	0	3	0	O	O	X	O
	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	O	O	X	O
Source image 2: Conversion 0: XNOR	Parameter	PRM.TRNS2[0].TPRMI		255	255	0	3	0	O	O	X	O
	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	O	O	X	O
Source image 2: Conversion 0: Right bit shift	Parameter	PRM.TRNS2[0].TPRMI		0	8	0	1	0	O	O	X	O
	Count	PRM.TRNS2[0].TTMS		1	1	0	1	0	O	O	X	O
Source image 2: Conversion 1		PRM.TRNS2[1].***										
:		:										
Source image 2: Conversion 12		PRM.TRNS2[12].***										

Robot Coordinate Conversion Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing		Unit properties
												User variable	System variable	Result data
General	Refer to Common settings Parameter													
Image Settings	Refer to Image settings Parameter													
Select Calibration Data	Calibration Data Specification Method	PRM.DTL.RBC_SEL	Choose from List Use Variable	0 1					1	0	X	X	X	O
	Calibration Data Scope	PRM.DTL.RBC_GLB							1	0	X	X	X	O
	Calibration Data No.	PRM.DTL.RBC_RNO		-1			-1		3	0	X	X	X	O
	Calibration Data Name	PRM.DTL.RBC_NM					0				X	X	X	X
	Calibration Data Array Variable	PRM.DTL.RBC_VAR		66			0				O	X	X	O
	Tool Center Offset	PRM.DTL.RBC_TCVEN							1	0	X	X	X	O
	Tool Center Offset Array Variable	PRM.DTL.RBC_TCVAR		66			0				O	X	X	O
	Diff. Height Correction	PRM.DTL.RBC_HEN							1	0	X	X	X	O
	Height Difference	PRM.DTL.RBC_H	0.0	999.9	-999.9				3	1	O	O	X	O
	Enable Calibration Data	PRM.DTL.RBC_CAEN							1	0	X	X	X	X
	Differing Height Correction	PRM.DTL.RBC_RHEN							1	0	X	X	X	X
	Calibration Plane Z Coordinate	PRM.DTL.RBC_RH	0.0	9999.999	-9999.999				4	3	X	X	X	X
	Offset X	PRM.DTL.RBREF_OFX	0.0	9999.999	-9999.999				4	3	O	O	X	O
	Offset Y	PRM.DTL.RBREF_OFY	0.0	9999.999	-9999.999				4	3	O	O	X	O
	Offset Rz	PRM.DTL.RBREF_OFT	0.0	180.0	-180.0				3	3	O	O	X	O
	Tool Center Rotation Correction	PRM.DTL.RBC_CCCEN							1	0	X	X	X	O
Detected Position Settings	Detected Pos. X	PRM.DTL.RBD_UIDX	0.0	9999999.999	-9999999.999				7	3	O	X	O	O
	Detected Pos. Y	PRM.DTL.RBD_UIDY	0.0	9999999.999	-9999999.999				7	3	O	X	O	O
	Angle Calculation	PRM.DTL.RBH_EN							1	0	X	X	X	O
	Detected Pos. Rz	PRM.DTL.RBD_UIDT	0.0	9999999.999	-9999999.999				7	3	O	X	O	O
	Multiple Detection	PRM.DTL.RBD_MDP							1	0	X	X	X	O
	Count	PRM.DTL.MXN	1	9999	1				4	0	X	X	X	O
	Direction	PRM.DTL.RBDIR	Master Pos. to Detected Pt.	0					1	0	X	X	X	O
			Detected Pt. to Master Pos.	1										

Category	Setting item	Name	Label	Selection			Numerical value format			Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data
Register	Master Position	PRM.DTL.RBRP_X		0.0	9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Robot	Coordinate X											
Coordinates	Master Position	PRM.DTL.RBRP_Y		0.0	9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Coordinate Y											
	Master Position	PRM.DTL.RBRP_Z		0.0	9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Coordinate Z											
	Master Position	PRM.DTL.RBRP_RX		0	180.0	-180.0		3	1	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Coordinate Rx											
	Master Position	PRM.DTL.RBRP_RY		0	180.0	-180.0		3	1	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Coordinate Ry											
	Master Position	PRM.DTL.RBRP_RZ		0	180.0	-180.0		3	1	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
	Coordinate Rz											
Variable Reference	PRM.DTL.RBRP_AREF			0	0	0				<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Robot Position	PRM.DTL.RBRP_WRES							1	0	X <input type="radio"/>	X <input type="radio"/>	X <input type="radio"/>
Coordinates Registration												
Status												
Add Shift Amount to	PRM.DTL.RBPL_EN							1	0	X <input type="radio"/>	X <input type="radio"/>	X <input type="radio"/>
Place Position												
Coordinates												
Correct RxRy Axes at	PRM.DTL.RBPL_CLRXY							1	0	X <input type="radio"/>	X <input type="radio"/>	X <input type="radio"/>
Place Position												
Place Position Coordinate X	PRM.DTL.RBPL_X			0.0	9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Place Position Coordinate Y	PRM.DTL.RBPL_Y			0.0	9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Place Position Coordinate Z	PRM.DTL.RBPL_Z			0.0	9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Place Position Coordinate Rx	PRM.DTL.RBPL_RX			0	180.0	-180.0		3	1	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Place Position Coordinate Ry	PRM.DTL.RBPL_RY			0	180.0	-180.0		3	1	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Place Position Coordinate Rz	PRM.DTL.RBPL_RZ			0	180.0	-180.0		3	1	<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Place Position	PRM.DTL.RBPL_AREF			0	0	0				<input type="radio"/>	<input type="radio"/>	X <input type="radio"/>
Coordinates Variable												
Reference												
Place Position	PRM.DTL.RBPL_WCNUM	0	0					1	0	X <input type="radio"/>	X <input type="radio"/>	X <input type="radio"/>
Coordinates Work		1	1									
Coordinate System No.		2	2									
		3	3									
		4	4									
		5	5									
		6	6									
		7	7									
		8	8									
		9	9									

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
			Label	Value				No. of integer digits	No. of decimal places		
Register Robot Coordinates (continued)	Place Position	PRM.DTL.RBPL_TCNUM	0	0				1	0	X	X
	Coordinates Tool		1	1						X	X
	Coordinate System No.		2	2						X	X
			3	3							
			4	4							
			5	5							
			6	6							
			7	7							
			8	8							
			9	9							
Place Position Coordinates Registration Status Add Offset from Capture Position X Offset from Capture Position Y Offset from Capture Position Z Offset from Capture Position Rx Offset from Capture Position Ry Offset from Capture Position Rz Offset from Capture Position Offset from Capture Position Variable Reference Target Position Coordinate X Target Position Coordinate Y Target Position Coordinate Z Target Position Coordinate Rx Target Position Coordinate Ry Target Position Coordinate Rz Target Position Coordinates Variable Reference Registration Status of Offset from Capture Position	PRM.DTL.RBPL_PRES							1	0	X	X
	Coordinates Registration									X	X
	Status										
	Add Offset from Capture	PRM.DTL.RBOH_OFEN						1	0	X	X
	Position									X	O
	X Offset from Capture	PRM.DTL.RBOH_OFX		0.0		9999.999	-9999.999	4	3	O	O
	Position									X	O
	Y Offset from Capture	PRM.DTL.RBOH_OFY		0.0		9999.999	-9999.999	4	3	O	O
	Position									X	O
	Z Offset from Capture	PRM.DTL.RBOH_OFZ		0.0		9999.999	-9999.999	4	3	O	O
	Position									X	O
	Rx Offset from Capture	PRM.DTL.RBOH_OFRX		0		180.0	-180.0	3	1	O	O
	Position									X	O
	Ry Offset from Capture	PRM.DTL.RBOH_OFRY		0		180.0	-180.0	3	1	O	O
	Position									X	O
	Rz Offset from Capture	PRM.DTL.RBOH_OFRZ		0		180.0	-180.0	3	1	O	O
	Position									X	O
	Offset from Capture	PRM.DTL.RBOH_OFAR		0		0	0			O	O
	Position Variable									X	O
	Reference										
	Target Position	PRM.DTL.RBOH_TGX		0.0		9999.999	-9999.999	4	3	O	O
	Coordinate X									X	O
	Target Position	PRM.DTL.RBOH_TGY		0.0		9999.999	-9999.999	4	3	O	O
	Coordinate Y									X	O
	Target Position	PRM.DTL.RBOH_TGZ		0.0		9999.999	-9999.999	4	3	O	O
	Coordinate Z									X	O
	Target Position	PRM.DTL.RBOH_TGRX		0		180.0	-180.0	3	1	O	O
	Coordinate Rx									X	O
	Target Position	PRM.DTL.RBOH_TGRY		0		180.0	-180.0	3	1	O	O
	Coordinate Ry									X	O
	Target Position	PRM.DTL.RBOH_TGRZ		0		180.0	-180.0	3	1	O	O
	Coordinate Rz									X	O
	Target Position	PRM.DTL.RBOH_TGAR		0		0	0			O	O
	Coordinates Variable									X	O
	Reference										
	Registration Status of	PRM.DTL.RBOH_OFPRES						1	0	X	X
	Offset from Capture									X	X
	Position										X

Category	Setting item	Name	Label	Selection			Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable
Register Master Position Image	Master Position Image Registration Status	PRM.DTL.RBREF_IRES						1	0	X	X
Register Reference Detection Position	Reference Detection Position Specification Method	PRM.DTL.RBR_TYP	Result Specify Arbitrarily	0 1				1	0	X	X
Position	Reference Detection Position Automatic Setting	PRM.DTL.RBR_AT						1	0	X	X
	Reference Detection Position X	PRM.DTL.RBR_UIDX		0.0	9999.999	-9999.999		7	3	O	X
	Reference Detection Position Y	PRM.DTL.RBR_UIDY		0.0	9999.999	-9999.999		7	3	O	X
	Reference Detection Position Rz	PRM.DTL.RBR_UIDT		0.0	180.0	-180.0		3	1	O	X
	Arbitrarily Specified Reference Detection Position X	PRM.DTL.RBR_SPX		0.0	9999.999	-9999.999		4	3	O	O
	Arbitrarily Specified Reference Detection Position Y	PRM.DTL.RBR_SPY		0.0	9999.999	-9999.999		4	3	O	O
	Arbitrarily Specified Reference Detection Position Rz	PRM.DTL.RBR_SPT		0.0	180.0	-180.0		3	1	O	O
	Reference Detection Position X (Current Value)	PRM.DTL.RBR_CRX		0.0	9999.999	-9999.999		4	3	X	X
	Reference Detection Position Y (Current Value)	PRM.DTL.RBR_CRY		0.0	9999.999	-9999.999		4	3	X	X
	Reference Detection Position Rz (Current Value)	PRM.DTL.RBR_CRT		0.0	180.0	-180.0		3	1	X	X
	Reference Detection Position X (Registered Value)	PRM.DTL.RBR_RGX		0.0	9999.999	-9999.999		4	3	X	X
	Reference Detection Position Y (Registered Value)	PRM.DTL.RBR_RGY		0.0	9999.999	-9999.999		4	3	X	X
	Reference Detection Position Rz (Registered Value)	PRM.DTL.RBR_RGT		0.0	180.0	-180.0		3	1	X	X
	Reference Detection Position Registration Status	PRM.DTL.RBR_PRES						1	0	X	X

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			Unit properties
				Value					No. of integer digits	No. of decimal places	User variable	System variable	Result data	
Limits	X Shift from Master: Upper Limit	PRM.DTLRB_X:HL				9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	X Shift from Master: Lower Limit	PRM.DTLRB_X:LL				9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Y Shift from Master: Upper Limit	PRM.DTLRB_Y:HL				9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Y Shift from Master: Lower Limit	PRM.DTLRB_Y:LL				9999.999	-9999.999		4	3	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Angle Shift from Master: Upper Limit	PRM.DTLRB_T:HL				180.0	-180.0		3	1	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>
	Angle Shift from Master: Lower Limit	PRM.DTLRB_T:LL				180.0	-180.0		3	1	<input type="radio"/>	<input type="radio"/>	X	<input type="radio"/>

Robot Coordinate Operation Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	
				No. of integer digits	No. of decimal places				User variable	System variable	Result data	Unit properties
General	Refer to Common settings Parameter											
Image Settings	Refer to Image settings Parameter											
Operation Settings	Operation	PRM.DTL_RB_CALCTYP	Average Add	0 1					1 0	X	X	X O
	Single On-hand Camera	PRM.DTL_RB_OHSC							1 0	X	X	X O
	Operation Target Unit 1	PRM.DTL_RB_UID1				999	0		4 0	X	X	X O
	Operation Target Unit 2	PRM.DTL_RB_UID2				999	0		4 0	X	X	X O
	Operation Target Unit 3	PRM.DTL_RB_UID3				999	0		4 0	X	X	X O
	Operation Target Unit 4	PRM.DTL_RB_UID4				999	0		4 0	X	X	X O
	Calculate Using Valid Detected Points Only	PRM.DTL_RB_EXCNG							1 0	X	X	X O
	Angle Calculation	PRM.DTL_RB_ANGENB							1 0	X	X	X O
	Angle Calculation Target Unit 1	PRM.DTL_RB_AUID1				999	0		4 0	X	X	X O
	Angle Calculation Target Unit 2	PRM.DTL_RB_AUID2				999	0		4 0	X	X	X O
	Master Position	PRM.DTL_RBREF_UID	-1	999	0				4 0	X	X	X O
	Offset X	PRM.DTL_RBREF_OFX	0.0	9999.999	-9999.999				4 3	X	X	X O
	Offset Y	PRM.DTL_RBREF_OFY	0.0	9999.999	-9999.999				4 3	X	X	X O
	Offset Rz	PRM.DTL_RBREF_OFT	0.0	180.0	-180.0				3 3	X	X	X O
Limits	X Shift from Master: Upper Limit	PRM.DTL_RB_XHL				9999.999	-9999.999		4 3	O	O	X O
	X Shift from Master: Lower Limit	PRM.DTL_RB_XLL				9999.999	-9999.999		4 3	O	O	X O
	Y Shift from Master: Upper Limit	PRM.DTL_RB_YHL				9999.999	-9999.999		4 3	O	O	X O
	Y Shift from Master: Lower Limit	PRM.DTL_RB_YLL				9999.999	-9999.999		4 3	O	O	X O
	Angle Shift from Master: Upper Limit	PRM.DTL_RB_THL				180.0	-180.0		3 1	O	O	X O
	Angle Shift from Master: Lower Limit	PRM.DTL_RB_TLL				180.0	-180.0		3 1	O	O	X O

Position Adjustment Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing			
			Label	Value							User variable	System variable	Result data	Unit properties
Reference value setting	Position adjustment mode	PRM.DTL.PATYP	Corrected by 1	0	points						X	X	X	O
			Corrected by 2	1										
Use interpolation		PRM.DTL.IPTYP	ON	1							X	X	X	O
			OFF	0										
Reference 1: Individual specification		PRM.DTL.DIND1	Specify individually	1							X	X	X	X
			Do not specify individually	0										
Reference 1: Unit ID		PRM.DTL.DUID1		-1	999	0		4	0	X	X	X	X	
Reference 1: Position X		PRM.DTL.DX1		0.000	16383.000	-16383.000		5	3	O	O	O	O	
Reference 1: Position Y		PRM.DTL.DY1		0.000	16383.000	-16383.000		5	3	O	O	O	O	
Reference 1: Angle		PRM.DTL.DT1		0.000	359.999	0.000		3	3	O	O	O	O	
Reference 2: Individual specification		PRM.DTL.DIND2	Specify individually	1							X	X	X	X
			Do not specify individually	0										
Reference 2: Unit ID		PRM.DTL.DUID2		-1	999	0		4	0	X	X	X	X	
Reference 2: Position X		PRM.DTL.DX2		0.000	16383.000	-16383.000		5	3	O	O	O	O	
Reference 2: Position Y		PRM.DTL.DY2		0.000	16383.000	-16383.000		5	3	O	O	O	O	
Base position specification		PRM.DTL.REFENB	User set	1							X	X	X	O
			Current value	0										
Base 1: Individual specification		PRM.DTL.RIND1	Specify individually	1							X	X	X	O
			Do not specify individually	0										
Base 1: Unit ID		PRM.DTL.RUID1		-1	999	0		4	0	X	X	X	X	
Base 1: Position X		PRM.DTL.RX1		0.000	16383.000	-16383.000		5	3	O	O	O	O	
Base 1: Position Y		PRM.DTL.RY1		0.000	16383.000	-16383.000		5	3	O	O	O	O	
Base 1: Angle		PRM.DTL.RT1		0.000	359.999	0.000		3	3	O	O	O	O	
Base 2: Individual specification		PRM.DTL.RIND2	Specify individually	1							X	X	X	O
			Do not specify individually	0										
Base 2: Unit ID		PRM.DTL.RUID2		-1	999	0		4	0	X	X	X	X	
Base 2: Position X		PRM.DTL.RX2		0.000	16383.000	-16383.000		5	3	O	O	O	O	
Base 2: Position Y		PRM.DTL.RY2		0.000	16383.000	-16383.000		5	3	O	O	O	O	

C PlugIn Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Source image 1 setting: Image setting	Image selection	PRM.IMGS1.URIMG	Registered image	1		999	0	3	0	X	X	X	X
			Current image	0									
	Current image variable	PRM.IMGS1.IIMG				999	0	3	0	X	X	X	X
	Camera No.	PRM.IMGS1.CNO	Camera 1	1						X	X	X	X
			Camera 2	2									
			Camera 3	3									
			Camera 4	4									
	Registered image No.	PRM.IMGS1.RIMG			0	999	0	3	0	X	X	X	X
	Assign variable for registered image No.	PRM.IMGS1.UVR	Enable	1		999	0	3	0	X	X	X	X
			Disable	0									
Source image 2 setting: Image setting	Numerical variable	PRM.IMGS1.RIREF				999	0	3	0	O	O	X	X
	Process variable only when changing programs	PRM.IMGS1.UOPEN	Enable	1						X	X	X	X
			Disable	0									
	Registered image type	PRM.IMGS1.RIMG_TYP	Gray	0						X	X	X	O
			Color	1		999	0	3	0				
			MultiSpectrum	2									
			Height	3									
	Use an image captured in MultiSpectrum mode	PRM.IMGS1.MSEXT_EN	Enable	1						X	X	X	O
			Disable	0		999	0	3	0				
	MultiSpectrum image setting	PRM.IMGS1.MSEXT_IMG											
Result image setting	Image selection	PRM.IMGS2.URIMG	Registered image	1		999	0	3	0	X	X	X	X
			Current image	0									
	Current image variable	PRM.IMGS2.IIMG				999	0	3	0	X	X	X	X
	Camera No.	PRM.IMGS2.CNO	Camera 1	1						X	X	X	X
			Camera 2	2									
			Camera 3	3									
			Camera 4	4									
	Registered image No.	PRM.IMGS2.RIMG			0	999	0	3	0	X	X	X	X
	Assign variable for registered image No.	PRM.IMGS2.UVR	Enable	1		999	0	3	0	X	X	X	X
			Disable	0									
Result image setting	Numerical variable	PRM.IMGS2.RIREF				999	0	3	0	O	O	X	X
	Process variable only when changing programs	PRM.IMGS2.UOPEN	Enable	1						X	X	X	X
			Disable	0									
	Registered image type	PRM.IMGS2.RIMG_TYP	Gray	0						X	X	X	O
			Color	1		999	0	3	0				
			MultiSpectrum	2									
			Height	3									
	Use an image captured in MultiSpectrum mode	PRM.IMGS1.MSEXT_EN	Enable	1						X	X	X	O
			Disable	0		999	0	3	0				
	Result image	PRM.DTL.OIMG								X	X	X	X

Category	Setting item	Name	Label	Selection			Initial value	Upper limit	Lower limit	Numerical value format			Referencing
				Value	Initial value	Upper limit				No. of integer digits	No. of decimal places	User variable	
Plugin file specification	Source file name	PRM.DTL.SFN								X	X	X	X
I/O setting	No. of referenced variables	PRM.DTL.RFN		0	256	0	3	0	X	X	X	X	X
	Referenced variable ID	PRM.DTL.RFV[*]								X	X	X	X
	No. of referenced variable array elements	PRM.DTL.ADN[*]		1	10000	1	5	0	X	X	X	X	X

Calibration Unit

Category	Setting item	Name	Label	Selection			Initial value	Upper limit	Lower limit	Numerical value format			Referencing
				Value	Initial value	Upper limit				No. of integer digits	No. of decimal places	User variable	
Image setting	Calibrate selected image	PRM.DTL.OIMGEN	Enable	1						X	X	X	O
			Disable	0									
	Calibrated image variable	PRM.DTL.OIMG								X	X	X	O
Image calibration setting	Distortion correction	PRM.DTL.CTYP	Lens distortion only	0						X	X	X	O
			Lens + angled camera distortion	1									
	Calibration region	PRM.RGN.SHP	Full image	0						X	X	X	O
			Rectangle	1									
	Enable region	PRM.RGN.RGNEN	Enable	1						X	X	X	O
			Disable	0									
	When the shape is "Rectangle"												
	Upper left XY	PRM.RGN.LUXY								5	0	O	X
	Upper left X	PRM.RGN.LUX		160	16383	0	5	0	O	O	O	X	O
	Upper left Y	PRM.RGN.LUY		160	16383	0	5	0	O	O	O	X	O
	Lower right XY	PRM.RGN.RDXY								5	0	O	X
	Lower right X	PRM.RGN.RDX		360	16383	0	5	0	O	O	O	X	O
	Lower right Y	PRM.RGN.RDY		320	16383	0	5	0	O	O	O	X	O
	Use interpolation	PRM.DTL.ENITP	ON	1						X	X	X	O
			OFF	0									
	Rotation correction	PRM.DTL.ENROT	Enable	1						O	O	X	O
			Disable	0									
	Adjustment angle	PRM.DTL.ROT		0.000	359.999	0.000	3	3	O	O	X	O	
	Size setting method	PRM.DTL.STYP	Scaling	0						X	X	X	O
			Pixel	1									
	Magnitude	PRM.DTL.MGN		1.000	5.000	0.200	1	3	O	O	X	O	
	Pixels per division	PRM.DTL.PIX		50.000	1000.000	5.000	4	3	O	O	X	O	

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Image calibration setting	Translation shift X	PRM.DTL.AFSX		0.000	9999.999	-9999.999	4	3	O	O	X	O
	Translation shift Y	PRM.DTL.AFSY		0.000	9999.999	-9999.999	4	3	O	O	X	O
	Grayscale conversion	PRM.DTL.WAY	Gray	3					X	X	X	O
Coordinate conversion			RGB	5								
	Spacing value (real)	PRM.DTL.PSPN		10.000	999.999	0.001	3	3	O	O	X	O
	Origin row	PRM.DTL.OGR		0	255	0	3	0	O	O	X	O
	Origin column	PRM.DTL.OCG		0	255	0	3	0	O	O	X	O
	X direction	PRM.DTL.XRD	Right (0) to Left (+ve)	0					O	O	X	O
			Bottom (0) to Top (+ve)	1								
			Left (0) to Right (+ve)	2								
			Top (0) to Bottom (+ve)	3								
	Relative Y direction	PRM.DTL.YRD	Righthand	4					O	O	X	O
			Lefthand	5								
Teaching setting: Common	XY coordinate	PRM.DTL.OGCXY					4	3	O	X	X	O
	X coordinate	PRM.DTL.OGCX		0.000	9999.999	-9999.999	4	3	O	O	X	O
	Y coordinate	PRM.DTL.OGCY		0.000	9999.999	-9999.999	4	3	O	O	X	O
	Angle	PRM.DTL.OGCT		0.000	359.999	0.000	3	3	O	O	X	O
	Adapt to axis setting	PRM.DTL.EAI	Not linked	0					X	X	X	O
			Linked	1								
	Pattern type	PRM.CLB.PTYP	Chess board	0					O	O	X	O
			Dot pattern	1								
	No. images	PRM.CLB.PSNM		1	16	1	2	0	X	X	X	O
	Lens distortion correction type	PRM.CLB.LTYP	OFF	0					O	O	X	O
			Low order	1								
			High order	2								
			Asymmetry	3								
			Auto	4								
	Axis shift correction	PRM.CLB.AXC	Enable	1					O	O	X	O
			Disable	0								
	Allow gaps	PRM.CLB.MPTN	Enable	1					O	O	X	O
			Disable	0								
	Calibration model	PRM.CLB.CREF							O	X	X	O
	Lens distortion correction type (Model data)	PRM.CLB.MLTYP	OFF	0					X	X	X	X
			Low order	1								
			High order	2								
			Asymmetry	3								
	Status (Model data)	PRM.CLB.CSTS	Unexecuted	0					X	X	X	X
			Success	1								
			Fail	2								
Rows (Model data)	PRM.CLB.ROW		0	256	0	3	0	X	X	X	X	
Columns (Model data)	PRM.CLB.COL		0	256	0	3	0	X	X	X	X	
Detected points (Model data)	PRM.CLB.VNUM		0	64000	0	5	0	X	X	X	X	
Average error (Model data)	PRM.CLB.EAVE		0.000	9999.999	0.000	4	3	X	X	X	X	
Maximum error (Model data)	PRM.CLB.EMAX		0.000	9999.999	0.000	4	3	X	X	X	X	

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Teaching image No. 1	Registered image	PRM.CLB[0].RIMG		0	999	0			X	X	X	O
	Assign variable for registered image No.	PRM.CLB[0].UVR	Enable	1					X	X	X	O
			Disable	0								
	Numerical variable	PRM.CLB[0].RIREF							O	O	X	O
	Process variable only when changing programs	PRM.CLB[0].UPEN	Enable	1					X	X	X	O
			Disable	0								
	Enable region	PRM.CLB[0].RGNEN	Enable	1					X	X	X	O
			Disable	0								
	Region	PRM.CLB[0].SHP	Full image	0					X	X	X	O
			User set	17								
	When the shape is "User set"											
	Point XY	PRM.CLB[0].PXY[*]					5	0	O	X	X	O
	Point X	PRM.CLB[0].PX[*]			16383	-16383	5	0	O	O	X	O
	Point Y	PRM.CLB[0].PY[*]			16383	-16383	5	0	O	O	X	O
	Detection threshold	PRM.CLB[0].DRTO		10	100	1	3	0	O	O	X	O
	Detection Count	PRM.CLB[0].DNUM		1000	4000	100	4	0	O	O	X	O
Teaching image No. 2		PRM.CLB[1].***										
	⋮	⋮										
Teaching image No. 16		PRM.CLB[15].***										

Contour Region Generator Unit

Category	Setting item	Name	Selection			Numerical value format		Referencing					
			Label	Value		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System Variable	Result data
Images/ Reference Unit	Multi-Profile Defect Unit ID	PRM.DTL.CONT_UID		-		999	0	4	0	x	x	x	○
	Resultant Image	PRM.DTL.OIMG		-		-	-	-	-	-	x	x	○
	Optimize Detection Conditions (Dedicated for Profile Images)	PRM.DTL.SETCC		0		1	0		1	0	x	x	○
Contour Region	Fit to Contour of Captured Image	PRM.DTL.CONT_FIT		0		1	0		1	0	x	x	○
	Refer to Model Line	PRM.DTL.REFM		0		1	0		1	0	x	x	○
Edge Detection	Edge Sensitivity (%)	PRM.DTL.SEN		30		100	0		3	0	○	○	○
	Edge Detection Width	PRM.DTL.FLW		5		100	0		3	0	○	○	○
	Edge Intensity lower limit	PRM.DTL.EI_LL		5.000		255.000	0.000		3	3	○	○	○
	Segment Size (Pixels)	PRM.DTL.SGSA		5		9999	1		4	0	x	x	○
	Segment Shift (Pixels)	PRM.DTL.MVSA		3.00		9999.99	0.01		4	2	x	x	○
	Selection for model line detection	PRM.DTL.THM	Auto	0							○	○	○
			Manual	1									
	Selection Settings for model line detection (manual)	PRM.DTL.THRM		50.00		99.99	0.00		2	2	○	○	○
Contour Grouping	Type of Expand/Shrink	PRM.DTL.MORM	Shrink	1					1	0	x	x	○
			Expand	2									
	No. of times of Expand/Shrink	PRM.DTL.MORN		0		99	0		2	0	○	○	○
	Contour Grouping 0: Contour Grouping Specified Color	PRM.DTL.ICLR[0]	White	255					3	0	x	x	○
			Black	0									
	Contour Grouping 0: Contour Grouping Region Count	PRM.DTL.RGNN[0]		0		128	0		3	0	x	x	○
	Contour Grouping 0: Contour Information Region No.	PRM.DTL.IMGR[0].CTN[0]		-1		999	0		3	0	x	x	○
	Contour Grouping 0: Contour Information Endpoint direction	PRM.DTL.IMGR[0].CTD[0]		0		1	0		1	0	x	x	○
	Contour Grouping 1	PRM.DTL.***[1]											
	⋮	⋮											
	Contour Grouping 127	PRM.DTL.***[127]											

Defect Extraction Operation Unit

Category	Setting item	Name	Selection			Numerical value format		Referencing		
			Label	Value		No. of integer digits	No. of decimal places	User variable	System Variable	Result data
Source 1: Image Settings	Captured image variable	PRM.IMGS1.IIMG						x	x	x
	Registered image No.*	PRM.IMGS1.RIMG		0	999	0	3 0	x x	x	o
Source 2: Image Settings	Captured image variable	PRM.IMGS2.IIMG						x x	x	o
	Registered image No.*	PRM.IMGS2.RIMG		0	999	0	3 0	x x	x	o
Source 3: Image Settings	Captured image variable	PRM.IMGS3.IIMG						x x	x	o
	Registered image No.*	PRM.IMGS3.RIMG		0	999	0	3 0	x x	x	o
Extract Defects Settings	(Image settings) Resultant image	PRM.DTL.OIMG						x x	x	o
	Source 1: Threshold upper limit	PRM.DTL.THLL1		255	255	0	3 0	o x	x	o
	Threshold upper limit	PRM.DTL.THHL1		0	255	0	3 0	o x	x	o
	Source 2: Threshold upper limit	PRM.DTL.THLL2		255	255	0	3 0	o x	x	o
	Threshold upper limit	PRM.DTL.THHL2		0	255	0	3 0	o x	x	o
	Source 3: Threshold upper limit	PRM.DTL.THLL3		255	255	0	3 0	o x	x	o
	Threshold upper limit	PRM.DTL.THHL3		0	255	0	3 0	o x	x	o
Gradation Width	PRM.DTL.BDRG			50	999	0	3 0	x x	x	o
Shading Setting	PRM.DTL.DMT	Binary	0					x x	x	o
		Gray	1							
Sensitivity*	PRM.DTL.DSEN			5	10	0	2 0	x x	x	o
Region Size*	PRM.DTL.DEW			5	32	1	2 0	x x	x	o

* Changing the value during run mode will not affect the setting.

Image Stitching Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing			
			Label	Value				No. of integer digits	No. of decimal places	User variable	System variable	Result data	Unit properties
Image Operation:	Captured image variable	PRM.IMGS1.IIMG						X	X	X	X	O	
Source Image 1 Settings	Include	PRM.IMGS1.ENB	Yes	1						O	O	X	O
			No	0									
	Source Image : Reference Position XY	PRM.IMGS1.SRCXY						5	3	O	O	X	O
	Source Image : Reference Position X	PRM.IMGS1.SRCX		0	16383.000	0		5	3	O	O	X	O
	Source Image : Reference Position Y	PRM.IMGS1.SRCY		0	16383.000	0		5	3	O	O	X	O
	Result Image : Reference Position XY	PRM.IMGS1.DSTXY						5	3	O	O	X	O
	Result Image : Reference Position X	PRM.IMGS1.DSTX		0	16383.000	-16383.000	5	3	O	O	X	O	
	Result Image : Reference Position Y	PRM.IMGS1.DSTY		0	16383.000	-16383.000	5	3	O	O	X	O	
	Angle	PRM.IMGS1.RCT		0	355.999	0.000	3	3	O	O	X	O	
Image Operation:	Captured image variable	PRM.IMGS2.IIMG						X	X	X	X	O	
Source Image 2 Settings	Include	PRM.IMGS2.ENB	Yes	1						O	O	X	O
			No	0									
	Source Image : Reference Position XY	PRM.IMGS2.SRCXY						5	3	O	O	X	O
	Source Image : Reference Position X	PRM.IMGS2.SRCX		0	16383.000	0	5	3	O	O	X	O	
	Source Image : Reference Position Y	PRM.IMGS2.SRCY		0	16383.000	0	5	3	O	O	X	O	
	Result Image : Reference Position XY	PRM.IMGS2.DSTXY						5	3	O	O	X	O
	Result Image : Reference Position X	PRM.IMGS2.DSTX		0	16383.000	-16383.000	5	3	O	O	X	O	
	Result Image : Reference Position Y	PRM.IMGS2.DSTY		0	16383.000	-16383.000	5	3	O	O	X	O	
	Angle	PRM.IMGS2.RCT		0	355.999	0.000	3	3	O	O	X	O	
Image Operation:	Captured image variable	PRM.IMGS3.IIMG						X	X	X	X	O	
Source Image 3 Settings	Include	PRM.IMGS3.ENB	Yes	1						O	O	X	O
			No	0									
	Source Image : Reference Position XY	PRM.IMGS3.SRCXY						5	3	O	O	X	O
	Source Image : Reference Position X	PRM.IMGS3.SRCX		0	16383.000	0	5	3	O	O	X	O	
	Source Image : Reference Position Y	PRM.IMGS3.SRCY		0	16383.000	0	5	3	O	O	X	O	
	Result Image : Reference Position XY	PRM.IMGS3.DSTXY						5	3	O	O	X	O
	Result Image : Reference Position X	PRM.IMGS3.DSTX		0	16383.000	-16383.000	5	3	O	O	X	O	
	Result Image : Reference Position Y	PRM.IMGS3.DSTY		0	16383.000	-16383.000	5	3	O	O	X	O	
	Angle	PRM.IMGS3.RCT		0	355.999	0.000	3	3	O	O	X	O	

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
									No. of integer digits	No. of decimal places		
Image Operation: Source Image 4 Settings	Captured image variable	PRM.IMGS4.IIMG							X	X	X	O
	Include	PRM.IMGS4.ENB	Yes	1					O	O	X	O
			No	0								
	Source Image : Reference Position XY	PRM.IMGS4.SRCXY							5	3	O	O
	Source Image : Reference Position X	PRM.IMGS4.SRCX		0	16383.000	0			5	3	O	X
	Source Image : Reference Position Y	PRM.IMGS4.SRCY		0	16383.000	0			5	3	O	X
	Result Image : Reference Position XY	PRM.IMGS4.DSTXY							5	3	O	X
	Result Image : Reference Position X	PRM.IMGS4.DSTX		0	16383.000	-16383.000	5	3	O	O	X	O
	Result Image : Reference Position Y	PRM.IMGS4.DSTY		0	16383.000	-16383.000	5	3	O	O	X	O
	Angle	PRM.IMGS4.RCT		0	355.999	0.000	3	3	O	O	X	O
Resultant Image	Resultant Image	PRM.DTL.OIMG							X	X	X	O
	Use Interpolation	PRM.DTL.IPTYP	ON	1					X	X	X	O
			OFF	0								
Overlap & Background	PRM.DTL.OPTYP		Max	58					X	X	X	O
			Min	59								

String Generator Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
									No. of integer digits	No. of decimal places		
String Generator	String Length	PRM.DTL.CMSTR_LEN				64	512	1	3	0	X	O

Pause Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing	Unit properties
									No. of integer digits	No. of decimal places		
Condition setting	Length	PRM.DTL.WTM				0	3600000	0	7	0	O	O

Timer Start Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				User variable	No. of integer digits	
Condition	Timer setting	PRM.DTL.TMRID	%UserTimer0	0				X	X	
			%UserTimer1	1				X	X	
			%UserTimer2	2						
			%UserTimer3	3						
			%UserTimer4	4						
			%UserTimer5	5						
			%UserTimer6	6						
			%UserTimer7	7						

Timer End Unit

Category	Setting item	Name	Selection		Initial value	Upper limit	Lower limit	Numerical value format		Referencing
			Label	Value				User variable	No. of integer digits	
Condition	Timer setting	PRM.DTL.TMRID	%UserTimer0	0				X	X	
			%UserTimer1	1				X	X	
			%UserTimer2	2						
			%UserTimer3	3						
			%UserTimer4	4						
			%UserTimer5	5						
			%UserTimer6	6						
			%UserTimer7	7						
Length	PRM.DTL.TMREXP			0	3600000	0	7 0	O O X X		

Terminal I/O Delay Unit

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Numerical value format	Referencing
				Value	Initial value	Upper limit				
Condition setting	Reference value	PRM.DTL.TGV[0]								X O X O
Condition 0	Bit	PRM.DTL.TGB[0]		0	31	0	2	0	X X X O	
	Signal type	PRM.DTL.VTP[0]	Rising /falling edge	0						X X X O
			Level	1						
	Signal change direction	PRM.DTL.VDR[0]	Both	2						X X X O
			ON->OFF	1						
			OFF->ON	0						
			ON	3						
			OFF	4						
Condition 1		PRM.DTL.***[1]								
:		PRM.DTL.***[19]								
Condition 19										
Condition setting (common)	Multiple BIT, single result logic	PRM.DTL.UJC	OR	1						X X X O
			AND	0						
	Timeout	PRM.DTL.ENTO	ON	1						X X X O
			OFF	0						
Timeout period	PRM.DTL.TO			1.0	600.0	0.1	3	1	X X X O	
Update view	PRM.DTL.UVW		ON	1						X X X O
			OFF	0						

Variable Delay Unit

Category	Setting item	Name	Selection			Upper limit	Lower limit	Numerical value format		Referencing		
			Label	Value	Initial value			No. of integer digits	No. of decimal places	User variable	System variable	Result data
Condition setting	Condition 0	PRM.DTL.VWC[0]	None	0				X	X	X		O
			Variable = Condition value 1	3								
			Variable <> Condition value 1	4								
			Variable > Condition value 1	5								
			Variable < Condition value 1	6								
			Variable >= Condition value 1	7								
			Variable <= Condition value 1	8								
			Cond.1 < Variable < Cond.2	9								
			Cond.1 <= Variable < Cond.2	10								
			Cond.1 < Variable <= Cond.2	11								
			Cond.1 <= Variable <= Cond.2	1								
			Variable < Condition value 1 OR Cond.2 < Variable	2								
			Variable <= Condition value 1 OR Cond.2 < Variable	12								
			Variable < Condition value 1 OR Cond.2 <= Variable	13								
			Variable <= Condition value 1 OR Cond.2 <= Variable	14								
Reference value	PRM.DTL.TGV[0]			0.000	99999999.999	-99999999.999	8	3	O	O	X	O
Condition value 1	PRM.DTL.REF1[0]			0.000	99999999.999	-99999999.999	8	3	O	O	X	O
Condition value 2	PRM.DTL.REF2[0]			0.000	99999999.999	-99999999.999	8	3	O	O	X	O
Condition 1	PRM.DTL.***[1]											
:	⋮											
Condition 7	PRM.DTL.***[7]											
Condition (common)	Multiple variable logic	PRM.DTL.UJC	OR	1							X	X
			AND	0								
	Timeout	PRM.DTL.ENTO	ON	1							X	X
			OFF	0								
	Timeout period	PRM.DTL.TO		1.0	600.0	0.1	3	1	X	X	X	O
	Update view	PRM.DTL.UVW	ON	1							X	X
			OFF	0								

User Menu Unit

Category	Setting item	Name	Label	Selection			Initial value	Upper limit	Lower limit	Numerical value format			Referencing
				Value						No. of integer digits	No. of decimal places	User variable	
Condition setting	Menu ID	PRM.DTL.DID		0	999	0	3	0	X	X	X	O	
	Timeout	PRM.DTL.ENTO	ON	1						X	X	X	O
			OFF	0									
	Timeout period	PRM.DTL.TO		60.0	600.0	0.1	3	1	X	X	X	O	

On-screen Graphics Unit

Category	Setting item	Name	Label	Selection			Initial value	Upper limit	Lower limit	Numerical value format			Referencing
				Value						No. of integer digits	No. of decimal places	User variable	
Graphics setting	Graphics type	PRM.GRPH[0].GTYP	None	-1						X	X	X	O
			Rectangle	0									
			Rotated rectangle	1									
			Circle	2									
			Oval	4									
			Ring	3									
			Arc	5									
			Point	6									
			Line (Co-ordinate)	7									
			Line (Rotation about origin)	8									
			Text	9									
			Value	10									
			Active Text	11									
			Decimal to ASCII	12									

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data
Graphics setting: Rectangle	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Point 1 XY	PRM.GRPH[0].DLUXY						5	3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Point 1 X	PRM.GRPH[0].DLUX		160.000	16383.000	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Point 1 Y	PRM.GRPH[0].DLUY		160.000	16383.000	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Point 2 XY	PRM.GRPH[0].DRDXY						5	3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Point 2 X	PRM.GRPH[0].DRDX		360.000	16383.000	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Point 2 Y	PRM.GRPH[0].DRDY		320.000	16383.000	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Fill	PRM.GRPH[0].PNT	ON OFF	1 0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Color and style	PRM.GRPH[0].JGSP	Default Alternative	0 1						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position offset XY	PRM.GRPH[0].OFXY						4	3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000		4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000		4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation center XY	PRM.GRPH[0].RCXY						5	3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000		3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Graphics setting: Rotated rectangle	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Width	PRM.GRPH[0].WIDTH		201.000	16383.000	1.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Height	PRM.GRPH[0].HIGHT		161.000	16383.000	1.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Center XY	PRM.GRPH[0].DCXY						5	3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Center X	PRM.GRPH[0].DCX		260.000	16382.000	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Center Y	PRM.GRPH[0].DCY		240.000	16382.000	0.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Rotation angle	PRM.GRPH[0].T		0.000	359.999	0.000		3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Fill	PRM.GRPH[0].PNT	ON OFF	1 0						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Color and style	PRM.GRPH[0].JGSP	Default Alternative	0 1						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position offset XY	PRM.GRPH[0].OFXY						4	3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000		4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000		4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation center XY	PRM.GRPH[0].RCXY						5	3	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000		5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000		3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Label	Selection				No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit	Lower limit			User variable	System variable	Result data	Unit properties
Graphics setting: Circle	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	○	○	○	○
	Center XY	PRM.GRPH[0].DCXY						5	3	○	X	○	○
	Center X	PRM.GRPH[0].DCX		260.000	16383.000	-16383.000		5	3	○	○	○	○
	Center Y	PRM.GRPH[0].DCY		240.000	16383.000	-16383.000		5	3	○	○	○	○
	Radius	PRM.GRPH[0].DCR		120.000	16000.000	0.000		5	3	○	○	○	○
	Fill	PRM.GRPH[0].PNT	ON OFF	1 0						○	○	○	○
	Color and style	PRM.GRPH[0].JGSP	Default Alternative	0 1						○	○	○	○
	Display position offset XY	PRM.GRPH[0].OFXY						4	3	○	X	○	○
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000		4	3	○	○	○	○
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000		4	3	○	○	○	○
	Display position rotation center XY	PRM.GRPH[0].RCXY						5	3	○	X	○	○
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000		5	3	○	○	○	○
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000		5	3	○	○	○	○
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000		3	3	○	○	○	○
Graphics setting: Oval	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	○	○	○	○
	Center XY	PRM.GRPH[0].DCXY						5	3	○	X	○	○
	Center X	PRM.GRPH[0].DCX		260.000	16383.000	-16383.000		5	3	○	○	○	○
	Center Y	PRM.GRPH[0].DCY		240.000	16383.000	-16383.000		5	3	○	○	○	○
	Radius 1	PRM.GRPH[0].DCR1		120.000	2580.000	8.000		4	3	○	○	○	○
	Radius 2	PRM.GRPH[0].DCR2		180.000	2580.000	8.000		4	3	○	○	○	○
	Rotation angle	PRM.GRPH[0].T		0.000	359.999	0.000		3	3	○	○	○	○
	Fill	PRM.GRPH[0].PNT	ON OFF	1 0						○	○	○	○
	Color and style	PRM.GRPH[0].JGSP	Default Alternative	0 1						○	○	○	○
	Display position offset XY	PRM.GRPH[0].OFXY						4	3	○	X	○	○
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000		4	3	○	○	○	○
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000		4	3	○	○	○	○
	Display position rotation center XY	PRM.GRPH[0].RCXY						5	3	○	X	○	○
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000		5	3	○	○	○	○
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000		5	3	○	○	○	○
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000		3	3	○	○	○	○
Graphics setting: Ring	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	○	○	○	○
	Center XY	PRM.GRPH[0].DCXY						5	3	○	X	○	○
	Center X	PRM.GRPH[0].DCX		260.000	16383.000	-16383.000		5	3	○	○	○	○
	Center Y	PRM.GRPH[0].DCY		240.000	16383.000	-16383.000		5	3	○	○	○	○
	Radius 1	PRM.GRPH[0].DCR1		120.000	9600.000	0.000		4	3	○	○	○	○
	Radius 2	PRM.GRPH[0].DCR2		60.000	9600.000	0.000		4	3	○	○	○	○
	Fill	PRM.GRPH[0].PNT	ON OFF	1 0						○	○	○	○
Color and style	Color and style	PRM.GRPH[0].JGSP	Default Alternative	0 1						○	○	○	○

Category	Setting item	Name	Label	Selection			Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable
Graphics setting: Ring (continued)	Display position offset XY	PRM.GRPH[0].OFXY						4	3	<input checked="" type="radio"/>	X
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000		4	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000		4	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Display position rotation center XY	PRM.GRPH[0].RCXY						5	3	<input checked="" type="radio"/>	X
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000		5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000		5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000		3	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Graphics setting: Arc	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Center XY	PRM.GRPH[0].DCXY						5	3	<input checked="" type="radio"/>	X
	Center X	PRM.GRPH[0].DCX		260.000	16383.000	-16383.000		5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Center Y	PRM.GRPH[0].DCY		240.000	16383.000	-16383.000		5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Radius 1	PRM.GRPH[0].DCR1		120.000	9600.000	0.000		4	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Radius 2	PRM.GRPH[0].DCR2		30.000	9600.000	0.000		4	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Starting angle	PRM.GRPH[0].STA		45.000	359.999	0.000		3	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	End angle	PRM.GRPH[0].ENA		315.000	359.999	0.000		3	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Fill	PRM.GRPH[0].PNT	ON	1						<input checked="" type="radio"/>	<input checked="" type="radio"/>
			OFF	0							
Graphics setting: Point	Color and style	PRM.GRPH[0].JGSP	Default	0						<input checked="" type="radio"/>	<input checked="" type="radio"/>
			Alternative	1							
	Display position offset XY	PRM.GRPH[0].OFXY						4	3	<input checked="" type="radio"/>	X
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000		4	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000		4	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Display position rotation center XY	PRM.GRPH[0].RCXY						5	3	<input checked="" type="radio"/>	X
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000		5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000		5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000		3	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Graphics setting: Point	Center XY	PRM.GRPH[0].DCXY						5	3	<input checked="" type="radio"/>	X
	Center X	PRM.GRPH[0].DCX		260.000	16383.000	-16383.000		5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Center Y	PRM.GRPH[0].DCY		240.000	16383.000	-16383.000		5	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Width 1	PRM.GRPH[0].W1	16.000	9600.000	0.000			4	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Width 2	PRM.GRPH[0].W2	0.000	9600.000	0.000			4	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Rotation angle	PRM.GRPH[0].T	0.000	359.999	0.000			3	3	<input checked="" type="radio"/>	<input checked="" type="radio"/>
	Zoom	PRM.GRPH[0].ZM	ON	1						X	X
			OFF	0							
	Color and style	PRM.GRPH[0].JGSP	Default	0						<input checked="" type="radio"/>	<input checked="" type="radio"/>
			Alternative	1							

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties
Graphics setting: Point (continued)	Display position offset XY	PRM.GRPH[0].OFXY					4	3	<input type="radio"/>	X	<input type="radio"/>	<input type="radio"/>
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000	4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000	4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation center XY	PRM.GRPH[0].RCXY					5	3	<input type="radio"/>	X	<input type="radio"/>	<input type="radio"/>
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Quantity	PRM.GRPH[0].CNT		1	10000	0	5	0	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Start position XY	PRM.GRPH[0].DSPXY					5	3	<input type="radio"/>	X	<input type="radio"/>	<input type="radio"/>
	Start position X	PRM.GRPH[0].DSPX		260.000	16383.000	-16383.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Start position Y	PRM.GRPH[0].DSPY		200.000	16383.000	-16383.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	End position XY	PRM.GRPH[0].DEPXY					5	3	<input type="radio"/>	X	<input type="radio"/>	<input type="radio"/>
	End position X	PRM.GRPH[0].DEPX		300.000	16383.000	-16383.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	End position Y	PRM.GRPH[0].DEPY		240.000	16383.000	-16383.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Graphics setting: Line	Line type	PRM.GRPH[0].LNTYP	2 points Continuous	1 0						X	X	X
	Arrowhead: Start	PRM.GRPH[0].SPARW	ON OFF	1 0						X	X	X
	Arrowhead: End	PRM.GRPH[0].EPARW	ON OFF	1 0						X	X	X
	Color and style	PRM.GRPH[0].JGSP	Default Alternative	0 1						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Line	PRM.GRPH[0].LNRTTH					5	3	<input type="radio"/>	X	<input type="radio"/>	<input type="radio"/>
	Line p	PRM.GRPH[0].LNR		240.000	16889.000	-16889.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Line θ	PRM.GRPH[0].LNTH		0.000	359.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position offset XY	PRM.GRPH[0].OFXY					4	3	<input type="radio"/>	X	<input type="radio"/>	<input type="radio"/>
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000	4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000	4	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation center XY	PRM.GRPH[0].RCXY					5	3	<input type="radio"/>	X	<input type="radio"/>	<input type="radio"/>
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000	5	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000	3	3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Category	Setting item	Name	Label	Selection				Numerical value format		Referencing		
				Value	Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	System variable	Result data
	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	○	○	○
	Text	PRM.GRPH[0].STR			Character string up to 100 bytes			-	-	X	X	○
	Display position XY	PRM.GRPH[0].XY						5	3	○	X	○
	Display position X	PRM.GRPH[0].X		0.000	16383.000	-16383.000		5	3	○	○	○
	Display position Y	PRM.GRPH[0].Y		0.000	16383.000	-16383.000		5	3	○	○	○
	Color and style	PRM.GRPH[0].JGSP	Default	0						○	○	○
Graphics setting: Text		Display position offset XY	Alternative	1				4	3	○	X	○
		Display position offset X		0.000	9600.000	-9600.000		4	3	○	○	○
		Display position offset Y		0.000	7200.000	-7200.000		4	3	○	○	○
		Display position rotation center XY						5	3	○	X	○
		Display position rotation center X		0.000	16383.000	-16383.000		5	3	○	○	○
		Display position rotation center Y		0.000	16383.000	-16383.000		5	3	○	○	○
		Display position rotation angle		0.000	359.999	0.000		3	3	○	○	○
		Quantity		1	10000	0		5	0	○	○	○
		Value		0.000000	9999999999 .999999	-9999999999 .999999		10	6	○	○	○
Graphics setting: Value		Display position XY	Alternative	1				5	3	○	X	○
		Display position X		0.000	16383.000	-16383.000		5	3	○	○	○
		Display position Y		0.000	16383.000	-16383.000		5	3	○	○	○
		Number of digits		7	10	1		2	0	X	X	○
		Decimal places		3	6	0		1	0	X	X	○
		+/- prefix	ON	1						X	X	X
			OFF	0								
		Zero suppression	ON	1						X	X	X
			OFF	0								
		Color and style	Default	0						○	○	○
			Alternative	1								
		Display position offset XY						4	3	○	X	○
		Display position offset X		0.000	9600.000	-9600.000		4	3	○	○	○
		Display position offset Y		0.000	7200.000	-7200.000		4	3	○	○	○
		Display position rotation center XY						5	3	○	X	○
		Display position rotation center X		0.000	16383.000	-16383.000		5	3	○	○	○
		Display position rotation center Y		0.000	16383.000	-16383.000		5	3	○	○	○
		Display position rotation angle		0.000	359.999	0.000		3	3	○	○	○

Category	Setting item	Name	Label	Selection				Numerical value format	Referencing		
				Value	Initial value	Upper limit	Lower limit		No. of integer digits	No. of decimal places	User variable
Graphics setting: Active text	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	○	○ ○ ○ ○ ○
	Table No./name	PRM.GRPH[0].TBL		0	63	0		2	0	X	X X ○ ○ ○
	Value	PRM.GRPH[0].NMR		0.000000	9999999999 .999999	-9999999999 .999999		10	6	○ ○ ○ ○ ○	
	Display position XY	PRM.GRPH[0].XY						5	3	○ X ○ ○ ○	
	Display position X	PRM.GRPH[0].X		0.000	16383.000	-16383.000		5	3	○ ○ ○ ○ ○	
	Display position Y	PRM.GRPH[0].Y		0.000	16383.000	-16383.000		5	3	○ ○ ○ ○ ○	
	Color and style	PRM.GRPH[0].JGSP	Default	0						○ ○ ○ ○ ○	
			Alternative	1							
	Display position offset XY	PRM.GRPH[0].OFXY						4	3	○ X ○ ○ ○	
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000		4	3	○ ○ ○ ○ ○	
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000		4	3	○ ○ ○ ○ ○	
	Display position rotation center XY	PRM.GRPH[0].RCXY						5	3	○ X ○ ○ ○	
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000		5	3	○ ○ ○ ○ ○	
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000		5	3	○ ○ ○ ○ ○	
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000		3	3	○ ○ ○ ○ ○	
Graphics setting: Decimal to ASCII	Quantity	PRM.GRPH[0].CNT		1	10000	0		5	0	○ ○ ○ ○ ○	
	Value	PRM.GRPH[0].NMR		0.000000	9999999999 .999999	-9999999999 .999999		10	6	○ ○ ○ ○ ○	
	No. of characters	PRM.GRPH[0].STRN		10	100	0		3	0	○ ○ ○ ○ ○	
	Display position XY	PRM.GRPH[0].XY						5	3	○ X ○ ○ ○	
	Display position X	PRM.GRPH[0].X		0.000	16383.000	-16383.000		5	3	○ ○ ○ ○ ○	
	Display position Y	PRM.GRPH[0].Y		0.000	16383.000	-16383.000		5	3	○ ○ ○ ○ ○	
	ASCII mode	PRM.GRPH[0].OCRDIS	ON	1						X X X ○ ○	
			OFF	0							
	Color and style	PRM.GRPH[0].JGSP	Default	0						○ ○ ○ ○ ○	
			Alternative	1							
	Display position offset XY	PRM.GRPH[0].OFXY						4	3	○ X ○ ○ ○	
	Display position offset X	PRM.GRPH[0].OFX		0.000	9600.000	-9600.000		4	3	○ ○ ○ ○ ○	
	Display position offset Y	PRM.GRPH[0].OFY		0.000	7200.000	-7200.000		4	3	○ ○ ○ ○ ○	
	Display position rotation center XY	PRM.GRPH[0].RCXY						5	3	○ X ○ ○ ○	
	Display position rotation center X	PRM.GRPH[0].RCX		0.000	16383.000	-16383.000		5	3	○ ○ ○ ○ ○	
	Display position rotation center Y	PRM.GRPH[0].RCY		0.000	16383.000	-16383.000		5	3	○ ○ ○ ○ ○	
	Display position rotation angle	PRM.GRPH[0].RCT		0.000	359.999	0.000		3	3	○ ○ ○ ○ ○	
Figure 1 ... Figure 1		PRM.GRPH[1].***									
		:									
		PRM.GRPH[31].***									

Parallel Terminal Output Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Numerical value format	Referencing
Output data setting	Output frequency	PRM.DTL.OTMS		1	8	1	1	1	0	X	X	X	O
	Full output buffer	PRM.DTL.PRIO	Skip output item	0						X	X	X	O
			Wait for free space	1									
	Skip unexecuted items	PRM.DTL.OSKP	ON	1						X	X	X	O
			OFF	0									

Data Output Unit

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	No. of integer digits	No. of decimal places	User variable	Numerical value format	Referencing
Output data setting	Device	PRM.DTL.DEV	SD Card	1							X	X	X
			RS-232C	2									
			Ethernet	3									
			PLC-Link	4									
			CC-Link	6									
			PC Program	9									
			EtherNet/IP	10									
			PROFINET	13									
			EtherCAT	17									
			FTP	12									
			USB HDD	16									
			VisionDataStorage (USB)	18									
			EtherNet/IP Module	19									
			PROFINET Module	20									
Data Delimiter	PRM.DTL.SEPA		Comma	" , "							X	X	X
			Tab	"\t"									
			Space	" [] "									
			None	" "									
Full output buffer	PRM.DTL.PRIO		Skip output item	0							X	X	X
			Wait for free space	1									
Skip unexecuted items	PRM.DTL.OSKP		ON	1							X	X	X
			OFF	0									
Use number of detected items to control outputting array data	PRM.DTL.USEDTN		OFF	0							X	X	X
			ON	1									
Output number of array data for output item 0						1	10000		5	0	O*	X	O*

* Variables and result data are available only when output data are user-defined array variables.

Category	Setting item	Name	Label	Selection		Initial value	Upper limit	Lower limit	Numerical value format	No. of integer digits No. of decimal places	Referencing		
											User variable	System variable	Result data
Output data setting	Output item 1	PRM.DTM.ADN[1]											
	:												
	Output item 255	PRM.DTM.ADN[255]											
Detailed setting (SD card)	Output folder	PRM.DTL.BFN			"SD2:\xg\result\"		Character string up to 255 bytes						O
	File naming	PRM.DTL.FNR	Auto	1							X	X	X
			Fixed name	0									O
	Fixed name	PRM.DTL.FHS			"ResultOutput"		Character string up to 64 bytes						O
Detailed setting (PLC-Link)	Output address offset	PRM.DTL.P_OAO			0		54255	0	5	0	X	X	X
	Result memory address offset	PRM.DTL.P_OCAO			0		54255	0	5	0	X	X	X
	Handshake	PRM.DTL.P_HSH	ON	1							X	X	X
			OFF	0									O
Detailed setting (CC-Link)	Offset of RWr	PRM.DTL.C_RWOO			0		126	0	3	0	X	X	X
	Handshake	PRM.DTL.C_HSH	ON	1							X	X	X
			OFF	0									O
Detailed setting (EtherNet/IP)	InputAssembly Output offset	PRM.DTL.C_RWOO			0		1436	0	4	0	X	X	X
	Handshake	PRM.DTL.E_HSH	ON	1							X	X	X
			OFF	0									O
Detailed setting (PROFINET)	InputAssembly output offset	PRM.DTL.PF_IAOO			0		4084	0	4	0	X	X	X
	Handshake	PRM.DTL.PF_HSH	ON	1							X	X	X
			OFF	0									O
Detailed setting (EtherCAT)	Bit output offset	PRM.DTL.ECAT_IAOOB			0		31	0	2	0	X	X	X
	InputAssembly output offset	PRM.DTL.ECAT_IAOO			0		4084	0	4	0	X	X	X
	Handshake	PRM.DTL.ECAT_HSH	ON	1							X	X	X
			OFF	0									O
Detailed setting (PC program)	Output folder	PRM.DTL.BFN			"SD2:\xg\result\"		Character string up to 255 bytes						O
	File naming	PRM.DTL.FNR	Auto	1							X	X	X
			Fixed name	0									O
	Fixed name	PRM.DTL.FHS			"ResultOutput"		Character string up to 64 bytes						O
Detailed setting (FTP/VisionData Storage(Ether))	Output folder	PRM.DTL.BFN			"\xg\result\"		Character string up to 255 bytes						O
	File naming	PRM.DTL.FNR	Auto	1							X	X	X
			Fixed name	0									O
	Fixed Name	PRM.DTL.FHS			"ResultOutput"		Character string up to 64 bytes						O
Detailed setting (VisionData Storage(USB))	Output folder	PRM.DTL.BFN			"\xg\result\"		Character string up to 255 bytes						O
	File naming	PRM.DTL.FNR	Auto	1							X	X	X
			Fixed name	0									O
	Fixed Name	PRM.DTL.FHS			"ResultOutput"		Character string up to 64 bytes						O
Detailed setting (USB HDD)	Output folder	PRM.DTL.BFN			"\xg\result\"		Character string up to 255 bytes						O
	File naming	PRM.DTL.FNR	Auto	1							X	X	X
			Fixed name	0									O
	Fixed Name	PRM.DTL.FHS			"ResultOutput"		Character string up to 64 bytes						O

Image Output Unit

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing					
				Value	Initial value	Upper limit			User variable	System variable	Result data	Unit properties		
Output data setting	Device	PRM.DTL.DEV	SD Card	1					X	X	X	<input type="radio"/>		
			PC Program	9										
			FTP	12										
			USB HDD	16										
			VisionDataStorage (USB)	18										
Output Image Selection	File format	PRM.DTL.FLFMT	BMP	0					X	X	X	<input type="radio"/>		
			BMP (1/2 resolution)	1										
			BMP (1/4 resolution)	2										
			BMP (1/8 resolution)	3										
			JPEG	4										
			PNG	5										
Full output buffer		PRM.DTL.PRIO	Skip output item	0					X	X	X	<input type="radio"/>		
			Wait for free space	1										
Extension		PRM.DTL.OI_ALL	All	0				1	0	X	X	<input type="radio"/>		
			Individual	1										
Specify Individually			PRM.DTL.OEI[0]					1	0	X	X	<input type="radio"/>		
File settings (SD card)	Output folder	PRM.DTL.BFN		"SD2:\xg\image"*		Character string up to 255 bytes						<input type="radio"/>		
			New folder rule	PRM.DTL.SFNR	None	0			X	X	X	<input type="radio"/>		
					No. of images	1								
					Date	2								
No. of images per folder			PRM.DTL.SFFC		1000	10000	1	5	0	X	X	<input type="radio"/>		
File naming		PRM.DTL.FNR	Auto	1					X	X	X	<input type="radio"/>		
			Sequential	2										
			Specified	3										
			Custom	4										
Sequence limit			PRM.DTL.MXSQN		1000	1000000	1	7	0	X	X	<input type="radio"/>		
Fixed name			PRM.DTL.FHS			Character string up to 64 bytes						<input type="radio"/>		
File settings (PC program)	Output folder	PRM.DTL.BFN		"SD2:\xg\image"*		Character string up to 255 bytes						<input type="radio"/>		
			New folder rule	PRM.DTL.SFNR	None	0			X	X	X	<input type="radio"/>		
					No. of images	1								
					Date	2								
No. of images per folder			PRM.DTL.SFFC		1000	10000	1	5	0	X	X	<input type="radio"/>		
File naming		PRM.DTL.FNR	Auto	1					X	X	X	<input type="radio"/>		
			Sequential	2										
			Specified	3										
			Custom	4										
Sequence limit			PRM.DTL.MXSQN		1000	1000000	1	7	0	X	X	<input type="radio"/>		
Fixed name			PRM.DTL.FHS			Character string up to 64 bytes						<input type="radio"/>		

Category	Setting item	Name	Label	Selection			Upper limit	Lower limit	No. of integer digits	No. of decimal places	Numerical value format	Referencing	Unit properties
				Value	Initial value								
File settings (FTP)	Output folder	PRM.DTL.BFN			"xg\image\"		Character string up to 255 bytes						O
	New folder rule	PRM.DTL.SFNR	None	0								X	X
			No. of images	1									O
			Date	2									
	No. of images per folder	PRM.DTL.SFFC			1000		10000	1	5	0	X	X	O
	File naming	PRM.DTL.FNR	Auto	1								X	X
			Sequential	2									O
			Specified	3									
			Custom	4									
	Sequence limit	PRM.DTL.MXSQN			1000		1000000	1	7	0	X	X	O
	Fixed name	PRM.DTL.FHS					Character string up to 64 bytes						O
File settings (VisionData Storage (USB))	Output folder	PRM.DTL.BFN			"xg\image\"		Character string up to 255 bytes						O
	New folder rule	PRM.DTL.SFNR	None	0								X	X
			No. of images	1									O
			Date	2									
	No. of images per folder	PRM.DTL.SFFC			1000		10000	1	5	0	X	X	O
	File naming	PRM.DTL.FNR	Auto	1								X	X
			Sequential	2									O
			Specified	3									
			Custom	4									
	Sequence limit	PRM.DTL.MXSQN			1000		1000000	1	7	0	X	X	O
	Fixed name	PRM.DTL.FHS					Character string up to 64 bytes						O
File settings (USB HDD)	Output folder	PRM.DTL.BFN			"USB\xg\image\"		Character string up to 255 bytes						O
	New folder rule	PRM.DTL.SFNR	None	0								X	X
			No. of images	1									O
			Date	2									
	No. of images per folder	PRM.DTL.SFFC			1000		10000	1	5	0	X	X	O
	File naming	PRM.DTL.FNR	Auto	1								X	X
			Sequential	2									O
			Specified	3									
			Custom	4									
	Sequence limit	PRM.DTL.MXSQN			1000		1000000	1	7	0	X	X	O
	Fixed name	PRM.DTL.FHS					Character string up to 64 bytes						O

Command Execution Unit

Category	Setting item	Name	Label	Selection			No. of integer digits	No. of decimal places	Referencing			
				Initial value	Upper limit	Lower limit			User variable	System variable	Result data	Unit properties
Instruction	Instruction	PRM.DTL.CMD		Character string up to 256 bytes			X	X	X	X	O	
	Wait for response	PRM.DTL.WOP	On	1			X	X	X	X	O	
			Off	0								
	Judgment value	PRM.DTL.JOP	OK	0			X	X	X	X	O	
			Command response	1								

List of result data

Common to All Units:

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Unit judgment value	RSLT.UJG	Unsigned	1	0	-
Unit judgment value	RSLT.UJGP	Unsigned	1	0	-
Unit judgment value	RSLT.UJGN	Unsigned	1	0	-
Unit judgment value	RSLT.UJGP	Unsigned	1	0	-
Unit judgment value	RSLT.UJGN	Unsigned	1	0	-
Unit judgment value	RSLT.UJGOK	Unsigned	1	0	-
Unit judgment value	RSLT.UJGNG	Unsigned	1	0	-
Unit error	RSLT.UERR	Unsigned	1	0	-
Unit error ID	RSLT.UEID	Unsigned	7	0	-
Unit execution time	RSLT.EXTM	Unsigned	7	3	-
Execution count	RSLT.EXCT	Unsigned	7	0	-
NG count	RSLT.NGCT	Unsigned	7	0	-
Scale factor X	RSLT.SCLX	Available	4	6	-
Scale factor Y	RSLT.SCLY	Available	4	6	-
Scale factor L	RSLT.SCLL	Unsigned	4	6	-
Unit Execution	RSLT.EXE	Unsigned	1	0	-
Unit Non-Execution	RSLT.EXEN	Unsigned	1	0	-



Scale factors X, Y, and L are used for vision units only.

Relationship between the unit judgment value and judgment result

	When judged as OK	When judged as NG	When unit is not executed
Unit judgment value: RSLT.UJG	0	1	0
Unit judgment value: RSLT.UJGP	0	1	1
Unit judgment value: RSLT.UJGN	1	0	1
Unit judgment value: RSLT.UJGOK	1	0	0
Unit judgment value: RSLT.UJGNG	0	1	0

Result data of height extraction plane

Plane equation info. XYZ of height extraction plane	RSLT.XPPABC	Available	3	6	-
Plane equation info. XYZ of height extraction plane: Measured value	RSLT.XPPABC:MS	Available	3	6	-
Plane equation info. XYZ of height extraction plane: Absolute measured value	RSLT.XPPABC:AB	Available	3	6	-
X slope of height extraction plane	RSLT.XPPA	Available	1	6	-
X slope of height extraction plane: Measured value	RSLT.XPPA:MS	Available	1	6	-
X slope of height extraction plane: Absolute measured value	RSLT.XPPA:AB	Available	1	6	-
Y slope of height extraction plane	RSLT.XPPB	Available	1	6	-
Y slope of height extraction plane: Measured value	RSLT.XPPB:MS	Available	1	6	-
Y slope of height extraction plane: Absolute measured value	RSLT.XPPB:AB	Available	1	6	-
Z intercept of height extraction plane	RSLT.XPPC	Available	3	3	-
Z intercept of height extraction plane: Measured value	RSLT.XPPC:MS	Available	3	3	-
Z intercept of height extraction plane: Absolute measured value	RSLT.XPPC:AB	Available	3	3	-

Inspection region

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Inspection region: Rectangle	Upper left X	RSLT.RGN.LUX	Available	5	3	X
	Upper left X: Measured value	RSLT.RGN.LUX:MS	Available	5	3	X
	Upper left X: Absolute measured value	RSLT.RGN.LUX:AB	Available	5	3	-
	Upper left X: Encoder measured value	RSLT.RGN.LUX:EC	Available	5	3	X
	Upper left X: Region Setting Value	RSLT.RGN.LUX:RG	Available	5	3	-
	Upper left Y	RSLT.RGN.LUY	Available	5	3	Y
	Upper left Y: Measured value	RSLT.RGN.LUY:MS	Available	5	3	Y
	Upper left Y: Absolute measured value	RSLT.RGN.LUY:AB	Available	5	3	-
	Upper left Y: Encoder measured value	RSLT.RGN.LUY:EC	Available	5	3	Y
	Upper left Y: Region Setting Value	RSLT.RGN.LUY:RG	Available	5	3	-
	Upper left XY	RSLT.RGN.LUXY	Available	5	3	-
	Upper left XY: Measured value	RSLT.RGN.LUXY:MS	Available	5	3	-
	Upper left XY: Absolute measured value	RSLT.RGN.LUXY:AB	Available	5	3	-
	Upper left XY: Encoder measured value	RSLT.RGN.LUXY:EC	Available	5	3	-
	Upper left XY: Region Setting Value	RSLT.RGN.LUXY:RG	Available	5	3	-
	Lower left X	RSLT.RGN.LDX	Available	5	3	X
	Lower left X: Measured value	RSLT.RGN.LDX:MS	Available	5	3	X
	Lower left X: Absolute measured value	RSLT.RGN.LDX:AB	Available	5	3	-
	Lower left X: Encoder measured value	RSLT.RGN.LDX:EC	Available	5	3	X
	Lower left X: Region Setting Value	RSLT.RGN.LDX:RG	Available	5	3	-
	Lower left Y	RSLT.RGN.LDY	Available	5	3	Y
	Lower left Y: Measured value	RSLT.RGN.LDY:MS	Available	5	3	Y
	Lower left Y: Absolute measured value	RSLT.RGN.LDY:AB	Available	5	3	-
	Lower left Y: Encoder measured value	RSLT.RGN.LDY:EC	Available	5	3	-
	Lower left Y: Region Setting Value	RSLT.RGN.LDY:RG	Available	5	3	-
	Lower left XY	RSLT.RGN.LDXY	Available	5	3	Y
	Lower left XY: Measured value	RSLT.RGN.LDXY:MS	Available	5	3	-
	Lower left XY: Absolute measured value	RSLT.RGN.LDXY:AB	Available	5	3	-
	Lower left XY: Encoder measured value	RSLT.RGN.LDXY:EC	Available	5	3	-
	Lower left XY: Region Setting Value	RSLT.RGN.LDXY:RG	Available	5	3	-
	Upper right X	RSLT.RGN.RUX	Available	5	3	X
	Upper right X: Measured value	RSLT.RGN.RUX:MS	Available	5	3	X
	Upper right X: Absolute measured value	RSLT.RGN.RUX:AB	Available	5	3	-
	Upper right X: Encoder measured value	RSLT.RGN.RUX:EC	Available	5	3	X
	Upper right X: Region Setting Value	RSLT.RGN.RUX:RG	Available	5	3	-
	Upper right Y	RSLT.RGN.RUY	Available	5	3	Y
	Upper right Y: Measured value	RSLT.RGN.RUY:MS	Available	5	3	Y
	Upper right Y: Absolute measured value	RSLT.RGN.RUY:AB	Available	5	3	-
	Upper right Y: Encoder measured value	RSLT.RGN.RUY:EC	Available	5	3	Y
	Upper right Y: Region Setting Value	RSLT.RGN.RUY:RG	Available	5	3	-
	Upper right XY	RSLT.RGN.RUXY	Available	5	3	-
	Upper right XY: Measured value	RSLT.RGN.RUXY:MS	Available	5	3	-
	Upper right XY: Absolute measured value	RSLT.RGN.RUXY:AB	Available	5	3	-
	Upper right XY: Encoder measured value	RSLT.RGN.RUXY:EC	Available	5	3	-
	Upper right XY: Region Setting Value	RSLT.RGN.RUXY:RG	Available	5	3	-
	Lower right X	RSLT.RGN.RDX	Available	5	3	X
	Lower right X: Measured value	RSLT.RGN.RDX:MS	Available	5	3	X
	Lower right X: Absolute measured value	RSLT.RGN.RDX:AB	Available	5	3	-
	Lower right X: Encoder measured value	RSLT.RGN.RDX:EC	Available	5	3	X
	Lower right X: Region Setting Value	RSLT.RGN.RDX:RG	Available	5	3	-
	Lower right Y	RSLT.RGN.RDY	Available	5	3	Y
	Lower right Y: Measured value	RSLT.RGN.RDY:MS	Available	5	3	Y
	Lower right Y: Absolute measured value	RSLT.RGN.RDY:AB	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Inspection region: Rectangle (continued)	Lower right Y: Encoder measured value	RSLT.RGN.RDY:EC	Available	5	3	Y
	Lower right Y: Region Setting Value	RSLT.RGN.RDY:RG	Available	5	3	-
	Lower right XY	RSLT.RGN.RDXY	Available	5	3	-
	Lower right XY: Measured value	RSLT.RGN.RDXY:MS	Available	5	3	-
	Lower right XY: Absolute measured value	RSLT.RGN.RDXY:AB	Available	5	3	-
	Lower right XY: Encoder measured value	RSLT.RGN.RDXY:EC	Available	5	3	-
	Lower right XY: Region Setting Value	RSLT.RGN.RDXY:RG	Available	5	3	-
Inspection region: Rotated rectangle (*Edge angle unit only)	Width	RSLT.RGN.WI	Available	5	3	L
	Width: Measured value	RSLT.RGN.WI:MS	Available	5	3	L
	Width: Absolute measured value	RSLT.RGN.WI:AB	Available	5	3	-
	Width: Region Setting Value	RSLT.RGN.WI:RG	Available	5	3	-
	Height	RSLT.RGN.HI	Available	5	3	L
	Height: Measured value	RSLT.RGN.HI:MS	Available	5	3	L
	Height: Absolute measured value	RSLT.RGN.HI:AB	Available	5	3	-
	Height: Region Setting Value	RSLT.RGN.HI:RG	Available	5	3	-
	Center X	RSLT.RGN.RCX	Available	5	3	X
	Center X: Measured value	RSLT.RGN.RCX:MS	Available	5	3	X
	Center X: Absolute measured value	RSLT.RGN.RCX:AB	Available	5	3	-
	Center X: Encoder measured value	RSLT.RGN.RCX:EC	Available	5	3	X
	Center X: Region Setting Value	RSLT.RGN.RCX:RG	Available	5	3	-
	Center Y	RSLT.RGN.RCY	Available	5	3	Y
	Center Y: Measured value	RSLT.RGN.RCY:MS	Available	5	3	Y
Center Y: Absolute measured value	RSLT.RGN.RCX:AB	Available	5	3	-	
	Center Y: Encoder measured value	RSLT.RGN.RCY:EC	Available	5	3	Y
	Center Y: Region Setting Value	RSLT.RGN.RCY:RG	Available	5	3	-
	Center XY	RSLT.RGN.RCXY	Available	5	3	-
	Center XY: Measured value	RSLT.RGN.RCXY:MS	Available	5	3	-
	Center XY: Absolute measured value	RSLT.RGN.RCXY:AB	Available	5	3	-
	Center XY: Encoder measured value	RSLT.RGN.RCXY:EC	Available	5	3	-
	Center XY: Region Setting Value	RSLT.RGN.RCXY:RG	Available	5	3	-
	Rotation angle	RSLT.RGN.T	Available	3	3	-
	Rotation angle: Measured value	RSLT.RGN.T:MS	Available	3	3	-
	Rotation angle: Absolute measured value	RSLT.RGN.T:AB	Available	3	3	-
	Rotation angle: Region Setting Value	RSLT.RGN.T:RG	Available	3	3	-
	Segment height	RSLT.RGN.SH	Available	5	3	L
Segment height: Measured value	RSLT.RGN.SH:MS	Available	5	3	L	
	Segment height: Absolute measured value	RSLT.RGN.SH:AB	Available	5	3	-
	Segment height: Region Setting Value	RSLT.RGN.SH:RG	Available	5	3	-
	Upper left X	RSLT.RGN.LUX	Available	5	3	X
	Upper left X: Measured value	RSLT.RGN.LUX:MS	Available	5	3	X
	Upper left X: Absolute measured value	RSLT.RGN.LUX:AB	Available	5	3	-
	Upper left X: Encoder measured value	RSLT.RGN.LUX:EC	Available	5	3	X
	Upper left X: Region Setting Value	RSLT.RGN.LUX:RG	Available	5	3	-
	Upper left Y	RSLT.RGN.LUY	Available	5	3	Y
	Upper left Y: Measured value	RSLT.RGN.LUY:MS	Available	5	3	Y
	Upper left Y: Absolute measured value	RSLT.RGN.LUY:AB	Available	5	3	-
	Upper left Y: Encoder measured value	RSLT.RGN.LUY:EC	Available	5	3	Y
	Upper left Y: Region Setting Value	RSLT.RGN.LUY:RG	Available	5	3	-
	Upper left XY	RSLT.RGN.LUXY	Available	5	3	-
Lower left X	Upper left XY: Measured value	RSLT.RGN.LUXY:MS	Available	5	3	-
	Upper left XY: Absolute measured value	RSLT.RGN.LUXY:AB	Available	5	3	-
	Upper left XY: Encoder measured value	RSLT.RGN.LUXY:EC	Available	5	3	-
	Upper left XY: Region Setting Value	RSLT.RGN.LUXY:RG	Available	5	3	-
	Lower left X	RSLT.RGN.LDX	Available	5	3	X
	Lower left X: Measured value	RSLT.RGN.LDX:MS	Available	5	3	X
	Lower left X: Absolute measured value	RSLT.RGN.LDX:AB	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Inspection region: Rotated rectangle (*Edge angle unit only) (continued)	Lower left X: Encoder measured value	RSLT.RGN.LDX:EC	Available	5	3	X
	Lower left X: Region Setting Value	RSLT.RGN.LDX:RG	Available	5	3	-
	Lower left Y	RSLT.RGN.LDY	Available	5	3	Y
	Lower left Y: Measured value	RSLT.RGN.LDY:MS	Available	5	3	Y
	Lower left Y: Absolute measured value	RSLT.RGN.LDY:AB	Available	5	3	-
	Lower left Y: Encoder measured value	RSLT.RGN.LDY:EC	Available	5	3	Y
	Lower left Y: Region Setting Value	RSLT.RGN.LDY:RG	Available	5	3	-
	Upper right X	RSLT.RGN.RUX	Available	5	3	X
	Upper right X: Measured value	RSLT.RGN.RUX:MS	Available	5	3	X
	Upper right X: Absolute measured value	RSLT.RGN.RUX:AB	Available	5	3	-
Inspection region: Rotated rectangle (*Other than edge angle unit)	Upper right X: Encoder measured value	RSLT.RGN.RUX:EC	Available	5	3	X
	Upper right X: Region Setting Value	RSLT.RGN.RUX:RG	Available	5	3	-
	Upper right Y	RSLT.RGN.RUY	Available	5	3	Y
	Upper right Y: Measured value	RSLT.RGN.RUY:MS	Available	5	3	Y
	Upper right Y: Absolute measured value	RSLT.RGN.RUY:AB	Available	5	3	-
	Upper right Y: Encoder measured value	RSLT.RGN.RUY:EC	Available	5	3	Y
	Upper right Y: Region Setting Value	RSLT.RGN.RUY:RG	Available	5	3	-
	Upper right XY	RSLT.RGN.RUXY	Available	5	3	-
	Upper right XY: Measured value	RSLT.RGN.RUXY:MS	Available	5	3	-
	Upper right XY: Absolute measured value	RSLT.RGN.RUXY:AB	Available	5	3	-
Inspection region: Rotated rectangle (*Other than edge angle unit)	Upper right XY: Encoder measured value	RSLT.RGN.RUXY:EC	Available	5	3	-
	Upper right XY: Region Setting Value	RSLT.RGN.RUXY:RG	Available	5	3	-
	Lower right X	RSLT.RGN.RDX	Available	5	3	X
	Lower right X: Measured value	RSLT.RGN.RDX:MS	Available	5	3	X
	Lower right X: Absolute measured value	RSLT.RGN.RDX:AB	Available	5	3	-
	Lower right X: Encoder measured value	RSLT.RGN.RDX:EC	Available	5	3	X
	Lower right X: Region Setting Value	RSLT.RGN.RDX:RG	Available	5	3	-
	Lower right Y	RSLT.RGN.RDY	Available	5	3	Y
	Lower right Y: Measured value	RSLT.RGN.RDY:MS	Available	5	3	Y
	Lower right Y: Absolute measured value	RSLT.RGN.RDY:AB	Available	5	3	-
Inspection region: Rotated rectangle (*Other than edge angle unit)	Lower right Y: Encoder measured value	RSLT.RGN.RDY:EC	Available	5	3	Y
	Lower right Y: Region Setting Value	RSLT.RGN.RDY:RG	Available	5	3	-
	Lower right XY	RSLT.RGN.RDXY	Available	5	3	-
	Lower right XY: Measured value	RSLT.RGN.RDXY:MS	Available	5	3	-
	Lower right XY: Absolute measured value	RSLT.RGN.RDXY:AB	Available	5	3	-
	Lower right XY: Encoder measured value	RSLT.RGN.RDXY:EC	Available	5	3	-
	Lower right XY: Region Setting Value	RSLT.RGN.RDXY:RG	Available	5	3	-
	Width	RSLT.RGN.WI	Available	5	3	L
	Width: Measured value	RSLT.RGN.WI:MS	Available	5	3	L
	Width: Absolute measured value	RSLT.RGN.WI:AB	Available	5	3	-
Inspection region: Rotated rectangle (*Other than edge angle unit)	Width: Region Setting Value	RSLT.RGN.WI:RG	Available	5	3	-
	Height	RSLT.RGN.HI	Available	5	3	L
	Height: Measured value	RSLT.RGN.HI:MS	Available	5	3	L
	Height: Absolute measured value	RSLT.RGN.HI:AB	Available	5	3	-
	Height: Region Setting Value	RSLT.RGN.HI:RG	Available	5	3	-
	Center X	RSLT.RGN.RCX	Available	5	3	X
	Center X: Measured value	RSLT.RGN.RCX:MS	Available	5	3	X
	Center X: Absolute measured value	RSLT.RGN.RCX:AB	Available	5	3	-
	Center X: Encoder measured value	RSLT.RGN.RCX:EC	Available	5	3	X
	Center X: Region Setting Value	RSLT.RGN.RCX:RG	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Inspection region: Rotated rectangle ("Other than edge angle unit) (continued)	Center Y	RSLT.RGN.RCY	Available	5	3	Y
	Center Y: Measured value	RSLT.RGN.RCY:MS	Available	5	3	Y
	Center Y: Absolute measured value	RSLT.RGN.RCX:AB	Available	5	3	-
	Center Y: Encoder measured value	RSLT.RGN.RCY:EC	Available	5	3	Y
	Center Y: Region Setting Value	RSLT.RGN.RCY:RG	Available	5	3	-
	Center XY	RSLT.RGN.RCXY	Available	5	3	-
	Center XY: Measured value	RSLT.RGN.RCXY:MS	Available	5	3	-
	Center XY: Absolute measured value	RSLT.RGN.RCXY:AB	Available	5	3	-
	Center XY: Encoder measured value	RSLT.RGN.RCXY:EC	Available	5	3	-
	Center XY: Region Setting Value	RSLT.RGN.RCXY:RG	Available	5	3	-
	Rotation angle	RSLT.RGN.T	Available	3	3	-
	Rotation angle: Measured value	RSLT.RGN.T:MS	Available	3	3	-
	Rotation angle: Absolute measured value	RSLT.RGN.T:AB	Available	3	3	-
	Rotation angle: Region Setting Value	RSLT.RGN.T:RG	Available	3	3	-
	Upper left X	RSLT.RGN.LUX	Available	5	3	X
	Upper left X: Measured value	RSLT.RGN.LUX:MS	Available	5	3	X
	Upper left X: Absolute measured value	RSLT.RGN.LUX:AB	Available	5	3	-
	Upper left X: Encoder measured value	RSLT.RGN.LUX:EC	Available	5	3	X
	Upper left X: Region Setting Value	RSLT.RGN.LUX:RG	Available	5	3	-
	Upper left Y	RSLT.RGN.LUY	Available	5	3	Y
	Upper left Y: Measured value	RSLT.RGN.LUY:MS	Available	5	3	Y
	Upper left Y: Absolute measured value	RSLT.RGN.LUY:AB	Available	5	3	-
	Upper left Y: Encoder measured value	RSLT.RGN.LUY:EC	Available	5	3	Y
	Upper left Y: Region Setting Value	RSLT.RGN.LUY:RG	Available	5	3	-
	Upper left XY	RSLT.RGN.LUXY	Available	5	3	-
	Upper left XY: Measured value	RSLT.RGN.LUXY:MS	Available	5	3	-
	Upper left XY: Absolute measured value	RSLT.RGN.LUXY:AB	Available	5	3	-
	Upper left XY: Encoder measured value	RSLT.RGN.LUXY:EC	Available	5	3	-
	Upper left XY: Region Setting Value	RSLT.RGN.LUXY:RG	Available	5	3	-
	Lower left X	RSLT.RGN.LDX	Available	5	3	X
	Lower left X: Measured value	RSLT.RGN.LDX:MS	Available	5	3	X
	Lower left X: Absolute measured value	RSLT.RGN.LDX:AB	Available	5	3	-
	Lower left X: Encoder measured value	RSLT.RGN.LDX:EC	Available	5	3	X
	Lower left X: Region Setting Value	RSLT.RGN.LDX:RG	Available	5	3	-
	Lower left Y	RSLT.RGN.LDY	Available	5	3	Y
	Lower left Y: Measured value	RSLT.RGN.LDY:MS	Available	5	3	Y
	Lower left Y: Absolute measured value	RSLT.RGN.LDY:AB	Available	5	3	-
	Lower left Y: Encoder measured value	RSLT.RGN.LDY:EC	Available	5	3	Y
	Lower left Y: Region Setting Value	RSLT.RGN.LDY:RG	Available	5	3	-
	Lower left XY	RSLT.RGN.LDXY	Available	5	3	-
	Lower left XY: Measured value	RSLT.RGN.LDXY:MS	Available	5	3	-
	Lower left XY: Absolute measured value	RSLT.RGN.LDXY:AB	Available	5	3	-
	Lower left XY: Encoder measured value	RSLT.RGN.LDXY:EC	Available	5	3	-
	Lower left XY: Region Setting Value	RSLT.RGN.LDXY:RG	Available	5	3	-
	Upper right X	RSLT.RGN.RUX	Available	5	3	X
	Upper right X: Measured value	RSLT.RGN.RUX:MS	Available	5	3	X
	Upper right X: Absolute measured value	RSLT.RGN.RUX:AB	Available	5	3	-
	Upper right X: Encoder measured value	RSLT.RGN.RUX:EC	Available	5	3	X
	Upper right X: Region Setting Value	RSLT.RGN.RUX:RG	Available	5	3	-
	Upper right Y	RSLT.RGN.RUY	Available	5	3	Y
	Upper right Y: Measured value	RSLT.RGN.RUY:MS	Available	5	3	Y
	Upper right Y: Absolute measured value	RSLT.RGN.RUY:AB	Available	5	3	-
	Upper right Y: Encoder measured value	RSLT.RGN.RUY:EC	Available	5	3	Y
	Upper right Y: Region Setting Value	RSLT.RGN.RUY:RG	Available	5	3	-
	Upper right XY	RSLT.RGN.RUXY	Available	5	3	-
	Upper right XY: Measured value	RSLT.RGN.RUXY:MS	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Inspection region: Rotated rectangle (*Other than edge angle unit) (continued)	Upper right XY: Absolute measured value	RSLT.RGN.RUXY:AB	Available	5	3	-
	Upper right XY: Encoder measured value	RSLT.RGN.RUXY:EC	Available	5	3	-
	Upper right XY: Region Setting Value	RSLT.RGN.RUXY:RG	Available	5	3	-
	Lower right X	RSLT.RGN.RDX	Available	5	3	X
	Lower right X: Measured value	RSLT.RGN.RDX:MS	Available	5	3	X
	Lower right X: Absolute measured value	RSLT.RGN.RDX:AB	Available	5	3	-
	Lower right X: Encoder measured value	RSLT.RGN.RDX:EC	Available	5	3	X
	Lower right X: Region Setting Value	RSLT.RGN.RDX:RG	Available	5	3	-
	Lower right Y	RSLT.RGN.RDY	Available	5	3	Y
	Lower right Y: Measured value	RSLT.RGN.RDY:MS	Available	5	3	Y
	Lower right Y: Absolute measured value	RSLT.RGN.RDY:AB	Available	5	3	-
	Lower right Y: Encoder measured value	RSLT.RGN.RDY:EC	Available	5	3	Y
	Lower right Y: Region Setting Value	RSLT.RGN.RDY:RG	Available	5	3	-
	Lower right XY	RSLT.RGN.RDXY	Available	5	3	-
	Lower right XY: Measured value	RSLT.RGN.RDXY:MS	Available	5	3	-
	Lower right XY: Absolute measured value	RSLT.RGN.RDXY:AB	Available	5	3	-
	Lower right XY: Encoder measured value	RSLT.RGN.RDXY:EC	Available	5	3	-
	Lower right XY: Region Setting Value	RSLT.RGN.RDXY:RG	Available	5	3	-
Inspection region: Circle	Center X	RSLT.RGN.CX	Available	5	3	X
	Center X: Measured value	RSLT.RGN.CX:MS	Available	5	3	X
	Center X: Absolute measured value	RSLT.RGN.CX:AB	Available	5	3	-
	Center X: Encoder measured value	RSLT.RGN.CX:EC	Available	5	3	X
	Center X: Region Setting Value	RSLT.RGN.CX:RG	Available	5	3	-
	Center Y	RSLT.RGN.CY	Available	5	3	Y
	Center Y: Measured value	RSLT.RGN.CY:MS	Available	5	3	Y
	Center Y: Absolute measured value	RSLT.RGN.CY:AB	Available	5	3	-
	Center Y: Encoder measured value	RSLT.RGN.CY:EC	Available	5	3	Y
	Center Y: Region Setting Value	RSLT.RGN.CY:RG	Available	5	3	-
	Center XY	RSLT.RGN.CXY	Available	5	3	-
	Center XY: Measured value	RSLT.RGN.CXY:MS	Available	5	3	-
	Center XY: Absolute measured value	RSLT.RGN.CXY:AB	Available	5	3	-
	Center XY: Encoder measured value	RSLT.RGN.CXY:EC	Available	5	3	-
	Center XY: Region Setting Value	RSLT.RGN.CXY:RG	Available	5	3	-
	Radius	RSLT.RGN.CR	Available	5	3	L
	Radius: Measured value	RSLT.RGN.CR:MS	Available	5	3	L
	Radius: Absolute measured value	RSLT.RGN.CR:AB	Available	5	3	-
	Radius: Region Setting Value	RSLT.RGN.CR:RG	Available	5	3	-
Inspection region: Oval	Center X	RSLT.RGN.CX	Available	5	3	X
	Center X: Measured value	RSLT.RGN.CX:MS	Available	5	3	X
	Center X: Absolute measured value	RSLT.RGN.CX:AB	Available	5	3	-
	Center X: Encoder measured value	RSLT.RGN.CX:EC	Available	5	3	X
	Center X: Region Setting Value	RSLT.RGN.CX:RG	Available	5	3	-
	Center Y	RSLT.RGN.CY	Available	5	3	Y
	Center Y: Measured value	RSLT.RGN.CY:MS	Available	5	3	Y
	Center Y: Absolute measured value	RSLT.RGN.CY:AB	Available	5	3	-
	Center Y: Encoder measured value	RSLT.RGN.CY:EC	Available	5	3	Y
	Center Y: Region Setting Value	RSLT.RGN.CY:RG	Available	5	3	-
	Center XY	RSLT.RGN.CXY	Available	5	3	-
	Center XY: Measured value	RSLT.RGN.CXY:MS	Available	5	3	-
	Center XY: Absolute measured value	RSLT.RGN.CXY:AB	Available	5	3	-
	Center XY: Encoder measured value	RSLT.RGN.CXY:EC	Available	5	3	-
	Center XY: Region Setting Value	RSLT.RGN.CXY:RG	Available	5	3	-
	Radius 1	RSLT.RGN.CR1	Available	5	3	L
	Radius 1: Measured value	RSLT.RGN.CR1:MS	Available	5	3	L
	Radius 1: Absolute measured value	RSLT.RGN.CR1:AB	Available	5	3	-
	Radius 1: Region Setting Value	RSLT.RGN.CR1:RG	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Inspection region: Oval (continued)	Radius 2	RSLT.RGN.CR2	Available	5	3	L
	Radius 2: Measured value	RSLT.RGN.CR2:MS	Available	5	3	L
	Radius 2: Absolute measured value	RSLT.RGN.CR2:AB	Available	5	3	-
	Radius 2: Region Setting Value	RSLT.RGN.CR2:RG	Available	5	3	-
	Rotation angle	RSLT.RGN.T	Available	3	3	-
	Rotation angle: Measured value	RSLT.RGN.T:MS	Available	3	3	-
	Rotation angle: Absolute measured value	RSLT.RGN.T:AB	Available	3	3	-
	Rotation angle: Region Setting Value	RSLT.RGN.T:RG	Available	3	3	-
Inspection region: Ring	Center X	RSLT.RGN.CX	Available	5	3	X
	Center X: Measured value	RSLT.RGN.CX:MS	Available	5	3	X
	Center X: Absolute measured value	RSLT.RGN.CX:AB	Available	5	3	-
	Center X: Encoder measured value	RSLT.RGN.CX:EC	Available	5	3	X
	Center X: Region Setting Value	RSLT.RGN.CX:RG	Available	5	3	-
	Center Y	RSLT.RGN.CY	Available	5	3	Y
	Center Y: Measured value	RSLT.RGN.CY:MS	Available	5	3	Y
	Center Y: Absolute measured value	RSLT.RGN.CY:AB	Available	5	3	-
	Center Y: Encoder measured value	RSLT.RGN.CY:AB	Available	5	3	Y
	Center Y: Region Setting Value	RSLT.RGN.CY:RG	Available	5	3	-
	Center XY	RSLT.RGN.CXY	Available	5	3	-
	Center XY: Measured value	RSLT.RGN.CXY:MS	Available	5	3	-
	Center XY: Absolute measured value	RSLT.RGN.CXY:AB	Available	5	3	-
	Center XY: Encoder measured value	RSLT.RGN.CXY:EC	Available	5	3	-
	Center XY: Region Setting Value	RSLT.RGN.CXY:RG	Available	5	3	-
Inspection region: Arc	Radius 1	RSLT.RGN.CR1	Available	5	3	L
	Radius 1: Measured value	RSLT.RGN.CR1:MS	Available	5	3	L
	Radius 1: Absolute measured value	RSLT.RGN.CR1:AB	Available	5	3	-
	Radius 1: Region Setting Value	RSLT.RGN.CR1:RG	Available	5	3	-
	Radius 2	RSLT.RGN.CR2	Available	5	3	L
	Radius 2: Measured value	RSLT.RGN.CR2:MS	Available	5	3	L
	Radius 2: Absolute measured value	RSLT.RGN.CR2:AB	Available	5	3	-
	Radius 2: Region Setting Value	RSLT.RGN.CR2:RG	Available	5	3	-
	Center X	RSLT.RGN.CX	Available	5	3	X
	Center X: Measured value	RSLT.RGN.CX:MS	Available	5	3	X
	Center X: Absolute measured value	RSLT.RGN.CX:AB	Available	5	3	-
	Center X: Encoder measured value	RSLT.RGN.CX:EC	Available	5	3	X
	Center X: Region Setting Value	RSLT.RGN.CX:RG	Available	5	3	-
	Center Y	RSLT.RGN.CY	Available	5	3	Y
	Center Y: Measured value	RSLT.RGN.CY:MS	Available	5	3	Y
Starting angle	Center Y: Absolute measured value	RSLT.RGN.CY:AB	Available	5	3	-
	Center Y: Encoder measured value	RSLT.RGN.CY:EC	Available	5	3	Y
	Center Y: Region Setting Value	RSLT.RGN.CY:RG	Available	5	3	-
	Center XY	RSLT.RGN.CXY	Available	5	3	-
	Center XY: Measured value	RSLT.RGN.CXY:MS	Available	5	3	-
	Center XY: Absolute measured value	RSLT.RGN.CXY:AB	Available	5	3	-
	Center XY: Encoder measured value	RSLT.RGN.CXY:EC	Available	5	3	-
	Center XY: Region Setting Value	RSLT.RGN.CXY:RG	Available	5	3	-
	Radius 1	RSLT.RGN.CR1	Available	5	3	L
	Radius 1: Measured value	RSLT.RGN.CR1:MS	Available	5	3	L
	Radius 1: Absolute measured value	RSLT.RGN.CR1:AB	Available	5	3	-
	Radius 1: Region Setting Value	RSLT.RGN.CR1:RG	Available	5	3	-
	Radius 2	RSLT.RGN.CR2	Available	5	3	L
	Radius 2: Measured value	RSLT.RGN.CR2:MS	Available	5	3	L
	Radius 2: Absolute measured value	RSLT.RGN.CR2:AB	Available	5	3	-
	Radius 2: Region Setting Value	RSLT.RGN.CR2:RG	Available	5	3	-
	Starting angle	RSLT.RGN.STA	Available	3	3	-
	Starting angle: Measured value	RSLT.RGN.STA:MS	Available	3	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Inspection region: Arc (continued)	Starting angle: Absolute measured value	RSLT.RGN.STA:AB	Available	3	3	-
	Starting angle: Region Setting Value	RSLT.RGN.STA:RG	Available	3	3	-
	End angle	RSLT.RGN.ENA	Available	3	3	-
	End angle: Measured value	RSLT.RGN.ENA:MS	Available	3	3	-
	End angle: Absolute measured value	RSLT.RGN.ENA:AB	Available	3	3	-
	End angle: Region Setting Value	RSLT.RGN.ENA:RG	Available	3	3	-
Mask region: Rectangle	Mask upper left X	RSLT.RGN.MSK[0].LUX	Available	5	3	X
	Mask upper left X: Measured value	RSLT.RGN.MSK[0].LUX:MS	Available	5	3	X
	Mask upper left X: Absolute measured value	RSLT.RGN.MSK[0].LUX:AB	Available	5	3	-
	Mask upper left X: Encoder measured value	RSLT.RGN.MSK[0].LUX:EC	Available	5	3	X
	Mask upper left X: Region Setting Value	RSLT.RGN.MSK[0].LUX:RG	Available	5	3	-
	Mask upper left Y	RSLT.RGN.MSK[0].LUY	Available	5	3	Y
	Mask upper left Y: Measured value	RSLT.RGN.MSK[0].LUY:MS	Available	5	3	Y
	Mask upper left Y: Absolute measured value	RSLT.RGN.MSK[0].LUY:AB	Available	5	3	-
	Mask upper left Y: Encoder measured value	RSLT.RGN.MSK[0].LUY:EC	Available	5	3	Y
	Mask upper left Y: Region Setting Value	RSLT.RGN.MSK[0].LUY:RG	Available	5	3	-
	Mask upper left XY	RSLT.RGN.MSK[0].LUXY	Available	5	3	-
	Mask upper left XY: Measured value	RSLT.RGN.MSK[0].LUXY:MS	Available	5	3	-
	Mask upper left XY: Absolute measured value	RSLT.RGN.MSK[0].LUXY:AB	Available	5	3	-
	Mask upper left XY: Encoder measured value	RSLT.RGN.MSK[0].LUXY:EC	Available	5	3	-
	Mask upper left XY: Region Setting Value	RSLT.RGN.MSK[0].LUXY:RG	Available	5	3	-
	Mask lower left X	RSLT.RGN.MSK[0].LDX	Available	5	3	X
	Mask lower left X: Measured value	RSLT.RGN.MSK[0].LDX:MS	Available	5	3	X
	Mask lower left X: Absolute measured value	RSLT.RGN.MSK[0].LDX:AB	Available	5	3	-
	Mask lower left X: Encoder measured value	RSLT.RGN.MSK[0].LDX:EC	Available	5	3	X
	Mask lower left X: Region Setting Value	RSLT.RGN.MSK[0].LDX:RG	Available	5	3	-
	Mask lower left Y	RSLT.RGN.MSK[0].LDY	Available	5	3	Y
	Mask lower left Y: Measured value	RSLT.RGN.MSK[0].LDY:MS	Available	5	3	Y
	Mask lower left Y: Absolute measured value	RSLT.RGN.MSK[0].LDY:AB	Available	5	3	-
	Mask lower left Y: Encoder measured value	RSLT.RGN.MSK[0].LDY:EC	Available	5	3	Y
	Mask lower left Y: Region Setting Value	RSLT.RGN.MSK[0].LDY:RG	Available	5	3	-
	Mask lower left XY	RSLT.RGN.MSK[0].LDXY	Available	5	3	-
	Mask lower left XY: Measured value	RSLT.RGN.MSK[0].LDXY:MS	Available	5	3	-
	Mask lower left XY: Absolute measured value	RSLT.RGN.MSK[0].LDXY:AB	Available	5	3	-
	Mask lower left XY: Encoder measured value	RSLT.RGN.MSK[0].LDXY:EC	Available	5	3	-
	Mask lower left XY: Region Setting Value	RSLT.RGN.MSK[0].LDXY:RG	Available	5	3	-
Mask upper right: Arc	Mask upper right X	RSLT.RGN.MSK[0].RUX	Available	5	3	X
	Mask upper right X: Measured value	RSLT.RGN.MSK[0].RUX:MS	Available	5	3	X
	Mask upper right X: Absolute measured value	RSLT.RGN.MSK[0].RUX:AB	Available	5	3	-
	Mask upper right X: Encoder measured value	RSLT.RGN.MSK[0].RUX:EC	Available	5	3	X
	Mask upper right X: Region Setting Value	RSLT.RGN.MSK[0].RUX:RG	Available	5	3	-
	Mask upper right Y	RSLT.RGN.MSK[0].RUY	Available	5	3	Y
	Mask upper right Y: Measured value	RSLT.RGN.MSK[0].RUY:MS	Available	5	3	Y
	Mask upper right Y: Absolute measured value	RSLT.RGN.MSK[0].RUY:AB	Available	5	3	-
	Mask upper right Y: Encoder measured value	RSLT.RGN.MSK[0].RUY:EC	Available	5	3	Y
	Mask upper right Y: Region Setting Value	RSLT.RGN.MSK[0].RUY:RG	Available	5	3	-
	Mask upper right XY	RSLT.RGN.MSK[0].RUXY	Available	5	3	-
	Mask upper right XY: Measured value	RSLT.RGN.MSK[0].RUXY:MS	Available	5	3	-
Mask upper right: Rectangle	Mask upper right XY: Absolute measured value	RSLT.RGN.MSK[0].RUXY:AB	Available	5	3	-
	Mask upper right XY: Encoder measured value	RSLT.RGN.MSK[0].RUXY:EC	Available	5	3	-
	Mask upper right XY: Region Setting Value	RSLT.RGN.MSK[0].RUXY:RG	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Mask region: Rectangle (continued)	Mask lower right X	RSLT.RGN.MSK[0].RDX	Available	5	3	X
	Mask lower right X: Measured value	RSLT.RGN.MSK[0].RDX:MS	Available	5	3	X
	Mask lower right X: Absolute measured value	RSLT.RGN.MSK[0].RDX:AB	Available	5	3	-
	Mask lower right X: Encoder measured value	RSLT.RGN.MSK[0].RDX:EC	Available	5	3	X
	Mask lower right X: Region Setting Value	RSLT.RGN.MSK[0].RDX:RG	Available	5	3	-
	Mask lower right Y	RSLT.RGN.MSK[0].RDY	Available	5	3	Y
	Mask lower right Y: Measured value	RSLT.RGN.MSK[0].RDY:MS	Available	5	3	Y
	Mask lower right Y: Absolute measured value	RSLT.RGN.MSK[0].RDY:AB	Available	5	3	-
	Mask lower right Y: Encoder measured value	RSLT.RGN.MSK[0].RDY:EC	Available	5	3	Y
	Mask lower right Y: Region Setting Value	RSLT.RGN.MSK[0].RDY:RG	Available	5	3	-
	Mask lower right XY	RSLT.RGN.MSK[0].RDXY	Available	5	3	-
	Mask lower right XY: Measured value	RSLT.RGN.MSK[0].RDXY:MS	Available	5	3	-
	Mask lower right XY: Absolute measured value	RSLT.RGN.MSK[0].RDXY:AB	Available	5	3	-
	Mask lower right XY: Encoder measured value	RSLT.RGN.MSK[0].RDXY:EC	Available	5	3	-
	Mask lower right XY: Region Setting Value	RSLT.RGN.MSK[0].RDXY:RG	Available	5	3	-
Mask region: Rotated rectangle	Mask width	RSLT.RGN.MSK[0].WI	Available	5	3	L
	Mask width: Measured value	RSLT.RGN.MSK[0].WI:MS	Available	5	3	L
	Mask width: Absolute measured value	RSLT.RGN.MSK[0].WI:AB	Available	5	3	-
	Mask width: Region Setting Value	RSLT.RGN.MSK[0].WI:RG	Available	5	3	-
	Mask height	RSLT.RGN.MSK[0].HI	Available	5	3	L
	Mask height: Measured value	RSLT.RGN.MSK[0].HI:MS	Available	5	3	L
	Mask height: Absolute measured value	RSLT.RGN.MSK[0].HI:AB	Available	5	3	-
	Mask height: Region Setting Value	RSLT.RGN.MSK[0].HI:RG	Available	5	3	-
	Mask center X	RSLT.RGN.MSK[0].RCX	Available	5	3	X
	Mask center X: Measured value	RSLT.RGN.MSK[0].RCX:MS	Available	5	3	X
	Mask center X: Absolute measured value	RSLT.RGN.MSK[0].RCX:AB	Available	5	3	-
	Mask center X: Encoder measured value	RSLT.RGN.MSK[0].RCX:EC	Available	5	3	X
	Mask center X: Region Setting Value	RSLT.RGN.MSK[0].RCX:RG	Available	5	3	-
	Mask center Y	RSLT.RGN.MSK[0].RCY	Available	5	3	Y
	Mask center Y: Measured value	RSLT.RGN.MSK[0].RCY:MS	Available	5	3	Y
	Mask center Y: Absolute measured value	RSLT.RGN.MSK[0].RCY:AB	Available	5	3	-
	Mask center Y: Encoder measured value	RSLT.RGN.MSK[0].RCY:EC	Available	5	3	Y
	Mask center Y: Region Setting Value	RSLT.RGN.MSK[0].RCY:RG	Available	5	3	-
	Mask center XY	RSLT.RGN.MSK[0].RCXY	Available	5	3	-
	Mask center XY: Measured value	RSLT.RGN.MSK[0].RCXY:MS	Available	5	3	-
	Mask center XY:	RSLT.RGN.MSK[0].RCXY:AB	Available	5	3	-
	Mask center XY: Encoder measured value	RSLT.RGN.MSK[0].RCXY:EC	Available	5	3	-
	Mask center XY: Region Setting Value	RSLT.RGN.MSK[0].RCXY:RG	Available	5	3	-
	Mask rotation angle	RSLT.RGN.MSK[0].T	Available	3	3	-
	Mask rotation angle: Measured value	RSLT.RGN.MSK[0].T:MS	Available	3	3	-
	Mask rotation angle: Absolute measured value	RSLT.RGN.MSK[0].T:AB	Available	3	3	-
	Mask rotation angle: Region Setting Value	RSLT.RGN.MSK[0].T:RG	Available	3	3	-
	Mask upper left X	RSLT.RGN.MSK[0].LUX	Available	5	3	X
	Mask upper left X: Measured value	RSLT.RGN.MSK[0].LUX:MS	Available	5	3	X
	Mask upper left X: Absolute measured value	RSLT.RGN.MSK[0].LUX:AB	Available	5	3	-
	Mask upper left X: Encoder measured value	RSLT.RGN.MSK[0].LUX:EC	Available	5	3	X
	Mask upper left X: Region Setting Value	RSLT.RGN.MSK[0].LUX:RG	Available	5	3	-
	Mask upper left Y	RSLT.RGN.MSK[0].LUY	Available	5	3	Y
	Mask upper left Y: Measured value	RSLT.RGN.MSK[0].LUY:MS	Available	5	3	Y
	Mask upper left Y: Absolute measured value	RSLT.RGN.MSK[0].LUY:AB	Available	5	3	-
	Mask upper left Y: Encoder measured value	RSLT.RGN.MSK[0].LUY:EC	Available	5	3	Y
	Mask upper left Y: Region Setting Value	RSLT.RGN.MSK[0].LUY:RG	Available	5	3	-
	Mask upper left XY	RSLT.RGN.MSK[0].LUXY	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Mask region: Rotated rectangle (continued)	Mask upper left XY: Measured value	RSLT.RGN.MSK[0].LUXY:MS	Available	5	3	-
	Mask upper left XY: Absolute measured value	RSLT.RGN.MSK[0].LUXY:AB	Available	5	3	-
	Mask upper left XY: Encoder measured value	RSLT.RGN.MSK[0].LUXY:EC	Available	5	3	-
	Mask upper left XY: Region Setting Value	RSLT.RGN.MSK[0].LUXY:RG	Available	5	3	-
	Mask lower left X	RSLT.RGN.MSK[0].LDX	Available	5	3	X
	Mask lower left X: Measured value	RSLT.RGN.MSK[0].LDX:MS	Available	5	3	X
	Mask lower left X: Absolute measured value	RSLT.RGN.MSK[0].LDX:AB	Available	5	3	-
	Mask lower left X: Encoder measured value	RSLT.RGN.MSK[0].LDX:EC	Available	5	3	X
	Mask lower left X: Region Setting Value	RSLT.RGN.MSK[0].LDX:RG	Available	5	3	-
	Mask lower left Y	RSLT.RGN.MSK[0].LDY	Available	5	3	Y
	Mask lower left Y: Measured value	RSLT.RGN.MSK[0].LDY:MS	Available	5	3	Y
	Mask lower left Y: Absolute measured value	RSLT.RGN.MSK[0].LDY:AB	Available	5	3	-
	Mask lower left Y: Encoder measured value	RSLT.RGN.MSK[0].LDY:EC	Available	5	3	Y
	Mask lower left Y: Region Setting Value	RSLT.RGN.MSK[0].LDY:RG	Available	5	3	-
	Mask lower left XY	RSLT.RGN.MSK[0].LDXY	Available	5	3	-
	Mask lower left XY: Measured value	RSLT.RGN.MSK[0].LDXY:MS	Available	5	3	-
	Mask lower left XY: Absolute measured value	RSLT.RGN.MSK[0].LDXY:AB	Available	5	3	-
	Mask lower left XY: Encoder measured value	RSLT.RGN.MSK[0].LDXY:EC	Available	5	3	-
	Mask lower left XY: Region Setting Value	RSLT.RGN.MSK[0].LDXY:RG	Available	5	3	-
	Mask upper right X	RSLT.RGN.MSK[0].RUX	Available	5	3	X
	Mask upper right X: Measured value	RSLT.RGN.MSK[0].RUX:MS	Available	5	3	X
	Mask upper right X: Absolute measured value	RSLT.RGN.MSK[0].RUX:AB	Available	5	3	-
	Mask upper right X: Encoder measured value	RSLT.RGN.MSK[0].RUX:EC	Available	5	3	X
	Mask upper right X: Region Setting Value	RSLT.RGN.MSK[0].RUX:RG	Available	5	3	-
	Mask upper right Y	RSLT.RGN.MSK[0].RUY	Available	5	3	Y
	Mask upper right Y: Measured value	RSLT.RGN.MSK[0].RUY:MS	Available	5	3	Y
	Mask upper right Y: Absolute measured value	RSLT.RGN.MSK[0].RUY:AB	Available	5	3	-
	Mask upper right Y: Encoder measured value	RSLT.RGN.MSK[0].RUY:EC	Available	5	3	Y
	Mask upper right Y: Region Setting Value	RSLT.RGN.MSK[0].RUY:RG	Available	5	3	-
	Mask upper right XY	RSLT.RGN.MSK[0].RUXY	Available	5	3	-
	Mask upper right XY: Measured value	RSLT.RGN.MSK[0].RUXY:MS	Available	5	3	-
	Mask upper right XY: Absolute measured value	RSLT.RGN.MSK[0].RUXY:AB	Available	5	3	-
	Mask upper right XY: Encoder measured value	RSLT.RGN.MSK[0].RUXY:EC	Available	5	3	-
	Mask upper right XY: Region Setting Value	RSLT.RGN.MSK[0].RUXY:RG	Available	5	3	-
	Mask lower right X	RSLT.RGN.MSK[0].RDX	Available	5	3	X
	Mask lower right X: Measured value	RSLT.RGN.MSK[0].RDX:MS	Available	5	3	X
	Mask lower right X: Absolute measured value	RSLT.RGN.MSK[0].RDX:AB	Available	5	3	-
	Mask lower right X: Encoder measured value	RSLT.RGN.MSK[0].RDX:EC	Available	5	3	X
	Mask lower right X: Region Setting Value	RSLT.RGN.MSK[0].RDX:RG	Available	5	3	-
	Mask lower right Y	RSLT.RGN.MSK[0].RDY	Available	5	3	Y
	Mask lower right Y: Measured value	RSLT.RGN.MSK[0].RDY:MS	Available	5	3	Y
	Mask lower right Y: Absolute measured value	RSLT.RGN.MSK[0].RDY:AB	Available	5	3	-
	Mask lower right Y: Encoder measured value	RSLT.RGN.MSK[0].RDY:EC	Available	5	3	Y
	Mask lower right Y: Region Setting Value	RSLT.RGN.MSK[0].RDY:RG	Available	5	3	-
	Mask lower right XY	RSLT.RGN.MSK[0].RDXY	Available	5	3	-
	Mask lower right XY: Measured value	RSLT.RGN.MSK[0].RDXY:MS	Available	5	3	-
	Mask lower right XY: Absolute measured value	RSLT.RGN.MSK[0].RDXY:AB	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Mask region: Rotated rectangle (continued)	Mask lower right XY: Encoder measured value	RSLT.RGN.MSK[0].RDXY:EC	Available	5	3	-
	Mask lower right XY: Region Setting Value	RSLT.RGN.MSK[0].RDXY:RG	Available	5	3	-
Mask region: Circle	Mask center X	RSLT.RGN.MSK[0].CX	Available	5	3	X
	Mask center X: Measured value	RSLT.RGN.MSK[0].CX:MS	Available	5	3	X
	Mask center X: Absolute measured value	RSLT.RGN.MSK[0].CX:AB	Available	5	3	-
	Mask center X: Encoder measured value	RSLT.RGN.MSK[0].CX:EC	Available	5	3	X
	Mask center X: Region Setting Value	RSLT.RGN.MSK[0].CX:RG	Available	5	3	-
	Mask center Y	RSLT.RGN.MSK[0].CY	Available	5	3	Y
	Mask center Y: Measured value	RSLT.RGN.MSK[0].CY:MS	Available	5	3	Y
	Mask center Y: Absolute measured value	RSLT.RGN.MSK[0].CY:AB	Available	5	3	-
	Mask center Y: Encoder measured value	RSLT.RGN.MSK[0].CY:EC	Available	5	3	Y
	Mask center Y: Region Setting Value	RSLT.RGN.MSK[0].CY:RG	Available	5	3	-
	Mask center XY	RSLT.RGN.MSK[0].CXY	Available	5	3	-
	Mask center XY: Measured value	RSLT.RGN.MSK[0].CXY:MS	Available	5	3	-
	Mask center XY: Absolute measured value	RSLT.RGN.MSK[0].CXY:AB	Available	5	3	-
	Mask center XY: Encoder measured value	RSLT.RGN.MSK[0].CXY:EC	Available	5	3	-
	Mask center XY: Region Setting Value	RSLT.RGN.MSK[0].CXY:RG	Available	5	3	-
	Mask radius	RSLT.RGN.MSK[0].CR	Available	5	3	L
	Mask radius: Measured value	RSLT.RGN.MSK[0].CR:MS	Available	5	3	L
	Mask radius: Absolute measured value	RSLT.RGN.MSK[0].CR:AB	Available	5	3	-
	Mask radius: Region Setting Value	RSLT.RGN.MSK[0].CR:RG	Available	5	3	-
Mask region: Oval	Mask center X	RSLT.RGN.MSK[0].CX	Available	5	3	X
	Mask center X: Measured value	RSLT.RGN.MSK[0].CX:MS	Available	5	3	X
	Mask center X: Absolute measured value	RSLT.RGN.MSK[0].CX:AB	Available	5	3	-
	Mask center X: Encoder measured value	RSLT.RGN.MSK[0].CX:EC	Available	5	3	X
	Mask center X: Region Setting Value	RSLT.RGN.MSK[0].CX:RG	Available	5	3	-
	Mask center Y	RSLT.RGN.MSK[0].CY	Available	5	3	Y
	Mask center Y: Measured value	RSLT.RGN.MSK[0].CY:MS	Available	5	3	Y
	Mask center Y: Absolute measured value	RSLT.RGN.MSK[0].CY:AB	Available	5	3	-
	Mask center Y: Encoder measured value	RSLT.RGN.MSK[0].CY:EC	Available	5	3	Y
	Mask center Y: Region Setting Value	RSLT.RGN.MSK[0].CY:RG	Available	5	3	-
	Mask center XY	RSLT.RGN.MSK[0].CXY	Available	5	3	-
	Mask center XY: Measured value	RSLT.RGN.MSK[0].CXY:MS	Available	5	3	-
	Mask center XY: Absolute measured value	RSLT.RGN.MSK[0].CXY:AB	Available	5	3	-
	Mask center XY: Encoder measured value	RSLT.RGN.MSK[0].CXY:EC	Available	5	3	-
	Mask center XY: Region Setting Value	RSLT.RGN.MSK[0].CXY:RG	Available	5	3	-
	Mask radius 1	RSLT.RGN.MSK[0].CR1	Available	5	3	L
	Mask radius 1: Measured value	RSLT.RGN.MSK[0].CR1:MS	Available	5	3	L
	Mask radius 1: Absolute measured value	RSLT.RGN.MSK[0].CR1:AB	Available	5	3	-
	Mask radius 1: Region Setting Value	RSLT.RGN.MSK[0].CR1:RG	Available	5	3	-
	Mask radius 2	RSLT.RGN.MSK[0].CR2	Available	5	3	L
	Mask radius 2: Measured value	RSLT.RGN.MSK[0].CR2:MS	Available	5	3	L
	Mask radius 2: Absolute measured value	RSLT.RGN.MSK[0].CR2:AB	Available	5	3	-
	Mask radius 2: Region Setting Value	RSLT.RGN.MSK[0].CR2:RG	Available	5	3	-
	Mask rotation angle	RSLT.RGN.MSK[0].T	Available	3	3	-
	Mask rotation angle: Measured value	RSLT.RGN.MSK[0].T:MS	Available	3	3	-
	Mask rotation angle: Absolute measured value	RSLT.RGN.MSK[0].T:AB	Available	3	3	-
	Mask rotation angle: Region Setting Value	RSLT.RGN.MSK[0].T:RG	Available	3	3	-
Mask region: Ring	Mask center X	RSLT.RGN.MSK[0].CX	Available	5	3	X
	Mask center X: Measured value	RSLT.RGN.MSK[0].CX:MS	Available	5	3	X
	Mask center X: Absolute measured value	RSLT.RGN.MSK[0].CX:AB	Available	5	3	-
	Mask center X: Encoder measured value	RSLT.RGN.MSK[0].CX:EC	Available	5	3	X
	Mask center X: Region Setting Value	RSLT.RGN.MSK[0].CX:RG	Available	5	3	-

Region shape	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Mask region Ring (continued)	Mask center Y	RSLT.RGN.MSK[0].CY	Available	5	3	Y
	Mask center Y: Measured value	RSLT.RGN.MSK[0].CY:MS	Available	5	3	Y
	Mask center Y: Absolute measured value	RSLT.RGN.MSK[0].CY:AB	Available	5	3	-
	Mask center Y: Encoder measured value	RSLT.RGN.MSK[0].CY:EC	Available	5	3	Y
	Mask center Y: Region Setting Value	RSLT.RGN.MSK[0].CY:RG	Available	5	3	-
	Mask center XY	RSLT.RGN.MSK[0].CXY	Available	5	3	-
	Mask center XY: Measured value	RSLT.RGN.MSK[0].CXY:MS	Available	5	3	-
	Mask center XY: Absolute measured value	RSLT.RGN.MSK[0].CXY:AB	Available	5	3	-
	Mask center XY: Encoder measured value	RSLT.RGN.MSK[0].CXY:EC	Available	5	3	-
	Mask center XY: Region Setting Value	RSLT.RGN.MSK[0].CXY:RG	Available	5	3	-
	Mask radius 1	RSLT.RGN.MSK[0].CR1	Available	5	3	L
	Mask radius 1: Measured value	RSLT.RGN.MSK[0].CR1:MS	Available	5	3	L
	Mask radius 1: Absolute measured value	RSLT.RGN.MSK[0].CR1:AB	Available	5	3	-
	Mask radius 1: Region Setting Value	RSLT.RGN.MSK[0].CR1:RG	Available	5	3	-
	Mask radius 2	RSLT.RGN.MSK[0].CR2	Available	5	3	L
Mask region Arc	Mask radius 2: Measured value	RSLT.RGN.MSK[0].CR2:MS	Available	5	3	L
	Mask radius 2: Absolute measured value	RSLT.RGN.MSK[0].CR2:AB	Available	5	3	-
	Mask radius 2: Region Setting Value	RSLT.RGN.MSK[0].CR2:RG	Available	5	3	-
	Mask center X	RSLT.RGN.MSK[0].CX	Available	5	3	X
	Mask center X: Measured value	RSLT.RGN.MSK[0].CX:MS	Available	5	3	X
	Mask center X: Absolute measured value	RSLT.RGN.MSK[0].CX:AB	Available	5	3	-
	Mask center X: Encoder measured value	RSLT.RGN.MSK[0].CX:EC	Available	5	3	X
	Mask center X: Region Setting Value	RSLT.RGN.MSK[0].CX:RG	Available	5	3	-
	Mask center Y	RSLT.RGN.MSK[0].CY	Available	5	3	Y
	Mask center Y: Measured value	RSLT.RGN.MSK[0].CY:MS	Available	5	3	Y
	Mask center Y: Absolute measured value	RSLT.RGN.MSK[0].CY:AB	Available	5	3	-
	Mask center Y: Encoder measured value	RSLT.RGN.MSK[0].CY:EC	Available	5	3	Y
	Mask center Y: Region Setting Value	RSLT.RGN.MSK[0].CY:RG	Available	5	3	-
	Mask center XY	RSLT.RGN.MSK[0].CXY	Available	5	3	-
	Mask center XY: Measured value	RSLT.RGN.MSK[0].CXY:MS	Available	5	3	-
	Mask center XY: Absolute measured value	RSLT.RGN.MSK[0].CXY:AB	Available	5	3	-
	Mask center XY: Encoder measured value	RSLT.RGN.MSK[0].CXY:EC	Available	5	3	-
	Mask center XY: Region Setting Value	RSLT.RGN.MSK[0].CXY:RG	Available	5	3	-
Mask region 1	Mask radius 1	RSLT.RGN.MSK[0].CR1	Available	5	3	L
	Mask radius 1: Measured value	RSLT.RGN.MSK[0].CR1:MS	Available	5	3	L
	Mask radius 1: Absolute measured value	RSLT.RGN.MSK[0].CR1:AB	Available	5	3	-
	Mask radius 1: Region Setting Value	RSLT.RGN.MSK[0].CR1:RG	Available	5	3	-
	Mask radius 2	RSLT.RGN.MSK[0].CR2	Available	5	3	L
	Mask radius 2: Measured value	RSLT.RGN.MSK[0].CR2:MS	Available	5	3	L
	Mask radius 2: Absolute measured value	RSLT.RGN.MSK[0].CR2:AB	Available	5	3	-
	Mask radius 2: Region Setting Value	RSLT.RGN.MSK[0].CR2:RG	Available	5	3	-
	Mask starting angle	RSLT.RGN.MSK[0].STA	Available	3	3	-
	Mask starting angle: Measured value	RSLT.RGN.MSK[0].STA:MS	Available	3	3	-
	Mask starting angle: Absolute measured value	RSLT.RGN.MSK[0].STA:AB	Available	3	3	-
	Mask starting angle: Region Setting Value	RSLT.RGN.MSK[0].STA:RG	Available	3	3	-
	Mask end angle	RSLT.RGN.MSK[0].ENA	Available	3	3	-
	Mask end angle: Measured value	RSLT.RGN.MSK[0].ENA:MS	Available	3	3	-
	Mask end angle: Absolute measured value	RSLT.RGN.MSK[0].ENA:AB	Available	3	3	-
	Mask end angle: Region Setting Value	RSLT.RGN.MSK[0].ENA:RG	Available	3	3	-
Mask region 2		RSLT.RGN.MSK[1].***				
Mask region 3		RSLT.RGN.MSK[2].***				
Mask region 3		RSLT.RGN.MSK[3].***				

Capture Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Status	RSLT.STAT	Unsigned	1	0	-
LumiTrax Result 1 Moving Object Tracking 1					
Pattern XY Position & Angle Result	RSLT.LTRX1.TRK1.XYT	Available	5	3	-
Pattern XY Position & Angle Result : Measured value	RSLT.LTRX1.TRK1.XYT:MS	Available	5	3	-
Pattern XY Position & Angle Result : Absolute measured value	RSLT.LTRX1.TRK1.XYT:AB	Available	5	3	-
Pattern XY Position Result	RSLT.LTRX1.TRK1.XY	Available	5	3	-
Pattern XY Position Result : Measured value	RSLT.LTRX1.TRK1.XY:MS	Available	5	3	-
Pattern XY Position Result : Absolute measured value	RSLT.LTRX1.TRK1.XY:AB	Available	5	3	-
Pattern X Position Result	RSLT.LTRX1.TRK1.X	Available	5	3	-
Pattern X Position Result : Measured value	RSLT.LTRX1.TRK1.X:MS	Available	5	3	-
Pattern X Position Result : Absolute measured value	RSLT.LTRX1.TRK1.X:AB	Available	5	3	-
Pattern Y Position Result	RSLT.LTRX1.TRK1.Y	Available	5	3	-
Pattern Y Position Result : Measured value	RSLT.LTRX1.TRK1.Y:MS	Available	5	3	-
Pattern Y Position Result : Absolute measured value	RSLT.LTRX1.TRK1.Y:AB	Available	5	3	-
Pattern Angle Result	RSLT.LTRX1.TRK1.T	Available	3	3	-
Pattern Angle Result : Measured value	RSLT.LTRX1.TRK1.T:MS	Available	3	3	-
Pattern Angle Result : Absolute measured value	RSLT.LTRX1.TRK1.T:AB	Available	3	3	-
Pattern % Match Result	RSLT.LTRX1.TRK1.C	Unsigned	2	3	-
Pattern % Match Result : Measured value	RSLT.LTRX1.TRK1.C:MS	Unsigned	2	3	-
Number	RSLT.LTRX1.TRK1.N	Unsigned	2	0	-
Number : Measured value	RSLT.LTRX1.TRK1.N:MS	Unsigned	2	0	-
Movement Amount XY/Angle	RSLT.LTRX1.TRK1.DXYT	Available	5	3	-
Movement Amount XY/Angle : Measured value	RSLT.LTRX1.TRK1.DXYT:MS	Available	5	3	-
Movement Amount XY/Angle : Absolute measured value	RSLT.LTRX1.TRK1.DXYT:AB	Available	5	3	-
Movement Amount XY	RSLT.LTRX1.TRK1.DXY	Available	5	3	-
Movement Amount XY : Measured value	RSLT.LTRX1.TRK1.DXY:MS	Available	5	3	-
Movement Amount XY : Absolute measured value	RSLT.LTRX1.TRK1.DXY:AB	Available	5	3	-
Movement Amount X	RSLT.LTRX1.TRK1.DX	Available	5	3	-
Movement Amount X : Measured value	RSLT.LTRX1.TRK1.DX:MS	Available	5	3	-
Movement Amount X : Absolute measured value	RSLT.LTRX1.TRK1.DX:AB	Available	5	3	-
Movement Amount Y	RSLT.LTRX1.TRK1.DY	Available	5	3	-
Movement Amount Y : Measured value	RSLT.LTRX1.TRK1.DY:MS	Available	5	3	-
Movement Amount Y : Absolute measured value	RSLT.LTRX1.TRK1.DY:AB	Available	5	3	-
Movement Amount Angle	RSLT.LTRX1.TRK1.DT	Available	3	3	-
Movement Amount Angle : Measured value	RSLT.LTRX1.TRK1.DT:MS	Available	3	3	-
Movement Amount Angle : Absolute measured value	RSLT.LTRX1.TRK1.DT:AB	Available	3	3	-
LumiTrax Result 1 Moving Object Tracking 2	RSLT.LTRX1.TRK2				
LumiTrax Result 1 Partial Lighting (Upper)	RSLT.LTRX1.LTUP				
LumiTrax Result 1 Partial Lighting (Upper Right)	RSLT.LTRX1.LTRU				
LumiTrax Result 1 Partial Lighting (Right)	RSLT.LTRX1.LTRT				
LumiTrax Result 1 Partial Lighting (Lower Right)	RSLT.LTRX1.LTRL				
LumiTrax Result 1 Partial Lighting (Lower)	RSLT.LTRX1.LTLO				
LumiTrax Result 1 Partial Lighting (Lower Left)	RSLT.LTRX1.LTLL				
LumiTrax Result 1 Partial Lighting (Left)	RSLT.LTRX1.LTLT				
LumiTrax Result 1 Partial Lighting (Upper Left)	RSLT.LTRX1.LTLU				
LumiTrax Result 1 Amb. Light	RSLT.LTRX1.AMB				
LumiTrax Result 2	RSLT.LTRX2.***				
.....					
LumiTrax Result 4	RSLT.LTRX4.***				
MultiSpectrum, Result 1, Track Moving Object 1					
Position XY / Angle	RSLT.LTRX1.MSTRK1.XYT	Available	5	3	-
Position XY / Angle: Measured value	RSLT.LTRX1.MSTRK1.XYT:MS	Available	5	3	-
Position XY / Angle: Absolute measured value	RSLT.LTRX1.MSTRK1.XYT:AB	Available	5	3	-
Position XY	RSLT.LTRX1.MSTRK1.XY	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Position XY: Measured value	RSLT.LTRX1.MSTRK1.XY:MS	Available	5	3	-
Position XY: Absolute measured value	RSLT.LTRX1.MSTRK1.XY:AB	Available	5	3	-
Position X	RSLT.LTRX1.MSTRK1.X	Available	5	3	-
Position X: Measured value	RSLT.LTRX1.MSTRK1.X:MS	Available	5	3	-
Position X: Absolute measured value	RSLT.LTRX1.MSTRK1.X:AB	Available	5	3	-
Position Y	RSLT.LTRX1.MSTRK1.Y	Available	5	3	-
Position Y: Measured value	RSLT.LTRX1.MSTRK1.Y:MS	Available	5	3	-
Position Y: Absolute measured value	RSLT.LTRX1.MSTRK1.Y:AB	Available	5	3	-
Angle	RSLT.LTRX1.MSTRK1.T	Available	3	3	-
Angle: Measured value	RSLT.LTRX1.MSTRK1.T:MS	Available	3	3	-
Angle: Absolute measured value	RSLT.LTRX1.MSTRK1.T:AB	Available	3	3	-
Match %	RSLT.LTRX1.MSTRK1.C	Unsigned	2	3	-
Match %: Measured value	RSLT.LTRX1.MSTRK1.C:MS	Unsigned	2	3	-
Count	RSLT.LTRX1.MSTRK1.N	Unsigned	2	0	-
Count: Measured value	RSLT.LTRX1.MSTRK1.N:MS	Unsigned	2	0	-
Shift XY / Angle	RSLT.LTRX1.MSTRK1.DXYT	Available	5	3	-
Shift XY / Angle: Measured value	RSLT.LTRX1.MSTRK1.DXYT:MS	Available	5	3	-
Shift XY / Angle: Absolute measured value	RSLT.LTRX1.MSTRK1.DXYT:AB	Available	5	3	-
Shift XY	RSLT.LTRX1.MSTRK1.DXY	Available	5	3	-
Position XY: Measured value	RSLT.LTRX1.MSTRK1.DXY:MS	Available	5	3	-
Shift XY: Absolute measured value	RSLT.LTRX1.MSTRK1.DXY:AB	Available	5	3	-
Shift X	RSLT.LTRX1.MSTRK1.DX	Available	5	3	-
Shift X: Measured value	RSLT.LTRX1.MSTRK1.DX:MS	Available	5	3	-
Shift X: Absolute measured value	RSLT.LTRX1.MSTRK1.DX:AB	Available	5	3	-
Shift Y	RSLT.LTRX1.MSTRK1.DY	Available	5	3	-
Shift Y: Measured value	RSLT.LTRX1.MSTRK1.DY:MS	Available	5	3	-
Shift Y: Absolute measured value	RSLT.LTRX1.MSTRK1.DY:AB	Available	5	3	-
Shift / Angle	RSLT.LTRX1.MSTRK1.DT	Available	3	3	-
Shift / Angle: Measured value	RSLT.LTRX1.MSTRK1.DT:MS	Available	3	3	-
Shift / Angle: Absolute measured value	RSLT.LTRX1.MSTRK1.DT:AB	Available	3	3	-
MultiSpectrum, Result 1, Track Moving Object 2	RSLT.LTRX1.MSTRK2.***				
MultiSpectrum, Result 1 (UV)	RSLT.LTRX1.MS_UV.***				
MultiSpectrum, Result 1 (B)	RSLT.LTRX1.MS_B.***				
MultiSpectrum, Result 1 (G)	RSLT.LTRX1.MS_G.***				
MultiSpectrum, Result 1 (AM)	RSLT.LTRX1.MS_AM.***				
MultiSpectrum, Result 1 (R)	RSLT.LTRX1.MS_R.***				
MultiSpectrum, Result 1 (FR)	RSLT.LTRX1.MS_FR.***				
MultiSpectrum, Result 1 (IR)	RSLT.LTRX1.MS_IR.***				
MultiSpectrum, Result 1 (W)	RSLT.LTRX1.MS_W.***				
MultiSpectrum, Result 1 (Ambient light image)	RSLT.LTRX1.MSAM				
MultiSpectrum, Result 2	RSLT.LTRX2.***				
MultiSpectrum, Result 4	RSLT.LTRX4.***				

Area Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Area	RSLT.AR	Unsigned	8	0	-
Area: Measured value	RSLT.AR:MS	Unsigned	8	0	-
Area: Judgment value	RSLT.AR:JG	Unsigned	1	0	-

Pattern Search Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Pattern base X	RSLT.PTSTX	Available	5	3	-
Pattern base Y	RSLT.PTSTY	Available	5	3	-
Pattern base XY	RSLT.PTSTXY	Available	5	3	-
No. of patterns	RSLT.N	Unsigned	2	0	-
No. of patterns: Measured value	RSLT.N:MS	Unsigned	2	0	-
No. of patterns: Judgment value	RSLT.N:JG	Unsigned	1	0	-
Position X	RSLT.X[*]	Available	5	3	X
Position X: Measured value	RSLT.X[*]:MS	Available	5	3	X
Position X: Absolute measured value	RSLT.X[*]:AB	Available	5	3	-
Position X: Encoder measured value	RSLT.X[*]:EC	Available	5	3	X
Position X: Judgment value	RSLT.X:JG	Unsigned	1	0	-
Position Y	RSLT.Y[*]	Available	5	3	Y
Position Y: Measured value	RSLT.Y[*]:MS	Available	5	3	Y
Position Y: Absolute measured value	RSLT.Y[*]:AB	Available	5	3	-
Position Y: Encoder measured value	RSLT.Y[*]:EC	Available	5	3	Y
Position Y: Judgment value	RSLT.Y:JG	Unsigned	1	0	-
Position XY	RSLT.XY[*]	Available	5	3	-
Position XY: Measured value	RSLT.XY[*]:MS	Available	5	3	-
Position XY: Absolute measured value	RSLT.XY[*]:AB	Available	5	3	-
Position XY: Encoder measured value	RSLT.XY[*]:EC	Available	5	3	-
Angle	RSLT.T[*]	Available	3	3	-
Angle: Measured value	RSLT.T[*]:MS	Available	3	3	-
Angle: Absolute measured value	RSLT.T[*]:AB	Available	3	3	-
Angle: Judgment value	RSLT.T:JG	Unsigned	1	0	-
Position XY/Angle	RSLT.XYT[*]	Available	5	3	-
Position XY/Angle: Measured value	RSLT.XYT[*]:MS	Available	5	3	-
Position XY/Angle: Absolute measured value	RSLT.XYT[*]:AB	Available	5	3	-
Position XY/Angle: Encoder measured value	RSLT.XYT[*]:EC	Available	5	3	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-
Match %	RSLT.C[*]	Unsigned	2	3	-
Match %: Measured value	RSLT.C[*]:MS	Unsigned	2	3	-
Match %: Judgment value	RSLT.C:JG	Unsigned	1	0	-

ShapeTrax3A Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Detected Pattern Center X	RSLT.PTSTX	Available	5	3	-
Detected Pattern Center Y	RSLT.PTSTY	Available	5	3	-
Detected Pattern Center XY	RSLT.PTSTXY	Available	5	3	-
Number of Detected Patterns Result	RSLTN	Unsigned	4	0	-
Number of Detected Patterns Result: Measured Value	RSLTN:MS	Unsigned	4	0	-
Number of Detected Patterns Result: Judgment Value	RSLTN:JG	Unsigned	1	0	-
Pattern X Position Result	RSLT.X[*]	Available	5	3	X
Pattern X Position Result: Measured Value	RSLT.X[*]:MS	Available	5	3	X
Pattern X Position Result: Absolute Value	RSLT.X[*]:AB	Available	5	3	-
Pattern X Position Result: Encoder Value	RSLT.X[*]:EC	Available	5	3	X
Pattern X Position Result: Judgment Value	RSLT.X:JG	Unsigned	1	0	-
Pattern Y Position Result	RSLT.Y[*]	Available	5	3	Y
Pattern Y Position Result: Measured Value	RSLT.Y[*]:MS	Available	5	3	Y
Pattern Y Position Result: Absolute Value	RSLT.Y[*]:AB	Available	5	3	-
Pattern Y Position Result: Encoder Value	RSLT.Y[*]:EC	Available	5	3	Y
Pattern Y Position Result: Judgment Value	RSLT.Y:JG	Unsigned	1	0	-
Pattern XY Position Result	RSLT.XY[*]	Available	5	3	-
Pattern XY Position Result: Measured Value	RSLT.XY[*]:MS	Available	5	3	-
Pattern XY Position Result: Absolute Value	RSLT.XY[*]:AB	Available	5	3	-
Pattern XY Position Result: Encoder Value	RSLT.XY[*]:EC	Available	5	3	-
Pattern Angle Result	RSLT.T[*]	Available	3	3	-
Pattern Angle Result: Measured Value	RSLT.T[*]:MS	Available	3	3	-
Pattern Angle Result: Absolute Value	RSLT.T[*]:AB	Available	3	3	-
Pattern Angle Result: Judgment Value	RSLT.T:JG	Unsigned	1	0	-
Pattern XY Position & Angle Result	RSLT.XYT[*]	Available	5	3	-
Pattern XY Position & Angle Result: Measured Value	RSLT.XYT[*]:MS	Available	5	3	-
Pattern XY Position & Angle Result: Absolute Value	RSLT.XYT[*]:AB	Available	5	3	-
Pattern XY Position & Angle Result: Encoder Value	RSLT.XYT[*]:EC	Available	5	3	-
XY Position for Position Adjustment Reference	RSLT.ADJXY	Available	5	3	-
X Position for Position Adjustment Reference	RSLT.ADJX	Available	5	3	-
Y Position for Position Adjustment Reference	RSLT.ADJY	Available	5	3	-
Angle for Position Adjustment Reference	RSLT.ADJT	Available	3	3	-
Pattern % Match Result	RSLT.C[*]	Unsigned	2	3	-
Pattern % Match Result: Measured Value	RSLT.C[*]:MS	Unsigned	2	3	-
Pattern % Match Result: Judgment Value	RSLT.C:JG	Unsigned	1	0	-
Pattern Scale Result	RSLT.S[*]	Unsigned	1	3	-
Pattern Scale Result: Measured Value	RSLT.S[*]:MS	Unsigned	1	3	-
Pattern Scale Result: Judgment Value	RSLT.S:JG	Unsigned	1	0	-
Number of Unselected	RSLT.NSN	Unsigned	4	0	-
Number of Unselected: Measured Value	RSLT.NSN:MS	Unsigned	4	0	-
Feature Pixel Count 1	RSLT.QZ1[*]	Unsigned	6	0	-
Feature Pixel Count 1: Measured Value	RSLT.QZ1[*]:MS	Unsigned	6	0	-
Feature Pixel Count 1: Judgment Value	RSLT.QZ1:JG	Unsigned	1	0	-
Feature Pixel Count 2	RSLT.QZ2[*]	Unsigned	6	0	-
Feature Pixel Count 2: Measured Value	RSLT.QZ2[*]:MS	Unsigned	6	0	-
Feature Pixel Count 2: Judgment Value	RSLT.QZ2:JG	Unsigned	1	0	-

PatternTrax Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Number of Detected Patterns Result	RSLT.N	Unsigned	4	0	-
Number of Detected Patterns Result: Measured Value	RSLTN:MS	Unsigned	4	0	-
Number of Detected Patterns Result: Judgment Value	RSLT.N:JG	Unsigned	1	0	-
Pattern XY Position & Angle Result	RSLT.XYT[*]	Available	5	3	-
Pattern XY Position & Angle Result: Measured Value	RSLT.XYT[*]:MS	Available	5	3	-
Pattern XY Position & Angle Result: Absolute Value	RSLT.XYT[*]:AB	Available	5	3	-
Pattern XY Position & Angle Result: Encoder Value	RSLT.XYT[*]:EC	Available	5	3	-
Pattern XY Position Result	RSLT.XY[*]	Available	5	3	-
Pattern XY Position Result: Measured Value	RSLT.XY[*]:MS	Available	5	3	-
Pattern XY Position Result: Absolute Value	RSLT.XY[*]:AB	Available	5	3	-
Pattern XY Position Result: Encoder Value	RSLT.XY[*]:EC	Available	5	3	-
Pattern X Position Result	RSLT.X[*]	Available	5	3	X
Pattern X Position Result: Measured Value	RSLT.X[*]:MS	Available	5	3	X
Pattern X Position Result: Absolute Value	RSLT.X[*]:AB	Available	5	3	-
Pattern X Position Result: Encoder Value	RSLT.X[*]:EC	Available	5	3	X
Pattern X Position Result: Judgment Value	RSLT.X:JG	Unsigned	1	0	-
Pattern Y Position Result	RSLT.Y[*]	Available	5	3	Y
Pattern Y Position Result: Measured Value	RSLT.Y[*]:MS	Available	5	3	Y
Pattern Y Position Result: Absolute Value	RSLT.Y[*]:AB	Available	5	3	-
Pattern Y Position Result: Encoder Value	RSLT.Y[*]:EC	Available	5	3	Y
Pattern Y Position Result: Judgment Value	RSLT.Y:JG	Unsigned	1	0	-
Pattern Angle Result	RSLT.TI[*]	Available	3	3	-
Pattern Angle Result: Measured Value	RSLT.TI[*]:MS	Available	3	3	-
Pattern Angle Result: Absolute Value	RSLT.TI[*]:AB	Available	3	3	-
Pattern Angle Result: Judgment Value	RSLT.T:JG	Available	3	3	-
Pattern % Match Result	RSLT.C[*]	Unsigned	2	3	-
Pattern % Match Result: Measured Value	RSLT.C[*]:MS	Unsigned	2	3	-
Pattern % Match Result: Judgment Value	RSLT.C:JG	Unsigned	1	0	-
Detected Pattern Center XY	RSLT.PTSTXY	Available	5	3	-
Detected Pattern Center X	RSLT.PTSTX	Available	5	3	-
Detected Pattern Center Y	RSLT.PTSTY	Available	5	3	-
XY Position for Position Adjustment Reference	RSLT.ADJXY	Available	5	3	-
X Position for Position Adjustment Reference	RSLT.ADJX	Available	5	3	-
Y Position for Position Adjustment Reference	RSLT.ADJY	Available	5	3	-
Angle for Position Adjustment Reference	RSLT.ADJT	Available	3	3	-

Edge Position Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
No. of edges	RSLT.N	Unsigned	4	0	-
No. of edges: Measured value	RSLT.N:MS	Unsigned	4	0	-
No. of edges: Judgment value	RSLT.N:JG	Unsigned	1	0	-
Position X	RSLT.X[*]	Available	5	3	X
Position X: Measured value	RSLT.X[*]:MS	Available	5	3	X
Position X: Absolute measured value	RSLT.X[*]:AB	Available	5	3	-
Position X: Encoder measured value	RSLT.X[*]:EC	Available	5	3	X
Position X: Judgment value	RSLT.X:JG	Unsigned	1	0	-
Position Y	RSLT.Y[*]	Available	5	3	Y
Position Y: Measured value	RSLT.Y[*]:MS	Available	5	3	Y
Position Y: Absolute measured value	RSLT.Y[*]:AB	Available	5	3	-
Position Y: Encoder measured value	RSLT.Y[*]:EC	Available	5	3	Y
Position Y: Judgment value	RSLT.Y:JG	Unsigned	1	0	-
Position XY	RSLT.XY[*]	Available	5	3	-
Position XY: Measured value	RSLT.XY[*]:MS	Available	5	3	-
Position XY: Absolute measured value	RSLT.XY[*]:AB	Available	5	3	-
Position XY: Encoder measured value	RSLT.XY[*]:EC	Available	5	3	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-
Angle	RSLT.T[*]	Available	3	3	-
Angle: Measured value	RSLT.T[*]:MS	Available	3	3	-
Angle: Absolute measured value	RSLT.T[*]:AB	Available	3	3	-
Angle: Judgment value	RSLT.T:JG	Unsigned	1	0	-
Distance	RSLT.P[*]	Unsigned	5	3	L*
Distance: Measured value	RSLT.P[*]:MS	Unsigned	5	3	L*
Distance: Absolute measured value	RSLT.P[*]:AB	Unsigned	5	3	-
Intensity	RSLT.I[*]	Unsigned	3	3	-
Intensity: Measured value	RSLT.I[*]:MS	Unsigned	3	3	-

* Scaling is available when the region shape is not a ring or an arc.

Edge Width Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
No. of pairs	RSLT.N	Unsigned	1	0	-
No. of pairs: Measured value	RSLT.N:MS	Unsigned	1	0	-
Edge width	RSLT.W	Unsigned	5	3	L*
Edge width: Measured value	RSLT.W:MS	Unsigned	5	3	L*
Edge width: Absolute measured value	RSLT.W:AB	Unsigned	5	3	-
Edge width: Judgment value	RSLT.W:JG	Unsigned	1	0	-
Position 1 X	RSLT.X1	Available	5	3	X
Position 1 X: Measured value	RSLT.X1:MS	Available	5	3	X
Position 1 X: Absolute measured value	RSLT.X1:AB	Available	5	3	-
Position 1 X: Encoder measured value	RSLT.X1:EC	Available	5	3	X
Position 1 Y	RSLT.Y1	Available	5	3	Y
Position 1 Y: Measured value	RSLT.Y1:MS	Available	5	3	Y
Position 1 Y: Absolute measured value	RSLT.Y1:AB	Available	5	3	-
Position 1 Y: Encoder measured value	RSLT.Y1:EC	Available	5	3	Y
Position 1 XY	RSLT.XY1	Available	5	3	-
Position 1 XY: Measured value	RSLT.XY1:MS	Available	5	3	-
Position 1 XY: Absolute measured value	RSLT.XY1:AB	Available	5	3	-
Position 1 XY: Encoder measured value	RSLT.XY1:EC	Available	5	3	-
Angle 1	RSLT.T1	Available	3	3	-
Angle 1: Measured value	RSLT.T1:MS	Available	3	3	-
Angle 1: Absolute measured value	RSLT.T1:AB	Available	3	3	-
Distance 1	RSLT.P1	Unsigned	5	3	L*
Distance 1: Measured value	RSLT.P1:MS	Unsigned	5	3	L*
Distance 1: Absolute measured value	RSLT.P1:AB	Unsigned	5	3	-
Intensity 1	RSLT.I1	Unsigned	3	3	-
Intensity 1: Measured value	RSLT.I1:MS	Unsigned	3	3	-
Position 2 X	RSLT.X2	Available	5	3	X
Position 2 X: Measured value	RSLT.X2:MS	Available	5	3	X
Position 2 X: Absolute measured value	RSLT.X2:AB	Available	5	3	-
Position 2 X: Encoder measured value	RSLT.X2:EC	Available	5	3	X
Position 2 Y	RSLT.Y2	Available	5	3	Y
Position 2 Y: Measured value	RSLT.Y2:MS	Available	5	3	Y
Position 2 Y: Absolute measured value	RSLT.Y2:AB	Available	5	3	-
Position 2 Y: Encoder measured value	RSLT.Y2:EC	Available	5	3	Y
Position 2 XY	RSLT.XY2	Available	5	3	-
Position 2 XY: Measured value	RSLT.XY2:MS	Available	5	3	-
Position 2 XY: Absolute measured value	RSLT.XY2:AB	Available	5	3	-
Position 2 XY: Encoder measured value	RSLT.XY2:EC	Available	5	3	-
Angle 2	RSLT.T2	Available	3	3	-
Angle 2: Measured value	RSLT.T2:MS	Available	3	3	-
Angle 2: Absolute measured value	RSLT.T2:AB	Available	3	3	-
Distance 2	RSLT.P2	Unsigned	5	3	L*
Distance 2: Measured value	RSLT.P2:MS	Unsigned	5	3	L*
Distance 2: Absolute measured value	RSLT.P2:AB	Unsigned	5	3	-
Intensity 2	RSLT.I2	Unsigned	3	3	-
Intensity 2: Measured value	RSLT.I2:MS	Unsigned	3	3	-

* Scaling is available when the region shape is not a ring or an arc.

Edge Pitch Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
No. of pitches	RSLT.N	Unsigned	4	0	-
No. of pitches: Measured value	RSLT.N:MS	Unsigned	4	0	-
No. of pitches: Judgment value	RSLT.N:JG	Unsigned	1	0	-
Pitch (Max)	RSLT.WH	Unsigned	5	3	L*
Pitch (Max): Measured value	RSLT.WH:MS	Unsigned	5	3	L*
Pitch (Max): Absolute measured value	RSLT.WH:AB	Unsigned	5	3	-
Pitch (Max): Judgment value	RSLT.WH:JG	Unsigned	1	0	-
Pitch (Min)	RSLT.WL	Unsigned	5	3	L*
Pitch (Min): Measured value	RSLT.WL:MS	Unsigned	5	3	L*
Pitch (Min): Absolute measured value	RSLT.WL:AB	Unsigned	5	3	-
Pitch (Min): Judgment value	RSLT.WL:JG	Unsigned	1	0	-
Pitch (Ave)	RSLT.WA	Unsigned	5	3	L*
Pitch (Ave): Measured value	RSLT.WA:MS	Unsigned	5	3	L*
Pitch (Ave): Absolute measured value	RSLT.WA:AB	Unsigned	5	3	-
Pitch	RSLT.W[*]	Unsigned	5	3	L*
Pitch: Measured value	RSLT.W[*]:MS	Unsigned	5	3	L*
Pitch: Absolute measured value	RSLT.W[*]:AB	Unsigned	5	3	-
Pitch: Judgment value	RSLT.W:JG	Unsigned	1	0	-
Position 1 X	RSLT.X1[*]	Available	5	3	X
Position 1 X: Measured value	RSLT.X1[*]:MS	Available	5	3	X
Position 1 X: Absolute measured value	RSLT.X1[*]:AB	Available	5	3	-
Position 1 X: Encoder measured value	RSLT.X1[*]:EC	Available	5	3	X
Position 1 Y	RSLT.Y1[*]	Available	5	3	Y
Position 1 Y: Measured value	RSLT.Y1[*]:MS	Available	5	3	Y
Position 1 Y: Absolute measured value	RSLT.Y1[*]:AB	Available	5	3	-
Position 1 Y: Encoder measured value	RSLT.Y1[*]:EC	Available	5	3	Y
Position 1 XY	RSLT.XY1[*]	Available	5	3	-
Position 1 XY: Measured value	RSLT.XY1[*]:MS	Available	5	3	-
Position 1 XY: Absolute measured value	RSLT.XY1[*]:AB	Available	5	3	-
Position 1 XY: Encoder measured value	RSLT.XY1[*]:EC	Available	5	3	-
Angle 1	RSLT.T1[*]	Available	3	3	-
Angle 1: Measured value	RSLT.T1[*]:MS	Available	3	3	-
Angle 1: Absolute measured value	RSLT.T1[*]:AB	Available	3	3	-
Distance 1	RSLT.P1[*]	Unsigned	5	3	L*
Distance 1: Measured value	RSLT.P1[*]:MS	Unsigned	5	3	L*
Distance 1: Absolute measured value	RSLT.P1[*]:AB	Unsigned	5	3	-
Intensity 1	RSLT.I1[*]	Unsigned	3	3	-
Intensity 1: Measured value	RSLT.I1[*]:MS	Unsigned	3	3	-
Position 2 X	RSLT.X2[*]	Available	5	3	X
Position 2 X: Measured value	RSLT.X2[*]:MS	Available	5	3	X
Position 2 X: Absolute measured value	RSLT.X2[*]:AB	Available	5	3	-
Position 2 X: Encoder measured value	RSLT.X2[*]:EC	Available	5	3	X
Position 2 Y	RSLT.Y2[*]	Available	5	3	Y
Position 2 Y: Measured value	RSLT.Y2[*]:MS	Available	5	3	Y
Position 2 Y: Absolute measured value	RSLT.Y2[*]:AB	Available	5	3	-
Position 2 Y: Encoder measured value	RSLT.Y2[*]:EC	Available	5	3	Y

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Position 2 XY	RSLT.XY2[*]	Available	5	3	-
Position 2 XY: Measured value	RSLT.XY2[*]:MS	Available	5	3	-
Position 2 XY: Absolute measured value	RSLT.XY2[*]:AB	Available	5	3	-
Position 2 XY: Encoder measured value	RSLT.XY2[*]:EC	Available	5	3	-
Angle 2	RSLT.T2[*]	Available	3	3	-
Angle 2: Measured value	RSLT.T2[*]:MS	Available	3	3	-
Angle 2: Absolute measured value	RSLT.T2[*]:AB	Available	3	3	-
Distance 2	RSLT.P2[*]	Unsigned	5	3	L*
Distance 2: Measured value	RSLT.P2[*]:MS	Unsigned	5	3	L*
Distance 2: Absolute measured value	RSLT.P2[*]:AB	Unsigned	5	3	-
Intensity 2	RSLT.I2[*]	Unsigned	3	3	-
Intensity 2: Measured value	RSLT.I2[*]:MS	Unsigned	3	3	-

* Scaling is available when the region shape is not a ring or an arc.

Edge Angle Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Angle	RSLT.T	Available	3	3	-
Angle: Measured value	RSLT.T:MS	Available	3	3	-
Angle: Absolute measured value	RSLT.T:AB	Available	3	3	-
Angle: Judgment value	RSLT.T:JG	Unsigned	1	0	-
Center X	RSLT.X	Available	5	3	X
Center X: Measured value	RSLT.X:MS	Available	5	3	X
Center X: Absolute measured value	RSLT.X:AB	Available	5	3	-
Center X: Encoder measured value	RSLT.X:EC	Available	5	3	X
Center Y	RSLT.Y	Available	5	3	Y
Center Y: Measured value	RSLT.Y:MS	Available	5	3	Y
Center Y: Absolute measured value	RSLT.Y:AB	Available	5	3	-
Center Y: Encoder measured value	RSLT.Y:EC	Available	5	3	Y
Center XY	RSLT.XY	Available	5	3	-
Center XY: Measured value	RSLT.XY:MS	Available	5	3	-
Center XY: Absolute measured value	RSLT.XY:AB	Available	5	3	-
Center XY: Encoder measured value	RSLT.XY:EC	Available	5	3	-
Position 1 X	RSLT.X1	Available	5	3	X
Position 1 X: Measured value	RSLT.X1:MS	Available	5	3	X
Position 1 X: Absolute measured value	RSLT.X1:AB	Available	5	3	-
Position 1 X: Encoder measured value	RSLT.X1:EC	Available	5	3	X
Position 1 Y	RSLT.Y1	Available	5	3	Y
Position 1 Y: Measured value	RSLT.Y1:MS	Available	5	3	Y
Position 1 Y: Absolute measured value	RSLT.Y1:AB	Available	5	3	-
Position 1 Y: Encoder measured value	RSLT.Y1:EC	Available	5	3	Y
Position 1 XY	RSLT.XY1	Available	5	3	-
Position 1 XY: Measured value	RSLT.XY1:MS	Available	5	3	-
Position 1 XY: Absolute measured value	RSLT.XY1:AB	Available	5	3	-
Position 1 XY: Encoder measured value	RSLT.XY1:EC	Available	5	3	-
Distance 1	RSLT.P1	Unsigned	5	3	L
Distance 1: Measured value	RSLT.P1:MS	Unsigned	5	3	L
Distance 1: Absolute measured value	RSLT.P1:AB	Unsigned	5	3	-
Intensity 1	RSLT.I1	Unsigned	3	3	-
Intensity 1: Measured value	RSLT.I1:MS	Unsigned	3	3	-
Position 2 X	RSLT.X2	Available	5	3	X
Position 2 X: Measured value	RSLT.X2:MS	Available	5	3	X
Position 2 X: Absolute measured value	RSLT.X2:AB	Available	5	3	-
Position 2 X: Encoder measured value	RSLT.X2:EC	Available	5	3	X
Position 2 Y	RSLT.Y2	Available	5	3	Y
Position 2 Y: Measured value	RSLT.Y2:MS	Available	5	3	Y
Position 2 Y: Absolute measured value	RSLT.Y2:AB	Available	5	3	-
Position 2 Y: Encoder measured value	RSLT.Y2:EC	Available	5	3	Y
Position 2 XY	RSLT.XY2	Available	5	3	-
Position 2 XY: Measured value	RSLT.XY2:MS	Available	5	3	-
Position 2 XY: Absolute measured value	RSLT.XY2:AB	Available	5	3	-
Position 2 XY: Encoder measured value	RSLT.XY2:EC	Available	5	3	-
Distance 2	RSLT.P2	Unsigned	5	3	L

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Distance 2: Measured value	RSLT.P2:MS	Unsigned	5	3	L
Distance 2: Absolute measured value	RSLT.P2:AB	Unsigned	5	3	-
Intensity 2	RSLT.I2	Unsigned	3	3	-
Intensity 2: Measured value	RSLT.I2:MS	Unsigned	3	3	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-

Edge Pairs Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
No. of pairs	RSLT.N	Unsigned	4	0	-
No. of pairs: Measured value	RSLT.N:MS	Unsigned	4	0	-
No. of pairs: Judgment value	RSLT.N:JG	Unsigned	1	0	-
Pair width (Max)	RSLT.WH	Unsigned	5	3	L*
Pair width (Max): Measured value	RSLT.WH:MS	Unsigned	5	3	L*
Pair width (Max): Absolute measured value	RSLT.WH:AB	Unsigned	5	3	-
Pair width (Max): Judgment value	RSLT.WH:JG	Unsigned	1	0	-
Pair width (Min)	RSLT.WL	Unsigned	5	3	L*
Pair width (Min): Measured value	RSLT.WL:MS	Unsigned	5	3	L*
Pair width (Min): Absolute measured value	RSLT.WL:AB	Unsigned	5	3	-
Pair width (Min): Judgment value	RSLT.WL:JG	Unsigned	1	0	-
Pair width (Ave)	RSLT.WA	Unsigned	5	3	L*
Pair width (Ave): Measured value	RSLT.WA:MS	Unsigned	5	3	L*
Pair width (Ave): Absolute measured value	RSLT.WA:AB	Unsigned	5	3	-
Pair width	RSLT.W[*]	Unsigned	5	3	L*
Pair width: Measured value	RSLT.W[*]:MS	Unsigned	5	3	L*
Pair width: Absolute measured value	RSLT.W[*]:AB	Unsigned	5	3	-
Pair width: Judgment value	RSLT.W:JG	Unsigned	1	0	-
Position 1 X	RSLT.X1[*]	Available	5	3	X
Position 1 X: Measured value	RSLT.X1[*]:MS	Available	5	3	X
Position 1 X: Absolute measured value	RSLT.X1[*]:AB	Available	5	3	-
Position 1 X: Encoder measured value	RSLT.X1[*]:EC	Available	5	3	X
Position 1 Y	RSLT.Y1[*]	Available	5	3	Y
Position 1 Y: Measured value	RSLT.Y1[*]:MS	Available	5	3	Y
Position 1 Y: Absolute measured value	RSLT.Y1[*]:AB	Available	5	3	-
Position 1 Y: Encoder measured value	RSLT.Y1[*]:EC	Available	5	3	Y
Position 1 XY	RSLT.XY1[*]	Available	5	3	-
Position 1 XY: Measured value	RSLT.XY1[*]:MS	Available	5	3	-
Position 1 XY: Absolute measured value	RSLT.XY1[*]:AB	Available	5	3	-
Position 1 XY: Encoder measured value	RSLT.XY1[*]:EC	Available	5	3	-
Angle 1	RSLT.T1[*]	Available	3	3	-
Angle 1: Measured value	RSLT.T1[*]:MS	Available	3	3	-
Angle 1: Absolute measured value	RSLT.T1[*]:AB	Available	3	3	-
Distance 1	RSLT.P1[*]	Unsigned	5	3	L*
Distance 1: Measured value	RSLT.P1[*]:MS	Unsigned	5	3	L*
Distance 1: Absolute measured value	RSLT.P1[*]:AB	Unsigned	5	3	-
Intensity 1	RSLT.I1[*]	Unsigned	3	3	-
Intensity 1: Measured value	RSLT.I1[*]:MS	Unsigned	3	3	-
Position 2 X	RSLT.X2[*]	Available	5	3	X
Position 2 X: Measured value	RSLT.X2[*]:MS	Available	5	3	X
Position 2 X: Absolute measured value	RSLT.X2[*]:AB	Available	5	3	-
Position 2 X: Encoder measured value	RSLT.X2[*]:EC	Available	5	3	X
Position 2 Y	RSLT.Y2[*]	Available	5	3	Y
Position 2 Y: Measured value	RSLT.Y2[*]:MS	Available	5	3	Y
Position 2 Y: Absolute measured value	RSLT.Y2[*]:AB	Available	5	3	-
Position 2 Y: Encoder measured value	RSLT.Y2[*]:EC	Available	5	3	Y

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Position 2 XY	RSLT.XY2[*]	Available	5	3	-
Position 2 XY: Measured value	RSLT.XY2[*]:MS	Available	5	3	-
Position 2 XY: Absolute measured value	RSLT.XY2[*]:AB	Available	5	3	-
Position 2 XY: Encoder measured value	RSLT.XY2[*]:EC	Available	5	3	-
Angle 2	RSLT.T2[*]	Available	3	3	-
Angle 2: Measured value	RSLT.T2[*]:MS	Available	3	3	-
Angle 2: Absolute measured value	RSLT.T2[*]:AB	Available	3	3	-
Distance 2	RSLT.P2[*]	Unsigned	5	3	L*
Distance 2: Measured value	RSLT.P2[*]:MS	Unsigned	5	3	L*
Distance 2: Absolute measured value	RSLT.P2[*]:AB	Unsigned	5	3	-
Intensity 2	RSLT.I2[*]	Unsigned	3	3	-
Intensity 2: Measured value	RSLT.I2[*]:MS	Unsigned	3	3	-

* Scaling is available when the region shape is not a ring or an arc.

Defect Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Detected defect level	RSLT.SL	Unsigned	3	0	-
Detected defect level: Measured value	RSLT.SL:MS	Unsigned	3	0	-
Total defect area	RSLT.TSA	Unsigned	8	0	-
Total defect area: Measured value	RSLT.TSA:MS	Unsigned	8	0	-
Total defect area: Judgment value	RSLT.TSA:JG	Unsigned	1	0	-
Position X	RSLT.X	Available	5	3	X
Position X: Measured value	RSLT.X:MS	Available	5	3	X
Position X: Absolute measured value	RSLT.X:AB	Available	5	3	-
Position X: Encoder measured value	RSLT.X:EC	Available	5	3	X
Position Y	RSLT.Y	Available	5	3	Y
Position Y: Measured value	RSLT.Y:MS	Available	5	3	Y
Position Y: Absolute measured value	RSLT.Y:AB	Available	5	3	-
Position Y: Encoder measured value	RSLT.Y:EC	Available	5	3	Y
Position XY	RSLT.XY	Available	5	3	-
Position XY: Measured value	RSLT.XY:MS	Available	5	3	-
Position XY: Absolute measured value	RSLT.XY:AB	Available	5	3	-
Position XY: Encoder measured value	RSLT.XY:EC	Available	5	3	-
No. of groups	RSLT.N	Unsigned	2	0	-
No. of groups: Measured value	RSLT.N:MS	Unsigned	2	0	-
No. of groups: Judgment value	RSLT.N:JG	Unsigned	1	0	-
Defect area	RSLT.GSA[*]	Unsigned	8	0	-
Defect area: Measured value	RSLT.GSA[*]:MS	Unsigned	8	0	-
Defect area: Judgment value	RSLT.GSA:JG	Unsigned	1	0	-
Group center X	RSLT.GX[*]	Available	5	3	X
Group center X: Measured value	RSLT.GX[*]:MS	Available	5	3	X
Group center X: Absolute measured value	RSLT.GX[*]:AB	Available	5	3	-
Group center X: Encoder measured value	RSLT.GX[*]:EC	Available	5	3	X
Group center X: Judgment value	RSLT.GX:JG	Unsigned	1	0	-
Group center Y	RSLT.GY[*]	Available	5	3	Y
Group center Y: Measured value	RSLT.GY[*]:MS	Available	5	3	Y
Group center Y: Absolute measured value	RSLT.GY[*]:AB	Available	5	3	-
Group center Y: Encoder measured value	RSLT.GY[*]:EC	Available	5	3	Y
Group center Y: Judgment value	RSLT.GY:JG	Unsigned	1	0	-
Group center XY	RSLT.GXY[*]	Available	5	3	-
Group center XY: Measured value	RSLT.GXY[*]:MS	Available	5	3	-
Group center XY: Absolute measured value	RSLT.GXY[*]:AB	Available	5	3	-
Group center XY: Encoder measured value	RSLT.GXY[*]:EC	Available	5	3	-
Major axis angle	RSLT.GT[*]	Available	3	3	-
Major axis angle: Measured value	RSLT.GT[*]:MS	Available	3	3	-
Major axis angle: Absolute measured value	RSLT.GT[*]:AB	Available	3	3	-
Group center XY/Major axis angle	RSLT.GXYT[*]	Available	5	3	-
Group center XY/Major axis angle: Measured value	RSLT.GXYT[*]:MS	Available	5	3	-
Group center XY/Major axis angle: Absolute measured value	RSLT.GXYT[*]:AB	Available	5	3	-
Group center XY/Major axis angle: Encoder measured value	RSLT.GXYT[*]:EC	Available	5	3	-
Feret diameter X	RSLT.GFX[*]	Available	5	3	L

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Feret diameter X: Measured value	RSLT.GFX[*]:MS	Available	5	3	L
Feret diameter X: Absolute measured value	RSLT.GFX[*]:AB	Available	5	3	-
Feret diameter Y	RSLT.GFY[*]	Available	5	3	L
Feret diameter Y: Measured value	RSLT.GFY[*]:MS	Available	5	3	L
Feret diameter Y: Absolute measured value	RSLT.GFY[*]:AB	Available	5	3	-
Perimeter	RSLT.GCL[*]	Unsigned	8	0	L
Perimeter: Measured value	RSLT.GCL[*]:MS	Unsigned	8	0	L
Perimeter: Absolute measured value	RSLT.GCL[*]:AB	Unsigned	8	0	-
Roundness	RSLT.GCD[*]	Unsigned	1	3	-
Roundness: Measured value	RSLT.GCD[*]:MS	Unsigned	1	3	-
Feret diameter box upper left X	RSLT.GRLUX[*]	Available	5	3	X
Feret diameter box upper left X: Measured value	RSLT.GRLUX[*]:MS	Available	5	3	X
Feret diameter box upper left X: Absolute measured value	RSLT.GRLUX[*]:AB	Available	5	3	-
Feret diameter box upper left X: Encoder measured value	RSLT.GRLUX[*]:EC	Available	5	3	X
Feret diameter box upper left Y	RSLT.GRLUY[*]	Available	5	3	Y
Feret diameter box upper left Y: Measured value	RSLT.GRLUY[*]:MS	Available	5	3	Y
Feret diameter box upper left Y: Absolute measured value	RSLT.GRLUY[*]:AB	Available	5	3	-
Feret diameter box upper left Y: Encoder measured value	RSLT.GRLUY[*]:EC	Available	5	3	Y
Feret diameter box upper left XY	RSLT.GRLUXY[*]	Available	5	3	-
Feret diameter box upper left XY: Measured value	RSLT.GRLUXY[*]:MS	Available	5	3	-
Feret diameter box upper left XY: Absolute measured value	RSLT.GRLUXY[*]:AB	Available	5	3	-
Feret diameter box upper left XY: Encoder measured value	RSLT.GRLUXY[*]:EC	Available	5	3	-
Feret diameter box lower left X	RSLT.GRLDX[*]	Available	5	3	X
Feret diameter box lower left X: Measured value	RSLT.GRLDX[*]:MS	Available	5	3	X
Feret diameter box lower left X: Absolute measured value	RSLT.GRLDX[*]:AB	Available	5	3	-
Feret diameter box lower left X: Encoder measured value	RSLT.GRLDX[*]:EC	Available	5	3	X
Feret diameter box lower left Y	RSLT.GRLDY[*]	Available	5	3	Y
Feret diameter box lower left Y: Measured value	RSLT.GRLDY[*]:MS	Available	5	3	Y
Feret diameter box lower left Y: Absolute measured value	RSLT.GRLDY[*]:AB	Available	5	3	-
Feret diameter box lower left Y: Encoder measured value	RSLT.GRLDY[*]:EC	Available	5	3	Y
Feret diameter box lower left XY	RSLT.GRLDXY[*]	Available	5	3	-
Feret diameter box lower left XY: Measured value	RSLT.GRLDXY[*]:MS	Available	5	3	-
Feret diameter box lower left XY: Absolute measured value	RSLT.GRLDXY[*]:AB	Available	5	3	-
Feret diameter box lower left XY: Encoder measured value	RSLT.GRLDXY[*]:EC	Available	5	3	-
Feret diameter box upper right X	RSLT.GRRUX[*]	Available	5	3	X
Feret diameter box upper right X: Measured value	RSLT.GRRUX[*]:MS	Available	5	3	X
Feret diameter box upper right X: Absolute measured value	RSLT.GRRUX[*]:AB	Available	5	3	-
Feret diameter box upper right X: Encoder measured value	RSLT.GRRUX[*]:EC	Available	5	3	X

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Feret diameter box upper right Y	RSLT.GRRUY[*]	Available	5	3	Y
Feret diameter box upper right Y: Measured value	RSLT.GRRUY[*]:MS	Available	5	3	Y
Feret diameter box upper right Y: Absolute measured value	RSLT.GRRUY[*]:AB	Available	5	3	-
Feret diameter box upper right Y: Encoder measured value	RSLT.GRRUY[*]:EC	Available	5	3	Y
Feret diameter box upper right XY	RSLT.GRRUXY[*]	Available	5	3	-
Feret diameter box upper right XY: Measured value	RSLT.GRRUXY[*]:MS	Available	5	3	-
Feret diameter box upper right XY: Absolute measured value	RSLT.GRRUXY[*]:AB	Available	5	3	-
Feret diameter box upper right XY: Encoder measured value	RSLT.GRRUXY[*]:EC	Available	5	3	-
Feret diameter box lower right X	RSLT.GRRDX[*]	Available	5	3	X
Feret diameter box lower right X: Measured value	RSLT.GRRDX[*]:MS	Available	5	3	X
Feret diameter box lower right X: Absolute measured value	RSLT.GRRDX[*]:AB	Available	5	3	-
Feret diameter box lower right X: Encoder measured value	RSLT.GRRDX[*]:EC	Available	5	3	X
Feret diameter box lower right Y	RSLT.GRRDY[*]	Available	5	3	Y
Feret diameter box lower right Y: Measured value	RSLT.GRRDY[*]:MS	Available	5	3	Y
Feret diameter box lower right Y: Absolute measured value	RSLT.GRLDY[*]:AB	Available	5	3	-
Feret diameter box lower right Y: Encoder measured value	RSLT.GRLRY[*]:EC	Available	5	3	Y
Feret diameter box lower right XY	RSLT.GRRDXY[*]	Available	5	3	-
Feret diameter box lower right XY: Measured value	RSLT.GRRDXY[*]:MS	Available	5	3	-
Feret diameter box lower right XY: Absolute measured value	RSLT.GRRDXY[*]:AB	Available	5	3	-
Feret diameter box lower right XY: Encoder measured value	RSLT.GRRDXY[*]:EC	Available	5	3	-
Defect axes box upper left X	RSLT.GR2LUX[*]	Available	5	3	X
Defect axes box upper left X: Measured value	RSLT.GR2LUX[*]:MS	Available	5	3	X
Defect axes box upper left X: Absolute measured value	RSLT.GR2LUX[*]:AB	Available	5	3	-
Defect axes box upper left X: Encoder measured value	RSLT.GR2LUX[*]:EC	Available	5	3	X
Defect axes box upper left Y	RSLT.GR2LUY[*]	Available	5	3	Y
Defect axes box upper left Y: Measured value	RSLT.GR2LUY[*]:MS	Available	5	3	Y
Defect axes box upper left Y: Absolute measured value	RSLT.GR2LUY[*]:AB	Available	5	3	-
Defect axes box upper left Y: Encoder measured value	RSLT.GR2LUY[*]:EC	Available	5	3	Y
Defect axes box upper left XY	RSLT.GR2LUXY[*]	Available	5	3	-
Defect axes box upper left XY: Measured value	RSLT.GR2LUXY[*]:MS	Available	5	3	-
Defect axes box upper left XY: Absolute measured value	RSLT.GR2LUXY[*]:AB	Available	5	3	-
Defect axes box upper left XY: Encoder measured value	RSLT.GR2LUXY[*]:EC	Available	5	3	-
Defect axes box lower left X	RSLT.GR2LDX[*]	Available	5	3	X
Defect axes box lower left X: Measured value	RSLT.GR2LDX[*]:MS	Available	5	3	X
Defect axes box lower left X: Absolute measured value	RSLT.GR2LDX[*]:AB	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Defect axes box lower left X: Encoder measured value	RSLT.GR2LDX[*]:EC	Available	5	3	X
Defect axes box lower left Y	RSLT.GR2LDY[*]	Available	5	3	Y
Defect axes box lower left Y: Measured value	RSLT.GR2LDY[*]:MS	Available	5	3	Y
Defect axes box lower left Y: Absolute measured value	RSLT.GR2LDY[*]:AB	Available	5	3	-
Defect axes box lower left Y: Encoder measured value	RSLT.GR2LDY[*]:EC	Available	5	3	Y
Defect axes box lower left XY	RSLT.GR2LDXY[*]	Available	5	3	-
Defect axes box lower left XY: Measured value	RSLT.GR2LDXY[*]:MS	Available	5	3	-
Defect axes box lower left XY: Absolute measured value	RSLT.GR2LDXY[*]:AB	Available	5	3	-
Defect axes box lower left XY: Encoder measured value	RSLT.GR2LDXY[*]:EC	Available	5	3	-
Defect axes box upper right X	RSLT.GR2RUX[*]	Available	5	3	X
Defect axes box upper right X: Measured value	RSLT.GR2RUX[*]:MS	Available	5	3	X
Defect axes box upper right X: Absolute measured value	RSLT.GR2RUX[*]:AB	Available	5	3	-
Defect axes box upper right X: Encoder measured value	RSLT.GR2RUX[*]:EC	Available	5	3	X
Defect axes box upper right Y	RSLT.GR2RUY[*]	Available	5	3	Y
Defect axes box upper right Y: Measured value	RSLT.GR2RUY[*]:MS	Available	5	3	Y
Defect axes box upper right Y: Absolute measured value	RSLT.GR2RUY[*]:AB	Available	5	3	-
Defect axes box upper right Y: Encoder measured value	RSLT.GR2RUY[*]:EC	Available	5	3	Y
Defect axes box upper right XY	RSLT.GR2RUXY[*]	Available	5	3	-
Defect axes box upper right XY: Measured value	RSLT.GR2RUXY[*]:MS	Available	5	3	-
Defect axes box upper right XY: Absolute measured value	RSLT.GR2RUXY[*]:AB	Available	5	3	-
Defect axes box upper right XY: Encoder measured value	RSLT.GR2RUXY[*]:EC	Available	5	3	-
Defect axes box lower right X	RSLT.GR2RDX[*]	Available	5	3	X
Defect axes box lower right X: Measured value	RSLT.GR2RDX[*]:MS	Available	5	3	X
Defect axes box lower right X: Absolute measured value	RSLT.GR2RDX[*]:AB	Available	5	3	-
Defect axes box lower right X: Encoder measured value	RSLT.GR2RDX[*]:EC	Available	5	3	X
Defect axes box lower right Y	RSLT.GR2RDY[*]	Available	5	3	Y
Defect axes box lower right Y: Measured value	RSLT.GR2RDY[*]:MS	Available	5	3	Y
Defect axes box lower right Y: Absolute measured value	RSLT.GR2RDY[*]:AB	Available	5	3	-
Defect axes box lower right Y: Encoder measured value	RSLT.GR2RLRY[*]:EC	Available	5	3	Y
Defect axes box lower right XY	RSLT.GR2RDXY[*]	Available	5	3	-
Defect axes box lower right XY: Measured value	RSLT.GR2RDXY[*]:MS	Available	5	3	-
Defect axes box lower right XY: Absolute measured value	RSLT.GR2RDXY[*]:AB	Available	5	3	-
Defect axes box lower right XY: Encoder measured value	RSLT.GR2RDXY[*]:EC	Available	5	3	-
Defect axes box width	RSLT.GMAA[*]	Unsigned	5	3	L
Defect axes box width: Measured value	RSLT.GMAA[*]:MS	Unsigned	5	3	L

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Defect axes box width: Absolute measured value	RSLT.GMAA[*]:AB	Unsigned	5	3	-
Defect axes box height	RSLT.GMIA[*]	Unsigned	5	3	L
Defect axes box height: Measured value	RSLT.GMIA[*]:MS	Unsigned	5	3	L
Defect axes box height: Absolute measured value	RSLT.GMIA[*]:AB	Unsigned	5	3	-
Axes ratio	RSLT.GRTO[*]	Unsigned	5	3	-
Axes ratio: Measured value	RSLT.GRTO[*]:MS	Unsigned	5	3	-
Distributed oval major axis	RSLT.GMAA2[*]	Unsigned	5	3	L
Distributed oval major axis: Measured value	RSLT.GMAA2[*]:MS	Unsigned	5	3	L
Distributed oval major axis: Absolute measured value	RSLT.GMAA2[*]:AB	Unsigned	5	3	-
Distributed oval minor axis	RSLT.GMIA2[*]	Unsigned	5	3	L
Distributed oval minor axis: Measured value	RSLT.GMIA2[*]:MS	Unsigned	5	3	L
Distributed oval minor axis: Absolute measured value	RSLT.GMIA2[*]:AB	Unsigned	5	3	-
Aspect ratio	RSLT.GRTO2[*]	Unsigned	5	3	-
Aspect ratio: Measured value	RSLT.GRTO2[*]:MS	Unsigned	5	3	-
Area	RSLT.NGSA[*]	Unsigned	8	0	-
Area: Measured value	RSLT.NGSA[*]:MS	Unsigned	8	0	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-
Target classification type	RSLT.CLSTYP[*]	Available	2	0	-
Target classification type: Measured value	RSLT.CLSTYP[*]:MS	Available	2	0	-
Number	RSLT.CLS[0].N	Unsigned	4	0	-
Number: Measured value	RSLT.CLS[0].N:MS	Unsigned	2	0	-
Center of gravity X	RSLT.CLS[0].GX[*]	Available	5	3	-
Center of gravity X: Measured value	RSLT.CLS[0].GX[*]:MS	Available	5	3	X
Center of gravity X: Absolute measured value	RSLT.CLS[0].GX[*]:AB	Available	5	3	-
Center of gravity X: Encoder measured value	RSLT.CLS[0].GX[*]:EC	Available	5	3	X
Center of gravity Y	RSLT.CLS[0].GY[*]	Available	5	3	-
Center of gravity Y: Measured value	RSLT.CLS[0].GY[*]:MS	Available	5	3	Y
Center of gravity Y: Absolute measured value	RSLT.CLS[0].GY[*]:AB	Available	5	3	-
Center of gravity Y: Encoder measured value	RSLT.CLS[0].GY[*]:EC	Available	5	3	Y
Major axis angle	RSLT.CLS[0].GT[*]	Available	3	3	-
Major axis angle: Measured value	RSLT.CLS[0].GT[*]:MS	Available	3	3	-
Major axis angle: Absolute measured value	RSLT.CLS[0].GT[*]:AB	Available	3	3	-
Area	RSLT.CLS[0].NGSA[*]	Unsigned	8	0	-
Area: Measured value	RSLT.CLS[0].NGSA[*]:MS	Unsigned	8	0	-
Feret diameter X	RSLT.CLS[0].GFX[*]	Available	5	3	-
Feret diameter X: Measured value	RSLT.CLS[0].GFX[*]:MS	Available	5	3	L
Feret diameter X: Absolute measured value	RSLT.CLS[0].GFX[*]:AB	Available	5	3	-
Feret diameter Y	RSLT.CLS[0].GFY[*]	Available	5	3	-
Feret diameter Y: Measured value	RSLT.CLS[0].GFY[*]:MS	Available	5	3	L
Feret diameter Y: Absolute measured value	RSLT.CLS[0].GFY[*]:AB	Available	5	3	-
Perimeter	RSLT.CLS[0].GCL[*]	Unsigned	8	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Perimeter: Measured value	RSLT.CLS[0].GCL[*]:MS	Unsigned	8	0	L
Perimeter: Absolute measured value	RSLT.CLS[0].GCL[*]:AB	Unsigned	8	0	-
Roundness	RSLT.CLS[0].GCD[*]	Unsigned	1	3	-
Roundness: Measured value	RSLT.CLS[0].GCD[*]:MS	Unsigned	1	3	-
Perimeter: Absolute measured value	RSLT.CLS[0].GCL[*]:AB	Unsigned	8	0	-
Major axis	RSLT.CLS[0].GMAA[*]	Unsigned	5	3	-
Major axis: Measured value	RSLT.CLS[0].GMAA[*]:MS	Unsigned	5	3	L
Major axis: Absolute measured value	RSLT.CLS[0].GMAA[*]:AB	Unsigned	5	3	-
Minor axis	RSLT.CLS[0].GMIA[*]	Unsigned	5	3	-
Minor axis: Measured value	RSLT.CLS[0].GMIA[*]:MS	Unsigned	5	3	L
Minor axis: Absolute measured value	RSLT.CLS[0].GMIA[*]:AB	Unsigned	5	3	-
Axes ratio	RSLT.CLS[0].GRTO[*]	Unsigned	5	3	-
Axes ratio: Measured value	RSLT.CLS[0].GRTO[*]:MS	Unsigned	5	3	-
Distributed oval major axis	RSLT.CLS[0].GMMA2[*]	Unsigned	5	3	-
Distributed oval major axis: Measured value	RSLT.CLS[0].GMMA2[*]:MS	Unsigned	5	3	L
Distributed oval major axis: Absolute measured value	RSLT.CLS[0].GMMA2[*]:AB	Unsigned	5	3	-
Distributed oval minor axis	RSLT.CLS[0].GMMA2[*]	Unsigned	5	3	-
Distributed oval minor axis: Measured value	RSLT.CLS[0].GMIA2[*]:MS	Unsigned	5	3	L
Distributed oval minor axis: Absolute measured value	RSLT.CLS[0].GMIA2[*]:AB	Unsigned	5	3	-
Aspect ratio	RSLT.CLS[0].GRTO2[*]	Unsigned	5	3	-
Aspect ratio: Measured value	RSLT.CLS[0].GRTO2[*]:ms	Unsigned	5	3	-
<hr/>					
RSLT.CLS[1].***					
<hr/>					
:					
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RSLT.CLS[19].***					

Blob Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Number of blobs	RSLT.N	Unsigned	4	0	-
Number of blobs: Measured value	RSLT.N:MS	Unsigned	4	0	-
Number of blobs: Judgment value	RSLT.N:JG	Unsigned	1	0	-
Center of gravity X	RSLT.X[*]	Available	5	3	X
Center of gravity X: Measured value	RSLT.X[*]:MS	Available	5	3	X
Center of gravity X: Absolute measured value	RSLT.X[*]:AB	Available	5	3	-
Center of gravity X: Encoder measured value	RSLT.X[*]:EC	Available	5	3	X
Center of gravity X: Judgment value	RSLT.X:JG	Unsigned	1	0	-
Center of gravity X (Max)	RSLT.XH	Available	5	3	X
Center of gravity X (Max): Measured value	RSLT.XH:MS	Available	5	3	X
Center of gravity X (Max): Encoder measured value	RSLT.XH:EC	Available	5	3	X
Center of gravity X (Max): Judgment value	RSLT.XH:JG	Unsigned	1	0	-
Center of gravity X (Min)	RSLT.XL	Available	5	3	X
Center of gravity X (Min): Measured value	RSLT.XL:MS	Available	5	3	X
Center of gravity X (Min): Encoder measured value	RSLT.XL:EC	Available	5	3	X
Center of gravity X (Min): Judgment value	RSLT.XL:JG	Unsigned	1	0	-
Center of gravity Y	RSLT.Y[*]	Available	5	3	Y
Center of gravity Y: Measured value	RSLT.Y[*]:MS	Available	5	3	Y
Center of gravity Y: Absolute measured value	RSLT.Y[*]:AB	Available	5	3	-
Center of gravity Y: Encoder measured value	RSLT.Y[*]:EC	Available	5	3	Y
Center of gravity Y: Judgment value	RSLT.Y:JG	Unsigned	1	0	-
Center of gravity Y (Max)	RSLT.YH	Available	5	3	Y
Center of gravity Y (Max): Measured value	RSLT.YH:MS	Available	5	3	Y
Center of gravity Y (Max): Encoder measured value	RSLT.YH:EC	Available	5	3	Y
Center of gravity Y (Max): Judgment value	RSLT.YH:JG	Unsigned	1	0	-
Center of gravity Y (Min)	RSLT.YL	Available	5	3	Y
Center of gravity Y (Min): Measured value	RSLT.YL:MS	Available	5	3	Y
Center of gravity Y (Min): Encoder measured value	RSLT.YL:EC	Available	5	3	Y
Center of gravity Y (Min): Judgment value	RSLT.YL:JG	Unsigned	1	0	-
Center of gravity XY	RSLT.XY[*]	Available	5	3	-
Center of gravity XY: Measured value	RSLT.XY[*]:MS	Available	5	3	-
Center of gravity XY: Absolute measured value	RSLT.XY[*]:AB	Available	5	3	-
Center of gravity XY: Encoder measured value	RSLT.XY[*]:EC	Available	5	3	-
Major axis angle	RSLT.T[*]	Available	3	3	-
Major axis angle: Measured value	RSLT.T[*]:MS	Available	3	3	-
Major axis angle: Absolute measured value	RSLT.T[*]:AB	Available	3	3	-
Major axis angle: Judgment value	RSLT.T:JG	Unsigned	1	0	-
Major axis angle (Max)	RSLT.TH	Available	3	3	-
Major axis angle (Max): Measured value	RSLT.TH:MS	Available	3	3	-
Major axis angle (Max): Judgment value	RSLT.TH:JG	Unsigned	1	0	-
Major axis angle (Min)	RSLT.TL	Available	3	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Major axis angle (Min): Measured value	RSLT.TL:MS	Available	3	3	-
Major axis angle (Min): Judgment value	RSLT.TL:JG	Unsigned	1	0	-
Center of gravity XY/Major axis angle	RSLT.XYT[*]	Available	5	3	-
Center of gravity XY/Major axis angle: Measured value	RSLT.XYT[*]:MS	Available	5	3	-
Center of gravity XY/Major axis angle: Absolute measured value	RSLT.XYT[*]:AB	Available	5	3	-
Center of gravity XY/Major axis angle: Encoder measured value	RSLT.XYT[*]:EC	Available	5	3	-
Area	RSLT.AR[*]	Unsigned	8	0	-
Area: Measured value	RSLT.AR[*]:MS	Unsigned	8	0	-
Area: Judgment value	RSLT.AR:JG	Unsigned	1	0	-
Area (Max)	RSLT.ARH	Unsigned	8	0	-
Area (Max): Measured value	RSLT.ARH:MS	Unsigned	8	0	-
Area (Max): Judgment value	RSLT.ARH:JG	Unsigned	1	0	-
Area (Min)	RSLT.ARL	Unsigned	8	0	-
Area (Min): Measured value	RSLT.ARL:MS	Unsigned	8	0	-
Area (Min): Judgment value	RSLT.ARL:JG	Unsigned	1	0	-
Feret diameter X	RSLT.FX[*]	Available	5	3	L
Feret diameter X: Measured value	RSLT.FX[*]:MS	Available	5	3	L
Feret diameter X: Absolute measured value	RSLT.FX[*]:AB	Available	5	3	-
Feret diameter X: Judgment value	RSLT.FX:JG	Unsigned	1	0	-
Feret diameter X (Max)	RSLT.FXH	Available	5	3	L
Feret diameter X (Max): Measured value	RSLT.FXH:MS	Available	5	3	L
Feret diameter X (Max): Absolute measured value	RSLT.FXH:AB	Available	5	3	-
Feret diameter X (Max): Judgment value	RSLT.FXH:JG	Unsigned	1	0	-
Feret diameter X (Min)	RSLT.FXL	Available	5	3	L
Feret diameter X (Min): Measured value	RSLT.FXL:MS	Available	5	3	L
Feret diameter X (Min): Absolute measured value	RSLT.FXL:AB	Available	5	3	-
Feret diameter X (Min): Judgment value	RSLT.FXL:JG	Unsigned	1	0	-
Feret diameter Y	RSLT.FY[*]	Available	5	3	L
Feret diameter Y: Measured value	RSLT.FY[*]:MS	Available	5	3	L
Feret diameter Y: Absolute measured value	RSLT.FY[*]:AB	Available	5	3	-
Feret diameter Y: Judgment value	RSLT.FY:JG	Unsigned	1	0	-
Feret diameter Y (Max)	RSLT.FYH	Available	5	3	L
Feret diameter Y (Max): Measured value	RSLT.FYH:MS	Available	5	3	L
Feret diameter Y (Max): Absolute measured value	RSLT.FYH:AB	Available	5	3	-
Feret diameter Y (Max): Judgment value	RSLT.FYH:JG	Unsigned	1	0	-
Feret diameter Y (Min)	RSLT.FYL	Available	5	3	L
Feret diameter Y (Min): Measured value	RSLT.FYL:MS	Available	5	3	L
Feret diameter Y (Min): Absolute measured value	RSLT.FYL:AB	Available	5	3	-
Feret diameter Y (Min): Judgment value	RSLT.FYL:JG	Unsigned	1	0	-
Perimeter	RSLT.CL[*]	Unsigned	8	0	L
Perimeter: Measured value	RSLT.CL[*]:MS	Unsigned	8	0	L
Perimeter: Absolute measured value	RSLT.CL[*]:AB	Unsigned	8	0	-
Perimeter: Judgment value	RSLT.CL:JG	Unsigned	1	0	-
Perimeter (Max)	RSLT.CLH	Unsigned	8	0	L
Perimeter (Max): Measured value	RSLT.CLH:MS	Unsigned	8	0	L

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Perimeter (Max): Absolute measured value	RSLT.CLH:AB	Unsigned	8	0	-
Perimeter (Max): Judgment value	RSLT.CLH:JG	Unsigned	1	0	-
Perimeter (Min)	RSLT.CLL	Unsigned	8	0	L
Perimeter (Min): Measured value	RSLT.CLL:MS	Unsigned	8	0	L
Perimeter (Min): Absolute measured value	RSLT.CLL:AB	Unsigned	8	0	-
Perimeter (Min): Judgment value	RSLT.CLL:JG	Unsigned	1	0	-
Roundness	RSLT.CD[*]	Unsigned	1	3	-
Roundness: Measured value	RSLT.CD[*]:MS	Unsigned	1	3	-
Roundness: Judgment value	RSLT.CD:JG	Unsigned	1	0	-
Roundness (Max)	RSLT.CDH	Unsigned	1	3	-
Roundness (Max): Measured value	RSLT.CDH:MS	Unsigned	1	3	-
Roundness (Max): Judgment value	RSLT.CDH:JG	Unsigned	1	0	-
Roundness (Min)	RSLT.CDL	Unsigned	1	3	-
Roundness (Min): Measured value	RSLT.CDL:MS	Unsigned	1	3	-
Roundness (Min): Judgment value	RSLT.CDL:JG	Unsigned	1	0	-
Feret diameter box upper left X	RSLT.RLUX[*]	Available	5	3	X
Feret diameter box upper left X: Measured value	RSLT.RLUX[*]:MS	Available	5	3	X
Feret diameter box upper left X: Absolute measured value	RSLT.RLUX[*]:AB	Available	5	3	-
Feret diameter box upper left X: Encoder measured value	RSLT.RLUX[*]:EC	Available	5	3	X
Feret diameter box upper left Y	RSLT.RLUY[*]	Available	5	3	Y
Feret diameter box upper left Y: Measured value	RSLT.RLUY[*]:MS	Available	5	3	Y
Feret diameter box upper left Y: Absolute measured value	RSLT.RLUY[*]:AB	Available	5	3	-
Feret diameter box upper left Y: Encoder measured value	RSLT.RLUY[*]:EC	Available	5	3	Y
Feret diameter box upper left XY	RSLT.RLUXY[*]	Available	5	3	-
Feret diameter box upper left XY: Measured value	RSLT.RLUXY[*]:MS	Available	5	3	-
Feret diameter box upper left XY: Absolute measured value	RSLT.RLUXY[*]:AB	Available	5	3	-
Feret diameter box upper left XY: Encoder measured value	RSLT.RLUXY[*]:EC	Available	5	3	-
Feret diameter box lower left X	RSLT.RLDX[*]	Available	5	3	X
Feret diameter box lower left X: Measured value	RSLT.RLDX[*]:MS	Available	5	3	X
Feret diameter box lower left X: Absolute measured value	RSLT.RLDX[*]:AB	Available	5	3	-
Feret diameter box lower left X: Encoder measured value	RSLT.RLDX[*]:EC	Available	5	3	X
Feret diameter box lower left Y	RSLT.RLDY[*]	Available	5	3	Y
Feret diameter box lower left Y: Measured value	RSLT.RLDY[*]:MS	Available	5	3	Y
Feret diameter box lower left Y: Absolute measured value	RSLT.RLDY[*]:AB	Available	5	3	-
Feret diameter box lower left Y: Encoder measured value	RSLT.RLDY[*]:EC	Available	5	3	Y
Feret diameter box lower left XY	RSLT.RLDXY[*]	Available	5	3	-
Feret diameter box lower left XY: Measured value	RSLT.RLDXY[*]:MS	Available	5	3	-
Feret diameter box lower left XY: Absolute measured value	RSLT.RLDXY[*]:AB	Available	5	3	-
Feret diameter box lower left XY: Encoder measured value	RSLT.RLDXY[*]:EC	Available	5	3	-
Feret diameter box upper right X	RSLT.RRUX[*]	Available	5	3	X

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Feret diameter box upper right X: Measured value	RSLT.RRUX[*]:MS	Available	5	3	X
Feret diameter box upper right X: Absolute measured value	RSLT.RRUX[*]:AB	Available	5	3	-
Feret diameter box upper right X: Encoder measured value	RSLT.RRUX[*]:EC	Available	5	3	X
Feret diameter box upper right Y	RSLT.RRUY[*]	Available	5	3	Y
Feret diameter box upper right Y: Measured value	RSLT.RRUY[*]:MS	Available	5	3	Y
Feret diameter box upper right Y: Absolute measured value	RSLT.RRUY[*]:AB	Available	5	3	-
Feret diameter box upper right Y: Encoder measured value	RSLT.RRUY[*]:EC	Available	5	3	Y
Feret diameter box upper right XY	RSLT.RRUXY[*]	Available	5	3	-
Feret diameter box upper right XY: Measured value	RSLT.RRUXY[*]:MS	Available	5	3	-
Feret diameter box upper right XY: Absolute measured value	RSLT.RRUXY[*]:AB	Available	5	3	-
Feret diameter box upper right XY: Encoder measured value	RSLT.RRUXY[*]:EC	Available	5	3	-
Feret diameter box lower right X	RSLT.RRDX[*]	Available	5	3	X
Feret diameter box lower right X: Measured value	RSLT.RRDX[*]:MS	Available	5	3	X
Feret diameter box lower right X: Absolute measured value	RSLT.RRDX[*]:AB	Available	5	3	-
Feret diameter box lower right X: Encoder measured value	RSLT.RRDX[*]:EC	Available	5	3	X
Feret diameter box lower right Y	RSLT.RRDY[*]	Available	5	3	Y
Feret diameter box lower right Y: Measured value	RSLT.RRDY[*]:MS	Available	5	3	Y
Feret diameter box lower right Y: Absolute measured value	RSLT.RRDY[*]:AB	Available	5	3	-
Feret diameter box lower right Y: Encoder measured value	RSLT.RRDY[*]:EC	Available	5	3	Y
Feret diameter box lower right XY	RSLT.RRDXY[*]	Available	5	3	-
Feret diameter box lower right XY: Measured value	RSLT.RRDXY[*]:MS	Available	5	3	-
Feret diameter box lower right XY: Absolute measured value	RSLT.RRDXY[*]:AB	Available	5	3	-
Feret diameter box lower right XY: Encoder measured value	RSLT.RRDXY[*]:EC	Available	5	3	-
Blob axes box upper left XY	RSLT.R2LUXY[*]	Available	5	3	-
Blob axes box upper left XY: Measured value	RSLT.R2LUXY[*]:MS	Available	5	3	-
Blob axes box upper left XY: Absolute measured value	RSLT.R2LUXY[*]:AB	Available	5	3	-
Blob axes box upper left XY: Encoder measured value	RSLT.R2LUXY[*]:EC	Available	5	3	-
Blob axes box upper left X	RSLT.R2LUX[*]	Available	5	3	X
Blob axes box upper left X: Measured value	RSLT.R2LUX[*]:MS	Available	5	3	X
Blob axes box upper left X: Absolute measured value	RSLT.R2LUX[*]:AB	Available	5	3	-
Blob axes box upper left X: Encoder measured value	RSLT.R2LUX[*]:EC	Available	5	3	X
Blob axes box upper left Y	RSLT.R2LUY[*]	Available	5	3	Y
Blob axes box upper left Y: Measured value	RSLT.R2LUY[*]:MS	Available	5	3	Y
Blob axes box upper left Y: Absolute measured value	RSLT.R2LUY[*]:AB	Available	5	3	-
Blob axes box upper left Y: Encoder measured value	RSLT.R2LUY[*]:EC	Available	5	3	Y
Blob axes box lower left XY	RSLT.R2LDXY[*]	Available	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Blob axes box lower left XY: Measured value	RSLT.R2LDXY[*]:MS	Available	5	3	-
Blob axes box lower left XY: Absolute measured value	RSLT.R2LDXY[*]:AB	Available	5	3	-
Blob axes box lower left XY: Encoder measured value	RSLT.R2LDXY[*]:EC	Available	5	3	-
Blob axes box lower left X	RSLT.R2LDX[*]	Available	5	3	X
Blob axes box lower left X: Measured value	RSLT.R2LDX[*]:MS	Available	5	3	X
Blob axes box lower left X: Absolute measured value	RSLT.R2LDX[*]:AB	Available	5	3	-
Blob axes box lower left X: Encoder measured value	RSLT.R2LDX[*]:EC	Available	5	3	-
Blob axes box lower left Y	RSLT.R2LDY[*]	Available	5	3	Y
Blob axes box lower left Y: Measured value	RSLT.R2LDY[*]:MS	Available	5	3	Y
Blob axes box lower left Y: Absolute measured value	RSLT.R2LDY[*]:AB	Available	5	3	-
Blob axes box lower left Y: Encoder measured value	RSLT.R2LDY[*]:EC	Available	5	3	Y
Blob axes box upper right XY	RSLT.R2RUXY[*]	Available	5	3	-
Blob axes box upper right XY: Measured value	RSLT.R2RUXY[*]:MS	Available	5	3	-
Blob axes box upper right XY: Absolute measured value	RSLT.R2RUXY[*]:AB	Available	5	3	-
Blob axes box upper right XY: Encoder measured value	RSLT.R2RUXY[*]:EC	Available	5	3	-
Blob axes box upper right X	RSLT.R2RUX[*]	Available	5	3	X
Blob axes box upper right X: Measured value	RSLT.R2RUX[*]:MS	Available	5	3	X
Blob axes box upper right X: Absolute measured value	RSLT.R2RUX[*]:AB	Available	5	3	-
Blob axes box upper right X: Encoder measured value	RSLT.R2RUX[*]:EC	Available	5	3	X
Blob axes box upper right Y	RSLT.R2RUY[*]	Available	5	3	Y
Blob axes box upper right Y: Measured value	RSLT.R2RUY[*]:MS	Available	5	3	Y
Blob axes box upper right Y: Absolute measured value	RSLT.R2RUY[*]:AB	Available	5	3	-
Blob axes box upper right Y: Encoder measured value	RSLT.R2RUY[*]:EC	Available	5	3	Y
Blob axes box lower right XY	RSLT.R2RDXY[*]	Available	5	3	-
Blob axes box lower right XY: Measured value	RSLT.R2RDXY[*]:MS	Available	5	3	-
Blob axes box lower right XY: Absolute measured value	RSLT.R2RDXY[*]:AB	Available	5	3	-
Blob axes box lower right XY: Encoder measured value	RSLT.R2RDXY[*]:EC	Available	5	3	-
Blob axes box lower right X	RSLT.R2RDX[*]	Available	5	3	X
Blob axes box lower right X: Measured value	RSLT.R2RDX[*]:MS	Available	5	3	X
Blob axes box lower right X: Absolute measured value	RSLT.R2RDX[*]:AB	Available	5	3	-
Blob axes box lower right X: Encoder measured value	RSLT.R2RDX[*]:EC	Available	5	3	X
Blob axes box lower right Y	RSLT.R2RDY[*]	Available	5	3	Y
Blob axes box lower right Y: Measured value	RSLT.R2RDY[*]:MS	Available	5	3	Y
Blob axes box lower right Y: Absolute measured value	RSLT.R2RDY[*]:AB	Available	5	3	-
Blob axes box lower right Y: Encoder measured value	RSLT.R2RDY[*]:EC	Available	5	3	Y
Major axis	RSLT.MAA[*]	Unsigned	5	3	L
Major axis: Measured value	RSLT.MAA[*]:MS	Unsigned	5	3	L

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Major axis: Absolute measured value	RSLT.MAA[*]:AB	Unsigned	5	3	-
Major axis box width: Judgment value	RSLT.MAA:JG	Unsigned	1	0	-
Major axis box width (Max)	RSLT.MAAH	Unsigned	5	3	L
Major axis box width (Max): Measured value	RSLT.MAAH:MS	Unsigned	5	3	L
Major axis box width (Max): Absolute measured value	RSLT.MAAH:AB	Unsigned	5	3	-
Major axis box width (Max): Judgment value	RSLT.MAAH:JG	Unsigned	1	0	-
Major axis box width (Min)	RSLT.MAAL	Unsigned	5	3	L
Major axis box width (Min): Measured value	RSLT.MAAL:MS	Unsigned	5	3	L
Major axis box width (Min): Absolute measured value	RSLT.MAAL:AB	Unsigned	5	3	-
Major axis box width (Min): Judgment value	RSLT.MAAL:JG	Unsigned	1	0	-
Minor axis box height	RSLT.MIA[*]	Unsigned	5	3	L
Minor axis box height: Measured value	RSLT.MIA[*]:MS	Unsigned	5	3	L
Minor axis box height: Absolute measured value	RSLT.MIA[*]:AB	Unsigned	5	3	-
Minor axis box height: Judgment value	RSLT.MIA:JG	Unsigned	1	0	-
Minor axis box height (Max)	RSLT.MIAH	Unsigned	5	3	L
Minor axis box height (Max): Measured value	RSLT.MIAH:MS	Unsigned	5	3	L
Minor axis box height (Max): Absolute measured value	RSLT.MIAH:AB	Unsigned	5	3	-
Minor axis box height (Max): Judgment value	RSLT.MIAH:JG	Unsigned	1	0	-
Minor axis box height (Min)	RSLT.MIAL	Unsigned	5	3	L
Minor axis box height (Min): Measured value	RSLT.MIAL:MS	Unsigned	5	3	L
Minor axis box height (Min): Absolute measured value	RSLT.MIAL:AB	Unsigned	5	3	-
Minor axis box height (Min): Judgment value	RSLT.MIAL:JG	Unsigned	1	0	-
Axes ratio	RSLT.RTO[*]	Unsigned	5	3	-
Axes ratio: Measured value	RSLT.RTO[*]:MS	Unsigned	5	3	-
Axes ratio: Judgment value	RSLT.RTO:JG	Unsigned	1	0	-
Axes ratio (Max)	RSLT.RTOH	Unsigned	5	3	-
Axes ratio (Max): Measured value	RSLT.RTOH:MS	Unsigned	5	3	-
Axes ratio (Max): Judgment value	RSLT.RTOH:JG	Unsigned	1	0	-
Axes ratio (Min)	RSLT.RTOL	Unsigned	5	3	-
Axes ratio (Min): Measured value	RSLT.RTOL:MS	Unsigned	5	3	-
Axes ratio (Min): Judgment value	RSLT.RTOL:JG	Unsigned	1	0	-
Minimum bounding rectangle long side	RSLT.MRLS[*]	Unsigned	5	3	L
Minimum bounding rectangle long side: Measured value	RSLT.MRLS[*]:MS	Unsigned	5	3	L
Minimum bounding rectangle long side: Absolute measured value	RSLT.MRLS[*]:AB	Unsigned	5	3	-
Minimum bounding rectangle long side (Max)	RSLT.MMRLSH[*]	Unsigned	5	3	L
Minimum bounding rectangle long side (Max): Measured value	RSLT.MMRLSH[*]:MS	Unsigned	5	3	L
Minimum bounding rectangle long side (Max): Absolute measured value	RSLT.MRRLSH[*]:AB	Unsigned	5	3	-
Minimum bounding rectangle long side (Min)	RSLT.MRLSL	Unsigned	5	3	L
Minimum bounding rectangle long side (Min): Measured value	RSLT.MRLSL:MS	Unsigned	5	3	L
Minimum bounding rectangle long side (Min): Absolute measured value	RSLT.MRLSL:AB	Unsigned	5	3	-
Minimum bounding rectangle short side	RSLT.MRSS[*]	Unsigned	5	3	L

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Minimum bounding rectangle short side: Measured value	RSLT.MRSS[*]:MS	Unsigned	5	3	L
Minimum bounding rectangle short side: Absolute measured value	RSLT.MRSS[*]:AB	Unsigned	5	3	-
Minimum bounding rectangle short side (Max)	RSLT.MRSSH	Unsigned	5	3	L
Minimum bounding rectangle short side (Max): Measured value	RSLT.MRSSH:MS	Unsigned	5	3	L
Minimum bounding rectangle short side (Max): Absolute measured value	RSLT.MRSSH:AB	Unsigned	5	3	-
Minimum bounding rectangle short side (Min)	RSLT.MRSSL	Unsigned	5	3	L
Minimum bounding rectangle short side (Min): Measured value	RSLT.MRSSL:MS	Unsigned	5	3	L
Minimum bounding rectangle short side (Min): Absolute measured value	RSLT.MRSSL:AB	Unsigned	5	3	-
Minimum bounding rectangle center coordinate X	RSLT.MRCX[*]	Available	5	3	X
Minimum bounding rectangle center coordinate X: Measured value	RSLT.MRCX[*]:MS	Available	5	3	X
Minimum bounding rectangle center coordinate X: Absolute measured value	RSLT.MRCX[*]:AB	Available	5	3	-
Minimum bounding rectangle center coordinate X: Encoder measured value	RSLT.MRCX[*]:EC	Available	5	3	X
Minimum bounding rectangle center coordinate X (Max)	RSLT.MRCXH	Available	5	3	X
Minimum bounding rectangle center coordinate X (Max): Measured value	RSLT.MRCXH:MS	Available	5	3	X
Minimum bounding rectangle center coordinate X (Max): Encoder measured value	RSLT.MRCXH:EC	Available	5	3	X
Minimum bounding rectangle center coordinate X (Min)	RSLT.MRCXL	Available	5	3	X
Minimum bounding rectangle center coordinate X (Min): Measured value	RSLT.MRCXL:MS	Available	5	3	X
Minimum bounding rectangle center coordinate X (Min): Encoder measured value	RSLT.MRCXL:EC	Available	5	3	X
Minimum bounding rectangle center coordinate Y	RSLT.MRCY[*]	Available	5	3	Y
Minimum bounding rectangle center coordinate Y: Measured value	RSLT.MRC[*]:MS	Available	5	3	Y
Minimum bounding rectangle center coordinate Y: Absolute measured value	RSLT.MRCY[*]:AB	Available	5	3	-
Minimum bounding rectangle center coordinate Y: Encoder measured value	RSLT.MRCY[*]:EC	Available	5	3	Y
Minimum bounding rectangle center coordinate Y (Max)	RSLT.MRCYH	Available	5	3	Y
Minimum bounding rectangle center coordinate Y (Max): Measured value	RSLT.MRCYH:MS	Available	5	3	Y
Minimum bounding rectangle center coordinate Y (Max): Encoder measured value	RSLT.MRCYH:EC	Available	5	3	Y
Minimum bounding rectangle center coordinate Y (Min)	RSLT.MRCYL	Available	5	3	Y
Minimum bounding rectangle center coordinate Y (Min): Measured value	RSLT.MRCYL:MS	Available	5	3	Y
Minimum bounding rectangle center coordinate Y (Min): Encoder measured value	RSLT.MRCYL:EC	Available	5	3	Y
Minimum bounding rectangle center coordinate XY	RSLT.MRCXY[*]	Available	5	3	-
Minimum bounding rectangle center coordinate XY: Measured value	RSLT.MRCXY[*]:MS	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Minimum bounding rectangle center coordinate XY: Absolute measured value	RSLT.MRCXY[*]:AB	Available	5	3	-
Minimum bounding rectangle center coordinate XY: Encoder measured value	RSLT.MRCXY[*]:EC	Available	5	3	-
Minimum bounding rectangle angle	RSLT.MRT[*]	Available	3	3	-
Minimum bounding rectangle angle: Measured value	RSLT.MRT[*]:MS	Available	3	3	-
Minimum bounding rectangle angle: Absolute measured value	RSLT.MRT[*]:AB	Available	3	3	-
Minimum bounding rectangle angle (Max)	RSLT.MRTH	Available	3	3	-
Minimum bounding rectangle angle (Max): Measured value	RSLT.MRTH:MS	Available	3	3	-
Minimum bounding rectangle angle (Min)	RSLT.MRTL	Available	3	3	-
Minimum bounding rectangle angle (Min): Measured value	RSLT.MRTL:MS	Available	3	3	-
Minimum bounding rectangle center coordinate XY angle	RSLT.MRXYT[*]	Available	5	3	-
Minimum bounding rectangle center coordinate XY angle: Measured value	RSLT.MCXYT[*]:MS	Available	5	3	-
Minimum bounding rectangle center coordinate XY angle: Absolute measured value	RSLT.MCXYT[*]:AB	Available	5	3	-
Minimum bounding rectangle center coordinate XY angle: Encoder measured value	RSLT.MCXYT[*]:EC	Available	5	3	-
Minimum bounding rectangle upper left XY	RSLT.MRLUXY[*]	Available	5	3	-
Minimum bounding rectangle upper left XY: Measured value	RSLT.MRLUXY[*]:MS	Available	5	3	-
Minimum bounding rectangle upper left XY: Absolute measured value	RSLT.MRLUXY[*]:AB	Available	5	3	-
Minimum bounding rectangle upper left XY: Encoder measured value	RSLT.MRLUXY[*]:EC	Available	5	3	-
Minimum bounding rectangle upper left X	RSLT.MRLUX[*]	Available	5	3	X
Minimum bounding rectangle upper left X: Measured value	RSLT.MRLUX[*]:MS	Available	5	3	X
Minimum bounding rectangle upper left X: Absolute measured value	RSLT.MRLUX[*]:AB	Available	5	3	-
Minimum bounding rectangle upper left X: Encoder measured value	RSLT.MRLUX[*]:EC	Available	5	3	X
Minimum bounding rectangle upper left Y	RSLT.MRLUY[*]	Available	5	3	Y
Minimum bounding rectangle upper left Y: Measured value	RSLT.MRLUY[*]:MS	Available	5	3	Y
Minimum bounding rectangle upper left Y: Absolute measured value	RSLT.MRLUY[*]:AB	Available	5	3	-
Minimum bounding rectangle upper left Y: Encoder measured value	RSLT.MRLUY[*]:EC	Available	5	3	Y
Minimum bounding rectangle lower left XY	RSLT.MRLDXY[*]	Available	5	3	-
Minimum bounding rectangle lower left XY: Measured value	RSLT.MRLDXY[*]:MS	Available	5	3	-
Minimum bounding rectangle lower left XY: Absolute measured value	RSLT.MRLDXY[*]:AB	Available	5	3	-
Minimum bounding rectangle lower left XY: Encoder measured value	RSLT.MRLDXY[*]:EC	Available	5	3	-
Minimum bounding rectangle lower left X	RSLT.MRLDX[*]	Available	5	3	X
Minimum bounding rectangle lower left X: Measured value	RSLT.MRLDX[*]:MS	Available	5	3	X
Minimum bounding rectangle lower left X: Absolute measured value	RSLT.MRLDX[*]:AB	Available	5	3	-
Minimum bounding rectangle lower left Y	RSLT.MRLDY[*]	Available	5	3	Y
Minimum bounding rectangle lower left Y: Measured value	RSLT.MRLDY[*]:MS	Available	5	3	Y

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Minimum bounding rectangle lower left Y: Absolute measured value	RSLT.MRLDY[*]:AB	Available	5	3	-
Minimum bounding rectangle lower left Y: Encoder measured value	RSLT.MRLDY[*]:EC	Available	5	3	Y
Minimum bounding rectangle upper right XY	RSLT.MRRUXY[*]	Available	5	3	-
Minimum bounding rectangle upper right XY: Measured value	RSLT.MRRUXY[*]:MS	Available	5	3	-
Minimum bounding rectangle upper right XY: Absolute measured value	RSLT.MRRUXY[*]:AB	Available	5	3	-
Minimum bounding rectangle upper right XY: Encoder measured value	RSLT.MRRUXY[*]:EC	Available	5	3	-
Minimum bounding rectangle upper right X	RSLT.MRRUX[*]	Available	5	3	X
Minimum bounding rectangle upper right X: Measured value	RSLT.MRRUX[*]:MS	Available	5	3	X
Minimum bounding rectangle upper right X: Absolute measured value	RSLT.MRRUX[*]:AB	Available	5	3	-
Minimum bounding rectangle upper right X: Encoder measured value	RSLT.MRRUX[*]:EC	Available	5	3	X
Minimum bounding rectangle upper right Y	RSLT.MRRUY[*]	Available	5	3	Y
Minimum bounding rectangle upper right Y: Measured value	RSLT.MRRUY[*]:MS	Available	5	3	Y
Minimum bounding rectangle upper right Y: Absolute measured value	RSLT.MRRUY[*]:AB	Available	5	3	-
Minimum bounding rectangle upper right Y: Encoder measured value	RSLT.MRRUY[*]:EC	Available	5	3	Y
Minimum bounding rectangle lower right XY	RSLT.MRRDXY[*]	Available	5	3	-
Minimum bounding rectangle lower right XY: Measured value	RSLT.MRRDXY[*]:MS	Available	5	3	-
Minimum bounding rectangle lower right XY: Absolute measured value	RSLT.MRRDXY[*]:AB	Available	5	3	-
Minimum bounding rectangle lower right XY: Encoder measured value	RSLT.MRRDXY[*]:EC	Available	5	3	-
Minimum bounding rectangle lower right X	RSLT.MRRDX[*]	Available	5	3	X
Minimum bounding rectangle lower right X: Measured value	RSLT.MRRDX[*]:MS	Available	5	3	X
Minimum bounding rectangle lower right X: Absolute measured value	RSLT.MRRDX[*]:AB	Available	5	3	-
Minimum bounding rectangle lower right X: Encoder measured value	RSLT.MRRDX[*]:EC	Available	5	3	X
Minimum bounding rectangle lower right Y	RSLT.MRRDY[*]	Available	5	3	Y
Minimum bounding rectangle lower right Y: Measured value	RSLT.MRRDY[*]:MS	Available	5	3	Y
Minimum bounding rectangle lower right Y: Absolute measured value	RSLT.MRRDY[*]:AB	Available	5	3	-
Minimum bounding rectangle lower right Y: Encoder measured value	RSLT.MRRDY[*]:EC	Available	5	3	Y
Distributed oval major axis	RSLT.MAA2[*]	Unsigned	5	3	L
Distributed oval major axis: Measured value	RSLT.MAA2[*]:MS	Unsigned	5	3	L
Distributed oval major axis: Absolute measured value	RSLT.MAA2[*]:AB	Unsigned	5	3	-
Distributed oval major axis: Judgment value	RSLT.MAA2:JG	Unsigned	1	0	-
Distributed oval major axis (Max)	RSLT.MAA2H	Unsigned	5	3	L
Distributed oval major axis (Max): Measured value	RSLT.MAA2H:MS	Unsigned	5	3	L
Distributed oval major axis (Max): Absolute measured value	RSLT.MAA2H:AB	Unsigned	5	3	L
Distributed oval major axis (Max): Judgment value	RSLT.MAA2H:JG	Unsigned	1	0	-
Distributed oval major axis (Min)	RSLT.MAA2L	Unsigned	5	3	L
Distributed oval major axis (Min): Measured value	RSLT.MAA2L:MS	Unsigned	5	3	L

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Distributed oval major axis (Min): Absolute measured value	RSLT.MAA2L:AB	Unsigned	5	3	-
Distributed oval major axis (Min): Judgment value	RSLT.MAA2L:JG	Unsigned	1	0	-
Distributed oval minor axis	RSLT.MIA2[*]	Unsigned	5	3	L
Distributed oval minor axis: Measured value	RSLT.MIA2[*]:MS	Unsigned	5	3	L
Distributed oval minor axis: Absolute measured value	RSLT.MIA2[*]:AB	Unsigned	5	3	-
Distributed oval minor axis: Judgment value	RSLT.MIA2:JG	Unsigned	1	0	-
Distributed oval minor axis (Max)	RSLT.MIA2H	Unsigned	5	3	L
Distributed oval minor axis (Max): Measured value	RSLT.MIA2H:MS	Unsigned	5	3	L
Distributed oval minor axis (Max): Absolute measured value	RSLT.MIA2H:AB	Unsigned	5	3	-
Distributed oval minor axis (Max): Judgment value	RSLT.MIA2H:JG	Unsigned	1	0	-
Distributed oval minor axis (Min)	RSLT.MIA2L	Unsigned	5	3	L
Distributed oval minor axis (Min): Measured value	RSLT.MIA2L:MS	Unsigned	5	3	L
Distributed oval minor axis (Min): Absolute measured value	RSLT.MIA2L:AB	Unsigned	5	3	-
Distributed oval minor axis (Min): Judgment value	RSLT.MIA2L:JG	Unsigned	1	0	-
Aspect ratio	RSLT.RTO2[*]	Unsigned	5	3	-
Aspect ratio: Measured value	RSLT.RTO2[*]:MS	Unsigned	5	3	-
Aspect ratio: Judgment value	RSLT.RTO2:JG	Unsigned	1	0	-
Aspect ratio (Max)	RSLT.RTO2H	Unsigned	5	3	-
Aspect ratio (Max): Measured value	RSLT.RTO2H:MS	Unsigned	5	3	-
Aspect ratio (Max): Judgment value	RSLT.RTO2H:JG	Unsigned	1	0	-
Aspect ratio (Min)	RSLT.RTO2L	Unsigned	5	3	-
Aspect ratio (Min): Measured value	RSLT.RTO2L:MS	Unsigned	5	3	-
Aspect ratio (Min): Judgment value	RSLT.RTO2L:JG	Unsigned	1	0	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-
Target classification type	RSLT.CLSTYP[*]	Available	2	0	-
Target classification type: Measured value	RSLT.CLSTYP[*]:MS	Available	2	0	-
Number	RSLT.CLS[0].N	Unsigned	4	0	-
Number: Measured value	RSLT.CLS[0].N:MS	Unsigned	2	0	-
Center of gravity X	RSLT.CLS[0].X[*]	Available	5	3	-
Center of gravity X: Measured value	RSLT.CLS[0].X[*]:MS	Available	5	3	X
Center of gravity X: Absolute measured value	RSLT.CLS[0].X[*]:AB	Available	5	3	-
Center of gravity X: Encoder measured value	RSLT.CLS[0].X[*]:EC	Available	5	3	X
Center of gravity Y	RSLT.CLS[0].Y[*]	Available	5	3	-
Center of gravity Y: Measured value	RSLT.CLS[0].Y[*]:MS	Available	5	3	Y
Center of gravity Y: Absolute measured value	RSLT.CLS[0].Y[*]:AB	Available	5	3	-
Center of gravity Y: Encoder measured value	RSLT.CLS[0].Y[*]:EC	Available	5	3	Y
Major axis angle	RSLT.CLS[0].T[*]	Available	3	3	-
Major axis angle: Measured value	RSLT.CLS[0].T[*]:MS	Available	3	3	-
Major axis angle: Absolute measured value	RSLT.CLS[0].T[*]:AB	Available	3	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Area	RSLT.CLS[0].AR[*]	Unsigned	8	0	-
Area: Measured value	RSLT.CLS[0].AR[*]:MS	Unsigned	8	0	-
Feret diameter X	RSLT.CLS[0].FX[*]	Available	5	3	-
Feret diameter X: Measured value	RSLT.CLS[0].FX[*]:MS	Available	5	3	L
Feret diameter X: Absolute measured value	RSLT.CLS[0].FX[*]:AB	Available	5	3	-
Feret diameter Y	RSLT.CLS[0].FY[*]	Available	5	3	-
Feret diameter Y: Measured value	RSLT.CLS[0].FY[*]:MS	Available	5	3	L
Feret diameter Y: Absolute measured value	RSLT.CLS[0].FY[*]:AB	Available	5	3	-
Perimeter	RSLT.CLS[0].CL[*]	Unsigned	8	0	-
Perimeter: Measured value	RSLT.CLS[0].CL[*]:MS	Unsigned	8	0	L
Perimeter: Absolute measured value	RSLT.CLS[0].CL[*]:AB	Unsigned	8	0	-
Roundness	RSLT.CLS[0].CD[*]	Unsigned	1	3	-
Roundness: Measured value	RSLT.CLS[0].CD[*]:MS	Unsigned	1	3	-
Roundness: Absolute measured value	RSLT.CLS[0].CD[*]:AB	Unsigned	8	0	-
Major axis	RSLT.CLS[0].MAA[*]	Unsigned	5	3	-
Major axis: Measured value	RSLT.CLS[0].MAA[*]:MS	Unsigned	5	3	L
Major axis: Absolute measured value	RSLT.CLS[0].MAA[*]:AB	Unsigned	5	3	-
Minor axis	RSLT.CLS[0].MIA[*]	Unsigned	5	3	-
Minor axis: Measured value	RSLT.CLS[0].MIA[*]:MS	Unsigned	5	3	L
Minor axis: Absolute measured value	RSLT.CLS[0].MIA[*]:AB	Unsigned	5	3	-
Axes ratio	RSLT.CLS[0].RTO[*]	Unsigned	5	3	-
Axes ratio: Measured value	RSLT.CLS[0].RTO[*]:MS	Unsigned	5	3	-
Distributed oval major axis	RSLT.CLS[0].MMA2[*]	Unsigned	5	3	-
Distributed oval major axis: Measured value	RSLT.CLS[0].MMA2[*]:MS	Unsigned	5	3	L
Distributed oval major axis: Absolute measured value	RSLT.CLS[0].MMA2[*]:AB	Unsigned	5	3	-
Distributed oval minor axis	RSLT.CLS[0].MMA2[*]	Unsigned	5	3	-
Distributed oval minor axis: Measured value	RSLT.CLS[0].MIA2[*]:MS	Unsigned	5	3	L
Distributed oval minor axis: Absolute measured value	RSLT.CLS[0].MIA2[*]:AB	Unsigned	5	3	-
Aspect ratio	RSLT.CLS[0].RTO2[*]	Unsigned	5	3	-
Aspect ratio: Measured value	RSLT.CLS[0].RTO2[*]:MS	Unsigned	5	3	-
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:					
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RSLT.CLS[1].***					
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RSLT.CLS[19].***					
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Grayscale Blob Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Target gray level	RSLT.DIL	Unsigned	3	0	-
Target gray level: Measured value	RSLT.DIL:MS	Unsigned	3	0	-
Base intensity	RSLT.BLV	Unsigned	3	0	-
Base intensity: Measured value	RSLT.BLV:MS	Unsigned	3	0	-
Total area	RSLT.TAR	Unsigned	8	0	-
Total area: Measured value	RSLT.TAR:MS	Unsigned	8	0	-
Total area: Judgment value	RSLT.TAR:JG	Unsigned	1	0	-
Number of targets	RSLT.N	Unsigned	4	0	-
Number of targets: Measured value	RSLT.N:MS	Unsigned	4	0	-
Number of targets: Judgment value	RSLT.N:JG	Unsigned	1	0	-
Center of gravity XY: Major axis angle	RSLT.XYT[*]	Available	5	3	-
Center of gravity XY: Major axis angle: Measured value	RSLT.XYT[*]:MS	Available	5	3	-
Center of gravity XY: Major axis angle: Absolute measured value	RSLT.XYT[*]:AB	Available	5	3	-
Center of gravity XY: Major axis angle: Encoder measured value	RSLT.XYT[*]:EC	Available	5	3	-
Center of gravity XY	RSLT.XY[*]	Available	5	3	-
Center of gravity XY: Measured value	RSLT.XY[*]:MS	Available	5	3	-
Center of gravity XY: Absolute measured value	RSLT.XY[*]:AB	Available	5	3	-
Center of gravity XY: Encoder measured value	RSLT.XY[*]:EC	Available	5	3	-
Center of gravity X	RSLT.X[*]	Available	5	3	X
Center of gravity X: Measured value	RSLT.X[*]:MS	Available	5	3	X
Center of gravity X: Absolute measured value	RSLT.X[*]:AB	Available	5	3	-
Center of gravity X: Encoder measured value	RSLT.X[*]:EC	Available	5	3	X
Center of gravity X (Max)	RSLT.XH[*]	Available	5	3	X
Center of gravity X (Max): Measured value	RSLT.XH[*]:MS	Available	5	3	X
Center of gravity X (Max): Absolute measured value	RSLT.XH[*]:AB	Available	5	3	-
Center of gravity X (Max): Encoder measured value	RSLT.XH[*]:EC	Available	5	3	X
Center of gravity X (Min)	RSLT.XL[*]	Available	5	3	X
Center of gravity X (Min): Measured value	RSLT.XL[*]:MS	Available	5	3	X
Center of gravity X (Min): Absolute measured value	RSLT.XL[*]:AB	Available	5	3	-
Center of gravity X (Min): Encoder measured value	RSLT.XL[*]:EC	Available	5	3	X
Center of gravity Y	RSLT.Y[*]	Available	5	3	Y
Center of gravity Y: Measured value	RSLT.Y[*]:MS	Available	5	3	Y
Center of gravity Y: Absolute measured value	RSLT.Y[*]:AB	Available	5	3	-
Center of gravity Y: Encoder measured value	RSLT.Y[*]:EC	Available	5	3	Y
Center of gravity Y (Max)	RSLT.YH[*]	Available	5	3	Y
Center of gravity Y (Max): Measured value	RSLT.YH[*]:MS	Available	5	3	Y
Center of gravity Y (Max): Absolute measured value	RSLT.YH[*]:AB	Available	5	3	-
Center of gravity Y (Max): Encoder measured value	RSLT.YH[*]:EC	Available	5	3	Y

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Center of gravity Y (Min)	RSLT.YL[*]	Available	5	3	Y
Center of gravity Y (Min): Measured value	RSLT.YL[*]:MS	Available	5	3	Y
Center of gravity Y (Min): Absolute measured value	RSLT.YL[*]:AB	Available	5	3	-
Center of gravity Y (Min): Encoder measured value	RSLT.YL[*]:EC	Available	5	3	Y
Major axis angle	RSLT.T[*]	Available	3	3	-
Major axis angle: Measured value	RSLT.T[*]:MS	Available	3	3	-
Major axis angle: Absolute measured value	RSLT.T[*]:AB	Available	3	3	-
Major axis angle: Judgment value	RSLT.T[*]:JG	Unsigned	1	0	-
Major axis angle (Max)	RSLT.TH[*]	Available	3	3	-
Major axis angle (Max): Measured value	RSLT.TH[*]:MS	Available	3	3	-
Major axis angle (Max): Judgment value	RSLT.TH[*]:JG	Unsigned	1	0	-
Major axis angle (Min)	RSLT.TL[*]	Available	3	3	-
Major axis angle (Min): Measured value	RSLT.TL[*]:MS	Available	3	3	-
Major axis angle (Min): Judgment value	RSLT.TL[*]:JG	Unsigned	1	0	-
Area	RSLT.AR[*]	Unsigned	8	0	-
Area: Measured value	RSLT.AR[*]:MS	Unsigned	8	0	-
Area: Judgment value	RSLT.AR[*]:JG	Unsigned	1	0	-
Area (Max)	RSLT.ARH[*]	Unsigned	8	0	-
Area (Max): Measured value	RSLT.ARH[*]:MS	Unsigned	8	0	-
Area (Max): Judgment value	RSLT.ARH[*]:JG	Unsigned	1	0	-
Area (Min)	RSLT.ARL[*]	Unsigned	8	0	-
Area (Min): Measured value	RSLT.ARL[*]:MS	Unsigned	8	0	-
Area (Min): Judgment value	RSLT.ARL[*]:JG	Unsigned	1	0	-
Volume	RSLT.VOL[*]	Unsigned	11	0	-
Volume: Measured value	RSLT.VOL[*]:MS	Unsigned	11	0	-
Volume: Judgment value	RSLT.VOL[*]:JG	Unsigned	1	0	-
Volume (Max)	RSLT.VOLH[*]	Unsigned	11	0	-
Volume (Max): Measured value	RSLT.VOLH[*]:MS	Unsigned	11	0	-
Volume (Max): Judgment value	RSLT.VOLH[*]:JG	Unsigned	1	0	-
Volume (Min)	RSLT.VOLL[*]	Unsigned	11	0	-
Volume (Min): Measured value	RSLT.VOLL[*]:MS	Unsigned	11	0	-
Volume (Min): Judgment value	RSLT.VOLL[*]:JG	Unsigned	1	0	-
Bright & Dark	RSLT.BOW[*]	Available	1	0	-
Bright & Dark: Measured value	RSLT.BOW[*]:MS	Available	1	0	-
Average intensity level	RSLT.AVI[*]	Unsigned	3	0	-
Average intensity level: Measured value	RSLT.AVI[*]:MS	Unsigned	3	0	-
Average intensity level: Judgment value	RSLT.AVI[*]:JG	Unsigned	1	0	-
Average intensity level (Max)	RSLT.AVIH[*]	Unsigned	3	0	-
Average intensity level (Max): Measured value	RSLT.AVIH[*]:MS	Unsigned	3	0	-
Average intensity level (Max): Judgment value	RSLT.AVIH[*]:JG	Unsigned	1	0	-
Average intensity level (Min)	RSLT.AVIL[*]	Unsigned	3	0	-
Average intensity level (Min): Measured value	RSLT.AVIL[*]:MS	Unsigned	3	0	-
Average intensity level (Min): Judgment value	RSLT.AVIL[*]:JG	Unsigned	1	0	-
Maximum intensity level	RSLT.MXI[*]	Unsigned	3	0	-
Maximum intensity level: Measured value	RSLT.MXI[*]:MS	Unsigned	3	0	-
Maximum intensity level: Judgment value	RSLT.MXI[*]:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Maximum intensity level (Max)	RSLT.MXIH[*]	Unsigned	3	0	-
Maximum intensity level (Max): Measured value	RSLT.MXIH[*]:MS	Unsigned	3	0	-
Maximum intensity level (Max): Judgment value	RSLT.MXIH[*]:JG	Unsigned	1	0	-
Maximum intensity level (Min)	RSLT.MXIL[*]	Unsigned	3	0	-
Maximum intensity level (Min): Measured value	RSLT.MXIL[*]:MS	Unsigned	3	0	-
Maximum intensity level (Min): Judgment value	RSLT.MXIL[*]:JG	Unsigned	1	0	-
Feret diameter X	RSLT.FX[*]	Available	5	3	L
Feret diameter X: Measured value	RSLT.FX[*]:MS	Available	5	3	L
Feret diameter X: Absolute measured value	RSLT.FX[*]:AB	Available	5	3	-
Feret diameter X: Judgment value	RSLT.FX[*]:JG	Unsigned	1	0	-
Feret diameter X (Max)	RSLT.FXH[*]	Available	5	3	L
Feret diameter X (Max): Measured value	RSLT.FXH[*]:MS	Available	5	3	L
Feret diameter X (Max): Absolute measured value	RSLT.FXH[*]:AB	Available	5	3	-
Feret diameter X (Max): Judgment value	RSLT.FXH[*]:JG	Unsigned	1	0	-
Feret diameter X (Min)	RSLT.FXL[*]	Available	5	3	L
Feret diameter X (Max): Measured value	RSLT.FXL[*]:MS	Available	5	3	L
Feret diameter X (Max): Absolute measured value	RSLT.FXL[*]:AB	Available	5	3	-
Feret diameter X (Max): Judgment value	RSLT.FXL[*]:JG	Unsigned	1	0	-
Feret diameter Y	RSLT.FY[*]	Available	5	3	L
Feret diameter Y: Measured value	RSLT.FY[*]:MS	Available	5	3	L
Feret diameter Y: Absolute measured value	RSLT.FY[*]:AB	Available	5	3	-
Feret diameter Y: Judgment value	RSLT.FY[*]:JG	Unsigned	1	0	-
Feret diameter Y (Max)	RSLT.FYH[*]	Available	5	3	L
Feret diameter Y (Max): Measured value	RSLT.FYH[*]:MS	Available	5	3	L
Feret diameter Y (Max): Absolute measured value	RSLT.FYH[*]:AB	Available	5	3	-
Feret diameter Y (Max): Judgment value	RSLT.FYH[*]:JG	Unsigned	1	0	-
Feret diameter Y (Min)	RSLT.FYL[*]	Available	5	3	L
Feret diameter Y (Min): Measured value	RSLT.FYL[*]:MS	Available	5	3	L
Feret diameter Y (Min): Absolute measured value	RSLT.FYL[*]:AB	Available	5	3	-
Feret diameter Y (Min): Judgment value	RSLT.FYL[*]:JG	Unsigned	1	0	-
Perimeter	RSLT.CL[*]	Unsigned	8	0	L
Perimeter: Measured value	RSLT.CL[*]:MS	Unsigned	8	0	L
Perimeter: Absolute measured value	RSLT.CL[*]:AB	Unsigned	8	0	-
Perimeter: Judgment value	RSLT.CL[*]:JG	Unsigned	1	0	-
Perimeter (Max)	RSLT.CLH[*]	Unsigned	8	0	L
Perimeter (Max): Measured value	RSLT.CLH[*]:MS	Unsigned	8	0	L
Perimeter (Max): Absolute measured value	RSLT.CLH[*]:AB	Unsigned	8	0	-
Perimeter (Max): Judgment value	RSLT.CLH[*]:JG	Unsigned	1	0	-
Perimeter (Min)	RSLT.CLL[*]	Unsigned	8	0	L
Perimeter (Min): Measured value	RSLT.CLL[*]:MS	Unsigned	8	0	L
Perimeter (Min): Absolute measured value	RSLT.CLL[*]:AB	Unsigned	8	0	-
Perimeter (Min): Judgment value	RSLT.CLL[*]:JG	Unsigned	1	0	-
Roundness	RSLT.CD[*]	Unsigned	1	3	-
Roundness: Measured value	RSLT.CD[*]:MS	Unsigned	1	3	-
Roundness: Judgment value	RSLT.CD[*]:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Roundness (Max)	RSLT.CDH[*]	Unsigned	1	3	-
Roundness (Max): Measured value	RSLT.CDH[*]:MS	Unsigned	1	3	-
Roundness (Max): Judgment value	RSLT.CDH[*]:JG	Unsigned	1	0	-
Roundness (Min)	RSLT.CDL[*]	Unsigned	1	3	-
Roundness (Min): Measured value	RSLT.CDL[*]:MS	Unsigned	1	3	-
Roundness (Min): Judgment value	RSLT.CDL[*]:JG	Unsigned	1	0	-
Feret diameter box upper left X	RSLT.RLUX[*]	Available	5	3	X
Feret diameter box upper left X: Measured value	RSLT.RLUX[*]:MS	Available	5	3	X
Feret diameter box upper left X: Absolute measured value	RSLT.RLUX[*]:AB	Available	5	3	-
Feret diameter box upper left X: Encoder measured value	RSLT.RLUX[*]:EC	Available	5	3	X
Feret diameter box upper left Y	RSLT.RLUY[*]	Available	5	3	Y
Feret diameter box upper left Y: Measured value	RSLT.RLUY[*]:MS	Available	5	3	Y
Feret diameter box upper left Y: Absolute measured value	RSLT.RLUY[*]:AB	Available	5	3	-
Feret diameter box upper left Y: Encoder measured value	RSLT.RLUY[*]:EC	Available	5	3	Y
Feret diameter box upper left XY	RSLT.RLUXY[*]	Available	5	3	-
Feret diameter box upper left XY: Measured value	RSLT.RLUXY[*]:MS	Available	5	3	-
Feret diameter box upper left XY: Absolute measured value	RSLT.RLUXY[*]:AB	Available	5	3	-
Feret diameter box upper left XY: Encoder measured value	RSLT.RLUXY[*]:EC	Available	5	3	-
Feret diameter box lower left X	RSLT.RLDX[*]	Available	5	3	X
Feret diameter box lower left X: Measured value	RSLT.RLDX[*]:MS	Available	5	3	X
Feret diameter box lower left X: Absolute measured value	RSLT.RLDX[*]:AB	Available	5	3	-
Feret diameter box lower left X: Encoder measured value	RSLT.RLDX[*]:EC	Available	5	3	X
Feret diameter box lower left Y	RSLT.RLDY[*]	Available	5	3	Y
Feret diameter box lower left Y: Measured value	RSLT.RLDY[*]:MS	Available	5	3	Y
Feret diameter box lower left Y: Absolute measured value	RSLT.RLDY[*]:AB	Available	5	3	-
Feret diameter box lower left Y: Encoder measured value	RSLT.RLDY[*]:EC	Available	5	3	Y
Feret diameter box lower left XY	RSLT.RLDXY[*]	Available	5	3	-
Feret diameter box lower left XY: Measured value	RSLT.RLDXY[*]:MS	Available	5	3	-
Feret diameter box lower left XY: Absolute measured value	RSLT.RLDXY[*]:AB	Available	5	3	-
Feret diameter box lower left XY: Encoder measured value	RSLT.RLDXY[*]:EC	Available	5	3	-
Feret diameter box upper right X	RSLT.RRUX[*]	Available	5	3	X
Feret diameter box upper right X: Measured value	RSLT.RRUX[*]:MS	Available	5	3	X
Feret diameter box upper right X: Absolute measured value	RSLT.RRUX[*]:AB	Available	5	3	-
Feret diameter box upper right X: Encoder measured value	RSLT.RRUX[*]:EC	Available	5	3	X
Feret diameter box upper right Y	RSLT.RRUUY[*]	Available	5	3	Y
Feret diameter box upper right Y: Measured value	RSLT.RRUUY[*]:MS	Available	5	3	Y
Feret diameter box upper right Y: Absolute measured value	RSLT.RRUUY[*]:AB	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Feret diameter box upper right Y: Encoder measured value	RSLT.RRUY[*]:EC	Available	5	3	Y
Feret diameter box upper right XY	RSLT.RRUXY[*]	Available	5	3	-
Feret diameter box upper right XY: Measured value	RSLT.RRUXY[*]:MS	Available	5	3	-
Feret diameter box upper right XY: Absolute measured value	RSLT.RRUXY[*]:AB	Available	5	3	-
Feret diameter box upper right XY: Encoder measured value	RSLT.RRUXY[*]:EC	Available	5	3	-
Feret diameter box lower right X	RSLT.RRDX[*]	Available	5	3	X
Feret diameter box lower right X: Measured value	RSLT.RRDX[*]:MS	Available	5	3	X
Feret diameter box lower right X: Absolute measured value	RSLT.RRDX[*]:AB	Available	5	3	-
Feret diameter box lower right X: Encoder measured value	RSLT.RRDX[*]:EC	Available	5	3	X
Feret diameter box lower right Y	RSLT.RRDY[*]	Available	5	3	Y
Feret diameter box lower right Y: Measured value	RSLT.RRDY[*]:MS	Available	5	3	Y
Feret diameter box lower right Y: Absolute measured value	RSLT.RRDY[*]:AB	Available	5	3	-
Feret diameter box lower right Y: Encoder measured value	RSLT.RRDY[*]:EC	Available	5	3	Y
Feret diameter box lower right XY	RSLT.RRDXY[*]	Available	5	3	-
Feret diameter box lower right XY: Measured value	RSLT.RRDXY[*]:MS	Available	5	3	-
Feret diameter box lower right XY: Absolute measured value	RSLT.RRDXY[*]:AB	Available	5	3	-
Feret diameter box lower right XY: Encoder measured value	RSLT.RRDXY[*]:EC	Available	5	3	-
Target axes box upper left XY	RSLT.R2LUXY[*]	Available	5	3	-
Target axes box upper left XY: Measured value	RSLT.R2LUXY[*]:MS	Available	5	3	-
Target axes box upper left XY: Absolute measured value	RSLT.R2LUXY[*]:AB	Available	5	3	-
Target axes box upper left XY: Encoder measured value	RSLT.R2LUXY[*]:EC	Available	5	3	-
Target axes box upper left X	RSLT.R2LUX[*]	Available	5	3	X
Target axes box upper left X: Measured value	RSLT.R2LUX[*]:MS	Available	5	3	X
Target axes box upper left X: Absolute measured value	RSLT.R2LUX[*]:AB	Available	5	3	-
Target axes box upper left X: Encoder measured value	RSLT.R2LUX[*]:EC	Available	5	3	X
Target axes box upper left Y	RSLT.R2LUY[*]	Available	5	3	Y
Target axes box upper left Y: Measured value	RSLT.R2LUY[*]:MS	Available	5	3	Y
Target axes box upper left Y: Absolute measured value	RSLT.R2LUY[*]:AB	Available	5	3	-
Target axes box upper left Y: Encoder measured value	RSLT.R2LUY[*]:EC	Available	5	3	Y
Target axes box lower left XY	RSLT.R2LDXY[*]	Available	5	3	-
Target axes box lower left XY: Measured value	RSLT.R2LDXY[*]:MS	Available	5	3	-
Target axes box lower left XY: Absolute measured value	RSLT.R2LDXY[*]:AB	Available	5	3	-
Target axes box lower left XY: Encoder measured value	RSLT.R2LDXY[*]:EC	Available	5	3	-
Target axes box lower left X	RSLT.R2LDX[*]	Available	5	3	X
Target axes box lower left X: Measured value	RSLT.R2LDX[*]:MS	Available	5	3	X

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Target axes box lower left X: Absolute measured value	RSLT.R2LDX[*]:AB	Available	5	3	-
Target axes box lower left Y	RSLT.R2LDY[*]	Available	5	3	Y
Target axes box lower left Y: Measured value	RSLT.R2LDY[*]:MS	Available	5	3	Y
Target axes box lower left Y: Absolute measured value	RSLT.R2LDY[*]:AB	Available	5	3	-
Target axes box lower left Y: Encoder measured value	RSLT.R2LDY[*]:EC	Available	5	3	Y
Target axes box upper right XY	RSLT.R2RUXY[*]	Available	5	3	-
Target axes box upper right XY: Measured value	RSLT.R2RUXY[*]:MS	Available	5	3	-
Target axes box upper right XY: Absolute measured value	RSLT.R2RUXY[*]:AB	Available	5	3	-
Target axes box upper right XY: Encoder measured value	RSLT.R2RUXY[*]:EC	Available	5	3	-
Target axes box upper right X	RSLT.R2RUX[*]	Available	5	3	X
Target axes box upper right X: Measured value	RSLT.R2RUX[*]:MS	Available	5	3	X
Target axes box upper right X: Absolute measured value	RSLT.R2RUX[*]:AB	Available	5	3	-
Target axes box upper right X: Encoder measured value	RSLT.R2RUX[*]:EC	Available	5	3	X
Target axes box upper right Y	RSLT.R2RUY[*]	Available	5	3	Y
Target axes box upper right Y: Measured value	RSLT.R2RUY[*]:MS	Available	5	3	Y
Target axes box upper right Y: Absolute measured value	RSLT.R2RUY[*]:AB	Available	5	3	-
Target axes box upper right Y: Encoder measured value	RSLT.R2RUY[*]:EC	Available	5	3	Y
Target axes box lower right XY	RSLT.R2RDXY[*]	Available	5	3	-
Target axes box lower right XY: Measured value	RSLT.R2RDXY[*]:MS	Available	5	3	-
Target axes box lower right XY: Absolute measured value	RSLT.R2RDXY[*]:AB	Available	5	3	-
Target axes box lower right XY: Encoder measured value	RSLT.R2RDXY[*]:EC	Available	5	3	-
Target axes box lower right X	RSLT.R2RDX[*]	Available	5	3	X
Target axes box lower right X: Measured value	RSLT.R2RDX[*]:MS	Available	5	3	X
Target axes box lower right X: Absolute measured value	RSLT.R2RDX[*]:AB	Available	5	3	-
Target axes box lower right X: Encoder measured value	RSLT.R2RDX[*]:EC	Available	5	3	X
Target axes box lower right Y	RSLT.R2RDY[*]	Available	5	3	Y
Target axes box lower right Y: Measured value	RSLT.R2RDY[*]:MS	Available	5	3	Y
Target axes box lower right Y: Absolute measured value	RSLT.R2RDY[*]:AB	Available	5	3	-
Target axes box lower right Y: Encoder measured value	RSLT.R2RDY[*]:EC	Available	5	3	Y
Major axis	RSLT.MAA[*]	Unsigned	5	3	L
Major axis: Measured value	RSLT.MAA[*]:MS	Unsigned	5	3	L
Major axis: Absolute measured value	RSLT.MAA[*]:AB	Unsigned	5	3	-
Major axis: Judgment value	RSLT.MAA:JG	Unsigned	1	0	-
Major axis (Max)	RSLT.MAAH	Unsigned	5	3	L
Major axis (Max): Measured value	RSLT.MAAH:MS	Unsigned	5	3	L
Major axis (Max): Absolute measured value	RSLT.MAAH:AB	Unsigned	5	3	-
Major axis (Max): Judgment value	RSLT.MAAH:JG	Unsigned	1	0	-
Major axis (Min)	RSLT.MAAL	Unsigned	5	3	L

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Major axis (Min): Measured value	RSLT.MAAL:MS	Unsigned	5	3	L
Major axis (Min): Absolute measured value	RSLT.MAAL:AB	Unsigned	5	3	-
Major axis (Min): Judgment value	RSLT.MAAL:JG	Unsigned	1	0	-
Minor axis	RSLT.MIA[*]	Unsigned	5	3	L
Minor axis: Measured value	RSLT.MIA[*]:MS	Unsigned	5	3	L
Minor axis: Absolute measured value	RSLT.MIA[*]:AB	Unsigned	5	3	-
Minor axis: Judgment value	RSLT.MIA:JG	Unsigned	1	0	-
Minor axis (Max)	RSLT.MIAH	Unsigned	5	3	L
Minor axis (Max): Measured value	RSLT.MIAH:MS	Unsigned	5	3	L
Minor axis (Max): Absolute measured value	RSLT.MIAH:AB	Unsigned	5	3	-
Minor axis (Max): Judgment value	RSLT.MIAH:JG	Unsigned	1	0	-
Minor axis (Min)	RSLT.MIAL	Unsigned	5	3	L
Minor axis (Min): Measured value	RSLT.MIAL:MS	Unsigned	5	3	L
Minor axis (Min): Absolute measured value	RSLT.MIAL:AB	Unsigned	5	3	-
Minor axis (Min): Judgment value	RSLT.MIAL:JG	Unsigned	1	0	-
Axes ratio	RSLT.RTO[*]	Unsigned	5	3	-
Axes ratio: Measured value	RSLT.RTO[*]:MS	Unsigned	5	3	-
Axes ratio: Judgment value	RSLT.RTO:JG	Unsigned	1	0	-
Axes ratio (Max)	RSLT.RTOH	Unsigned	5	3	-
Axes ratio (Max): Measured value	RSLT.RTOH:MS	Unsigned	5	3	-
Axes ratio (Max): Judgment value	RSLT.RTOH:JG	Unsigned	1	0	-
Axes ratio (Min)	RSLT.RTOL	Unsigned	5	3	-
Axes ratio (Min): Measured value	RSLT.RTOL:MS	Unsigned	5	3	-
Axes ratio (Min): Judgment value	RSLT.RTOL:JG	Unsigned	1	0	-
Distributed oval major axis	RSLT.MAA2[*]	Unsigned	5	3	L
Distributed oval major axis: Measured value	RSLT.MAA2[*]:MS	Unsigned	5	3	L
Distributed oval major axis: Absolute measured value	RSLT.MAA2[*]:AB	Unsigned	5	3	-
Distributed oval major axis: Judgment value	RSLT.MAA2:JG	Unsigned	1	0	-
Distributed oval major axis (Max)	RSLT.MAA2H	Unsigned	5	3	L
Distributed oval major axis (Max): Measured value	RSLT.MAA2H:MS	Unsigned	5	3	L
Distributed oval major axis (Max): Absolute measured value	RSLT.MAA2H:AB	Unsigned	5	3	L
Distributed oval major axis (Max): Judgment value	RSLT.MAA2H:JG	Unsigned	1	0	-
Distributed oval major axis (Min)	RSLT.MAA2L	Unsigned	5	3	L
Distributed oval major axis (Min): Measured value	RSLT.MAA2L:MS	Unsigned	5	3	L
Distributed oval major axis (Min): Absolute measured value	RSLT.MAA2L:AB	Unsigned	5	3	-
Distributed oval major axis (Min): Judgment value	RSLT.MAA2L:JG	Unsigned	1	0	-
Distributed oval minor axis	RSLT.MIA2[*]	Unsigned	5	3	L
Distributed oval minor axis: Measured value	RSLT.MIA2[*]:MS	Unsigned	5	3	L
Distributed oval minor axis: Absolute measured value	RSLT.MIA2[*]:AB	Unsigned	5	3	-
Distributed oval minor axis: Judgment value	RSLT.MIA2:JG	Unsigned	1	0	-
Distributed oval minor axis (Max)	RSLT.MIA2H	Unsigned	5	3	L
Distributed oval minor axis (Max): Measured value	RSLT.MIA2H:MS	Unsigned	5	3	L
Distributed oval minor axis (Max): Absolute measured value	RSLT.MIA2H:AB	Unsigned	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Distributed oval minor axis (Max): Judgment value	RSLT.MIA2H:JG	Unsigned	1	0	-
Distributed oval minor axis (Min)	RSLT.MIA2L	Unsigned	5	3	L
Distributed oval minor axis (Min): Measured value	RSLT.MIA2L:MS	Unsigned	5	3	L
Distributed oval minor axis (Min): Absolute measured value	RSLT.MIA2L:AB	Unsigned	5	3	-
Distributed oval minor axis (Min): Judgment value	RSLT.MIA2L:JG	Unsigned	1	0	-
Aspect ratio	RSLT.RTO2[*]	Unsigned	5	3	-
Aspect ratio: Measured value	RSLT.RTO2[*]:MS	Unsigned	5	3	-
Aspect ratio: Judgment value	RSLT.RTO2:JG	Unsigned	1	0	-
Aspect ratio (Max)	RSLT.RTO2H	Unsigned	5	3	-
Aspect ratio (Max): Measured value	RSLT.RTO2H:MS	Unsigned	5	3	-
Aspect ratio (Max): Judgment value	RSLT.RTO2H:JG	Unsigned	1	0	-
Aspect ratio (Min)	RSLT.RTO2L	Unsigned	5	3	-
Aspect ratio (Min): Measured value	RSLT.RTO2L:MS	Unsigned	5	3	-
Aspect ratio (Min): Judgment value	RSLT.RTO2L:JG	Unsigned	1	0	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-
Target classification type	RSLT.CLSTYP[*]	Available	2	0	-
Target classification type: Measured value	RSLT.CLSTYP[*]:MS	Available	2	0	-
Number	RSLT.CLS[0].N	Unsigned	4	0	-
Number: Measured value	RSLT.CLS[0].N:MS	Unsigned	2	0	-
Center of gravity X	RSLT.CLS[0].X[*]	Available	5	3	-
Center of gravity X: Measured value	RSLT.CLS[0].X[*]:MS	Available	5	3	X
Center of gravity X: Absolute measured value	RSLT.CLS[0].X[*]:AB	Available	5	3	-
Center of gravity X: Encoder measured value	RSLT.CLS[0].X[*]:EC	Available	5	3	X
Center of gravity Y	RSLT.CLS[0].Y[*]	Available	5	3	-
Center of gravity Y: Measured value	RSLT.CLS[0].Y[*]:MS	Available	5	3	Y
Center of gravity Y: Absolute measured value	RSLT.CLS[0].Y[*]:AB	Available	5	3	-
Center of gravity Y: Encoder measured value	RSLT.CLS[0].Y[*]:EC	Available	5	3	Y
Major axis angle	RSLT.CLS[0].T[*]	Available	3	3	-
Major axis angle: Measured value	RSLT.CLS[0].T[*]:MS	Available	3	3	-
Major axis angle: Absolute measured value	RSLT.CLS[0].T[*]:AB	Available	3	3	-
Area	RSLT.CLS[0].AR[*]	Unsigned	8	0	-
Area: Measured value	RSLT.CLS[0].AR[*]:MS	Unsigned	8	0	-
Feret diameter X	RSLT.CLS[0].FX[*]	Available	5	3	-
Feret diameter X: Measured value	RSLT.CLS[0].FX[*]:MS	Available	5	3	L
Feret diameter X: Absolute measured value	RSLT.CLS[0].FX[*]:AB	Available	5	3	-
Feret diameter Y	RSLT.CLS[0].FY[*]	Available	5	3	-
Feret diameter Y: Measured value	RSLT.CLS[0].FY[*]:MS	Available	5	3	L
Feret diameter Y: Absolute measured value	RSLT.CLS[0].FY[*]:AB	Available	5	3	-
Perimeter	RSLT.CLS[0].CL[*]	Unsigned	8	0	-
Perimeter: Measured value	RSLT.CLS[0].CL[*]:MS	Unsigned	8	0	L
Perimeter: Absolute measured value	RSLT.CLS[0].CL[*]:AB	Unsigned	8	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Roundness	RSLT.CLS[0].CD[*]	Unsigned	1	3	-
Roundness: Measured value	RSLT.CLS[0].CD[*]:MS	Unsigned	1	3	-
Major axis	RSLT.CLS[0].MAA[*]	Unsigned	5	3	-
Major axis: Measured value	RSLT.CLS[0].MAA[*]:MS	Unsigned	5	3	L
Major axis: Absolute measured value	RSLT.CLS[0].MAA[*]:AB	Unsigned	5	3	-
Minor axis	RSLT.CLS[0].MIA[*]	Unsigned	5	3	-
Minor axis: Measured value	RSLT.CLS[0].MIA[*]:MS	Unsigned	5	3	L
Minor axis: Absolute measured value	RSLT.CLS[0].MIA[*]:AB	Unsigned	5	3	-
Axes ratio	RSLT.CLS[0].RTO[*]	Unsigned	5	3	-
Axes ratio: Measured value	RSLT.CLS[0].RTO[*]:MS	Unsigned	5	3	-
Distributed oval major axis	RSLT.CLS[0].MMA2[*]	Unsigned	5	3	-
Distributed oval major axis: Measured value	RSLT.CLS[0].MMA2[*]:MS	Unsigned	5	3	L
Distributed oval major axis: Absolute measured value	RSLT.CLS[0].MMA2[*]:AB	Unsigned	5	3	-
Distributed oval minor axis	RSLT.CLS[0].MMA2[*]	Unsigned	5	3	-
Distributed oval minor axis: Measured value	RSLT.CLS[0].MIA2[*]:MS	Unsigned	5	3	L
Distributed oval minor axis: Absolute measured value	RSLT.CLS[0].MIA2[*]:AB	Unsigned	5	3	-
Aspect ratio	RSLT.CLS[0].RTO2[*]	Unsigned	5	3	-
Aspect ratio: Measured value	RSLT.CLS[0].RTO2[*]:ms	Unsigned	5	3	-
Volume	RSLT.CLS[0].VOL[*]	Unsigned	11	0	-
Volume: Measured value	RSLT.CLS[0].VOL[*]:MS	Unsigned	11	0	-
Bright & Dark	RSLT.CLS[0].BOW[*]	Unsigned	1	0	-
Bright & Dark: Measured value	RSLT.CLS[0].BOW[*]:MS	Unsigned	1	0	-
Average intensity level	RSLT.CLS[0].AVI	Unsigned	3	0	-
Average intensity level: Measured value	RSLT.CLS[0].AVI:MS	Unsigned	3	0	-
Maximum intensity level	RSLT.CLS[0].MXI	Unsigned	3	0	-
Maximum intensity level: Measured value	RSLT.CLS[0].MXI:MS	Unsigned	3	0	-
RSLT.CLS[1].***					
⋮					
RSLT.CLS[19].***					

Profile Position Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
No. of segments	RSLT.SGN	Unsigned	4	0	-
No. of segments: Measured value	RSLT.SGN:MS	Unsigned	4	0	-
No. of detected segments	RSLT.DSGN	Unsigned	4	0	-
No. of detected segments: Measured value	RSLT.DSGN:MS	Unsigned	4	0	-
No. of detected segments: Judgment value	RSLT.DSGN:JG	Unsigned	1	0	-
No. of edges	RSLT.N[*]	Unsigned	4	0	-
No. of edges: Measured value	RSLT.N[*]:MS	Unsigned	4	0	-
No. of edges (Max)	RSLT.NHI	Unsigned	4	0	-
No. of edges (Max): Measured value	RSLT.NHI:MS	Unsigned	4	0	-
No. of edges (Min)	RSLT.NLO	Unsigned	4	0	-
No. of edges (Min): Measured value	RSLT.NLO:MS	Unsigned	4	0	-
Position X	RSLT.X[*]	Available	5	3	X
Position X: Measured value	RSLT.X[*]:MS	Available	5	3	X
Position X: Absolute measured value	RSLT.X[*]:AB	Available	5	3	-
Position X: Encoder measured value	RSLT.X[*]:EC	Available	5	3	X
Position X: Judgment value	RSLT.X:JG	Unsigned	1	0	-
Position X (Max)	RSLT.XHI	Available	5	3	X
Position X (Max): Measured value	RSLT.XHI:MS	Available	5	3	X
Position X (Max): Absolute measured value	RSLT.XHI:AB	Available	5	3	-
Position X (Max): Encoder measured value	RSLT.XHI:EC	Available	5	3	X
Position X (Max): Judgment value	RSLT.XHI:JG	Unsigned	1	0	-
Position X (Min)	RSLT.XLO	Available	5	3	X
Position X (Min): Measured value	RSLT.XLO:MS	Available	5	3	X
Position X (Min): Absolute measured value	RSLT.XLO:AB	Available	5	3	-
Position X (Min): Encoder measured value	RSLT.XLO:EC	Available	5	3	X
Position X (Min): Judgment value	RSLT.XLO:JG	Unsigned	1	0	-
Position X (Ave)	RSLT.XA	Available	5	3	X
Position X (Ave): Measured value	RSLT.XA:MS	Available	5	3	X
Position X (Ave): Absolute measured value	RSLT.XA:AB	Available	5	3	-
Position X (Ave): Encoder measured value	RSLT.XA:EC	Available	5	3	Y
Position Y	RSLT.Y[*]	Available	5	3	Y
Position Y: Measured value	RSLT.Y[*]:MS	Available	5	3	Y
Position Y: Absolute measured value	RSLT.Y[*]:AB	Available	5	3	-
Position Y: Encoder measured value	RSLT.Y[*]:EC	Available	5	3	Y
Position Y: Judgment value	RSLT.Y:JG	Unsigned	1	0	-
Position Y (Max)	RSLT.YHI	Available	5	3	Y
Position Y (Max): Measured value	RSLT.YHI:MS	Available	5	3	Y
Position Y (Max): Absolute measured value	RSLT.YHI:AB	Available	5	3	-
Position Y (Max): Encoder measured value	RSLT.YHI:EC	Available	5	3	Y
Position Y (Max): Judgment value	RSLT.YHI:JG	Unsigned	1	0	-
Position Y (Min)	RSLT.YLO	Available	5	3	Y
Position Y (Min): Measured value	RSLT.YLO:MS	Available	5	3	Y
Position Y (Min): Absolute measured value	RSLT.YLO:AB	Available	5	3	-
Position Y (Min): Encoder measured value	RSLT.YLO:EC	Available	5	3	Y
Position Y (Min): Judgment value	RSLT.YLO:JG	Unsigned	1	0	-
Position Y (Ave)	RSLT.YA	Available	5	3	Y

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Position Y (Ave): Measured value	RSLT.YA:MS	Available	5	3	Y
Position Y (Ave): Absolute measured value	RSLT.YA:AB	Available	5	3	-
Position Y (Ave): Encoder measured value	RSLT.YA:EC	Available	5	3	Y
Position XY	RSLT.XY[*]	Available	5	3	-
Position XY: Measured value	RSLT.XY[*]:MS	Available	5	3	-
Position XY: Absolute measured value	RSLT.XY[*]:AB	Available	5	3	-
Position XY: Encoder measured value	RSLT.XY[*]:EC	Available	5	3	-
Position XY (Max)	RSLT.XYHI	Available	5	3	-
Position XY (Max): Measured value	RSLT.XYHI:MS	Available	5	3	-
Position XY (Max): Absolute measured value	RSLT.XYHI:AB	Available	5	3	-
Position XY (Max): Encoder measured value	RSLT.XYHI:EC	Available	5	3	-
Position XY (Min)	RSLT.XYLO	Available	5	3	-
Position XY (Min): Measured value	RSLT.XYLO:MS	Available	5	3	-
Position XY (Min): Absolute measured value	RSLT.XYLO:AB	Available	5	3	-
Position XY (Min): Encoder measured value	RSLT.XYLO:EC	Available	5	3	-
Position XY (Ave)	RSLT.XYA	Available	5	3	-
Position XY (Ave): Measured value	RSLT.XYA:MS	Available	5	3	-
Position XY (Ave): Absolute measured value	RSLT.XYA:AB	Available	5	3	-
Position XY (Ave): Encoder measured value	RSLT.XYA:EC	Available	5	3	-
Angle	RSLT.T[*]	Available	3	3	-
Angle: Measured value	RSLT.T[*]:MS	Available	3	3	-
Angle: Absolute measured value	RSLT.T[*]:AB	Available	3	3	-
Angle (Max)	RSLT.THI	Available	3	3	-
Angle (Max): Measured value	RSLT.THI:MS	Available	3	3	-
Angle (Max): Absolute measured value	RSLT.THI:AB	Available	3	3	-
Angle (Min)	RSLT.TLO	Available	3	3	-
Angle (Min): Measured value	RSLT.TLO:MS	Available	3	3	-
Angle (Min): Absolute measured value	RSLT.TLO:AB	Available	3	3	-
Distance	RSLT.P[*]	Unsigned	5	3	L
Distance: Measured value	RSLT.P[*]:MS	Unsigned	5	3	L
Distance: Absolute measured value	RSLT.P[*]:AB	Unsigned	5	3	-
Distance: Judgment value	RSLT.P:JG	Unsigned	1	0	-
Distance (Max)	RSLT.PHI	Unsigned	5	3	L
Distance (Max): Measured value	RSLT.PHI:MS	Unsigned	5	3	L
Distance (Max): Absolute measured value	RSLT.PHI:AB	Unsigned	5	3	-
Distance (Max): Judgment value	RSLT.PHI:JG	Unsigned	1	0	-
Distance (Min)	RSLT.PLO	Unsigned	5	3	L
Distance (Min): Measured value	RSLT.PLO:MS	Unsigned	5	3	L
Distance (Min): Absolute measured value	RSLT.PLO:AB	Unsigned	5	3	-
Distance (Min): Judgment value	RSLT.PLO:JG	Unsigned	1	0	-
Distance (Ave)	RSLT.PA	Unsigned	5	3	L
Distance (Ave): Measured value	RSLT.PA:MS	Unsigned	5	3	L
Distance (Ave): Absolute measured value	RSLT.PA:AB	Unsigned	5	3	-
Radius	RSLT.RW[*]	Unsigned	5	3	L
Radius: Measured value	RSLT.RW[*]:MS	Unsigned	5	3	L
Radius: Absolute measured value	RSLT.RW[*]:AB	Unsigned	5	3	-
Radius: Judgment value	RSLT.RW:JG	Unsigned	1	0	-
Radius (Max)	RSLT.RWHI	Unsigned	5	3	L
Radius (Max): Measured value	RSLT.RWHI:MS	Unsigned	5	3	L

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Radius (Max): Absolute measured value	RSLT.RWHI:AB	Unsigned	5	3	-
Radius (Max): Judgment value	RSLT.RWHI:JG	Unsigned	1	0	-
Radius (Min)	RSLT.RWLO	Unsigned	5	3	L
Radius (Min): Measured value	RSLT.RWLO:MS	Unsigned	5	3	L
Radius (Min): Absolute measured value	RSLT.RWLO:AB	Unsigned	5	3	-
Radius (Min): Judgment value	RSLT.RWLO:JG	Unsigned	1	0	-
Radius (Ave)	RSLT.RWA	Unsigned	5	3	L
Radius (Ave): Measured value	RSLT.RWA:MS	Unsigned	5	3	L
Radius (Ave): Absolute measured value	RSLT.RWA:AB	Unsigned	5	3	-
Intensity	RSLT.I[*]	Unsigned	3	3	-
Intensity: Measured value	RSLT.I[*]:MS	Unsigned	3	3	-
Intensity (Max)	RSLT.IHI	Unsigned	3	3	-
Intensity (Max): Measured value	RSLT.IHI:MS	Unsigned	3	3	-
Intensity (Min)	RSLT.ILO	Unsigned	3	3	-
Intensity (Min): Measured value	RSLT.ILO:MS	Unsigned	3	3	-
Circle center X	RSLT.DCX	Available	6	3	X
Circle center X: Measured value	RSLT.DCX:MS	Available	6	3	X
Circle center X: Absolute measured value	RSLT.DCX:AB	Available	6	3	-
Circle center X: Encoder measured value	RSLT.DCX:EC	Available	6	3	X
Circle center Y	RSLT.DCY	Available	6	3	Y
Circle center Y: Measured value	RSLT.DCY:MS	Available	6	3	Y
Circle center Y: Absolute measured value	RSLT.DCY:AB	Available	6	3	-
Circle center Y: Encoder measured value	RSLT.DCY:EC	Available	6	3	Y
Circle center XY	RSLT.DCXY	Available	6	3	-
Circle center XY: Measured value	RSLT.DCXY:MS	Available	6	3	-
Circle center XY: Absolute measured value	RSLT.DCXY:AB	Available	6	3	-
Circle center XY: Encoder measured value	RSLT.DCXY:EC	Available	6	3	-
Circle radius	RSLT.DCR	Unsigned	6	3	L
Circle radius: Measured value	RSLT.DCR:MS	Unsigned	6	3	L
Circle radius: Absolute measured value	RSLT.DCR:AB	Unsigned	6	3	-
Circle center XY radius	RSLT.DCXYR	Unsigned	6	3	L
Circle center XY radius: Measured value	RSLT.DCXYR:MS	Unsigned	6	3	L
Circle center XY radius: Absolute measured value	RSLT.DCXYR:AB	Unsigned	6	3	-
Circle center XY radius: Encoder measured value	RSLT.DCXYR:EC	Unsigned	6	3	-
Line angle	RSLT.DLT	Available	3	3	-
Line angle: Measured value	RSLT.DLT:MS	Available	3	3	-
Line angle: Absolute measured value	RSLT.DLT:AB	Available	3	3	-
Line center X	RSLT.DLX	Available	5	3	X
Line center X: Measured value	RSLT.DLX:MS	Available	5	3	X
Line center X: Absolute measured value	RSLT.DLX:AB	Available	5	3	-
Line center X: Encoder measured value	RSLT.DLX:EC	Available	5	3	X
Line center Y	RSLT.DLY	Available	5	3	Y
Line center Y: Measured value	RSLT.DLY:MS	Available	5	3	Y
Line center Y: Absolute measured value	RSLT.DLY:AB	Available	5	3	-
Line center Y: Encoder measured value	RSLT.DLY:EC	Available	5	3	Y
Line center XY	RSLT.DLXY	Available	5	3	-
Line center XY: Measured value	RSLT.DLXY:MS	Available	5	3	-
Line center XY: Absolute measured value	RSLT.DLXY:AB	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Line center Y: Encoder measured value	RSLT.DLY:EC	Available	5	3	-
Line X1	RSLT.DLX1	Available	5	3	X
Line X1: Measured value	RSLT.DLX1:MS	Available	5	3	X
Line X1: Absolute measured value	RSLT.DLX1:AB	Available	5	3	-
Line X1: Encoder measured value	RSLT.DLX1:EC	Available	5	3	X
Line Y1	RSLT.DLY1	Available	5	3	Y
Line Y1: Measured value	RSLT.DLY1:MS	Available	5	3	Y
Line Y1: Absolute measured value	RSLT.DLY1:AB	Available	5	3	-
Line Y1: Encoder measured value	RSLT.DLY1:EC	Available	5	3	Y
Line XY1	RSLT.DLXY1	Available	5	3	-
Line XY1: Measured value	RSLT.DLXY1:MS	Available	5	3	-
Line XY1: Absolute measured value	RSLT.DLXY1:AB	Available	5	3	-
Line XY1: Encoder measured value	RSLT.DLXY1:EC	Available	5	3	-
Line X2	RSLT.DLX2	Available	5	3	X
Line X2: Measured value	RSLT.DLX2:MS	Available	5	3	X
Line X2: Absolute measured value	RSLT.DLX2:AB	Available	5	3	-
Line X2: Encoder measured value	RSLT.DLX2:EC	Available	5	3	X
Line Y2	RSLT.DLY2	Available	5	3	Y
Line Y2: Measured value	RSLT.DLY2:MS	Available	5	3	Y
Line Y2: Absolute measured value	RSLT.DLY2:AB	Available	5	3	-
Line Y2: Encoder measured value	RSLT.DLY2:EC	Available	5	3	Y
Line XY2	RSLT.DLXY2	Available	5	3	-
Line XY2: Measured value	RSLT.DLXY2:MS	Available	5	3	-
Line XY2: Absolute measured value	RSLT.DLXY2:AB	Available	5	3	-
Line XY2: Encoder measured value	RSLT.DLXY2:EC	Available	5	3	-
Line p	RSLT.DLR	Available	5	3	-
Line p: Measured value	RSLT.DLR:MS	Available	5	3	-
Line p: Absolute measured value	RSLT.DLR:AB	Available	5	3	-
Line p: Encoder measured value	RSLT.DLR:EC	Available	5	3	-
Line θ	RSLT.DLTH	Available	5	3	-
Line θ: Measured value	RSLT.DLTH:MS	Available	5	3	-
Line θ: Absolute measured value	RSLT.DLTH:AB	Available	5	3	-
Line θ: Encoder measured value	RSLT.DLTH:EC	Available	5	3	-
Line p θ	RSLT.DLRTH	Available	5	3	-
Line p θ: Measured value	RSLT.DLRTH:MS	Available	5	3	-
Line p θ: Absolute measured value	RSLT.DLRTH:AB	Available	5	3	-
Line p θ: Encoder measured value	RSLT.DLRTH:EC	Available	5	3	-
Maximum segment No.	RSLT.MXSGI	Unsigned	4	0	-
Maximum segment No.: Measured value	RSLT.MXSGI:MS	Unsigned	4	0	-
Minimum segment No.	RSLT.MNSGI	Unsigned	4	0	-
Minimum segment No.: Measured value	RSLT.MNSGI:MS	Unsigned	4	0	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-

Profile Width Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
No. of segments	RSLT.SGN	Unsigned	4	0	-
No. of segments: Measured value	RSLT.SGN:MS	Unsigned	4	0	-
No. of detected segments	RSLT.DSGN	Unsigned	4	0	-
No. of detected segments: Measured value	RSLT.DSGN:MS	Unsigned	4	0	-
No. of detected segments: Judgment value	RSLT.DSGN:JG	Unsigned	1	0	-
No. of pairs	RSLT.N[*]	Unsigned	4	0	-
No. of pairs: Measured value	RSLT.N[*]:MS	Unsigned	4	0	-
No. of pairs (Max)	RSLT.NHI	Unsigned	4	0	-
No. of pairs (Max): Measured value	RSLT.NHI:MS	Unsigned	4	0	-
No. of pairs (Min)	RSLT.NLO	Unsigned	4	0	-
No. of pairs (Min): Measured value	RSLT.NLO:MS	Unsigned	4	0	-
Edge width	RSLT.W[*]	Unsigned	5	3	L
Edge width: Measured value	RSLT.W[*]:MS	Unsigned	5	3	L
Edge width: Absolute measured value	RSLT.W[*]:AB	Unsigned	5	3	-
Edge width: Judgment value	RSLT.W:JG	Unsigned	1	0	-
Edge width (Max)	RSLT.WHI	Unsigned	5	3	L
Edge width (Max): Measured value	RSLT.WHI:MS	Unsigned	5	3	L
Edge width (Max): Absolute measured value	RSLT.WHI:AB	Unsigned	5	3	-
Edge width (Max): Judgment value	RSLT.WHI:JG	Unsigned	1	0	-
Edge width (Min)	RSLT.WLO	Unsigned	5	3	L
Edge width (Min): Measured value	RSLT.WLO:MS	Unsigned	5	3	L
Edge width (Min): Absolute measured value	RSLT.WLO:AB	Unsigned	5	3	-
Edge width (Min): Judgment value	RSLT.WLO:JG	Unsigned	1	0	-
Edge width (Ave)	RSLT.WA	Unsigned	5	3	L
Edge width (Ave): Measured value	RSLT.WA:MS	Unsigned	5	3	L
Edge width (Ave): Absolute measured value	RSLT.WA:AB	Unsigned	5	3	-
Position 1 X	RSLT.X1[*]	Available	5	3	X
Position 1 X: Measured value	RSLT.X1[*]:MS	Available	5	3	X
Position 1 X: Absolute measured value	RSLT.X1[*]:AB	Available	5	3	-
Position 1 X: Encoder measured value	RSLT.X1[*]:EC	Available	5	3	X
Position 1 X (Max)	RSLT.X1HI	Available	5	3	X
Position 1 X (Max): Measured value	RSLT.X1HI:MS	Available	5	3	X
Position 1 X (Max): Absolute measured value	RSLT.X1HI:AB	Available	5	3	-
Position 1 X (Max): Encoder measured value	RSLT.X1HI:EC	Available	5	3	X
Position 1 X (Min)	RSLT.X1LO	Available	5	3	X
Position 1 X (Min): Measured value	RSLT.X1LO:MS	Available	5	3	X
Position 1 X (Min): Absolute measured value	RSLT.X1LO:AB	Available	5	3	-
Position 1 X (Min): Encoder measured value	RSLT.X1LO:EC	Available	5	3	X
Position 1 Y	RSLT.Y1[*]	Available	5	3	Y
Position 1 Y: Measured value	RSLT.Y1[*]:MS	Available	5	3	Y
Position 1 Y: Absolute measured value	RSLT.Y1[*]:AB	Available	5	3	-
Position 1 Y: Encoder measured value	RSLT.Y1[*]:EC	Available	5	3	Y
Position 1 Y (Max)	RSLT.Y1HI	Available	5	3	Y
Position 1 Y (Max): Measured value	RSLT.Y1HI:MS	Available	5	3	Y
Position 1 Y (Max): Absolute measured value	RSLT.Y1HI:AB	Available	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Position 1 Y (Max): Encoder measured value	RSLT.Y1HI:EC	Available	5	3	Y
Position 1 Y (Min)	RSLT.Y1LO	Available	5	3	Y
Position 1 Y (Min): Measured value	RSLT.Y1LO:MS	Available	5	3	Y
Position 1 Y (Min): Absolute measured value	RSLT.Y1LO:AB	Available	5	3	-
Position 1 Y (Min): Encoder measured value	RSLT.Y1LO:EC	Available	5	3	Y
Position 1 XY	RSLT.XY1[*]	Available	5	3	-
Position 1 XY: Measured value	RSLT.XY1[*]:MS	Available	5	3	-
Position 1 XY: Absolute measured value	RSLT.XY1[*]:AB	Available	5	3	-
Position 1 XY: Encoder measured value	RSLT.XY1[*]:EC	Available	5	3	-
Position 1 XY (Max)	RSLT.XY1HI	Available	5	3	-
Position 1 XY (Max): Measured value	RSLT.XY1HI:MS	Available	5	3	-
Position 1 XY (Max): Absolute measured value	RSLT.XY1HI:AB	Available	5	3	-
Position 1 XY (Max): Encoder measured value	RSLT.XY1HI:EC	Available	5	3	-
Position 1 XY (Min)	RSLT.XY1LO	Available	5	3	-
Position 1 XY (Min): Measured value	RSLT.XY1LO:MS	Available	5	3	-
Position 1 XY (Min): Absolute measured value	RSLT.XY1LO:AB	Available	5	3	-
Position 1 XY (Min): Encoder measured value	RSLT.XY1LO:EC	Available	5	3	-
Angle 1	RSLT.T1[*]	Available	3	3	-
Angle 1: Measured value	RSLT.T1[*]:MS	Available	3	3	-
Angle 1: Absolute measured value	RSLT.T1[*]:AB	Available	3	3	-
Angle 1 (Max)	RSLT.T1HI	Available	3	3	-
Angle 1 (Max): Measured value	RSLT.T1HI:MS	Available	3	3	-
Angle 1 (Max): Absolute measured value	RSLT.T1HI:AB	Available	3	3	-
Angle 1 (Min)	RSLT.T1LO	Available	3	3	-
Angle 1 (Min): Measured value	RSLT.T1LO:MS	Available	3	3	-
Angle 1 (Min): Absolute measured value	RSLT.T1LO:AB	Available	3	3	-
Distance 1	RSLT.P1[*]	Unsigned	5	3	L
Distance 1: Measured value	RSLT.P1[*]:MS	Unsigned	5	3	L
Distance 1: Absolute measured value	RSLT.P1[*]:AB	Unsigned	5	3	-
Distance 1 (Max)	RSLT.P1HI	Unsigned	5	3	L
Distance 1 (Max): Measured value	RSLT.P1HI:MS	Unsigned	5	3	L
Distance 1 (Max): Absolute measured value	RSLT.P1HI:AB	Unsigned	5	3	-
Distance 1 (Min)	RSLT.P1LO	Unsigned	5	3	L
Distance 1 (Min): Measured value	RSLT.P1LO:MS	Unsigned	5	3	L
Distance 1 (Min): Absolute measured value	RSLT.P1LO:AB	Unsigned	5	3	-
Intensity 1	RSLT.I1[*]	Unsigned	3	3	-
Intensity 1: Measured value	RSLT.I1[*]:MS	Unsigned	3	3	-
Intensity 1 (Max)	RSLT.I1HI	Unsigned	3	3	-
Intensity 1 (Max): Measured value	RSLT.I1HI:MS	Unsigned	3	3	-
Intensity 1 (Min)	RSLT.I1LO	Unsigned	3	3	-
Intensity 1 (Min): Measured value	RSLT.I1LO:MS	Unsigned	3	3	-
Position 2 X	RSLT.X2[*]	Available	5	3	X
Position 2 X: Measured value	RSLT.X2[*]:MS	Available	5	3	X
Position 2 X: Absolute measured value	RSLT.X2[*]:AB	Available	5	3	-
Position 2 X: Encoder measured value	RSLT.X2[*]:EC	Available	5	3	X
Position 2 X (Max)	RSLT.X2HI	Available	5	3	X
Position 2 X (Max): Measured value	RSLT.X2HI:MS	Available	5	3	X

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Position 2 X (Max): Absolute measured value	RSLT.X2HI:AB	Available	5	3	-
Position 2 X (Max): Encoder measured value	RSLT.X2HI:EC	Available	5	3	X
Position 2 X (Min)	RSLT.X2LO	Available	5	3	X
Position 2 X (Min): Measured value	RSLT.X2LO:MS	Available	5	3	X
Position 2 X (Min): Absolute measured value	RSLT.X2LO:AB	Available	5	3	-
Position 2 X (Min): Encoder measured value	RSLT.X2LO:EC	Available	5	3	X
Position 2 Y	RSLT.Y2[*]	Available	5	3	Y
Position 2 Y: Measured value	RSLT.Y2[*]:MS	Available	5	3	Y
Position 2 Y: Absolute measured value	RSLT.Y2[*]:AB	Available	5	3	-
Position 2 Y: Encoder measured value	RSLT.Y2[*]:EC	Available	5	3	Y
Position 2 Y (Max)	RSLT.Y2HI	Available	5	3	Y
Position 2 Y (Max): Measured value	RSLT.Y2HI:MS	Available	5	3	Y
Position 2 Y (Max): Absolute measured value	RSLT.Y2HI:AB	Available	5	3	-
Position 2 Y (Max): Encoder measured value	RSLT.Y2HI:EC	Available	5	3	Y
Position 2 Y (Min)	RSLT.Y2LO	Available	5	3	Y
Position 2 Y (Min): Measured value	RSLT.Y2LO:MS	Available	5	3	Y
Position 2 Y (Min): Absolute measured value	RSLT.Y2LO:AB	Available	5	3	-
Position 2 Y (Min): Encoder measured value	RSLT.Y2LO:EC	Available	5	3	Y
Position 2 XY	RSLT.XY2[*]	Available	5	3	-
Position 2 XY: Measured value	RSLT.XY2[*]:MS	Available	5	3	-
Position 2 XY: Absolute measured value	RSLT.XY2[*]:AB	Available	5	3	-
Position 2 XY: Encoder measured value	RSLT.XY2[*]:EC	Available	5	3	-
Position 2 XY (Max)	RSLT.XY2HI	Available	5	3	-
Position 2 XY (Max): Measured value	RSLT.XY2HI:MS	Available	5	3	-
Position 2 XY (Max): Absolute measured value	RSLT.XY2HI:AB	Available	5	3	-
Position 2 XY (Max): Encoder measured value	RSLT.XY2HI:EC	Available	5	3	-
Position 2 XY (Min)	RSLT.XY2LO	Available	5	3	-
Position 2 XY (Min): Measured value	RSLT.XY2LO:MS	Available	5	3	-
Position 2 XY (Min): Absolute measured value	RSLT.XY2LO:AB	Available	5	3	-
Position 2 XY (Min): Encoder measured value	RSLT.XY2LO:EC	Available	5	3	-
Angle 2	RSLT.T2[*]	Available	3	3	-
Angle 2: Measured value	RSLT.T2[*]:MS	Available	3	3	-
Angle 2: Absolute measured value	RSLT.T2[*]:AB	Available	3	3	-
Angle 2 (Max)	RSLT.T2HI	Available	3	3	-
Angle 2 (Max): Measured value	RSLT.T2HI:MS	Available	3	3	-
Angle 2 (Max): Absolute measured value	RSLT.T2HI:AB	Available	3	3	-
Angle 2 (Min)	RSLT.T2LO	Available	3	3	-
Angle 2 (Min): Measured value	RSLT.T2LO:MS	Available	3	3	-
Angle 2 (Min): Absolute measured value	RSLT.T2LO:AB	Available	3	3	-
Distance 2	RSLT.P2[*]	Unsigned	5	3	L
Distance 2: Measured value	RSLT.P2[*]:MS	Unsigned	5	3	L
Distance 2: Absolute measured value	RSLT.P2[*]:AB	Unsigned	5	3	-
Distance 2 (Max)	RSLT.P2HI	Unsigned	5	3	L
Distance 2 (Max): Measured value	RSLT.P2HI:MS	Unsigned	5	3	L
Distance 2 (Max): Absolute measured value	RSLT.P2HI:AB	Unsigned	5	3	-
Distance 2 (Min)	RSLT.P2LO	Unsigned	5	3	L

Result item	Name	Numerical value format				Applicable scaling
		Sign	No. of integer digits	No. of decimal places		
Distance 2 (Min): Measured value	RSLT.P2LO:MS	Unsigned	5	3	L	
Distance 2 (Min): Absolute measured value	RSLT.P2LO:AB	Unsigned	5	3	-	
Intensity 2	RSLT.I2[*]	Unsigned	3	3	-	
Intensity 2: Measured value	RSLT.I2[*]:MS	Unsigned	3	3	-	
Intensity 2 (Max)	RSLT.I2HI	Unsigned	3	3	-	
Intensity 2 (Max): Measured value	RSLT.I2HI:MS	Unsigned	3	3	-	
Intensity 2 (Min)	RSLT.I2LO	Unsigned	3	3	-	
Intensity 2 (Min): Measured value	RSLT.I2LO:MS	Unsigned	3	3	-	
Maximum segment No.	RSLT.MXSGI	Unsigned	4	0	-	
Maximum segment No.: Measured value	RSLT.MXSGI:MS	Unsigned	4	0	-	
Minimum segment No.	RSLT.MNSGI	Unsigned	4	0	-	
Minimum segment No.: Measured value	RSLT.MNSGI:MS	Unsigned	4	0	-	

Profile Defect Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
No. of segments	RSLT.SGN	Unsigned	4	0	-
No. of segments: Measured value	RSLT.SGN:MS	Unsigned	4	0	-
No. of detected segments	RSLT.DSGN	Unsigned	4	0	-
No. of detected segments: Measured value	RSLT.DSGN:MS	Unsigned	4	0	-
No. of detected segments: Judgment value	RSLT.DSGN:JG	Unsigned	1	0	-
Defect count	RSLT.STN	Unsigned	4	0	-
Defect count: Measured value	RSLT.STN:MS	Unsigned	4	0	-
Defect count: Judgment value	RSLT.STN:JG	Unsigned	1	0	-
Total defect size	RSLT.TSTG	Unsigned	7	3	-
Total defect size: Measured value	RSLT.TSTG:MS	Unsigned	7	3	-
Total defect size: Judgment value	RSLT.TSTG:JG	Unsigned	1	0	-
Total defect level	RSLT.TSTL	Unsigned	5	3	-
Total defect level: Measured value	RSLT.TSTL:MS	Unsigned	5	3	-
Total defect width	RSLT.TSTW	Unsigned	4	0	-
Total defect width: Measured value	RSLT.TSTW:MS	Unsigned	4	0	-
Defect size	RSLT.STG[*]	Unsigned	7	3	-
Defect size: Measured value	RSLT.STG[*]:MS	Unsigned	7	3	-
Defect size: Judgment value	RSLT.STG:JG	Unsigned	1	0	-
Defect size (Max)	RSLT.STGHI	Unsigned	7	3	-
Defect size (Max): Measured value	RSLT.STGHI:MS	Unsigned	7	3	-
Defect size (Max): Judgment value	RSLT.STGHI:JG	Unsigned	1	0	-
Defect size (Min)	RSLT.STGLO	Unsigned	7	3	-
Defect size (Min): Measured value	RSLT.STGLO:MS	Unsigned	7	3	-
Defect size (Min): Judgment value	RSLT.STGLO:JG	Unsigned	1	0	-
Defect level	RSLT.STL[*]	Unsigned	5	3	-
Defect level: Measured value	RSLT.STL[*]:MS	Unsigned	5	3	-
Defect level (Max)	RSLT.STLHI	Unsigned	5	3	-
Defect level (Max): Measured value	RSLT.STLHI:MS	Unsigned	5	3	-
Defect level (Min)	RSLT.STLLO	Unsigned	5	3	-
Defect level (Min): Measured value	RSLT.STLLO:MS	Unsigned	5	3	-
Defect width	RSLT.STW[*]	Unsigned	4	0	-
Defect width: Measured value	RSLT.STW[*]:MS	Unsigned	4	0	-
Defect width (Max)	RSLT.STWHI	Unsigned	4	0	-
Defect width (Max): Measured value	RSLT.STWHI:MS	Unsigned	4	0	-
Defect width (Min)	RSLT.STWLO	Unsigned	4	0	-
Defect width (Min): Measured value	RSLT.STWLO:MS	Unsigned	4	0	-
Defect position X	RSLT.STX[*]	Available	5	3	X
Defect position X: Measured value	RSLT.STX[*]:MS	Available	5	3	X
Defect position X: Absolute measured value	RSLT.STX[*]:AB	Available	5	3	-
Defect position X: Encoder measured value	RSLT.STX[*]:EC	Available	5	3	X
Defect position X: Judgment value	RSLT.STX:JG	Unsigned	1	0	-
Defect position X (Max)	RSLT.STXHI	Available	5	3	X
Defect position X (Max): Measured value	RSLT.STXHI:MS	Available	5	3	X
Defect position X (Max): Encoder measured value	RSLT.STXHI:EC	Available	5	3	X
Defect position X (Max): Judgment value	RSLT.STXHI:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Defect position X (Min)	RSLT.STXLO	Available	5	3	X
Defect position X (Min): Measured value	RSLT.STXLO:MS	Available	5	3	X
Defect position X (Min): Encoder measured value	RSLT.STXLO:EC	Available	5	3	X
Defect position X (Min): Judgment value	RSLT.STXLO:JG	Unsigned	1	0	-
Defect position Y	RSLT.STY[*]	Available	5	3	Y
Defect position Y: Measured value	RSLT.STY[*]:MS	Available	5	3	Y
Defect position Y: Absolute measured value	RSLT.STY[*]:AB	Available	5	3	-
Defect position Y: Encoder measured value	RSLT.STY[*]:EC	Available	5	3	Y
Defect position Y: Judgment value	RSLT.STY:JG	Unsigned	1	0	-
Defect position Y (Max)	RSLT.STYHI	Available	5	3	Y
Defect position Y (Max): Measured value	RSLT.STYHI:MS	Available	5	3	Y
Defect position Y (Max): Encoder measured value	RSLT.STYHI:EC	Available	5	3	Y
Defect position Y (Max): Judgment value	RSLT.STYHI:JG	Unsigned	1	0	-
Defect position Y (Min)	RSLT.STYLO	Available	5	3	Y
Defect position Y (Min): Measured value	RSLT.STYLO:MS	Available	5	3	Y
Defect position Y (Min): Encoder measured value	RSLT.STYLO:EC	Available	5	3	Y
Defect position Y (Min): Judgment value	RSLT.STYLO:JG	Unsigned	1	0	-
Defect position XY	RSLT.STXY[*]	Available	5	3	-
Defect position XY: Measured value	RSLT.STXY[*]:MS	Available	5	3	-
Defect position XY: Absolute measured value	RSLT.STXY[*]:AB	Available	5	3	-
Defect position XY: Encoder measured value	RSLT.STXY[*]:EC	Available	5	3	-
Defect angle	RSLT.STT[*]	Available	3	3	-
Defect angle: Measured value	RSLT.STT[*]:MS	Available	3	3	-
Defect angle: Absolute measured value	RSLT.STT[*]:AB	Available	3	3	-
Defect top position X	RSLT.STTX[*]	Available	5	3	X
Defect top position X: Measured value	RSLT.STTX[*]:MS	Available	5	3	X
Defect top position X: Absolute measured value	RSLT.STTX[*]:AB	Available	5	3	-
Defect top position X: Encoder measured value	RSLT.STTX[*]:EC	Available	5	3	X
Defect top position Y	RSLT.STTY[*]	Available	5	3	Y
Defect top position Y: Measured value	RSLT.STTY[*]:MS	Available	5	3	Y
Defect top position Y: Absolute measured value	RSLT.STTY[*]:AB	Available	5	3	-
Defect top position Y: Encoder measured value	RSLT.STTY[*]:EC	Available	5	3	Y
Defect top position XY	RSLT.STTXY[*]	Available	5	3	-
Defect top position XY: Measured value	RSLT.STTXY[*]:MS	Available	5	3	-
Defect top position XY: Absolute measured value	RSLT.STTXY[*]:AB	Available	5	3	-
Defect top position XY: Encoder measured value	RSLT.STTXY[*]:EC	Available	5	3	-
Defect edge position X1	RSLT.STBX1[*]	Available	5	3	X
Defect edge position X1: Measured value	RSLT.STBX1[*]:MS	Available	5	3	X
Defect edge position X1: Absolute measured value	RSLT.STBX1[*]:AB	Available	5	3	-
Defect edge position X1: Encoder measured value	RSLT.STBX1[*]:EC	Available	5	3	X
Defect edge position Y1	RSLT.STBY1[*]	Available	5	3	Y
Defect edge position Y1: Measured value	RSLT.STBY1[*]:MS	Available	5	3	Y
Defect edge position Y1: Absolute measured value	RSLT.STBY1[*]:AB	Available	5	3	-
Defect edge position Y1: Encoder measured value	RSLT.STBY1[*]:EC	Available	5	3	Y
Defect edge position XY1	RSLT.STBXY1[*]	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Defect edge position XY1: Measured value	RSLT.STBXY1[*]:MS	Available	5	3	-
Defect edge position XY1: Absolute measured value	RSLT.STBXY1[*]:AB	Available	5	3	-
Defect edge position XY1: Encoder measured value	RSLT.STBXY1[*]:EC	Available	5	3	-
Defect edge position X2	RSLT.STBX2[*]	Available	5	3	X
Defect edge position X2: Measured value	RSLT.STBX2[*]:MS	Available	5	3	X
Defect edge position X2: Absolute measured value	RSLT.STBX2[*]:AB	Available	5	3	-
Defect edge position X2: Encoder measured value	RSLT.STBX2[*]:EC	Available	5	3	X
Defect edge position Y2	RSLT.STBY2[*]	Available	5	3	Y
Defect edge position Y2: Measured value	RSLT.STBY2[*]:MS	Available	5	3	Y
Defect edge position Y2: Absolute measured value	RSLT.STBY2[*]:AB	Available	5	3	-
Defect edge position Y2: Encoder measured value	RSLT.STBY2[*]:EC	Available	5	3	Y
Defect edge position XY2	RSLT.STBXY2[*]	Available	5	3	-
Defect edge position XY2: Measured value	RSLT.STBXY2[*]:MS	Available	5	3	-
Defect edge position XY2: Absolute measured value	RSLT.STBXY2[*]:AB	Available	5	3	-
Defect edge position XY2: Encoder measured value	RSLT.STBXY2[*]:EC	Available	5	3	-
Defect start segment No.	RSLT.STSN[*]	Unsigned	4	0	-
Defect start segment No.: Measured value	RSLT.STSN[*]:MS	Unsigned	4	0	-
Defect top segment No.	RSLT.STTN[*]	Unsigned	4	0	-
Defect top segment No.: Measured value	RSLT.STTN[*]:MS	Unsigned	4	0	-
Defect end segment No.	RSLT.STEN[*]	Unsigned	4	0	-
Defect end segment No.: Measured value	RSLT.STEN[*]:MS	Unsigned	4	0	-
No. of base lines	RSLT.BMN	Unsigned	1	0	-
No. of base lines: Measured value	RSLT.BMN:MS	Unsigned	1	0	-
Base line X1	RSLT.BLX1	Available	5	3	X
Base line X1: Measured value	RSLT.BLX1:MS	Available	5	3	X
Base line X1: Absolute measured value	RSLT.BLX1:AB	Available	5	3	-
Base line X1: Encoder measured value	RSLT.BLX1:EC	Available	5	3	X
Base line Y1	RSLT.BLY1	Available	5	3	Y
Base line Y1: Measured value	RSLT.BLY1:MS	Available	5	3	Y
Base line Y1: Absolute measured value	RSLT.BLY1:AB	Available	5	3	-
Base line Y1: Encoder measured value	RSLT.BLY1:EC	Available	5	3	Y
Base line XY1	RSLT.BLXY1	Available	5	3	-
Base line XY1: Measured value	RSLT.BLXY1:MS	Available	5	3	-
Base line XY1: Absolute measured value	RSLT.BLXY1:AB	Available	5	3	-
Base line XY1: Encoder measured value	RSLT.BLXY1:EC	Available	5	3	-
Base line X2	RSLT.BLX2	Available	5	3	X
Base line X2: Measured value	RSLT.BLX2:MS	Available	5	3	X
Base line X2: Absolute measured value	RSLT.BLX2:AB	Available	5	3	-
Base line X2: Encoder measured value	RSLT.BLX2:EC	Available	5	3	X
Base line Y2	RSLT.BLY2	Available	5	3	Y
Base line Y2: Measured value	RSLT.BLY2:MS	Available	5	3	Y
Base line Y2: Absolute measured value	RSLT.BLY2:AB	Available	5	3	-
Base line Y2: Encoder measured value	RSLT.BLY2:EC	Available	5	3	Y
Base line XY2	RSLT.BLXY2	Available	5	3	-
Base line XY2: Measured value	RSLT.BLXY2:MS	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Base line XY2: Absolute measured value	RSLT.BLXY2:AB	Available	5	3	-
Base line XY2: Encoder measured value	RSLT.BLXY2:EC	Available	5	3	-
Base line center X	RSLT.BLX	Available	5	3	X
Base line center X: Measured value	RSLT.BLX:MS	Available	5	3	X
Base line center X: Absolute measured value	RSLT.BLX:AB	Available	5	3	-
Base line center X: Encoder measured value	RSLT.BLX:EC	Available	5	3	X
Base line center Y	RSLT.BLY	Available	5	3	Y
Base line center Y: Measured value	RSLT.BLY:MS	Available	5	3	Y
Base line center Y: Absolute measured value	RSLT.BLY:AB	Available	5	3	-
Base line center Y: Encoder measured value	RSLT.BLY:EC	Available	5	3	Y
Base line center XY	RSLT.BLXY	Available	5	3	-
Base line center XY: Measured value	RSLT.BLXY:MS	Available	5	3	-
Base line center XY: Absolute measured value	RSLT.BLXY:AB	Available	5	3	-
Base line center XY: Encoder measured value	RSLT.BLXY:EC	Available	5	3	-
Base line angle	RSLT.BLT	Available	3	3	-
Base line angle: Measured value	RSLT.BLT:MS	Available	3	3	-
Base line angle: Absolute measured value	RSLT.BLT:AB	Available	3	3	-
Base line p	RSLT.BLR	Available	5	3	-
Base line p: Measured value	RSLT.BLR:MS	Available	5	3	-
Base line p: Absolute measured value	RSLT.BLR:AB	Available	5	3	-
Base line p: Encoder measured value	RSLT.BLR:EC	Available	5	3	-
Base line θ	RSLT.BLTH	Available	5	3	-
Base line θ: Measured value	RSLT.BLTH:MS	Available	5	3	-
Base line θ: Absolute measured value	RSLT.BLTH:AB	Available	5	3	-
Base line θ: Encoder measured value	RSLT.BLTH:EC	Available	5	3	-
Base line p θ	RSLT.BLRTH	Available	5	3	-
Base line p θ: Measured value	RSLT.BLRTH:MS	Available	5	3	-
Base line p θ: Absolute measured value	RSLT.BLRTH:AB	Available	5	3	-
Base line p θ: Encoder measured value	RSLT.BLRTH:EC	Available	5	3	-
Base circle radius	RSLT.BCR	Unsigned	6	3	L
Base circle radius: Measured value	RSLT.BCR:MS	Unsigned	6	3	L
Base circle radius: Absolute measured value	RSLT.BCR:AB	Unsigned	6	3	-
Base circle center X	RSLT.BCX	Available	6	3	X
Base circle center X: Measured value	RSLT.BCX:MS	Available	6	3	X
Base circle center X: Absolute measured value	RSLT.BCX:AB	Available	6	3	-
Base circle center X: Encoder measured value	RSLT.BCX:EC	Available	6	3	X
Base circle center Y	RSLT.BCY	Available	6	3	Y
Base circle center Y: Measured value	RSLT.BCY:MS	Available	6	3	Y
Base circle center Y: Absolute measured value	RSLT.BCY:AB	Available	6	3	-
Base circle center Y: Encoder measured value	RSLT.BCY:EC	Available	6	3	Y
Base circle center XY	RSLT.BCXY	Available	6	3	-
Base circle center XY: Measured value	RSLT.BCXY:MS	Available	6	3	-
Base circle center XY: Absolute measured value	RSLT.BCXY:AB	Available	6	3	-
Base circle center XY: Encoder measured value	RSLT.BCXY:EC	Available	6	3	-
Base circle center XY radius	RSLT.BCXYR	Unsigned	6	3	L
Base circle center XY radius: Measured value	RSLT.BCXYR:MS	Unsigned	6	3	L
Base circle center XY radius: Absolute measured value	RSLT.BCXYR:AB	Unsigned	6	3	L
Base circle center XY radius: Encoder measured value	RSLT.BCXYR:EC	Unsigned	6	3	L

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Base oval radius 1	RSLT.BER1	Unsigned	6	3	L
Base oval radius 1: Measured value	RSLT.BER1:MS	Unsigned	6	3	L
Base oval radius 1: Absolute measured value	RSLT.BER1:AB	Unsigned	6	3	-
Base oval radius 2	RSLT.BER2	Unsigned	6	3	L
Base oval radius 2: Measured value	RSLT.BER2:MS	Unsigned	6	3	L
Base oval radius 2: Absolute measured value	RSLT.BER2:AB	Unsigned	6	3	-
Base oval center X	RSLT.BEX	Available	6	3	X
Base oval center X: Measured value	RSLT.BEX:MS	Available	6	3	X
Base oval center X: Absolute measured value	RSLT.BEX:AB	Available	6	3	-
Base oval center X: Encoder measured value	RSLT.BEX:EC	Available	6	3	X
Base oval center Y	RSLT.BEY	Available	6	3	Y
Base oval center Y: Measured value	RSLT.BEY:MS	Available	6	3	Y
Base oval center Y: Absolute measured value	RSLT.BEY:AB	Available	6	3	-
Base oval center Y: Encoder measured value	RSLT.BEY:EC	Available	6	3	Y
Base oval center XY	RSLT.BEXY	Available	6	3	-
Base oval center XY: Measured value	RSLT.BEXY:MS	Available	6	3	-
Base oval center XY: Absolute measured value	RSLT.BEXY:AB	Available	6	3	-
Base oval center XY: Encoder measured value	RSLT.BEXY:EC	Available	6	3	-
Base oval angle	RSLT.BET	Available	3	3	-
Base oval angle: Measured value	RSLT.BET:MS	Available	3	3	-
Base oval angle: Absolute measured value	RSLT.BET:AB	Available	3	3	-
Base free curve X	RSLT.BFX[+]	Available	5	3	X
Base free curve X: Measured value	RSLT.BFX[+]:MS	Available	5	3	X
Base free curve X: Absolute measured value	RSLT.BFX[+]:AB	Available	5	3	-
Base free curve X: Encoder measured value	RSLT.BFX[+]:EC	Available	5	3	X
Base free curve Y	RSLT.BFY[+]	Available	5	3	Y
Base free curve Y: Measured value	RSLT.BFY[+]:MS	Available	5	3	Y
Base free curve Y: Absolute measured value	RSLT.BFY[+]:AB	Available	5	3	-
Base free curve Y: Encoder measured value	RSLT.BFY[+]:EC	Available	5	3	Y
Base free curve XY	RSLT.BFXY[+]	Available	5	3	-
Base free curve XY: Measured value	RSLT.BFXY[+]:MS	Available	5	3	-
Base free curve XY: Absolute measured value	RSLT.BFXY[+]:AB	Available	5	3	-
Base free curve XY: Encoder measured value	RSLT.BFXY[+]:EC	Available	5	3	-
Difference	RSLT.DIFF[+]	Available	5	3	-
Difference: Measured value	RSLT.DIFF[+]:MS	Available	5	3	-
No. of edges	RSLT.N[+]	Unsigned	4	0	-
No. of edges: Measured value	RSLT.N[+]:MS	Unsigned	4	0	-
Edge position X	RSLT.X[+]	Available	5	3	X
Edge position X: Measured value	RSLT.X[+]:MS	Available	5	3	X
Edge position X: Absolute measured value	RSLT.X[+]:AB	Available	5	3	-
Edge position X: Encoder measured value	RSLT.X[+]:EC	Available	5	3	X
Edge position Y	RSLT.Y[+]	Available	5	3	Y
Edge position Y: Measured value	RSLT.Y[+]:MS	Available	5	3	Y
Edge position Y: Absolute measured value	RSLT.Y[+]:AB	Available	5	3	-
Edge position Y: Encoder measured value	RSLT.Y[+]:EC	Available	5	3	Y
Edge position XY	RSLT.XY[+]	Available	5	3	-
Edge position XY: Measured value	RSLT.XY[+]:MS	Available	5	3	-
Edge position XY: Absolute measured value	RSLT.XY[+]:AB	Available	5	3	-
Edge position XY: Encoder measured value	RSLT.XY[+]:EC	Available	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Edge angle	RSLT.T[+]	Available	3	3	-
Edge angle: Measured value	RSLT.T[+]:MS	Available	3	3	-
Edge angle: Absolute measured value	RSLT.T[+]:AB	Available	3	3	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-

* [*] represents an index to a detected defect, and [+] represents an index to a segment.

Multi-Profile Defect Unit

Result item	Name	Numerical value format			Scaling target
		Sign	No. of integer digits	No. of decimal places	
Total Detected Segments	RSLT.TDSGN	Unsigned	6	0	-
Total Detected Segments: Measured value	RSLT.TDSGN:MS	Unsigned	6	0	-
Total Detected Segments: Judged value	RSLT.TDSGN:JG	Unsigned	1	0	-
Detected Segments (min.)	RSLT.DSGNL	Unsigned	6	0	-
Detected Segments (min.): Measured value	RSLT.DSGNL:MS	Unsigned	6	0	-
Detected Segments (min.): Judgment value	RSLT.DSGNL:JG	Unsigned	1	0	-
Total Defect Count	RSLT.TSTN	Unsigned	4	0	-
Defect Count: Measured value	RSLT.TSTN:MS	Unsigned	4	0	-
Defect Count: Judgment value	RSLT.TSTN:JG	Unsigned	1	0	-
Total Defect Size	RSLT.TSTG	Unsigned	7	3	-
Total Defect Size: Measured value	RSLT.TSTG:MS	Unsigned	7	3	-
Total Defect Size: Judgment value	RSLT.TSTG:JG	Unsigned	1	0	-
Total Defect Level	RSLT.TSTL	Unsigned	5	3	-
Total Defect Level: Measured value	RSLT.TSTL:MS	Unsigned	5	3	-
Total Defect Level: Judgment value	RSLT.TSTL:JG	Unsigned	1	0	-
Total Defect Width	RSLT.TSTW	Unsigned	4	0	-
Total Defect Width: Measured value	RSLT.TSTW:MS	Unsigned	4	0	-
Total Defect Width: Judgment value	RSLT.TSTW:JG	Unsigned	1	0	-
Number of Intersections	RSLT.MXCN	Unsigned	4	0	-
Number of Intersections: Measured value	RSLT.MXCN:MS	Unsigned	4	0	-
Number of Intersections: Judgment value	RSLT.MXCN:JG	Unsigned	1	0	-
Total Corner Defect Count	RSLT.CSTN	Unsigned	4	0	-
Total Corner Defect Count: Measured value	RSLT.CSTN:MS	Unsigned	4	0	-
Total Corner Defect Count: Judgment value	RSLT.CSTN:JG	Unsigned	1	0	-
Defect Size	RSLT.STG[st]	Unsigned	7	3	-
Defect Size: Measured value	RSLT.STG[st]:MS	Unsigned	7	3	-
Defect Size: Judgment value	RSLT.STG:JG	Unsigned	1	0	-
Maximum Defect Size	RSLT.STGHI	Unsigned	7	3	-
Maximum Defect Size: Measured value	RSLT.STGHI:MS	Unsigned	7	3	-
Maximum Defect Size: Judgment value	RSLT.STGHI:JG	Unsigned	1	0	-
Minimum Defect Size	RSLT.STGLO	Unsigned	7	3	-
Minimum Defect Size: Measured value	RSLT.STGLO:MS	Unsigned	7	3	-
Minimum Defect Size: Judgment value	RSLT.STGLO:JG	Unsigned	1	0	-
Defect Level	RSLT.STL[st]	Unsigned	5	3	-
Defect Level: Measured value	RSLT.STL[st]:MS	Unsigned	5	3	-
Defect Level: Judgment value	RSLT.STL:JG	Unsigned	1	0	-
Maximum Defect Level	RSLT.STLHI	Unsigned	5	3	-
Maximum Defect Level: Measured value	RSLT.STLHI:MS	Unsigned	5	3	-
Maximum Defect Level: Judgment value	RSLT.STLHI:JG	Unsigned	1	0	-
Minimum Defect Level	RSLT.STLLO	Unsigned	5	3	-
Minimum Defect Level : Measured value	RSLT.STLLO:MS	Unsigned	5	3	-
Minimum Defect Level : Judgment value	RSLT.STLLO:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Defect Width	RSLT.STW[st]	Unsigned	4	0	-
Defect Width: Measured value	RSLT.STW[st]:MS	Unsigned	4	0	-
Defect Width: Judgment value	RSLT.STW:JG	Unsigned	1	0	-
Maximum Defect Width	RSLT.STWHI	Unsigned	4	0	-
Maximum Defect Width: Measured value	RSLT.STWHI:MS	Unsigned	4	0	-
Maximum Defect Width: Judgment value	RSLT.STWHI:JG	Unsigned	1	0	-
Minimum Defect Width	RSLT.STWLO	Unsigned	4	0	-
Minimum Defect Width: Measured value	RSLT.STWLO:MS	Unsigned	4	0	-
Minimum Defect Width: Judgment value	RSLT.STWLO:JG	Unsigned	1	0	-
Defect XY Position	RSLT.STXY[st]	Available	5	3	-
Defect XY Position: Measured value	RSLT.STXY[st]:MS	Available	5	3	-
Defect XY Position: Absolute measured value	RSLT.STXY[st]:AB	Available	5	3	-
Defect XY Position: Encoder pulse count	RSLT.STXY[st]:EC	Available	5	3	-
Defect X Position	RSLT.STX[st]	Available	5	3	X
Defect X Position: Measured value	RSLT.STX[st]:MS	Available	5	3	X
Defect X Position: Absolute measured value	RSLT.STX[st]:AB	Available	5	3	-
Defect X Position: Encoder pulse count	RSLT.STX[st]:EC	Available	5	3	X
Defect X Position: Judgment value	RSLT.STX:JG	Unsigned	1	0	-
Maximum Defect X Position	RSLT.STXHI	Available	5	3	X
Maximum Defect X Position : Measured value	RSLT.STXHI:MS	Available	5	3	X
Maximum Defect X Position : Encoder pulse count	RSLT.STXHI:EC	Available	5	3	X
Maximum Defect X Position : Judgment value	RSLT.STXHI:JG	Unsigned	1	0	-
Minimum Defect X Position	RSLT.STXLO	Available	5	3	X
Minimum Defect X Position: Measured value	RSLT.STXLO:MS	Available	5	3	X
Minimum Defect X Position: Encoder pulse count	RSLT.STXLO:EC	Available	5	3	X
Minimum Defect X Position: Judgment value	RSLT.STXLO:JG	Unsigned	1	0	-
Defect Y Position	RSLT.STY[st]	Available	5	3	Y
Defect Y Position: Measured value	RSLT.STY[st]:MS	Available	5	3	Y
Defect Y Position: Absolute measured value	RSLT.STY[st]:AB	Available	5	3	-
Defect Y Position: Encoder pulse count	RSLT.STY[st]:EC	Available	5	3	Y
Defect Y Position: Judgment value	RSLT.STY:JG	Unsigned	1	0	-
Maximum Defect Y Position	RSLT.STYHI	Available	5	3	Y
Maximum Defect Y Position : Measured value	RSLT.STYHI:MS	Available	5	3	Y
Maximum Defect Y Position : Encoder pulse count	RSLT.STYHI:EC	Available	5	3	Y
Maximum Defect Y Position : Judgment value	RSLT.STYHI:JG	Unsigned	1	0	-
Minimum Defect Y Position	RSLT.STYLO	Available	5	3	Y
Minimum Defect Y Position: Measured value	RSLT.STYLO:MS	Available	5	3	Y
Minimum Defect Y Position: Encoder pulse count	RSLT.STYLO:EC	Available	5	3	Y
Minimum Defect Y Position: Judgment value	RSLT.STYLO:JG	Unsigned	1	0	-
Defect angle	RSLT.STT[st]	Available	3	3	-
Defect angle: Measured value	RSLT.STT[st]:MS	Available	3	3	-
Defect angle: Absolute measured value	RSLT.STT[st]:AB	Available	3	3	-
Defect Start XY1 Position	RSLT.STBXY1[st]	Available	5	3	-
Defect Start XY1 Position: Measured value	RSLT.STBXY1[st]:MS	Available	5	3	-
Defect Start XY1 Position: Absolute measured value	RSLT.STBXY1[st]:AB	Available	5	3	-
Defect Start XY1 Position: Encoder pulse count	RSLT.STBXY1[st]:EC	Available	5	3	-
Defect Start X1 Position	RSLT.STBX1[st]	Available	5	3	X
Defect Start X1 Position: Measured value	RSLT.STBX1[st]:MS	Available	5	3	X
Defect Start X1 Position: Absolute measured value	RSLT.STBX1[st]:AB	Available	5	3	-
Defect Start X1 Position: Encoder pulse count	RSLT.STBX1[st]:EC	Available	5	3	X
Defect Start Y1 Position	RSLT.STBY1[st]	Available	5	3	Y
Defect Start Y1 Position: Measured value	RSLT.STBY1[st]:MS	Available	5	3	Y
Defect Start Y1 Position: Absolute measured value	RSLT.STBY1[st]:AB	Available	5	3	-
Defect Start Y1 Position: Encoder pulse count	RSLT.STBY1[st]:EC	Available	5	3	Y
Defect Top XY Position	RSLT.STTXY[st]	Available	5	3	-
Defect Top XY Position: Measured value	RSLT.STTXY[st]:MS	Available	5	3	-
Defect Top XY Position: Absolute measured value	RSLT.STTXY[st]:AB	Available	5	3	-
Defect Top XY Position: Encoder pulse count	RSLT.STTXY[st]:EC	Available	5	3	-
Defect Top X Position	RSLT.STTX[st]	Available	5	3	X
Defect Top X Position: Measured value	RSLT.STTX[st]:MS	Available	5	3	X

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Defect Top X Position: Absolute measured value	RSLT.STTX[st]:AB	Available	5	3	-
Defect Top X Position: Encoder pulse count	RSLT.STTX[st]:EC	Available	5	3	X
Defect Top Y Position	RSLT.STTY[st]	Available	5	3	Y
Defect Top Y Position: Measured value	RSLT.STTY[st]:MS	Available	5	3	Y
Defect Top Y Position: Absolute measured value	RSLT.STTY[st]:AB	Available	5	3	-
Defect Top Y Position: Encoder pulse count	RSLT.STTY[st]:EC	Available	5	3	Y
Defect Start XY2 Position	RSLT.STBXY2[st]	Available	5	3	-
Defect Start XY2 Position: Measured value	RSLT.STBXY2[st]:MS	Available	5	3	-
Defect Start XY2 Position: Absolute measured value	RSLT.STBXY2[st]:AB	Available	5	3	-
Defect Start XY2 Position: Encoder pulse count	RSLT.STBXY2[st]:EC	Available	5	3	-
Defect Start X2 Position	RSLT.STBX2[st]	Available	5	3	X
Defect Start X2 Position: Measured value	RSLT.STBX2[st]:MS	Available	5	3	X
Defect Start X2 Position: Absolute measured value	RSLT.STBX2[st]:AB	Available	5	3	-
Defect Start X2 Position: Encoder pulse count	RSLT.STBX2[st]:EC	Available	5	3	X
Defect Start Y2 Position	RSLT.STBY2[st]	Available	5	3	Y
Defect Start Y2 Position: Measured value	RSLT.STBY2[st]:MS	Available	5	3	Y
Defect Start Y2 Position: Absolute measured value	RSLT.STBY2[st]:AB	Available	5	3	-
Defect Start Y2 Position: Encoder pulse count	RSLT.STBY2[st]:EC	Available	5	3	Y
Defect start segment Number	RSLT.STSN[st]	Unsigned	4	0	-
Defect start segment Number: Measured value	RSLT.STSN[st]:MS	Unsigned	4	0	-
Defect top segment Number	RSLT.STTN[st]	Unsigned	4	0	-
Defect top segment Number: Measured value	RSLT.STTN[st]:MS	Unsigned	4	0	-
Defect end segment Number	RSLT.STEN[st]	Unsigned	4	0	-
Defect end segment Number: Measured value	RSLT.STEN[st]:MS	Unsigned	4	0	-
Region No.	RSLT.RGNO[st]	Unsigned	3	0	-
Region No.: Measured value	RSLT.RGNO[st]:MS	Unsigned	3	0	-
Corner Area: Judgment value	RSLT.CGL:JG	Unsigned	1	0	-
Corner Area (max.)	RSLT.CGLHI	Unsigned	7	2	-
Corner Area (max.): Measured value	RSLT.CGLHI:MS	Unsigned	7	2	-
Corner Area (max.): Judgment value	RSLT.CGLHI:JG	Unsigned	1	0	-
Corner Area (min.)	RSLT.CGLLO	Unsigned	7	2	-
Corner Area (min.): Measured value	RSLT.CGLLO:MS	Unsigned	7	2	-
Corner Area (min.): Judgment value	RSLT.CGLLO:JG	Unsigned	1	0	-
Corner Distance: Judgment value	RSLT.CDSL:JG	Unsigned	1	0	-
Corner Distance (max.)	RSLT.CDSLHI	Unsigned	5	2	-
Corner Distance (max.): Measured value	RSLT.CDSLHI:MS	Unsigned	5	2	-
Corner Distance (max.): Judgment value	RSLT.CDSLHI:JG	Unsigned	1	0	-
Corner Distance (min.)	RSLT.CDSLLO	Unsigned	5	2	-
Corner Distance (min.): Measured value	RSLT.CDSLLO:MS	Unsigned	5	2	-
Corner Distance (min.): Judgment value	RSLT.CDSLLO:JG	Unsigned	1	0	-
XY Position for Position Adjustment Reference	RSLT.ADJXY	Available	5	3	-
X Position for Position Adjustment Reference	RSLT.ADJX	Available	5	3	-
Y Position for Position Adjustment Reference	RSLT.ADJY	Available	5	3	-
Angle for Position Adjustment Reference	RSLT.ADJT	Available	3	3	-
No. Points for Target Model	RSLT.FLEX[0].BMN	Unsigned	1	0	-
No. Points for Target Model: Measured value	RSLT.FLEX[0].BMN:MS	Unsigned	1	0	-
Inspection Region 0: Circle Model Radius	RSLT.FLEX[0].BCR	Unsigned	6	3	L
Inspection Region 0: Circle Model Radius: Measured value	RSLT.FLEX[0].BCR:MS	Unsigned	6	3	L
Inspection Region 0:Circle Model Radius: Absolute measured value	RSLT.FLEX[0].BCR:AB	Unsigned	6	3	-
Inspection Region 0: Circle Model Center XY	RSLT.FLEX[0].BCXY	Available	6	3	-
Inspection Region 0: Circle Model Center XY: Measured value	RSLT.FLEX[0].BCXY:MS	Available	6	3	-
Inspection Region 0: Circle Model Center XY: Absolute measured value	RSLT.FLEX[0].BCXY:AB	Available	6	3	-
Inspection Region 0: Circle Model Center XY: Encoder pulse count	RSLT.FLEX[0].BCXY:EC	Available	6	3	-
Inspection Region 0: Circle Model Center X	RSLT.FLEX[0].BCX	Available	6	3	X
Inspection Region 0: Circle Model Center X: Measured value	RSLT.FLEX[0].BCX:MS	Available	6	3	X

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Inspection Region 0: Circle Model Center X: Absolute measured value	RSLT.FLEX[0].BCX:AB	Available	6	3	-
Inspection Region 0: Circle Model Center X: Encoder pulse count	RSLT.FLEX[0].BCX:EC	Available	6	3	X
Inspection Region 0: Circle Model Center Y	RSLT.FLEX[0].BCY	Available	6	3	Y
Inspection Region 0: Circle Model Center Y: Measured value	RSLT.FLEX[0].BCY:MS	Available	6	3	Y
Inspection Region 0: Circle Model Center Y: Absolute measured value	RSLT.FLEX[0].BCY:AB	Available	6	3	-
Inspection Region 0: Circle Model Center Y: Encoder pulse count	RSLT.FLEX[0].BCY:EC	Available	6	3	Y
Inspection Region 0: Circle Model Center XY / radius	RSLT.FLEX[0].BCXYR	Available	6	3	-
Inspection Region 0: Circle Model Center XY / radius: Measured value	RSLT.FLEX[0].BCXYR:MS	Available	6	3	-
Inspection Region 0: Circle Model Center XY / radius: Absolute measured value	RSLT.FLEX[0].BCXYR:AB	Available	6	3	-
Inspection Region 0: Circle Model Center XY / radius: Encoder pulse count	RSLT.FLEX[0].BCXYR:EC	Available	6	3	-
Inspection Region 0: Oval Model Radius 1	RSLT.FLEX[0].BER1	Unsigned	6	3	L
Inspection Region 0: Oval Model Radius 1: Measured value	RSLT.FLEX[0].BER1:MS	Unsigned	6	3	L
Inspection Region 0: Oval Model Radius 1: Absolute measured value	RSLT.FLEX[0].BER1:AB	Unsigned	6	3	-
Inspection Region 0: Oval Model Radius 2	RSLT.FLEX[0].BER2	Unsigned	6	3	L
Inspection Region 0: Oval Model Radius 2: Measured value	RSLT.FLEX[0].BER2:MS	Unsigned	6	3	L
Inspection Region 0: Oval Model Radius 2: Absolute measured value	RSLT.FLEX[0].BER2:AB	Unsigned	6	3	-
Inspection Region 0: Oval Model Center XY	RSLT.FLEX[0].BEXY	Available	6	3	-
Inspection Region 0: Oval Model Center XY: Measured value	RSLT.FLEX[0].BEXY:MS	Available	6	3	-
Inspection Region 0: Oval Model Center XY: Absolute measured value	RSLT.FLEX[0].BEXY:AB	Available	6	3	-
Inspection Region 0: Oval Model Center XY: Encoder pulse count	RSLT.FLEX[0].BEXY:EC	Available	6	3	-
Inspection Region 0: Oval Model Center X	RSLT.FLEX[0].BEX	Available	6	3	X
Inspection Region 0: Oval Model Center X: Measured value	RSLT.FLEX[0].BEX:MS	Available	6	3	X
Inspection Region 0: Oval Model Center X: Absolute measured value	RSLT.FLEX[0].BEX:AB	Available	6	3	-
Inspection Region 0: Oval Model Center X: Encoder pulse count	RSLT.FLEX[0].BEX:EC	Available	6	3	X
Inspection Region 0: Oval Model Center Y	RSLT.FLEX[0].BEY	Available	6	3	Y
Inspection Region 0: Oval Model Center Y: Measured value	RSLT.FLEX[0].BEY:MS	Available	6	3	Y
Inspection Region 0: Oval Model Center Y: Absolute measured value	RSLT.FLEX[0].BEY:AB	Available	6	3	-
Inspection Region 0: Oval Model Center Y: Encoder pulse count	RSLT.FLEX[0].BEY:EC	Available	6	3	Y
Inspection Region 0: Oval Model Angle	RSLT.FLEX[0].BET	Available	3	3	-
Inspection Region 0: Oval Model Angle: Measured value	RSLT.FLEX[0].BET:MS	Available	3	3	-
Inspection Region 0: Oval Model Angle: Absolute measured value	RSLT.FLEX[0].BET:AB	Available	3	3	-
Inspection Region 0: Line Model XY Position 1	RSLT.FLEX[0].BLXY1	Available	5	3	-
Inspection Region 0: Line Model XY Position 1: Measured value	RSLT.FLEX[0].BLXY1:MS	Available	5	3	-
Inspection Region 0: Line Model XY Position 1: Absolute measured value	RSLT.FLEX[0].BLXY1:AB	Available	5	3	-
Inspection Region 0: Line Model XY Position 1: Encoder pulse count	RSLT.FLEX[0].BLXY1:EC	Available	5	3	-
Inspection Region 0: Line Model X Position 1	RSLT.FLEX[0].BLX1	Available	5	3	X
Inspection Region 0: Line Model X Position 1: Measured value	RSLT.FLEX[0].BLX1:MS	Available	5	3	X

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Inspection Region 0: Line Model X Position 1: Absolute measured value	RSLT.FLEX[0].BLX1:AB	Available	5	3	-
Inspection Region 0: Line Model X Position 1: Encoder pulse count	RSLT.FLEX[0].BLX1:EC	Available	5	3	X
Inspection Region 0: Line Model Y Position 1 Measured value	RSLT.FLEX[0].BLY1	Available	5	3	Y
Inspection Region 0: Line Model Y Position 1: Measured value	RSLT.FLEX[0].BLY1:MS	Available	5	3	Y
Inspection Region 0: Line Model Y Position 1: Absolute measured value	RSLT.FLEX[0].BLY1:AB	Available	5	3	-
Inspection Region 0: Line Model Y Position 1: Encoder pulse count	RSLT.FLEX[0].BLY1:EC	Available	5	3	Y
Inspection Region 0: Line Model XY Position 2 Measured value	RSLT.FLEX[0].BLXY2	Available	5	3	-
Inspection Region 0: Line Model XY Position 2: Measured value	RSLT.FLEX[0].BLXY2:MS	Available	5	3	-
Inspection Region 0: Line Model XY Position 2: Absolute measured value	RSLT.FLEX[0].BLXY2:AB	Available	5	3	-
Inspection Region 0: Line Model XY Position 2: Encoder pulse count	RSLT.FLEX[0].BLXY2:EC	Available	5	3	-
Inspection Region 0: Line Model X Position 2 Measured value	RSLT.FLEX[0].BLX2	Available	5	3	X
Inspection Region 0: Line Model X Position 2: Measured value	RSLT.FLEX[0].BLX2:MS	Available	5	3	X
Inspection Region 0: Line Model X Position 2: Absolute measured value	RSLT.FLEX[0].BLX2:AB	Available	5	3	-
Inspection Region 0: Line Model X Position 2: Encoder pulse count	RSLT.FLEX[0].BLX2:EC	Available	5	3	X
Inspection Region 0: Line Model Y Position 2 Measured value	RSLT.FLEX[0].BLY2	Available	5	3	Y
Inspection Region 0: Line Model Y Position 2: Measured value	RSLT.FLEX[0].BLY2:MS	Available	5	3	Y
Inspection Region 0: Line Model Y Position 2: Absolute measured value	RSLT.FLEX[0].BLY2:AB	Available	5	3	-
Inspection Region 0: Line Model Y Position 2: Encoder pulse count	RSLT.FLEX[0].BLY2:EC	Available	5	3	Y
Inspection Region 0: Line Model Center XY Measured value	RSLT.FLEX[0].BLXY	Available	5	3	-
Inspection Region 0: Line Model Center XY: Measured value	RSLT.FLEX[0].BLXY:MS	Available	5	3	-
Inspection Region 0: Line Model Center XY: Absolute measured value	RSLT.FLEX[0].BLXY:AB	Available	5	3	-
Inspection Region 0: Line Model Center XY: Encoder pulse count	RSLT.FLEX[0].BLXY:EC	Available	5	3	-
Inspection Region 0: Line Model Center X Measured value	RSLT.FLEX[0].BLX	Available	5	3	X
Inspection Region 0: Line Model Center X: Measured value	RSLT.FLEX[0].BLX:MS	Available	5	3	X
Inspection Region 0: Line Model Center X: Absolute measured value	RSLT.FLEX[0].BLX:AB	Available	5	3	-
Inspection Region 0: Line Model Center X: Encoder pulse count	RSLT.FLEX[0].BLX:EC	Available	5	3	X
Inspection Region 0: Line Model Center Y Measured value	RSLT.FLEX[0].BLY	Available	5	3	Y
Inspection Region 0: Line Model Center Y: Measured value	RSLT.FLEX[0].BLY:MS	Available	5	3	Y
Inspection Region 0: Line Model Center Y: Absolute measured value	RSLT.FLEX[0].BLY:AB	Available	5	3	-
Inspection Region 0: Line Model Center Y: Encoder pulse count	RSLT.FLEX[0].BLY:EC	Available	5	3	Y
Inspection Region 0: Line Model Angle Measured value	RSLT.FLEX[0].BLT	Available	3	3	-
Inspection Region 0: Line Model Angle: Measured value	RSLT.FLEX[0].BLT:MS	Available	3	3	-
Inspection Region 0: Line Model Angle: Absolute measured value	RSLT.FLEX[0].BLT:AB	Available	3	3	-
Inspection Region 0: Rho and Theta of Reference Line	RSLT.FLEX[0].BLRTH	Available	5	3	-
Inspection Region 0: Rho and Theta of Reference Line: Measured value	RSLT.FLEX[0].BLRTH:MS	Available	5	3	-
Inspection Region 0: Rho and Theta of Reference Line: Absolute measured value	RSLT.FLEX[0].BLRTH:AB	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Inspection Region 0: Rho and Theta of Reference Line: Encoder pulse count	RSLT.FLEX[0].BLRTH:EC	Available	5	3	-
Inspection Region 0: Rho of Reference Line	RSLT.FLEX[0].BLR	Available	5	3	-
Inspection Region 0: Rho of Reference Line: Measured value	RSLT.FLEX[0].BLR:MS	Available	5	3	-
Inspection Region 0: Rho of Reference Line: Absolute measured value	RSLT.FLEX[0].BLR:AB	Available	5	3	-
Inspection Region 0: Rho of Reference Line: Encoder pulse count	RSLT.FLEX[0].BLR:EC	Available	5	3	-
Inspection Region 0: Theta of Reference Line	RSLT.FLEX[0].BLTH	Available	3	3	-
Inspection Region 0: Theta of Reference Line: Measured value	RSLT.FLEX[0].BLTH:MS	Available	3	3	-
Inspection Region 0: Theta of Reference Line: Absolute measured value	RSLT.FLEX[0].BLTH:AB	Available	3	3	-
Inspection Region 0: Theta of Reference Line: Encoder pulse count	RSLT.FLEX[0].BLTH:EC	Available	3	3	-
Inspection Region 0: Segment Start Position of Model Line Calculation Region	RSLT.FLEX[0].CEGID	Unsigned	3	0	-
Inspection Region 0: Number of Segments of Model Line Calculation Region	RSLT.FLEX[0].CEGN	Unsigned	3	0	-
Inspection Region 0: Segment Start Position of Defect Detection Region	RSLT.FLEX[0].IEGID	Unsigned	3	0	-
Inspection Region 0: Number of Segments of Defect Detection Region	RSLT.FLEX[0].IEGN	Unsigned	3	0	-
Inspection Region 0: Defect detection region start point coordinate XY	RSLT.FLEX[0].IRGSXY	Available	5	3	-
Inspection Region 0: Defect detection region start point coordinate XY: Measured value	RSLT.FLEX[0].IRGSXY:MS	Available	5	3	-
Inspection Region 0: Defect detection region start point coordinate XY: Absolute measured value	RSLT.FLEX[0].IRGSXY:AB	Available	5	3	-
Inspection Region 0: Defect detection region start point coordinate XY: Encoder pulse count	RSLT.FLEX[0].IRGSXY:EC	Available	5	3	-
Inspection Region 0: Defect detection region start point coordinate X	RSLT.FLEX[0].IRGSX	Available	5	3	X
Inspection Region 0: Defect detection region start point coordinate X: Measured value	RSLT.FLEX[0].IRGSX:MS	Available	5	3	X
Inspection Region 0: Defect detection region start point coordinate X: Absolute measured value	RSLT.FLEX[0].IRGSX:AB	Available	5	3	-
Inspection Region 0: Defect detection region start point coordinate X: Encoder pulse count	RSLT.FLEX[0].IRGSX:EC	Available	5	3	X
Inspection Region 0: Defect detection region start point coordinate Y	RSLT.FLEX[0].IRGSY	Available	5	3	Y
Inspection Region 0: Defect detection region start point coordinate Y: Measured value	RSLT.FLEX[0].IRGSY:MS	Available	5	3	Y
Inspection Region 0: Defect detection region start point coordinate Y: Absolute measured value	RSLT.FLEX[0].IRGSY:AB	Available	5	3	-
Inspection Region 0: Defect detection region start point coordinate Y: Encoder pulse count	RSLT.FLEX[0].IRGSY:EC	Available	5	3	Y
Inspection Region 0: Defect detection region end point coordinate XY	RSLT.FLEX[0].IRGEXY	Available	5	3	-
Inspection Region 0: Defect detection region end point coordinate XY: Measured value	RSLT.FLEX[0].IRGEXY:MS	Available	5	3	-
Inspection Region 0: Defect detection region end point coordinate XY: Absolute measured value	RSLT.FLEX[0].IRGEXY:AB	Available	5	3	-
Inspection Region 0: Defect detection region end point coordinate XY: Encoder pulse count	RSLT.FLEX[0].IRGEXY:EC	Available	5	3	-
Inspection Region 0: Defect detection region end point coordinate X	RSLT.FLEX[0].IRGEX	Available	5	3	X
Inspection Region 0: Defect detection region end point coordinate X: Measured value	RSLT.FLEX[0].IRGEX:MS	Available	5	3	X
Inspection Region 0: Defect detection region end point coordinate X: Absolute measured value	RSLT.FLEX[0].IRGEX:AB	Available	5	3	-
Inspection Region 0: Defect detection region end point coordinate X: Encoder pulse count	RSLT.FLEX[0].IRGEX:EC	Available	5	3	X

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Inspection Region 0: Defect detection region end point coordinate Y	RSLT.FLEX[0].IRGEY	Available	5	3	Y
Inspection Region 0: Defect detection region end point coordinate Y: Measured value	RSLT.FLEX[0].IRGEY:MS	Available	5	3	Y
Inspection Region 0: Defect detection region end point coordinate Y: Absolute measured value	RSLT.FLEX[0].IRGEY:AB	Available	5	3	-
Inspection Region 0: Defect detection region end point coordinate Y: Encoder pulse count	RSLT.FLEX[0].IRGEY:EC	Available	5	3	Y
Inspection Region 0: Contour Length	RSLT.FLEX[0].CLEN	Unsigned	5	3	-
Inspection Region 0: Contour Length: Measured value	RSLT.FLEX[0].CLEN:MS	Unsigned	5	3	-
Inspection Region 0 (edge-related result): Segment XY Edge Position	RSLT.FLEX[0].XY[s]	Available	5	3	-
Inspection Region 0 (edge-related result): Segment XY Edge Position: Measured value	RSLT.FLEX[0].XY[s]:MS	Available	5	3	-
Inspection Region 0 (edge-related result): Segment XY Edge Position: Absolute measured value	RSLT.FLEX[0].XY[s]:AB	Available	5	3	-
Inspection Region 0 (edge-related result): Segment XY Edge Position: Encoder pulse count	RSLT.FLEX[0].XY[s]:EC	Available	5	3	-
Inspection Region 0 (edge-related result): Segment X Edge Position	RSLT.FLEX[0].X[s]	Available	5	3	X
Inspection Region 0 (edge-related result): Segment X Edge Position: Measured value	RSLT.FLEX[0].X[s]:MS	Available	5	3	X
Inspection Region 0 (edge-related result): Segment X Edge Position: Absolute measured value	RSLT.FLEX[0].X[s]:AB	Available	5	3	-
Inspection Region 0 (edge-related result): Segment X Edge Position: Encoder pulse count	RSLT.FLEX[0].X[s]:EC	Available	5	3	X
Inspection Region 0 (edge-related result): Segment Y Edge Position	RSLT.FLEX[0].Y[s]	Available	5	3	Y
Inspection Region 0 (edge-related result): Segment Y Edge Position: Measured value	RSLT.FLEX[0].Y[s]:MS	Available	5	3	Y
Inspection Region 0 (edge-related result): Segment Y Edge Position: Absolute measured value	RSLT.FLEX[0].Y[s]:AB	Available	5	3	-
Inspection Region 0 (edge-related result): Segment Y Edge Position: Encoder pulse count	RSLT.FLEX[0].Y[s]:EC	Available	5	3	Y
Inspection Region 0 (edge-related result): Segment Edge Angle	RSLT.FLEX[0].T[s]	Available	3	3	-
Inspection Region 0 (edge-related result): Segment Edge Angle: Measured value	RSLT.FLEX[0].T[s]:MS	Available	3	3	-
Inspection Region 0 (edge-related result): Segment Edge Angle: Absolute measured value	RSLT.FLEX[0].T[s]:AB	Available	3	3	-
Inspection Region 0 (edge-related result): Defect to Threshold Difference	RSLT.FLEX[0].DIFF[s]	Available	5	3	-
Inspection Region 0 (edge-related result): Defect to Threshold Difference: Measured value	RSLT.FLEX[0].DIFF[s]:MS	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual XY	RSLT.FLEX[0].BFXY[s]	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual XY: Measured value	RSLT.FLEX[0].BFXY[s]:MS	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual XY: Absolute measured value	RSLT.FLEX[0].BFXY[s]:AB	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual XY: Encoder pulse count	RSLT.FLEX[0].BFXY[s]:EC	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual X	RSLT.FLEX[0].BFX[s]	Available	5	3	X
Inspection Region 0 (free curve-related result): Free Curve Model Individual X: Measured value	RSLT.FLEX[0].BFX[s]:MS	Available	5	3	X
Inspection Region 0 (free curve-related result): Free Curve Model Individual X: Absolute measured value	RSLT.FLEX[0].BFX[s]:AB	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual X: Encoder pulse count	RSLT.FLEX[0].BFX[s]:EC	Available	5	3	X
Inspection Region 0 (free curve-related result): Free Curve Model Individual Y	RSLT.FLEX[0].BFY[s]	Available	5	3	Y

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Inspection Region 0 (free curve-related result): Free Curve Model Individual Y: Measured value	RSLT.FLEX[0].BFY[s]:MS	Available	5	3	Y
Inspection Region 0 (free curve-related result): Free Curve Model Individual Y: Absolute measured value	RSLT.FLEX[0].BFY[s]:AB	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual Y: Encoder pulse count	RSLT.FLEX[0].BFY[s]:EC	Available	5	3	Y
Inspection Region 1	RSLT.FLEX[1]***				
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Inspection Region 127	RSLT.FLEX[127]***				
Intersection 0: Corner Defect Count	RSLT.CORNER[0].CSTEN	Unsigned	1	0	-
Intersection 0: Corner Defect Count: Measured value	RSLT.CORNER[0].CSTEN:MS	Unsigned	4	3	-
Intersection 0: Corner Area	RSLT.CORNER[0].CGL	Unsigned	7	2	-
Intersection 0: Corner Area: Measured value	RSLT.CORNER[0].CGL:MS	Unsigned	7	2	-
Intersection 0: Corner Distance	RSLT.CORNER[0].CDSL	Unsigned	5	2	-
Intersection 0: Corner Distance: Measured value	RSLT.CORNER[0].CDSL:MS	Unsigned	5	2	-
Intersection 0: Intersection No.	RSLT.CORNER[0].CRID	Unsigned	3	0	-
Intersection 0: Intersection No.: Measured value	RSLT.CORNER[0].CRID:MS	Unsigned	3	0	-
Intersection 0: Intersection Detection (Presence/Absence)	RSLT.CORNER[0].CREN	Unsigned	1	0	-
Intersection 0: Intersection Detection (Presence/Absence): Measured value	RSLT.CORNER[0].CREN:MS	Unsigned	1	0	-
Intersection 0: Intersection coordinate XY	RSLT.CORNER[0].BFXY	Available	5	3	-
Intersection 0: Intersection coordinate XY: Measured value	RSLT.CORNER[0].BFXY:MS	Available	5	3	-
Intersection 0: Intersection coordinate XY: Absolute measured value	RSLT.CORNER[0].BFXY:AB	Available	5	3	-
Intersection 0: Intersection coordinate XY: Encoder pulse count	RSLT.CORNER[0].BFXY:EC	Available	5	3	-
Intersection 0: Intersection coordinate X	RSLT.CORNER[0].BFX	Available	5	3	X
Intersection 0: Intersection coordinate X: Measured value	RSLT.CORNER[0].BFX:MS	Available	5	3	X
Intersection 0: Intersection coordinate X: Absolute measured value	RSLT.CORNER[0].BFX:AB	Available	5	3	-
Intersection 0: Intersection coordinate X: Encoder pulse count	RSLT.CORNER[0].BFX:EC	Available	5	3	X
Intersection 0: Intersection coordinate Y	RSLT.CORNER[0].BFY	Available	5	3	Y
Intersection 0: Intersection coordinate Y: Measured value	RSLT.CORNER[0].BFY:MS	Available	5	3	Y
Intersection 0: Intersection coordinate Y: Absolute measured value	RSLT.CORNER[0].BFY:AB	Available	5	3	-
Intersection 0: Intersection coordinate Y: Encoder pulse count	RSLT.CORNER[0].BFY:EC	Available	5	3	Y
Intersection 0: Angle of One Line Forming the Intersection	RSLT.CORNER[0].CRANG1	Unsigned	4	3	-
Intersection 0: Angle of One Line Forming the Intersection: Measured value	RSLT.CORNER[0].CRANG1:MS	Unsigned	4	3	-
Intersection 0: Angle of One Line Forming the Intersection: Absolute measured value	RSLT.CORNER[0].CRANG1:AB	Unsigned	4	3	-
Intersection 0: Angle of Other Line Forming the Intersection	RSLT.CORNER[0].CRANG2	Unsigned	4	3	-
Intersection 0: Angle of Other Line Forming the Intersection: Measured value	RSLT.CORNER[0].CRANG2:MS	Unsigned	4	3	-
Intersection 0: Angle of Other Line Forming the Intersection: Absolute measured value	RSLT.CORNER[0].CRANG2:AB	Unsigned	4	3	-
Intersection 0: No. of segments	RSLT.CORNER[0].SGN	Unsigned	4	0	-
Intersection 0: No. of segments: Measured value	RSLT.CORNER[0].SGN:MS	Unsigned	4	0	-
Intersection 0: No. of detected segments	RSLT.CORNER[0].DSGN	Unsigned	4	0	-
Intersection 0: No. of detected segments: Measured value	RSLT.CORNER[0].DSGN:MS	Unsigned	4	0	-
Intersection 0: No. of the representative segment	RSLT.CORNER[0].ROSI	Unsigned	4	0	-
Intersection 0: No. of the representative segment: Measured value	RSLT.CORNER[0].ROSI:MS	Unsigned	4	0	-
Intersection 0: Line Model XY Position 1	RSLT.CORNER[0].BLXY1	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Intersection 0: Line Model XY Position 1: Measured value	RSLT.CORNER[0].BLXY1:MS	Available	5	3	-
Intersection 0: Line Model XY Position 1: Absolute measured value	RSLT.CORNER[0].BLXY1:AB	Available	5	3	-
Intersection 0: Line Model XY Position 1: Encoder pulse count	RSLT.CORNER[0].BLXY1:EC	Available	5	3	-
Intersection 0: Line Model X Position 1	RSLT.CORNER[0].BLX1	Available	5	3	X
Intersection 0: Line Model X Position 1: Measured value	RSLT.CORNER[0].BLX1:MS	Available	5	3	X
Intersection 0: Line Model X Position 1: Absolute measured value	RSLT.CORNER[0].BLX1:AB	Available	5	3	-
Intersection 0: Line Model X Position 1: Encoder pulse count	RSLT.CORNER[0].BLX1:EC	Available	5	3	X
Intersection 0: Line Model Y Position 1	RSLT.CORNER[0].BLY1	Available	5	3	Y
Intersection 0: Line Model Y Position 1: Measured value	RSLT.CORNER[0].BLY1:MS	Available	5	3	Y
Intersection 0: Line Model Y Position 1: Absolute measured value	RSLT.CORNER[0].BLY1:AB	Available	5	3	-
Intersection 0: Line Model Y Position 1: Encoder pulse count	RSLT.CORNER[0].BLY1:EC	Available	5	3	Y
Intersection 0: Line Model XY Position 2	RSLT.CORNER[0].BLXY2	Available	5	3	-
Intersection 0: Line Model XY Position 2: Measured value	RSLT.CORNER[0].BLXY2:MS	Available	5	3	-
Intersection 0: Line Model XY Position 2: Absolute measured value	RSLT.CORNER[0].BLXY2:AB	Available	5	3	-
Intersection 0: Line Model XY Position 2: Encoder pulse count	RSLT.CORNER[0].BLXY2:EC	Available	5	3	-
Intersection 0: Line Model X Position 2	RSLT.CORNER[0].BLX2	Available	5	3	X
Intersection 0: Line Model X Position 2: Measured value	RSLT.CORNER[0].BLX2:MS	Available	5	3	X
Intersection 0: Line Model X Position 2: Absolute measured value	RSLT.CORNER[0].BLX2:AB	Available	5	3	-
Intersection 0: Line Model X Position 2: Encoder pulse count	RSLT.CORNER[0].BLX2:EC	Available	5	3	X
Intersection 0: Line Model Y Position 2	RSLT.CORNER[0].BLY2	Available	5	3	Y
Intersection 0: Line Model Y Position 2: Measured value	RSLT.CORNER[0].BLY2:MS	Available	5	3	Y
Intersection 0: Line Model Y Position 2: Absolute measured value	RSLT.CORNER[0].BLY2:AB	Available	5	3	-
Intersection 0: Line Model Y Position 2: Encoder pulse count	RSLT.CORNER[0].BLY2:EC	Available	5	3	Y
Intersection 0: Line Model Center XY	RSLT.CORNER[0].BLXY	Available	5	3	-
Intersection 0: Line Model Center XY: Measured value	RSLT.CORNER[0].BLXY:MS	Available	5	3	-
Intersection 0: Line Model Center XY: Absolute measured value	RSLT.CORNER[0].BLXY:AB	Available	5	3	-
Intersection 0: Line Model Center XY: Encoder pulse count	RSLT.CORNER[0].BLXY:EC	Available	5	3	-
Intersection 0: Line Model Center X	RSLT.CORNER[0].BLX	Available	5	3	X
Intersection 0: Line Model Center X: Measured value	RSLT.CORNER[0].BLX:MS	Available	5	3	X
Intersection 0: Line Model Center X: Absolute measured value	RSLT.CORNER[0].BLX:AB	Available	5	3	-
Intersection 0: Line Model Center X: Encoder pulse count	RSLT.CORNER[0].BLX:EC	Available	5	3	X
Intersection 0: Line Model Center Y	RSLT.CORNER[0].BLY	Available	5	3	Y
Intersection 0: Line Model Center Y: Measured value	RSLT.CORNER[0].BLY:MS	Available	5	3	Y
Intersection 0: Line Model Center Y: Absolute measured value	RSLT.CORNER[0].BLY:AB	Available	5	3	-
Intersection 0: Line Model Center Y: Encoder pulse count	RSLT.CORNER[0].BLY:EC	Available	5	3	Y
Intersection 0: Line Model Angle	RSLT.CORNER[0].BLT	Available	3	3	-
Intersection 0: Line Model Angle: Measured value	RSLT.CORNER[0].BLT:MS	Available	3	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Scaling target
Intersection 0: Line Model Angle: Absolute measured value	RSLT.CORNER[0].BLT:AB	Available	3	3	-
Intersection 0: Rho and Theta of Reference Line	RSLT.CORNER[0].BLRTH	Available	5	3	-
Intersection 0: Rho and Theta of Reference Line: Measured value	RSLT.CORNER[0].BLRTH:MS	Available	5	3	-
Intersection 0: Rho and Theta of Reference Line: Absolute measured value	RSLT.CORNER[0].BLRTH:AB	Available	5	3	-
Intersection 0: Rho and Theta of Reference Line: Encoder pulse count	RSLT.CORNER[0].BLRTH:EC	Available	5	3	-
Intersection 0: Rho of Reference Line	RSLT.CORNER[0].BLR	Available	5	3	-
Intersection 0: Rho of Reference Line: Measured value	RSLT.CORNER[0].BLR:MS	Available	5	3	-
Intersection 0: Rho of Reference Line: Absolute measured value	RSLT.CORNER[0].BLR:AB	Available	5	3	-
Intersection 0: Rho of Reference Line: Encoder pulse count	RSLT.CORNER[0].BLR:EC	Available	5	3	-
Intersection 0: Theta of Reference Line	RSLT.CORNER[0].BLTH	Available	3	3	-
Intersection 0: Theta of Reference Line: Measured value	RSLT.CORNER[0].BLTH:MS	Available	3	3	-
Intersection 0: Theta of Reference Line: Absolute measured value	RSLT.CORNER[0].BLTH:AB	Available	3	3	-
Intersection 0: Theta of Reference Line: Encoder pulse count	RSLT.CORNER[0].BLTH:EC	Available	3	3	-
Intersection 0 (edge-related result): Segment XY Edge Position	RSLT.CORNER[0].XY[s]	Available	5	3	-
Intersection 0 (edge-related result): Segment XY Edge Position: Measured value	RSLT.CORNER[0].XY[s]:MS	Available	5	3	-
Intersection 0 (edge-related result): Segment XY Edge Position: Absolute measured value	RSLT.CORNER[0].XY[s]:AB	Available	5	3	-
Intersection 0 (edge-related result): Segment XY Edge Position: Encoder pulse count	RSLT.CORNER[0].XY[s]:EC	Available	5	3	-
Intersection 0 (edge-related result): Segment X Edge Position	RSLT.CORNER[0].X[s]	Available	5	3	X
Intersection 0 (edge-related result): Segment X Edge Position: Measured value	RSLT.CORNER[0].X[s]:MS	Available	5	3	X
Intersection 0 (edge-related result): Segment X Edge Position: Absolute measured value	RSLT.CORNER[0].X[s]:AB	Available	5	3	-
Intersection 0 (edge-related result): Segment X Edge Position: Encoder pulse count	RSLT.CORNER[0].X[s]:EC	Available	5	3	X
Intersection 0 (edge-related result): Segment Y Edge Position	RSLT.CORNER[0].Y[s]	Available	5	3	Y
Intersection 0 (edge-related result): Segment Y Edge Position: Measured value	RSLT.CORNER[0].Y[s]:MS	Available	5	3	Y
Intersection 0 (edge-related result): Segment Y Edge Position: Absolute measured value	RSLT.CORNER[0].Y[s]:AB	Available	5	3	-
Intersection 0 (edge-related result): Segment Y Edge Position: Encoder pulse count	RSLT.CORNER[0].Y[s]:EC	Available	5	3	Y
Intersection 0 (edge-related result): Segment Edge Angle	RSLT.CORNER[0].T[s]	Available	3	3	-
Intersection 0 (edge-related result): Segment Edge Angle: Measured value	RSLT.CORNER[0].T[s]:MS	Available	3	3	-
Intersection 0 (edge-related result): Segment Edge Angle: Absolute measured value	RSLT.CORNER[0].T[s]:AB	Available	3	3	-
Intersection 0 (edge-related result): Defect to Threshold Difference	RSLT.CORNER[0].DIFF[s]	Available	5	3	-
Intersection 0 (edge-related result): Defect to Threshold Difference: Measured value	RSLT.CORNER[0].DIFF[s]:MS	Available	5	3	-
Intersection 1	RSLT.CORNER[1].***				
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Intersection 127	RSLT.CORNER[127].***				

Intensity Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Average intensity	RSLT.DA	Unsigned	3	3	-
Average intensity: Measured value	RSLT.DA:MS	Unsigned	3	3	-
Average intensity: Judgment value	RSLT.DA:JG	Unsigned	1	0	-
Intensity deviation	RSLT.DD	Unsigned	3	3	-
Intensity deviation: Measured value	RSLT.DD:MS	Unsigned	3	3	-
Intensity deviation: Judgment value	RSLT.DD:JG	Unsigned	1	0	-
Maximum intensity	RSLT.DH	Unsigned	3	0	-
Maximum intensity: Measured value	RSLT.DH:MS	Unsigned	3	0	-
Maximum intensity: Judgment value	RSLT.DH:JG	Unsigned	1	0	-
Minimum intensity	RSLT.DL	Unsigned	3	0	-
Minimum intensity: Measured value	RSLT.DL:MS	Unsigned	3	0	-
Minimum intensity: Judgment value	RSLT.DL:JG	Unsigned	1	0	-

Color Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
R: Average intensity	RSLT.RA	Unsigned	3	3	-
R: Average intensity: Measured value	RSLT.RA:MS	Unsigned	3	3	-
R: Average intensity: Judgment value	RSLT.RA:JG	Unsigned	1	0	-
G: Average intensity	RSLT.GA	Unsigned	3	3	-
G: Average intensity: Measured value	RSLT.GA:MS	Unsigned	3	3	-
G: Average intensity: Judgment value	RSLT.GA:JG	Unsigned	1	0	-
B: Average intensity	RSLT.BA	Unsigned	3	3	-
B: Average intensity: Measured value	RSLT.BA:MS	Unsigned	3	3	-
B: Average intensity: Judgment value	RSLT.BA:JG	Unsigned	1	0	-
R: Intensity deviation	RSLT.RD	Unsigned	3	3	-
R: Intensity deviation: Measured value	RSLT.RD:MS	Unsigned	3	3	-
R: Intensity deviation: Judgment value	RSLT.RD:JG	Unsigned	1	0	-
G: Intensity deviation	RSLT.GD	Unsigned	3	3	-
G: Intensity deviation: Measured value	RSLT.GD:MS	Unsigned	3	3	-
G: Intensity deviation: Judgment value	RSLT.GD:JG	Unsigned	1	0	-
B: Intensity deviation	RSLT.BD	Unsigned	3	3	-
B: Intensity deviation: Measured value	RSLT.BD:MS	Unsigned	3	3	-
B: Intensity deviation: Judgment value	RSLT.BD:JG	Unsigned	1	0	-
R: Maximum intensity	RSLT.RH	Unsigned	3	0	-
R: Maximum intensity: Measured value	RSLT.RH:MS	Unsigned	3	0	-
R: Maximum intensity: Judgment value	RSLT.RH:JG	Unsigned	1	0	-
G: Maximum intensity	RSLT.GH	Unsigned	3	0	-
G: Maximum intensity: Measured value	RSLT.GH:MS	Unsigned	3	0	-
G: Maximum intensity: Judgment value	RSLT.GH:JG	Unsigned	1	0	-
B: Maximum intensity	RSLT.BH	Unsigned	3	0	-
B: Maximum intensity: Measured value	RSLT.BH:MS	Unsigned	3	0	-
B: Maximum intensity: Judgment value	RSLT.BH:JG	Unsigned	1	0	-
R: Minimum intensity	RSLT.RL	Unsigned	3	0	-
R: Minimum intensity: Measured value	RSLT.RL:MS	Unsigned	3	0	-
R: Minimum intensity: Judgment value	RSLT.RL:JG	Unsigned	1	0	-
G: Minimum intensity	RSLT.GL	Unsigned	3	0	-
G: Minimum intensity: Measured value	RSLT.GL:MS	Unsigned	3	0	-
G: Minimum intensity: Judgment value	RSLT.GL:JG	Unsigned	1	0	-
B: Minimum intensity	RSLT.BL	Unsigned	3	0	-
B: Minimum intensity: Measured value	RSLT.BL:MS	Unsigned	3	0	-
B: Minimum intensity: Judgment value	RSLT.BL:JG	Unsigned	1	0	-
H: Average hue	RSLT.HUA	Unsigned	3	3	-
H: Average hue: Measured value	RSLT.HUA:MS	Unsigned	3	3	-
H: Average hue: Judgment value	RSLT.HUA:JG	Unsigned	1	0	-
S: Average saturation	RSLT.SAA	Unsigned	3	3	-
S: Average saturation: Measured value	RSLT.SAA:MS	Unsigned	3	3	-
S: Average saturation: Judgment value	RSLT.SAA:JG	Unsigned	1	0	-
B: Average brightness	RSLT.VAA	Unsigned	3	3	-
B: Average brightness: Measured value	RSLT.VAA:MS	Unsigned	3	3	-
B: Average brightness: Judgment value	RSLT.VAA:JG	Unsigned	1	0	-
H: Hue deviation	RSLT.HUD	Unsigned	3	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
H: Hue deviation: Measured value	RSLT.HUD:MS	Unsigned	3	3	-
H: Hue deviation: Judgment value	RSLT.HUD:JG	Unsigned	1	0	-
S: Saturation deviation	RSLT.SAD	Unsigned	3	3	-
S: Saturation deviation: Measured value	RSLT.SAD:MS	Unsigned	3	3	-
S: Saturation deviation: Judgment value	RSLT.SAD:JG	Unsigned	1	0	-
B: Brightness deviation	RSLT.VAD	Unsigned	3	3	-
B: Brightness deviation: Measured value	RSLT.VAD:MS	Unsigned	3	3	-
B: Brightness deviation: Judgment value	RSLT.VAD:JG	Unsigned	1	0	-
H: Maximum hue	RSLT.HUEH	Unsigned	3	0	-
H: Maximum hue: Measured value	RSLT.HUEH:MS	Unsigned	3	0	-
H: Maximum hue: Judgment value	RSLT.HUEH:JG	Unsigned	1	0	-
S: Maximum saturation	RSLT.SATH	Unsigned	3	0	-
S: Maximum saturation: Measured value	RSLT.SATH:MS	Unsigned	3	0	-
S: Maximum saturation: Judgment value	RSLT.SATH:JG	Unsigned	1	0	-
B: Maximum brightness	RSLT.VALH	Unsigned	3	0	-
B: Maximum brightness: Measured value	RSLT.VALH:MS	Unsigned	3	0	-
B: Maximum brightness: Judgment value	RSLT.VALH:JG	Unsigned	1	0	-
H: Minimum hue	RSLT.HUEL	Unsigned	3	0	-
H: Minimum hue: Measured value	RSLT.HUEL:MS	Unsigned	3	0	-
H: Minimum hue: Judgment value	RSLT.HUEL:JG	Unsigned	1	0	-
S: Minimum saturation	RSLT.SATL	Unsigned	3	0	-
S: Minimum saturation: Measured value	RSLT.SATL:MS	Unsigned	3	0	-
S: Minimum saturation: Judgment value	RSLT.SATL:JG	Unsigned	1	0	-
B: Minimum brightness	RSLT.VALL	Unsigned	3	0	-
B: Minimum brightness: Measured value	RSLT.VALL:MS	Unsigned	3	0	-
B: Minimum brightness: Judgment value	RSLT.VALL:JG	Unsigned	1	0	-
Gray Intensity Ave. for UV	RSLT.MC_UVA	Unsigned	3	3	-
Gray Intensity Ave. for UV: Measured value	RSLT.MC_UVA:MS	Unsigned	3	3	-
Gray Intensity Ave. for UV: Judgment value	RSLT.MC_UVA:JG	Unsigned	1	0	-
Gray Intensity Ave. for B	RSLT.MC_BA	Unsigned	3	3	-
Gray Intensity Ave. for B: Measured value	RSLT.MC_BA:MS	Unsigned	3	3	-
Gray Intensity Ave. for B: Judgment value	RSLT.MC_BA:JG	Unsigned	1	0	-
Gray Intensity Ave. for G	RSLT.MC_GA	Unsigned	3	3	-
Gray Intensity Ave. for G: Measured value	RSLT.MC_GA:MS	Unsigned	3	3	-
Gray Intensity Ave. for G: Judgment value	RSLT.MC_GA:JG	Unsigned	1	0	-
Gray Intensity Ave. for AM	RSLT.MC_AMA	Unsigned	3	3	-
Gray Intensity Ave. for AM: Measured value	RSLT.MC_AMA:MS	Unsigned	3	3	-
Gray Intensity Ave. for AM: Judgment value	RSLT.MC_AMA:JG	Unsigned	1	0	-
Gray Intensity Ave. for R	RSLT.MC_RA	Unsigned	3	3	-
Gray Intensity Ave. for R: Measured value	RSLT.MC_RA:MS	Unsigned	3	3	-
Gray Intensity Ave. for R: Judgment value	RSLT.MC_RA:JG	Unsigned	1	0	-
Gray Intensity Ave. for FR	RSLT.MC_FRA	Unsigned	3	3	-
Gray Intensity Ave. for FR: Measured value	RSLT.MC_FRA:MS	Unsigned	3	3	-
Gray Intensity Ave. for FR: Judgment value	RSLT.MC_FRA:JG	Unsigned	1	0	-
Gray Intensity Ave. for IR	RSLT.MC_IRA	Unsigned	3	3	-
Gray Intensity Ave. for IR: Measured value	RSLT.MC_IRA:MS	Unsigned	3	3	-
Gray Intensity Ave. for IR: Judgment value	RSLT.MC_IRA:JG	Unsigned	1	0	-
Gray Intensity Ave. for W	RSLT.MC_WA	Unsigned	3	3	-
Gray Intensity Ave. for W: Measured value	RSLT.MC_WA:MS	Unsigned	3	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Gray Intensity Ave. for W: Judgment value	RSLT.MC_WA:JG	Unsigned	1	0	-
Gray Intensity Deviation for UV	RSLT.MC_UVD	Unsigned	3	3	-
Gray Intensity Deviation for UV: Measured value	RSLT.MC_UVD:MS	Unsigned	3	3	-
Gray Intensity Deviation for UV: Judgment value	RSLT.MC_UVD:JG	Unsigned	1	0	-
Gray Intensity Deviation for B	RSLT.MC_BD	Unsigned	3	3	-
Gray Intensity Deviation for B: Measured value	RSLT.MC_BD:MS	Unsigned	3	3	-
Gray Intensity Deviation for B: Judgment value	RSLT.MC_BD:JG	Unsigned	1	0	-
Gray Intensity Deviation for G	RSLT.MC_GD	Unsigned	3	3	-
Gray Intensity Deviation for G: Measured value	RSLT.MC_GD:MS	Unsigned	3	3	-
Gray Intensity Deviation for G: Judgment value	RSLT.MC_GD:JG	Unsigned	1	0	-
Gray Intensity Deviation for AM	RSLT.MC_AMD	Unsigned	3	3	-
Gray Intensity Deviation for AM: Measured value	RSLT.MC_AMD:MS	Unsigned	3	3	-
Gray Intensity Deviation for AM: Judgment value	RSLT.MC_AMD:JG	Unsigned	1	0	-
Gray Intensity Deviation for R	RSLT.MC_RD	Unsigned	3	3	-
Gray Intensity Deviation for R: Measured value	RSLT.MC_RD:MS	Unsigned	3	3	-
Gray Intensity Deviation for R: Judgment value	RSLT.MC_RD:JG	Unsigned	1	0	-
Gray Intensity Deviation for FR	RSLT.MC_FRD	Unsigned	3	3	-
Gray Intensity Deviation for FR: Measured value	RSLT.MC_FRD:MS	Unsigned	3	3	-
Gray Intensity Deviation for FR: Judgment value	RSLT.MC_FRD:JG	Unsigned	1	0	-
Gray Intensity Deviation for IR	RSLT.MC_IRD	Unsigned	3	3	-
Gray Intensity Deviation for IR: Measured value	RSLT.MC_IRD:MS	Unsigned	3	3	-
Gray Intensity Deviation for IR: Judgment value	RSLT.MC_IRD:JG	Unsigned	1	0	-
Gray Intensity Deviation for W	RSLT.MC_WD	Unsigned	3	3	-
Gray Intensity Deviation for W: Measured value	RSLT.MC_WD:MS	Unsigned	3	3	-
Gray Intensity Deviation for W: Judgment value	RSLT.MC_WD:JG	Unsigned	1	0	-
Max. Gray Intensity of UV	RSLT.MC_UVH	Unsigned	3	0	-
Max. Gray Intensity of UV: Measured value	RSLT.MC_UVH:MS	Unsigned	3	0	-
Max. Gray Intensity of UV: Judgment value	RSLT.MC_UVH:JG	Unsigned	1	0	-
Max. Gray Intensity of B	RSLT.MC_BH	Unsigned	3	0	-
Max. Gray Intensity of B: Measured value	RSLT.MC_BH:MS	Unsigned	3	0	-
Max. Gray Intensity of B: Judgment value	RSLT.MC_BH:JG	Unsigned	1	0	-
Max. Gray Intensity of G	RSLT.MC_GH	Unsigned	3	0	-
Max. Gray Intensity of G: Measured value	RSLT.MC_GH:MS	Unsigned	3	0	-
Max. Gray Intensity of G: Judgment value	RSLT.MC_GH:JG	Unsigned	1	0	-
Max. Gray Intensity of AM	RSLT.MC_AMH	Unsigned	3	0	-
Max. Gray Intensity of AM: Measured value	RSLT.MC_AMH:MS	Unsigned	3	0	-
Max. Gray Intensity of AM: Judgment value	RSLT.MC_AMH:JG	Unsigned	1	0	-
Max. Gray Intensity of R	RSLT.MC_RH	Unsigned	3	0	-
Max. Gray Intensity of R: Measured value	RSLT.MC_RH:MS	Unsigned	3	0	-
Max. Gray Intensity of R: Judgment value	RSLT.MC_RH:JG	Unsigned	1	0	-
Max. Gray Intensity of FR	RSLT.MC_FRH	Unsigned	3	0	-
Max. Gray Intensity of FR: Measured value	RSLT.MC_FRH:MS	Unsigned	3	0	-
Max. Gray Intensity of FR: Judgment value	RSLT.MC_FRH:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Max. Gray Intensity of IR	RSLT.MC_IRH	Unsigned	3	0	-
Max. Gray Intensity of IR: Measured value	RSLT.MC_IRH:MS	Unsigned	3	0	-
Max. Gray Intensity of IR: Judgment value	RSLT.MC_IRH:JG	Unsigned	1	0	-
Max. Gray Intensity of W	RSLT.MC_WH	Unsigned	3	0	-
Max. Gray Intensity of W: Measured value	RSLT.MC_WH:MS	Unsigned	3	0	-
Max. Gray Intensity of W: Judgment value	RSLT.MC_WH:JG	Unsigned	1	0	-
Min. Gray Intensity of UV	RSLT.MC_UVL	Unsigned	3	0	-
Min. Gray Intensity of UV: Measured value	RSLT.MC_UVL:MS	Unsigned	3	0	-
Min. Gray Intensity of UV: Judgment value	RSLT.MC_UVL:JG	Unsigned	1	0	-
Min. Gray Intensity of B	RSLT.MC_BL	Unsigned	3	0	-
Min. Gray Intensity of B: Measured value	RSLT.MC_BL:MS	Unsigned	3	0	-
Min. Gray Intensity of B: Judgment value	RSLT.MC_BL:JG	Unsigned	1	0	-
Min. Gray Intensity of G	RSLT.MC_GL	Unsigned	3	0	-
Min. Gray Intensity of G: Measured value	RSLT.MC_GL:MS	Unsigned	3	0	-
Min. Gray Intensity of G: Judgment value	RSLT.MC_GL:JG	Unsigned	1	0	-
Min. Gray Intensity of AM	RSLT.MC_AML	Unsigned	3	0	-
Min. Gray Intensity of AM: Measured value	RSLT.MC_AML:MS	Unsigned	3	0	-
Min. Gray Intensity of AM: Judgment value	RSLT.MC_AML:JG	Unsigned	1	0	-
Min. Gray Intensity of R	RSLT.MC_RL	Unsigned	3	0	-
Min. Gray Intensity of R: Measured value	RSLT.MC_RL:MS	Unsigned	3	0	-
Min. Gray Intensity of R: Judgment value	RSLT.MC_RL:JG	Unsigned	1	0	-
Min. Gray Intensity of FR	RSLT.MC_FRL	Unsigned	3	0	-
Min. Gray Intensity of FR: Measured value	RSLT.MC_FRL:MS	Unsigned	3	0	-
Min. Gray Intensity of FR: Judgment value	RSLT.MC_FRL:JG	Unsigned	1	0	-
Min. Gray Intensity of IR	RSLT.MC_IRL	Unsigned	3	0	-
Min. Gray Intensity of IR: Measured value	RSLT.MC_IRL:MS	Unsigned	3	0	-
Min. Gray Intensity of IR: Judgment value	RSLT.MC_IRL:JG	Unsigned	1	0	-
Min. Gray Intensity of W	RSLT.MC_WL	Unsigned	3	0	-
Min. Gray Intensity of W: Measured value	RSLT.MC_WL:MS	Unsigned	3	0	-
Min. Gray Intensity of W: Judgment value	RSLT.MC_WL:JG	Unsigned	1	0	-

Color Grouping Unit

Result item	Name	Numerical value format			Scaling target
		Sign	No. of integer digits	No. of decimal places	
Primary Candidate (Group No.)	RSLT.MXARGID	Unsigned	2	0	-
Primary Candidate (Group No.): Measured value	RSLT.MXARGID:MS	Unsigned	2	0	-
Primary Candidate (Group No.): Judgment value	RSLT.MXARGID:JG	Unsigned	1	0	-
(Group 0) Individual Area	RSLT.GAR[0]	Unsigned	8	0	-
(Group 0) Individual Area: Measured value	RSLT.GAR[0]:MS	Unsigned	8	0	-
(Group 0) Individual Area: Judgment value	RSLT.GAR[0]:JG	Unsigned	1	0	-
(Group 0) Individual Area (%)	RSLT.GRT[0]	Unsigned	3	1	-
(Group 0) Individual Area (%): Measured value	RSLT.GRT[0]:MS	Unsigned	3	1	-
(Group 0) Individual Area (%): Judgment value	RSLT.GRT[0]:JG	Unsigned	1	0	-
(Group 1)	RSLT.***[1]				
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(Group 15)	RSLT.***[15]				
Primary Candidate (Area)	RSLT.MXAR	Unsigned	8	0	-
Primary Candidate (Area): Measured value	RSLT.MXAR:MS	Unsigned	8	0	-
Primary Candidate (Area): Judgment value	RSLT.MXAR:JG	Unsigned	1	0	-
Area of All Groups	RSLT.ESAR	Unsigned	8	0	-
Area of All Groups: Measured value	RSLT.ESAR:MS	Unsigned	8	0	-
Area of All Groups: Judgment value	RSLT.ESAR:JG	Unsigned	1	0	-
Primary Candidate (Area) (%)	RSLT.MXRT	Unsigned	3	1	-
Primary Candidate (Area) (%): Measured value	RSLT.MXRT:MS	Unsigned	3	1	-
Primary Candidate (Area) (%): Judgment value	RSLT.MXRT:JG	Unsigned	1	0	-
Primary Candidate (Group Name)	RSLT.MXGRNM				
(Group 0) Group Name	RSLT.GRNM[0]				
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(Group 15) Group Name	RSLT.GRNM[15]				

OCR Unit

 All values will be character strings except for the value for ".JG" of STR1/2 and JG_STR1/2.

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Line 1 string	RSLT.STR1	-	-	-	-
Line 1 string: Measured value	RSLT.STR1:MS	-	-	-	-
Line 1 string: Judgment value	RSLT.STR1:JG	Unsigned	1	0	-
Line 2 string	RSLT.STR2	-	-	-	-
Line 2 string: Measured value	RSLT.STR2:MS	-	-	-	-
Line 2 string: Judgment value	RSLT.STR2:JG	Unsigned	1	0	-
Line 1 registered string	RSLT.JG_STR1	-	-	-	-
Line 1 registered string: Measured value	RSLT.JG_STR1:MS	-	-	-	-
Line 2 registered string	RSLT.JG_STR2	-	-	-	-
Line 2 registered string: Measured value	RSLT.JG_STR2:MS	-	-	-	-
Detected character	RSLT.RCG_CHR[*]	Unsigned	3	0	-
Detected character: Measured value	RSLT.RCG_CHR[*]:MS	Unsigned	3	0	-
Detected character: Judgment value	RSLT.RCG_CHR[*]:JG	Unsigned	1	0	-
Registered character	RSLT.JG_CHR[*]	Unsigned	3	0	-
Registered character: Measured value	RSLT.JG_CHR[*]:MS	Unsigned	3	0	-
1st candidate character	RSLT.CHR1[*]	Unsigned	3	0	-
1st candidate character: Measured value	RSLT.CHR1[*]:MS	Unsigned	3	0	-
2nd candidate character	RSLT.CHR2[*]	Unsigned	3	0	-
2nd candidate character: Measured value	RSLT.CHR2[*]:MS	Unsigned	3	0	-
1st candidate correlation value	RSLT.CRR1[*]	Unsigned	2	0	-
1st candidate correlation value: Measured value	RSLT.CRR1[*]:MS	Unsigned	2	0	-
2nd candidate correlation value	RSLT.CRR2[*]	Unsigned	2	0	-
2nd candidate correlation value: Measured value	RSLT.CRR2[*]:MS	Unsigned	2	0	-
Stability	RSLT.STBL[*]	Unsigned	2	0	-
Stability: Measured value	RSLT.STBL[*]:MS	Unsigned	2	0	-
Character contrast	RSLT.GDEV[*]	Unsigned	2	0	-
Character contrast: Measured value	RSLT.GDEV[*]:MS	Unsigned	2	0	-
No. of lines	RSLT.CLN	Unsigned	2	0	-
No. of lines: Measured value	RSLT.CLN:MS	Unsigned	2	0	-
No. of characters in line 1	RSLT.CCN1	Unsigned	2	0	-
No. of characters in line 1: Measured value	RSLT.CCN1:MS	Unsigned	2	0	-
No. of characters in line 2	RSLT.CCN2	Unsigned	2	0	-
No. of characters in line 2: Measured value	RSLT.CCN2:MS	Unsigned	2	0	-
Line 1 correlation value (Max)	RSLT.L1CRR1_H	Unsigned	2	0	-
Line 1 correlation value (Max): Measured value	RSLT.L1CRR1_H:MS	Unsigned	2	0	-
Line 1 correlation value (Max): Judgment value	RSLT.L1CRR1_H:JG	Unsigned	1	0	-
Line 1 correlation value (Min)	RSLT.L1CRR1_L	Unsigned	2	0	-
Line 1 correlation value (Min): Measured value	RSLT.L1CRR1_L:MS	Unsigned	2	0	-
Line 1 correlation value (Min): Judgment value	RSLT.L1CRR1_L:JG	Unsigned	1	0	-
Line 1 stability (Max)	RSLT.L1STBL_H	Unsigned	2	0	-
Line 1 stability (Max): Measured value	RSLT.L1STBL_H:MS	Unsigned	2	0	-
Line 1 stability (Max): Judgment value	RSLT.L1STBL_H:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Line 1 stability (Min)	RSLT.L1STBL_L	Unsigned	2	0	-
Line 1 stability (Min): Measured value	RSLT.L1STBL_L:MS	Unsigned	2	0	-
Line 1 stability (Min): Judgment value	RSLT.L1STBL_L:JG	Unsigned	1	0	-
Line 2 correlation value (Max)	RSLT.L2CRR1_H	Unsigned	2	0	-
Line 2 correlation value (Max): Measured value	RSLT.L2CRR1_H:MS	Unsigned	2	0	-
Line 2 correlation value (Max): Judgment value	RSLT.L2CRR1_H:JG	Unsigned	1	0	-
Line 2 correlation value (Min)	RSLT.L2CRR1_L	Unsigned	2	0	-
Line 2 correlation value (Min): Measured value	RSLT.L2CRR1_L:MS	Unsigned	2	0	-
Line 2 correlation value (Min): Judgment value	RSLT.L2CRR1_L:JG	Unsigned	1	0	-
Line 2 stability (Max)	RSLT.L2STBL_H	Unsigned	2	0	-
Line 2 stability (Max): Measured value	RSLT.L2STBL_H:MS	Unsigned	2	0	-
Line 2 stability (Max): Judgment value	RSLT.L2STBL_H:JG	Unsigned	1	0	-
Line 2 stability (Min)	RSLT.L2STBL_L	Unsigned	2	0	-
Line 2 stability (Min): Measured value	RSLT.L2STBL_L:MS	Unsigned	2	0	-
Line 2 stability (Min): Judgment value	RSLT.L2STBL_L:JG	Unsigned	1	0	-
Block: Point 1 X	RSLT.CCORX1[*]	Available	5	0	X
Block: Point 1 X: Measured value	RSLT.CCORX1[*]:MS	Available	5	0	X
Block: Point 1 X: Absolute measured value	RSLT.CCORX1[*]:AB	Available	5	0	-
Block: Point 1 X: Encoder measured value	RSLT.CCORX1[*]:EC	Available	5	0	X
Block: Point 1 Y	RSLT.CCORY1[*]	Available	5	0	Y
Block: Point 1 Y: Measured value	RSLT.CCORY1[*]:MS	Available	5	0	Y
Block: Point 1 Y: Absolute measured value	RSLT.CCORY1[*]:AB	Available	5	0	-
Block: Point 1 Y: Encoder measured value	RSLT.CCORY1[*]:EC	Available	5	0	Y
Block: Point 1 XY	RSLT.CCORXY1[*]	Available	5	0	-
Block: Point 1 XY: Measured value	RSLT.CCORXY1[*]:MS	Available	5	0	-
Block: Point 1 XY: Absolute measured value	RSLT.CCORXY1[*]:AB	Available	5	0	-
Block: Point 1 XY: Encoder measured value	RSLT.CCORXY1[*]:EC	Available	5	0	-
Block: Point 2 X	RSLT.CCORX2[*]	Available	5	0	X
Block: Point 2 X: Measured value	RSLT.CCORX2[*]:MS	Available	5	0	X
Block: Point 2 X: Absolute measured value	RSLT.CCORX2[*]:AB	Available	5	0	-
Block: Point 2 X: Encoder measured value	RSLT.CCORX2[*]:EC	Available	5	0	X
Block: Point 2 Y	RSLT.CCORY2[*]	Available	5	0	Y
Block: Point 2 Y: Measured value	RSLT.CCORY2[*]:MS	Available	5	0	Y
Block: Point 2 Y: Absolute measured value	RSLT.CCORY2[*]:AB	Available	5	0	-
Block: Point 2 Y: Encoder measured value	RSLT.CCORY2[*]:EC	Available	5	0	Y
Block: Point 2 XY	RSLT.CCORXY2[*]	Available	5	0	-
Block: Point 2 XY: Measured value	RSLT.CCORXY2[*]:MS	Available	5	0	-
Block: Point 2 XY: Absolute measured value	RSLT.CCORXY2[*]:AB	Available	5	0	-
Block: Point 2 XY: Encoder measured value	RSLT.CCORXY2[*]:EC	Available	5	0	-
Block: Point 3 X	RSLT.CCORX3[*]	Available	5	0	X
Block: Point 3 X: Measured value	RSLT.CCORX3[*]:MS	Available	5	0	X
Block: Point 3 X: Absolute measured value	RSLT.CCORX3[*]:AB	Available	5	0	-
Block: Point 3 X: Encoder measured value	RSLT.CCORX3[*]:EC	Available	5	0	X
Block: Point 3 Y	RSLT.CCORY3[*]	Available	5	0	Y
Block: Point 3 Y: Measured value	RSLT.CCORY3[*]:MS	Available	5	0	Y
Block: Point 3 Y: Absolute measured value	RSLT.CCORY3[*]:AB	Available	5	0	-
Block: Point 3 Y: Encoder measured value	RSLT.CCORY3[*]:EC	Available	5	0	Y

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Block: Point 3 XY	RSLT.CCORY3[*]	Available	5	0	-
Block: Point 3 XY: Measured value	RSLT.CCORY3[*]:MS	Available	5	0	-
Block: Point 3 XY: Absolute measured value	RSLT.CCORY3[*]:AB	Available	5	0	-
Block: Point 3 XY: Encoder measured value	RSLT.CCORY3[*]:EC	Available	5	0	-
Block: Point 4 X	RSLT.CCORY4[*]	Available	5	0	X
Block: Point 4 X: Measured value	RSLT.CCORY4[*]:MS	Available	5	0	X
Block: Point 4 X: Absolute measured value	RSLT.CCORY4[*]:AB	Available	5	0	-
Block: Point 4 X: Encoder measured value	RSLT.CCORY4[*]:EC	Available	5	0	X
Block: Point 4 Y	RSLT.CCORY4[*]	Available	5	0	Y
Block: Point 4 Y: Measured value	RSLT.CCORY4[*]:MS	Available	5	0	Y
Block: Point 4 Y: Absolute measured value	RSLT.CCORY4[*]:AB	Available	5	0	-
Block: Point 4 Y: Encoder measured value	RSLT.CCORY4[*]:EC	Available	5	0	Y
Block: Point 4 XY	RSLT.CCORY4[*]	Available	5	0	-
Block: Point 4 XY: Measured value	RSLT.CCORY4[*]:MS	Available	5	0	-
Block: Point 4 XY: Absolute measured value	RSLT.CCORY4[*]:AB	Available	5	0	-
Block: Point 4 XY: Encoder measured value	RSLT.CCORY4[*]:EC	Available	5	0	-

OCR2 Unit

Reference All values will be character strings except for the value for ".JG" of STR1/2(Q) and JG_STR1/2(Q).

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Line 1 string	RSLT.STR1	-	-	-	-
Line 1 string: Measured value	RSLT.STR1:MS	-	-	-	-
Line 1 string: Judgment value	RSLT.STR1:JG	Unsigned	1	0	-
L1 Trimmed String	RSLT.STR1Q	-	-	-	-
L1 Trimmed String; Measured value	RSLT.STR1Q:MS	-	-	-	-
Line 2 string	RSLT.STR2	-	-	-	-
Line 2 string: Measured value	RSLT.STR2:MS	-	-	-	-
Line 2 string: Judgment value	RSLT.STR2:JG	Unsigned	1	0	-
L2 Trimmed String	RSLT.STR2Q	-	-	-	-
L2 Trimmed String: Measured value	RSLT.STR2Q:MS	-	-	-	-
Detected character	RSLT.RCG_CHR[s]	Unsigned	3	0	-
Detected character: Measured value	RSLT.RCG_CHR[s]:MS	Unsigned	3	0	-
Detected character: Judgment value	RSLT.RCG_CHR[s]:JG	Unsigned	1	0	-
Line 1 registered string	RSLT.JG_STR1	-	-	-	-
Line 1 registered string: Measured value	RSLT.JG_STR1:MS	-	-	-	-
L1 Trimmed Regist String	RSLT.JG_STR1Q	-	-	-	-
L1 Trimmed Regist String: Measured value	RSLT.JG_STR1Q:MS	-	-	-	-
Line 2 registered string	RSLT.JG_STR2	-	-	-	-
Line 2 registered string: Measured value	RSLT.JG_STR2:MS	-	-	-	-
L2 Trimmed Regist String	RSLT.JG_STR2Q	-	-	-	-
L2 Trimmed Regist String: Measured value	RSLT.JG_STR2Q:MS	-	-	-	-
Registered character	RSLT.JG_CHR[s]	-	-	-	-
Registered character: Measured value	RSLT.JG_CHR[s]:MS	-	-	-	-
1st candidate character	RSLT.CHR1[s]	Unsigned	3	0	-
1st candidate character: Measured value	RSLT.CHR1[s]:MS	Unsigned	3	0	-
2nd candidate character	RSLT.CHR2[s]	Unsigned	3	0	-
2nd candidate character: Measured value	RSLT.CHR2[s]:MS	Unsigned	3	0	-
Char1 Library Character Variation No.	RSLT.CPL1[s]	Unsigned	3	0	-
Char1 Library Character Variation No.: Measured value	RSLT.CPL1[s]:MS	Unsigned	3	0	-
Char2 Library Character Variation No.	RSLT.CPL2[s]	Unsigned	3	0	-
Char2 Library Character Variation No.: Measured value	RSLT.CPL2[s]:MS	Unsigned	3	0	-
1st candidate correlation value	RSLT.CRR1[s]	Unsigned	2	0	-
1st candidate correlation value: Measured value	RSLT.CRR1[s]:MS	Unsigned	2	0	-
2nd candidate correlation value	RSLT.CRR2[s]	Unsigned	2	0	-
2nd candidate correlation value: Measured value	RSLT.CRR2[s]:MS	Unsigned	2	0	-
Stability	RSLT.STBL[s]	Unsigned	2	0	-
Stability: Measured value	RSLT.STBL[s]:MS	Unsigned	2	0	-
Character contrast	RSLT.GDEV[s]	Unsigned	2	0	-
Character contrast: Measured value	RSLT.GDEV[s]:MS	Unsigned	2	0	-
No. of lines	RSLT.CLN	Unsigned	2	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
No. of lines: Measured value	RSLT.CLN:MS	Unsigned	2	0	-
No. of characters in line 1	RSLT.CCN1	Unsigned	2	0	-
No. of characters in line 1: Measured value	RSLT.CCN1:MS	Unsigned	2	0	-
No. of characters in line 1: Judgment value	RSLT.CCN1:JG	Unsigned	1	0	-
No. of characters in line 2	RSLT.CCN2	Unsigned	2	0	-
No. of characters in line 2: Measured value	RSLT.CCN2:MS	Unsigned	2	0	-
No. of characters in line 2: Judgment value	RSLT.CCN2:JG	Unsigned	1	0	-
Line 1 correlation value (Max)	RSLT.L1CRR1_H	Unsigned	2	0	-
Line 1 correlation value (Max): Measured value	RSLT.L1CRR1_H:MS	Unsigned	2	0	-
Line 1 correlation value (Max): Judgment value	RSLT.L1CRR1_H:JG	Unsigned	1	0	-
Line 1 correlation value (Min)	RSLT.L1CRR1_L	Unsigned	2	0	-
Line 1 correlation value (Min): Measured value	RSLT.L1CRR1_L:MS	Unsigned	2	0	-
Line 1 correlation value (Min): Judgment value	RSLT.L1CRR1_L:JG	Unsigned	1	0	-
Line 2 correlation value (Max)	RSLT.L2CRR1_H	Unsigned	2	0	-
Line 2 correlation value (Max): Measured value	RSLT.L2CRR1_H:MS	Unsigned	2	0	-
Line 2 correlation value (Max): Judgment value	RSLT.L2CRR1_H:JG	Unsigned	1	0	-
Line 2 correlation value (Min)	RSLT.L2CRR1_L	Unsigned	2	0	-
Line 2 correlation value (Min): Measured value	RSLT.L2CRR1_L:MS	Unsigned	2	0	-
Line 2 correlation value (Min): Judgment value	RSLT.L2CRR1_L:JG	Unsigned	1	0	-
Line 1 stability (Max)	RSLT.L1STBL_H	Unsigned	2	0	-
Line 1 stability (Max): Measured value	RSLT.L1STBL_H:MS	Unsigned	2	0	-
Line 1 stability (Max): Judgment value	RSLT.L1STBL_H:JG	Unsigned	1	0	-
Line 1 stability (Min)	RSLT.L1STBL_L	Unsigned	2	0	-
Line 1 stability (Min): Measured value	RSLT.L1STBL_L:MS	Unsigned	2	0	-
Line 1 stability (Min): Judgment value	RSLT.L1STBL_L:JG	Unsigned	1	0	-
Line 2 stability (Max)	RSLT.L2STBL_H	Unsigned	2	0	-
Line 2 stability (Max): Measured value	RSLT.L2STBL_H:MS	Unsigned	2	0	-
Line 2 stability (Max): Judgment value	RSLT.L2STBL_H:JG	Unsigned	1	0	-
Line 2 stability (Min)	RSLT.L2STBL_L	Unsigned	2	0	-
Line 2 stability (Min): Measured value	RSLT.L2STBL_L:MS	Unsigned	2	0	-
Line 2 stability (Min): Judgment value	RSLT.L2STBL_L:JG	Unsigned	1	0	-
Block: Point 1 XY	RSLT.CCORXY1[s]	Available	5	0	-
Block: Point 1 XY: Measured value	RSLT.CCORXY1[s]:MS	Available	5	0	-
Block: Point 1 XY: Absolute measured value	RSLT.CCORXY1[s]:AB	Available	5	0	-
Block: Point 1 XY: Encoder measured value	RSLT.CCORXY1[s]:EC	Available	5	0	-
Block: Point 1 X	RSLT.CCORX1[s]	Available	5	0	X
Block: Point 1 X: Measured value	RSLT.CCORX1[s]:MS	Available	5	0	X
Block: Point 1 X: Absolute measured value	RSLT.CCORX1[s]:AB	Available	5	0	-
Block: Point 1 X: Encoder measured value	RSLT.CCORX1[s]:EC	Available	5	0	X
Block: Point 1 Y	RSLT.CCORY1[s]	Available	5	0	Y
Block: Point 1 Y: Measured value	RSLT.CCORY1[s]:MS	Available	5	0	Y
Block: Point 1 Y: Absolute measured value	RSLT.CCORY1[s]:AB	Available	5	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Block: Point 1 Y: Encoder measured value	RSLT.CCORY1[s]:EC	Available	5	0	Y
Block: Point 2 XY	RSLT.CCORY2[s]	Available	5	0	-
Block: Point 2 XY: Measured value	RSLT.CCORY2[s]:MS	Available	5	0	-
Block: Point 2 XY: Absolute measured value	RSLT.CCORY2[s]:AB	Available	5	0	-
Block: Point 2 XY: Encoder measured value	RSLT.CCORY2[s]:EC	Available	5	0	-
Block: Point 2 X	RSLT.CCORY2[s]	Available	5	0	X
Block: Point 2 X: Measured value	RSLT.CCORY2[s]:MS	Available	5	0	X
Block: Point 2 X: Absolute measured value	RSLT.CCORY2[s]:AB	Available	5	0	-
Block: Point 2 X: Encoder measured value	RSLT.CCORY2[s]:EC	Available	5	0	X
Block: Point 2 Y	RSLT.CCORY2[s]	Available	5	0	Y
Block: Point 2 Y: Measured value	RSLT.CCORY2[s]:MS	Available	5	0	Y
Block: Point 2 Y: Absolute measured value	RSLT.CCORY2[s]:AB	Available	5	0	-
Block: Point 2 Y: Encoder measured value	RSLT.CCORY2[s]:EC	Available	5	0	Y
Block: Point 3 XY	RSLT.CCORY3[s]	Available	5	0	-
Block: Point 3 XY: Measured value	RSLT.CCORY3[s]:MS	Available	5	0	-
Block: Point 3 XY: Absolute measured value	RSLT.CCORY3[s]:AB	Available	5	0	-
Block: Point 3 XY: Encoder measured value	RSLT.CCORY3[s]:EC	Available	5	0	-
Block: Point 3 X	RSLT.CCORY3[s]	Available	5	0	X
Block: Point 3 X: Measured value	RSLT.CCORY3[s]:MS	Available	5	0	X
Block: Point 3 X: Absolute measured value	RSLT.CCORY3[s]:AB	Available	5	0	-
Block: Point 3 X: Encoder measured value	RSLT.CCORY3[s]:EC	Available	5	0	X
Block: Point 3 Y	RSLT.CCORY3[s]	Available	5	0	Y
Block: Point 3 Y: Measured value	RSLT.CCORY3[s]:MS	Available	5	0	Y
Block: Point 3 Y: Absolute measured value	RSLT.CCORY3[s]:AB	Available	5	0	-
Block: Point 3 Y: Encoder measured value	RSLT.CCORY3[s]:EC	Available	5	0	Y
Block: Point 4 XY	RSLT.CCORY4[s]	Available	5	0	-
Block: Point 4 XY: Measured value	RSLT.CCORY4[s]:MS	Available	5	0	-
Block: Point 4 XY: Absolute measured value	RSLT.CCORY4[s]:AB	Available	5	0	-
Block: Point 4 XY: Encoder measured value	RSLT.CCORY4[s]:EC	Available	5	0	-
Block: Point 4 X	RSLT.CCORY4[s]	Available	5	0	X
Block: Point 4 X: Measured value	RSLT.CCORY4[s]:MS	Available	5	0	X
Block: Point 4 X: Absolute measured value	RSLT.CCORY4[s]:AB	Available	5	0	-
Block: Point 4 X: Encoder measured value	RSLT.CCORY4[s]:EC	Available	5	0	X
Block: Point 4 Y	RSLT.CCORY4[s]	Available	5	0	Y
Block: Point 4 Y: Measured value	RSLT.CCORY4[s]:MS	Available	5	0	Y
Block: Point 4 Y: Absolute measured value	RSLT.CCORY4[s]:AB	Available	5	0	-
Block: Point 4 Y: Encoder measured value	RSLT.CCORY4[s]:EC	Available	5	0	Y

2D code reader Unit

 If in the [] is not specified, Readout (ID_DATA [*]) and Split Data (ID_DATA 1-8 [*]) are considered to be Readout text data.

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Code length	RSLT.ID_LEN	Unsigned	3	0	-
Code length: Measured value	RSLT.ID_LEN:MS	Unsigned	3	0	-
Code length: Judgment value	RSLT.ID_LEN:JG	Unsigned	1	0	-
Readout	RSLT.ID_DATA[*]	Unsigned	3	0	-
Readout: Measured value	RSLT.ID_DATA[*]:MS	Unsigned	3	0	-
Position X	RSLT.X	Available	5	3	X
Position X: Measured value	RSLT.X:MS	Available	5	3	X
Position X: Absolute measured value	RSLT.X:AB	Available	5	3	-
Position X: Encoder measured value	RSLT.X:EC	Available	5	3	X
Position X: Judgment value	RSLT.X:JG	Unsigned	1	0	-
Position Y	RSLT.Y	Available	5	3	Y
Position Y: Measured value	RSLT.Y:MS	Available	5	3	Y
Position Y: Absolute measured value	RSLT.Y:AB	Available	5	3	-
Position Y: Encoder measured value	RSLT.Y:EC	Available	5	3	Y
Position Y: Judgment value	RSLT.Y:JG	Unsigned	1	0	-
Position XY/Detection angle	RSLT.XYT	Available	5	3	-
Position XY/Detection angle: Measured value	RSLT.XYT:MS	Available	5	3	-
Position XY/Detection angle: Absolute measured value	RSLT.XYT:AB	Available	5	3	-
Position XY/Detection angle: Encoder measured value	RSLT.XYT:EC	Available	5	3	-
Position XY	RSLT.XY	Available	5	3	-
Position XY: Measured value	RSLT.XY:MS	Available	5	3	-
Position XY: Absolute measured value	RSLT.XY:AB	Available	5	3	-
Position XY: Encoder measured value	RSLT.XY:EC	Available	5	3	-
Detection angle	RSLT.T	Available	3	3	-
Detection angle: Measured value	RSLT.T:MS	Available	3	3	-
Detection angle: Absolute measured value	RSLT.T:AB	Available	3	3	-
Detection angle: Judgment value	RSLT.T:JG	Unsigned	1	0	-
Split 1 length	RSLT.ID_LEN1	Unsigned	3	0	-
Split 1 length: Measured value	RSLT.ID_LEN1:MS	Unsigned	3	0	-
.....				
Split 8 length	RSLT.ID_LEN8	Unsigned	3	0	-
Split 8 length: Measured value	RSLT.ID_LEN8:MS	Unsigned	3	0	-
Split readout 1	RSLT.ID_DATA1[*]	Unsigned	3	0	-
Split readout 1: Measured value	RSLT.ID_DATA1[*]:MS	Unsigned	3	0	-
.....				
Split readout 8	RSLT.ID_DATA8[*]	Unsigned	3	0	-
Split readout 8: Measured value	RSLT.ID_DATA8[*]:MS	Unsigned	3	0	-
Cell size	RSLT.ID_CSIZE	Unsigned	3	3	-
Cell size: Measured value	RSLT.ID_CSIZE:MS	Unsigned	3	3	-
Unused error correction	RSLT.ID_UECR	Unsigned	3	0	-
Unused error correction: Measured value	RSLT.ID_UECR:MS	Unsigned	3	0	-
Number of rows	RSLT.ID_CNR	Unsigned	3	0	-
Number of rows: Measured value	RSLT.ID_CNR:MS	Unsigned	3	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Number of columns	RSLT.ID_CNC	Unsigned	3	0	-
Number of columns: Measured value	RSLT.ID_CNC:MS	Unsigned	3	0	-
Cell color	RSLT.ID_CCLR	Unsigned	1	0	-
Cell color: Measured value	RSLT.ID_CCLR:MS	Unsigned	1	0	-
Mirrored reading	RSLT.ID_MRI	Unsigned	1	0	-
Mirrored reading: Measured value	RSLT.ID_MRI:MS	Unsigned	1	0	-
Code angle	RSLT.ID_CDT	Available	3	3	-
Code angle: Measured value	RSLT.ID_CDT:MS	Available	3	3	-
Code angle: Absolute measured value	RSLT.ID_CDT:AB	Available	3	3	-
Total code length	RSLT.ID_CDL	Unsigned	4	0	-
Total code length: Measured value	RSLT.ID_CDL:MS	Unsigned	4	0	-
Error result	RSLT.ID_ERR	Unsigned	1	0	-
Error result: Measured value	RSLT.ID_ERR:MS	Unsigned	1	0	-
Error cause	RSLT.ID_ERSN	Unsigned	1	0	-
Error cause: Measured value	RSLT.ID_ERSN:MS	Unsigned	1	0	-
Multi Reference No.	RSLT.M_IDX	Unsigned	2	0	-
Multi Reference No: Measured value	RSLT.M_IDX:MS	Unsigned	2	0	-
Reference 1	RSLT.M_DATA1[*]	Unsigned	3	0	-
Reference 1: Measured value	RSLT.M_DATA1[*]:MS	Unsigned	3	0	-
.....				
Reference 16	RSLT.M_DATA16[*]	Unsigned	3	0	-
Reference 16: Measured value	RSLT.M_DATA16[*]:MS	Unsigned	3	0	-
Reference: Judgment value	RSLT.M_RSLT:JG	Unsigned	1	0	-
Reference 1 result	RSLT.M_RSLT1	Available	3	0	-
Reference 1 result: Measured value	RSLT.M_RSLT1:MS	Available	3	0	-
.....				
Reference 16 result	RSLT.M_RSLT16	Available	3	0	-
Reference 16 result: Measured value	RSLT.M_RSLT16:MS	Available	3	0	-
Code area: Point 1 X	RSLT.DAX1	Available	5	0	X
Code area: Point 1 X: Measured value	RSLT.DAX1:MS	Available	5	0	X
Code area: Point 1 X: Absolute measured value	RSLT.DAX1:AB	Available	5	0	-
Code area: Point 1 X: Encoder measured value	RSLT.DAX1:EC	Available	5	0	X
Code area: Point 1 Y	RSLT.DAY1	Available	5	0	Y
Code area: Point 1 Y: Measured value	RSLT.DAY1:MS	Available	5	0	Y
Code area: Point 1 Y: Absolute measured value	RSLT.DAY1:AB	Available	5	0	-
Code area: Point 1 Y: Encoder measured value	RSLT.DAY1:EC	Available	5	0	Y
Code area: Point 1 XY	RSLT.DAXY1	Available	5	0	-
Code area: Point 1 XY: Measured value	RSLT.DAXY1:MS	Available	5	0	-
Code area: Point 1 XY: Absolute measured value	RSLT.DAXY1:AB	Available	5	0	-
Code area: Point 1 XY: Encoder measured value	RSLT.DAXY1:EC	Available	5	0	-
Code area: Point 2 X	RSLT.DAX2	Available	5	0	X
Code area: Point 2 X: Measured value	RSLT.DAX2:MS	Available	5	0	X
Code area: Point 2 X: Absolute measured value	RSLT.DAX2:AB	Available	5	0	-
Code area: Point 2 X: Encoder measured value	RSLT.DAX2:EC	Available	5	0	X

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Code area: Point 2 Y	RSLT.DAY2	Available	5	0	Y
Code area: Point 2 Y: Measured value	RSLT.DAY2:MS	Available	5	0	Y
Code area: Point 2 Y: Absolute measured value	RSLT.DAY2:AB	Available	5	0	-
Code area: Point 2 Y: Encoder measured value	RSLT.DAY2:EC	Available	5	0	Y
Code area: Point 2 XY	RSLT.DAXY2	Available	5	0	-
Code area: Point 2 XY: Measured value	RSLT.DAXY2:MS	Available	5	0	-
Code area: Point 2 XY: Absolute measured value	RSLT.DAXY2:AB	Available	5	0	-
Code area: Point 2 XY: Encoder measured value	RSLT.DAXY2:EC	Available	5	0	-
Code area: Point 3 X	RSLT.DAX3	Available	5	0	X
Code area: Point 3 X: Measured value	RSLT.DAX3:MS	Available	5	0	X
Code area: Point 3 X: Absolute measured value	RSLT.DAX3:AB	Available	5	0	-
Code area: Point 3 X: Encoder measured value	RSLT.DAX3:EC	Available	5	0	X
Code area: Point 3 Y	RSLT.DAY3	Available	5	0	Y
Code area: Point 3 Y: Measured value	RSLT.DAY3:MS	Available	5	0	Y
Code area: Point 3 Y: Absolute measured value	RSLT.DAY3:AB	Available	5	0	-
Code area: Point 3 Y: Encoder measured value	RSLT.DAY3:EC	Available	5	0	Y
Code area: Point 3 XY	RSLT.DAXY3	Available	5	0	-
Code area: Point 3 XY: Measured value	RSLT.DAXY3:MS	Available	5	0	-
Code area: Point 3 XY: Absolute measured value	RSLT.DAXY3:AB	Available	5	0	-
Code area: Point 3 XY: Encoder measured value	RSLT.DAXY3:EC	Available	5	0	-
Code area: Point 4 X	RSLT.DAX4	Available	5	0	X
Code area: Point 4 X: Measured value	RSLT.DAX4:MS	Available	5	0	X
Code area: Point 4 X: Absolute measured value	RSLT.DAX4:AB	Available	5	0	-
Code area: Point 4 X: Encoder measured value	RSLT.DAX4:EC	Available	5	0	X
Code area: Point 4 Y	RSLT.DAY4	Available	5	0	Y
Code area: Point 4 Y: Measured value	RSLT.DAY4:MS	Available	5	0	Y
Code area: Point 4 Y: Absolute measured value	RSLT.DAY4:AB	Available	5	0	-
Code area: Point 4 Y: Encoder measured value	RSLT.DAY4:EC	Available	5	0	Y
Code area: Point 4 XY	RSLT.DAXY4	Available	5	0	-
Code area: Point 4 XY: Measured value	RSLT.DAXY4:MS	Available	5	0	-
Code area: Point 4 XY: Absolute measured value	RSLT.DAXY4:AB	Available	5	0	-
Code area: Point 4 XY: Encoder measured value	RSLT.DAXY4:EC	Available	5	0	-
Reference position XY for position adjustment	RSLT.ADJXY	Available	5	3	-
Reference position X for position adjustment	RSLT.ADJX	Available	5	3	-
Reference position Y for position adjustment	RSLT.ADJY	Available	5	3	-
Reference angle for position adjustment	RSLT.ADJT	Available	3	3	-
ISO/IEC15415 Grade					

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Overall Symbol Grade	RSLT.ISO_ALL	Available	1	0	-
Overall Symbol Grade: Measured value	RSLT.ISO_ALL:MS	Available	1	0	-
Overall Symbol Grade: Judgment value	RSLT.ISO_ALL:JG	Unsigned	1	0	-
Decode	RSLT.ISO_DEC	Available	1	0	-
Decode: Measured value	RSLT.ISO_DEC:MS	Available	1	0	-
Decode: Judgment value	RSLT.ISO_DEC:JG	Unsigned	1	0	-
Symbol Contrast	RSLT.ISO_SC	Available	1	0	-
Symbol Contrast: Measured value	RSLT.ISO_SC:MS	Available	1	0	-
Symbol Contrast: Judgment value	RSLT.ISO_SC:JG	Unsigned	1	0	-
Modulation	RSLT.ISO_MOD	Available	1	0	-
Modulation: Measured value	RSLT.ISO_MOD:MS	Available	1	0	-
Modulation: Judgment value	RSLT.ISO_MOD:JG	Unsigned	1	0	-
Reflect. Margin	RSLT.ISO_RM	Available	1	0	-
Reflect. Margin: Measured value	RSLT.ISO_RM:MS	Available	1	0	-
Reflect. Margin: Judgment value	RSLT.ISO_RM:JG	Unsigned	1	0	-
Fixed Pat.Dmg.	RSLT.ISO_FPD	Available	1	0	-
Fixed Pat.Dmg.: Measured value	RSLT.ISO_FPD:MS	Available	1	0	-
Fixed Pat.Dmg.: Judgment value	RSLT.ISO_FPD:JG	Unsigned	1	0	-
Axial N-uniform.	RSLT.ISO_AN	Available	1	0	-
Axial N-uniform.: Measured value	RSLT.ISO_AN:MS	Available	1	0	-
Axial N-uniform.: Judgment value	RSLT.ISO_AN:JG	Unsigned	1	0	-
Grid N-uniform.	RSLT.ISO_GN	Available	1	0	-
Grid N-uniform.: Measured value	RSLT.ISO_GN:MS	Available	1	0	-
Grid N-uniform.: Judgment value	RSLT.ISO_GN:JG	Unsigned	1	0	-
Unused Err.Crr.	RSLT.ISO_UEC	Available	1	0	-
Unused Err.Crr.: Measured value	RSLT.ISO_UEC:MS	Available	1	0	-
Unused Err.Crr.: Judgment value	RSLT.ISO_UEC:JG	Unsigned	1	0	-
Form.Info.Dmg.	RSLT.ISO_FID	Available	1	0	-
Form.Info.Dmg.: Measured value	RSLT.ISO_FID:MS	Available	1	0	-
Form.Info.Dmg.: Judgment value	RSLT.ISO_FID:JG	Unsigned	1	0	-
Vers.Info.Dmg.	RSLT.ISO_VID	Available	1	0	-
Vers.Info.Dmg.: Measured value	RSLT.ISO_VID:MS	Available	1	0	-
Vers.Info.Dmg.: Judgment value	RSLT.ISO_VID:JG	Unsigned	1	0	-
Print Growth H.	RSLT.ISO_PGH	Available	1	0	-
Print Growth H.: Measured value	RSLT.ISO_PGH:MS	Available	1	0	-
Print Growth H.: Judgment value	RSLT.ISO_PGH:JG	Unsigned	1	0	-
Print Growth V.	RSLT.ISO_PGV	Available	1	0	-
Print Growth V.: Measured value	RSLT.ISO_PGV:MS	Available	1	0	-
Print Growth V.: Judgment value	RSLT.ISO_PGV:JG	Unsigned	1	0	-
AIM DPM-1-2006 Grade					
Overall Symbol Grade	RSLT.AIM_ALL	Available	1	0	-
Overall Symbol Grade: Measured value	RSLT.AIM_ALL:MS	Available	1	0	-
Overall Symbol Grade: Judgment value	RSLT.AIM_ALL:JG	Unsigned	1	0	-
Decode	RSLT.AIM_DEC	Available	1	0	-
Decode: Measured value	RSLT.AIM_DEC:MS	Available	1	0	-
Decode: Judgment value	RSLT.AIM_DEC:JG	Unsigned	1	0	-
Cell Contrast	RSLT.AIM_CC	Available	1	0	-
Cell Contrast: Measured value	RSLT.AIM_CC:MS	Available	1	0	-
Cell Contrast: Judgment value	RSLT.AIM_CC:JG	Unsigned	1	0	-
Cell Modulation	RSLT.AIM_CM	Available	1	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Cell Modulation: Measured value	RSLT.AIM_CM:MS	Available	1	0	-
Cell Modulation: Judgment value	RSLT.AIM_CM:JG	Unsigned	1	0	-
Reflect. Margin	RSLT.AIM_RM	Available	1	0	-
Reflect. Margin: Measured value	RSLT.AIM_RM:MS	Available	1	0	-
Reflect. Margin: Judgment value	RSLT.AIM_RM:JG	Unsigned	1	0	-
Fixed Pat.Dmg.	RSLT.AIM_FPD	Available	1	0	-
Fixed Pat.Dmg.: Measured value	RSLT.AIM_FPD:MS	Available	1	0	-
Fixed Pat.Dmg.: Judgment value	RSLT.AIM_FPD:JG	Unsigned	1	0	-
Axial N-uniform.	RSLT.AIM_AN	Available	1	0	-
Axial N-uniform.: Measured value	RSLT.AIM_AN:MS	Available	1	0	-
Axial N-uniform.: Judgment value	RSLT.AIM_AN:JG	Unsigned	1	0	-
Grid N-uniform.	RSLT.AIM_GN	Available	1	0	-
Grid N-uniform.: Measured value	RSLT.AIM_GN:MS	Available	1	0	-
Grid N-uniform.: Judgment value	RSLT.AIM_GN:JG	Unsigned	1	0	-
Unused Err.Crr.	RSLT.AIM_UEC	Available	1	0	-
Unused Err.Crr.: Measured value	RSLT.AIM_UEC:MS	Available	1	0	-
Unused Err.Crr.: Judgment value	RSLT.AIM_UEC:JG	Unsigned	1	0	-
Form.Info.Dmg.	RSLT.AIM_FID	Available	1	0	-
Form.Info.Dmg.: Measured value	RSLT.AIM_FID:MS	Available	1	0	-
Form.Info.Dmg.: Judgment value	RSLT.AIM_FID:JG	Unsigned	1	0	-
Vers.Info.Dmg.	RSLT.AIM_VID	Available	1	0	-
Vers.Info.Dmg.: Measured value	RSLT.AIM_VID:MS	Available	1	0	-
Vers.Info.Dmg.: Judgment value	RSLT.AIM_VID:JG	Unsigned	1	0	-
Print Growth H.	RSLT.AIM_PGH	Available	1	0	-
Print Growth H.: Measured value	RSLT.AIM_PGH:MS	Available	1	0	-
Print Growth H.: Judgment value	RSLT.AIM_PGH:JG	Unsigned	1	0	-
Print Growth V.	RSLT.AIM_PGV	Available	1	0	-
Print Growth V.: Measured value	RSLT.AIM_PGV:MS	Available	1	0	-
Print Growth V.: Judgment value	RSLT.AIM_PGV:JG	Unsigned	1	0	-
SAE AS9132 Grade					
Overall Symbol Grade	RSLT.SAE_ALL	Available	1	0	-
Overall Symbol Grade: Measured value	RSLT.SAE_ALL:MS	Available	1	0	-
Overall Symbol Grade: Judgment value	RSLT.SAE_ALL:JG	Unsigned	1	0	-
Quiet Zone	RSLT.SAE_QZ	Available	1	0	-
Quiet Zone: Measured value	RSLT.SAE_QZ:MS	Available	1	0	-
Quiet Zone: Judgment value	RSLT.SAE_QZ:JG	Unsigned	1	0	-
Symbol Contrast	RSLT.SAE_SC	Available	1	0	-
Symbol Contrast: Measured value	RSLT.SAE_SC:MS	Available	1	0	-
Symbol Contrast: Judgment value	RSLT.SAE_SC:JG	Unsigned	1	0	-
Angular Dist.	RSLT.SAE_AD	Available	1	0	-
Angular Dist.: Measured value	RSLT.SAE_AD:MS	Available	1	0	-
Angular Dist.: Judgment value	RSLT.SAE_AD:JG	Unsigned	1	0	-
Module Fill	RSLT.SAE_MF	Available	1	0	-
Module Fill: Measured value	RSLT.SAE_MF:MS	Available	1	0	-
Module Fill: Judgment value	RSLT.SAE_MF:JG	Unsigned	1	0	-
ISO/IEC15415 Value					
Symbol Contrast	RSLT.ISO_SC_VAL	Unsigned	1	2	-
Symbol Contrast: Measured value	RSLT.ISO_SC_VAL:MS	Unsigned	1	2	-
Axial N-uniform.	RSLT.ISO_AN_VAL	Unsigned	1	2	-
Axial N-uniform.: Measured value	RSLT.ISO_AN_VAL:MS	Unsigned	1	2	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Grid N-uniform.	RSLT.ISO_GN_VAL	Unsigned	1	2	-
Grid N-uniform.: Measured value	RSLT.ISO_GN_VAL:MS	Unsigned	1	2	-
Unused Err.Crr.	RSLT.ISO_UEC_VAL	Unsigned	1	2	-
Unused Err.Crr.: Measured value	RSLT.ISO_UEC_VAL:MS	Unsigned	1	2	-
Form.Info.Dmg.	RSLT.ISO_FID_VAL	Unsigned	1	1	-
Form.Info.Dmg.: Measured value	RSLT.ISO_FID_VAL:MS	Unsigned	1	1	-
Vers.Info.Dmg.	RSLT.ISO_VID_VAL	Available	1	1	-
Vers.Info.Dmg.: Measured value	RSLT.ISO_VID_VAL:MS	Available	1	1	-
Print Growth H.	RSLT.ISO_PGH_VAL	Available	1	2	-
Print Growth H.: Measured value	RSLT.ISO_PGH_VAL:MS	Available	1	2	-
Print Growth V.	RSLT.ISO_PGV_VAL	Available	1	2	-
Print Growth V.: Measured value	RSLT.ISO_PGV_VAL:MS	Available	1	2	-
AIM DPM-1-2006 Reference value					
Cell Contrast	RSLT.AIM_CC_VAL	Unsigned	1	2	-
Cell Contrast: Measured value	RSLT.AIM_CC_VAL:MS	Unsigned	1	2	-
Axial N-uniform.	RSLT.AIM_AN_VAL	Unsigned	1	2	-
Axial N-uniform.: Measured value	RSLT.AIM_AN_VAL:MS	Unsigned	1	2	-
Grid N-uniform.	RSLT.AIM_GN_VAL	Unsigned	1	2	-
Grid N-uniform.: Measured value	RSLT.AIM_GN_VAL:MS	Unsigned	1	2	-
Unused Err.Crr.	RSLT.AIM_UEC_VAL	Unsigned	1	2	-
Unused Err.Crr.: Measured value	RSLT.AIM_UEC_VAL:MS	Unsigned	1	2	-
Form.Info.Dmg.	RSLT.AIM_FID_VAL	Unsigned	1	1	-
Form.Info.Dmg.: Measured value	RSLT.AIM_FID_VAL:MS	Unsigned	1	1	-
Vers.Info.Dmg.	RSLT.AIM_VID_VAL	Unsigned	1	1	-
Vers.Info.Dmg.: Measured value	RSLT.AIM_VID_VAL:MS	Unsigned	1	1	-
Print Growth H.	RSLT.AIM_PGH_VAL	Available	1	2	-
Print Growth H.: Measured value	RSLT.AIM_PGH_VAL:MS	Available	1	2	-
Print Growth V.	RSLT.AIM_PGV_VAL	Available	1	2	-
Print Growth V.: Measured value	RSLT.AIM_PGV_VAL:MS	Available	1	2	-
SAE AS9132 Value					
Symbol Contrast	RSLT.SAE_SC_VAL	Unsigned	1	2	-
Symbol Contrast: Measured value	RSLT.SAE_SC_VAL:MS	Unsigned	1	2	-
Angular Dist.	RSLT.SAE_AD_VAL	Available	2	0	-
Angular Dist.: Measured value	RSLT.SAE_AD_VAL:MS	Available	2	0	-
Module Fill	RSLT.SAE_MF_VAL	Unsigned	1	2	-
Module Fill: Measured value	RSLT.SAE_MF_VAL:MS	Unsigned	1	2	-
XY Position / Detected Angle (Composite Code 1D Part)	RSLT.CC1D_XYT	Available	5	3	-
XY Position / Detected Angle (Composite Code 1D Part): Measured Value	RSLT.CC1D_XYT:MS	Available	5	3	-
XY Position / Detected Angle (Composite Code 1D Part): Absolute Value	RSLT.CC1D_XYT:AB	Available	5	3	-
XY Position / Detected Angle (Composite Code 1D Part): Encoder Value	RSLT.CC1D_XYT:EC	Available	5	3	-
XY Position (Composite Code 1D Part)	RSLT.CC1D_XY	Available	5	3	-
XY Position (Composite Code 1D Part): Measured Value	RSLT.CC1D_XY:MS	Available	5	3	-
XY Position (Composite Code 1D Part): Absolute Value	RSLT.CC1D_XY:AB	Available	5	3	-
XY Position (Composite Code 1D Part): Encoder Value	RSLT.CC1D_XY:EC	Available	5	3	-
X Position (Composite Code 1D Part)	RSLT.CC1D_X	Available	5	3	X

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
X Position (Composite Code 1D Part): Measured Value	RSLT.CC1D_X:MS	Available	5	3	X
X Position (Composite Code 1D Part): Absolute Value	RSLT.CC1D_X:AB	Available	5	3	-
X Position (Composite Code 1D Part): Encoder Value	RSLT.CC1D_X:EC	Available	5	3	X
Y Position (Composite Code 1D Part)	RSLT.CC1D_Y	Available	5	3	Y
Y Position (Composite Code 1D Part): Measured Value	RSLT.CC1D_Y:MS	Available	5	3	Y
Y Position (Composite Code 1D Part): Absolute Value	RSLT.CC1D_Y:AB	Available	5	3	-
Y Position (Composite Code 1D Part): Encoder Value	RSLT.CC1D_Y:EC	Available	5	3	Y
Detected Angle (Composite Code 1D Part)	RSLT.CC1D_T	Available	3	3	-
Detected Angle (Composite Code 1D Part): Measured Value	RSLT.CC1D_T:MS	Available	3	3	-
Detected Angle (Composite Code 1D Part): Absolute Value	RSLT.CC1D_T:AB	Available	3	3	-
XY Position / Detected Angle (Composite Code 2D Part)	RSLT.CC2D_XYT	Available	5	3	-
XY Position / Detected Angle (Composite Code 2D Part): Measured Value	RSLT.CC2D_XYT:MS	Available	5	3	-
XY Position / Detected Angle (Composite Code 2D Part): Absolute Value	RSLT.CC2D_XYT:AB	Available	5	3	-
XY Position / Detected Angle (Composite Code 2D Part): Encoder Value	RSLT.CC2D_XYT:EC	Available	5	3	-
XY Position (Composite Code 2D Part)	RSLT.CC2D_XY	Available	5	3	-
XY Position (Composite Code 2D Part): Measured Value	RSLT.CC2D_XY:MS	Available	5	3	-
XY Position (Composite Code 2D Part): Absolute Value	RSLT.CC2D_XY:AB	Available	5	3	-
XY Position (Composite Code 2D Part): Encoder Value	RSLT.CC2D_XY:EC	Available	5	3	-
X Position (Composite Code 2D Part)	RSLT.CC2D_X	Available	5	3	X
X Position (Composite Code 2D Part): Measured Value	RSLT.CC2D_X:MS	Available	5	3	X
X Position (Composite Code 2D Part): Absolute Value	RSLT.CC2D_X:AB	Available	5	3	-
X Position (Composite Code 2D Part): Encoder Value	RSLT.CC2D_X:EC	Available	5	3	X
Y Position (Composite Code 2D Part)	RSLT.CC2D_Y	Available	5	3	Y
Y Position (Composite Code 2D Part): Measured Value	RSLT.CC2D_Y:MS	Available	5	3	Y
Y Position (Composite Code 2D Part): Absolute Value	RSLT.CC2D_Y:AB	Available	5	3	-
Y Position (Composite Code 2D Part): Encoder Value	RSLT.CC2D_Y:EC	Available	5	3	Y
Detected Angle (Composite Code 2D Part)	RSLT.CC2D_T	Available	3	3	-
Detected Angle (Composite Code 2D Part): Measured Value	RSLT.CC2D_T:MS	Available	3	3	-
Detected Angle (Composite Code 2D Part): Absolute Value	RSLT.CC2D_T:AB	Available	3	3	-
Read Data Length (Composite Code 1D Part)	RSLT.CC1D_LEN	Unsigned	3	0	-
Read Data Length (Composite Code 1D Part): Measured Value	RSLT.CC1D_LEN:MS	Unsigned	3	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Read Data (Composite Code 1D Part)	RSLT.CC1D_DATA[s]	Unsigned	3	0	-
Read Data (Composite Code 1D Part): Measured Value	RSLT.CC1D_DATA[s]:MS	Unsigned	3	0	-
Read Data Length (Composite Code 2D Part)	RSLT.CC2D_LEN	Unsigned	3	0	-
Read Data Length (Composite Code 2D Part): Measured Value	RSLT.CC2D_LEN:MS	Unsigned	3	0	-
Read Data (Composite Code 2D Part)	RSLT.CC2D_DATA[s]	Unsigned	3	0	-
Read Data (Composite Code 2D Part): Measured Value	RSLT.CC2D_DATA[s]:MS	Unsigned	3	0	-
Min. Bar Width	RSLT.MSIZE	Unsigned	3	3	-
Min. Bar Width: Measured Value	RSLT.MSIZE:MS	Unsigned	3	3	-
Composite Code Side Slip Width	RSLT.CC_HGAP	Available	3	3	-
Composite Code Side Slip Width: Measured Value	RSLT.CC_HGAP:MS	Available	3	3	-
Code Area (Composite Code 1D Part): Point1 X	RSLT.CC1D_DAX1	Available	5	0	X
Code Area (Composite Code 1D Part): Point1 X: Measured Value	RSLT.CC1D_DAX1:MS	Available	5	0	X
Code Area (Composite Code 1D Part): Point1 X: Absolute Value	RSLT.CC1D_DAX1:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point1 X: Encoder Value	RSLT.CC1D_DAX1:EC	Available	5	0	X
Code Area (Composite Code 1D Part): Point1 Y	RSLT.CC1D_DAY1	Available	5	0	Y
Code Area (Composite Code 1D Part): Point1 Y: Measured Value	RSLT.CC1D_DAY1:MS	Available	5	0	Y
Code Area (Composite Code 1D Part): Point1 Y: Absolute Value	RSLT.CC1D_DAY1:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point1 Y: Encoder Value	RSLT.CC1D_DAY1:EC	Available	5	0	Y
Code Area (Composite Code 1D Part): Point1 XY	RSLT.CC1D_DAXY1	Available	5	0	-
Code Area (Composite Code 1D Part): Point1 XY: Measured Value	RSLT.CC1D_DAXY1:MS	Available	5	0	-
Code Area (Composite Code 1D Part): Point1 XY: Absolute Value	RSLT.CC1D_DAXY1:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point1 XY: Encoder Value	RSLT.CC1D_DAXY1:EC	Available	5	0	-
Code Area (Composite Code 1D Part): Point2 X	RSLT.CC1D_DAX2	Available	5	0	X
Code Area (Composite Code 1D Part): Point2 X: Measured Value	RSLT.CC1D_DAX2:MS	Available	5	0	X
Code Area (Composite Code 1D Part): Point2 X: Absolute Value	RSLT.CC1D_DAX2:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point2 X: Encoder Value	RSLT.CC1D_DAX2:EC	Available	5	0	X
Code Area (Composite Code 1D Part): Point2 Y	RSLT.CC1D_DAY2	Available	5	0	Y
Code Area (Composite Code 1D Part): Point2 Y: Measured Value	RSLT.CC1D_DAY2:MS	Available	5	0	Y
Code Area (Composite Code 1D Part): Point2 Y: Absolute Value	RSLT.CC1D_DAY2:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point2 Y: Encoder Value	RSLT.CC1D_DAY2:EC	Available	5	0	Y

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Code Area (Composite Code 1D Part): Point2 XY	RSLT.CC1D_DAXY2	Available	5	0	-
Code Area (Composite Code 1D Part): Point2 XY: Measured Value	RSLT.CC1D_DAXY2:MS	Available	5	0	-
Code Area (Composite Code 1D Part): Point2 XY: Absolute Value	RSLT.CC1D_DAXY2:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point2 XY: Encoder Value	RSLT.CC1D_DAXY2:EC	Available	5	0	-
Code Area (Composite Code 1D Part): Point3 X	RSLT.CC1D_DAX3	Available	5	0	X
Code Area (Composite Code 1D Part): Point3 X: Measured Value	RSLT.CC1D_DAX3:MS	Available	5	0	X
Code Area (Composite Code 1D Part): Point3 X: Absolute Value	RSLT.CC1D_DAX3:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point3 X: Encoder Value	RSLT.CC1D_DAX3:EC	Available	5	0	X
Code Area (Composite Code 1D Part): Point3 Y	RSLT.CC1D_DAY3	Available	5	0	Y
Code Area (Composite Code 1D Part): Point3 Y: Measured Value	RSLT.CC1D_DAY3:MS	Available	5	0	Y
Code Area (Composite Code 1D Part): Point3 Y: Absolute Value	RSLT.CC1D_DAY3:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point3 Y: Encoder Value	RSLT.CC1D_DAY3:EC	Available	5	0	Y
Code Area (Composite Code 1D Part): Point3 XY	RSLT.CC1D_DAXY3	Available	5	0	-
Code Area (Composite Code 1D Part): Point3 XY: Measured Value	RSLT.CC1D_DAXY3:MS	Available	5	0	-
Code Area (Composite Code 1D Part): Point3 XY: Absolute Value	RSLT.CC1D_DAXY3:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point3 XY: Encoder Value	RSLT.CC1D_DAXY3:EC	Available	5	0	-
Code Area (Composite Code 1D Part): Point4 X	RSLT.CC1D_DAX4	Available	5	0	X
Code Area (Composite Code 1D Part): Point4 X: Measured Value	RSLT.CC1D_DAX4:MS	Available	5	0	X
Code Area (Composite Code 1D Part): Point4 X: Absolute Value	RSLT.CC1D_DAX4:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point4 X: Encoder Value	RSLT.CC1D_DAX4:EC	Available	5	0	X
Code Area (Composite Code 1D Part): Point4 Y	RSLT.CC1D_DAY4	Available	5	0	Y
Code Area (Composite Code 1D Part): Point4 Y: Measured Value	RSLT.CC1D_DAY4:MS	Available	5	0	Y
Code Area (Composite Code 1D Part): Point4 Y: Absolute Value	RSLT.CC1D_DAY4:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point4 Y: Encoder Value	RSLT.CC1D_DAY4:EC	Available	5	0	Y
Code Area (Composite Code 1D Part): Point4 XY	RSLT.CC1D_DAXY4	Available	5	0	-
Code Area (Composite Code 1D Part): Point4 XY: Measured Value	RSLT.CC1D_DAXY4:MS	Available	5	0	-
Code Area (Composite Code 1D Part): Point4 XY: Absolute Value	RSLT.CC1D_DAXY4:AB	Available	5	0	-
Code Area (Composite Code 1D Part): Point4 XY: Encoder Value	RSLT.CC1D_DAXY4:EC	Available	5	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Code Area (Composite Code 2D Part): Point1 X	RSLT.CC2D_DAX1	Available	5	0	X
Code Area (Composite Code 2D Part): Point1 X: Measured Value	RSLT.CC2D_DAX1:MS	Available	5	0	X
Code Area (Composite Code 2D Part): Point1 X: Absolute Value	RSLT.CC2D_DAX1:AB	Available	5	0	-
Code Area (Composite Code 2D Part): Point1 X: Encoder Value	RSLT.CC2D_DAX1:EC	Available	5	0	X
Code Area (Composite Code 2D Part): Point1 Y	RSLT.CC2D_DAY1	Available	5	0	Y
Code Area (Composite Code 2D Part): Point1 Y: Measured Value	RSLT.CC2D_DAY1:MS	Available	5	0	Y
Code Area (Composite Code 2D Part): Point1 Y: Absolute Value	RSLT.CC2D_DAY1:AB	Available	5	0	-
Code Area (Composite Code 2D Part): Point1 Y: Encoder Value	RSLT.CC2D_DAY1:EC	Available	5	0	Y
Code Area (Composite Code 2D Part): Point1 XY	RSLT.CC2D_DAXY1	Available	5	0	-
Code Area (Composite Code 2D Part): Point1 XY: Measured Value	RSLT.CC2D_DAXY1:MS	Available	5	0	-
Code Area (Composite Code 2D Part): Point1 XY: Absolute Value	RSLT.CC2D_DAXY1:AB	Available	5	0	-
Code Area (Composite Code 2D Part): Point1 XY: Encoder Value	RSLT.CC2D_DAXY1:EC	Available	5	0	-
Code Area (Composite Code 2D Part): Point2 X	RSLT.CC2D_DAX2	Available	5	0	X
Code Area (Composite Code 2D Part): Point2 X: Measured Value	RSLT.CC2D_DAX2:MS	Available	5	0	X
Code Area (Composite Code 2D Part): Point2 X: Absolute Value	RSLT.CC2D_DAX2:AB	Available	5	0	-
Code Area (Composite Code 2D Part): Point2 X: Encoder Value	RSLT.CC2D_DAX2:EC	Available	5	0	X
Code Area (Composite Code 2D Part): Point2 Y	RSLT.CC2D_DAY2	Available	5	0	Y
Code Area (Composite Code 2D Part): Point2 Y: Measured Value	RSLT.CC2D_DAY2:MS	Available	5	0	Y
Code Area (Composite Code 2D Part): Point2 Y: Absolute Value	RSLT.CC2D_DAY2:AB	Available	5	0	-
Code Area (Composite Code 2D Part): Point2 Y: Encoder Value	RSLT.CC2D_DAY2:EC	Available	5	0	Y
Code Area (Composite Code 2D Part): Point2 XY	RSLT.CC2D_DAXY2	Available	5	0	-
Code Area (Composite Code 2D Part): Point2 XY: Measured Value	RSLT.CC2D_DAXY2:MS	Available	5	0	-
Code Area (Composite Code 2D Part): Point2 XY: Absolute Value	RSLT.CC2D_DAXY2:AB	Available	5	0	-
Code Area (Composite Code 2D Part): Point2 XY: Encoder Value	RSLT.CC2D_DAXY2:EC	Available	5	0	-
Code Area (Composite Code 2D Part): Point3 X	RSLT.CC2D_DAX3	Available	5	0	X
Code Area (Composite Code 2D Part): Point3 X: Measured Value	RSLT.CC2D_DAX3:MS	Available	5	0	X
Code Area (Composite Code 2D Part): Point3 X: Absolute Value	RSLT.CC2D_DAX3:AB	Available	5	0	-
Code Area (Composite Code 2D Part): Point3 X: Encoder Value	RSLT.CC2D_DAX3:EC	Available	5	0	X

Result item	Name	Numerical value format				Applicable scaling
		Sign	No. of integer digits	No. of decimal places		
Code Area (Composite Code 2D Part): Point3 Y	RSLT.CC2D_DAY3	Available	5	0	Y	
Code Area (Composite Code 2D Part): Point3 Y: Measured Value	RSLT.CC2D_DAY3:MS	Available	5	0	Y	
Code Area (Composite Code 2D Part): Point3 Y: Absolute Value	RSLT.CC2D_DAY3:AB	Available	5	0	-	
Code Area (Composite Code 2D Part): Point3 Y: Encoder Value	RSLT.CC2D_DAY3:EC	Available	5	0	Y	
Code Area (Composite Code 2D Part): Point3 XY	RSLT.CC2D_DAXY3	Available	5	0	-	
Code Area (Composite Code 2D Part): Point3 XY: Measured Value	RSLT.CC2D_DAXY3:MS	Available	5	0	-	
Code Area (Composite Code 2D Part): Point3 XY: Absolute Value	RSLT.CC2D_DAXY3:AB	Available	5	0	-	
Code Area (Composite Code 2D Part): Point3 XY: Encoder Value	RSLT.CC2D_DAXY3:EC	Available	5	0	-	
Code Area (Composite Code 2D Part): Point4 X	RSLT.CC2D_DAX4	Available	5	0	X	
Code Area (Composite Code 2D Part): Point4 X: Measured Value	RSLT.CC2D_DAX4:MS	Available	5	0	X	
Code Area (Composite Code 2D Part): Point4 X: Absolute Value	RSLT.CC2D_DAX4:AB	Available	5	0	-	
Code Area (Composite Code 2D Part): Point4 X: Encoder Value	RSLT.CC2D_DAX4:EC	Available	5	0	X	
Code Area (Composite Code 2D Part): Point4 Y	RSLT.CC2D_DAY4	Available	5	0	Y	
Code Area (Composite Code 2D Part): Point4 Y: Measured Value	RSLT.CC2D_DAY4:MS	Available	5	0	Y	
Code Area (Composite Code 2D Part): Point4 Y: Absolute Value	RSLT.CC2D_DAY4:AB	Available	5	0	-	
Code Area (Composite Code 2D Part): Point4 Y: Encoder Value	RSLT.CC2D_DAY4:EC	Available	5	0	Y	
Code Area (Composite Code 2D Part): Point4 XY	RSLT.CC2D_DAXY4	Available	5	0	-	
Code Area (Composite Code 2D Part): Point4 XY: Measured Value	RSLT.CC2D_DAXY4:MS	Available	5	0	-	
Code Area (Composite Code 2D Part): Point4 XY: Absolute Value	RSLT.CC2D_DAXY4:AB	Available	5	0	-	
Code Area (Composite Code 2D Part): Point4 XY: Encoder Value	RSLT.CC2D_DAXY4:EC	Available	5	0	-	
ISO/IEC 15415 Grade						
Overall Symbol Grade	RSLT.ST_ALL	Available	1	1	-	
Overall Symbol Grade: Measured Value	RSLT.ST_ALL:MS	Available	1	1	-	
Overall Symbol Grade: Judgment Value	RSLT.ST_ALL:JG	Unsigned	1	0	-	
Decode(DEC)	RSLT.ST_DEC	Available	1	0	-	
Decode(DEC): Measured Value	RSLT.ST_DEC:MS	Available	1	0	-	
Edge Determination(EDGE)	RSLT.ST_EDG	Available	1	0	-	
Edge Determination(EDGE): Measured Value	RSLT.ST_EDG:MS	Available	1	0	-	
Symbol Contrast(SC)	RSLT.ST_SC	Available	1	0	-	
Symbol Contrast(SC): Measured Value	RSLT.ST_SC:MS	Available	1	0	-	
Minimum Reflectance(MINR) Value	RSLT.ST_MINR	Available	1	0	-	
Minimum Reflectance(MINR) Value: Measured Value	RSLT.ST_MINR:MS	Available	1	0	-	
Minimum Edge Contrast(MINE)	RSLT.ST_MINE	Available	1	0	-	

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Minimum Edge Contrast(MINE): Measured Value	RSLT.ST_MINE:MS	Available	1	0	-
Modulation(MOD)	RSLT.ST_MOD	Available	1	0	-
Modulation(MOD): Measured Value	RSLT.ST_MOD:MS	Available	1	0	-
Minimum Quiet Zone(QZ)	RSLT.ST_QZ	Available	1	0	-
Minimum Quiet Zone(QZ): Measured Value	RSLT.ST_QZ:MS	Available	1	0	-
Decodability(DCD)	RSLT.ST_DCD	Available	1	0	-
Decodability(DCD): Measured Value	RSLT.ST_DCD:MS	Available	1	0	-
Defects(DEF)	RSLT.ST_DEF	Available	1	0	-
Defects(DEF): Measured Value	RSLT.ST_DEF:MS	Available	1	0	-
Codeword Yield(CY)	RSLT.ST_CY	Available	1	0	-
Codeword Yield(CY): Measured Value	RSLT.ST_CY:MS	Available	1	0	-
Codeword Print Quality(CPQ)	RSLT.ST_CPQ	Available	1	0	-
Codeword Print Quality(CPQ): Measured Value	RSLT.ST_CPQ:MS	Available	1	0	-
Unused Error Correction(UEC)	RSLT.ST_UEC	Available	1	0	-
Unused Error Correction(UEC): Measured Value	RSLT.ST_UEC:MS	Available	1	0	-
ISO/IEC 15415 Value					
Edge Determination(EDGE) Value	RSLT.ST_EDG_VAL	Unsigned	1	2	-
Edge Determination(EDGE) Value: Measured Value	RSLT.ST_EDG_VAL:MS	Unsigned	1	2	-
Symbol Contrast(SC) Value	RSLT.ST_SC_VAL	Unsigned	1	2	-
Symbol Contrast(SC) Value: Measured Value	RSLT.ST_SC_VAL:MS	Unsigned	1	2	-
Minimum Reflectance(MINR) Value	RSLT.ST_MINR_VAL	Unsigned	1	2	-
Minimum Reflectance(MINR) Value: Measured Value	RSLT.ST_MINR_VAL:MS	Unsigned	1	2	-
Minimum Edge Contrast(MINE) Value	RSLT.ST_MINE_VAL	Unsigned	1	2	-
Minimum Edge Contrast(MINE) Value: Measured Value	RSLT.ST_MINE_VAL:MS	Unsigned	1	2	-
Modulation(MOD) Value	RSLT.ST_MOD_VAL	Unsigned	1	2	-
Modulation(MOD) Value: Measured Value	RSLT.ST_MOD_VAL:MS	Unsigned	1	2	-
Minimum Quiet Zone(QZ) Value	RSLT.ST_QZ_VAL	Unsigned	1	2	-
Minimum Quiet Zone(QZ) Value: Measured Value	RSLT.ST_QZ_VAL:MS	Unsigned	1	2	-
Decodability(DCD) Value	RSLT.ST_DCD_VAL	Unsigned	1	2	-
Decodability(DCD) Value: Measured Value	RSLT.ST_DCD_VAL:MS	Unsigned	1	2	-
Defects(DEF) Value	RSLT.ST_DEF_VAL	Unsigned	1	2	-
Defects(DEF) Value: Measured Value	RSLT.ST_DEF_VAL:MS	Unsigned	1	2	-
Codeword Yield(CY) Value	RSLT.ST_CY_VAL	Unsigned	1	2	-
Codeword Yield(CY) Value: Measured Value	RSLT.ST_CY_VAL:MS	Unsigned	1	2	-
Codeword Print Quality(CPQ) Value	RSLT.ST_CPQ_VAL	Unsigned	1	2	-
Codeword Print Quality(CPQ) Value: Measured Value	RSLT.ST_CPQ_VAL:MS	Unsigned	1	2	-
Unused Error Correction(UEC) Value	RSLT.ST_UEC_VAL	Unsigned	1	2	-
Unused Error Correction(UEC) Value: Measured Value	RSLT.ST_UEC_VAL:MS	Unsigned	1	2	-
ISO/IEC 15415 Grade					
Decode(DEC)	RSLT.BC_DEC	Available	1	0	-
Decode(DEC): Measured Value	RSLT.BC_DEC:MS	Available	1	0	-
Edge Determination(EDGE)	RSLT.BC_EDG	Available	1	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Edge Determination(EDGE): Measured Value	RSLT.BC_EDG:MS	Available	1	0	-
Symbol Contrast(SC)	RSLT.BC_SC	Available	1	0	-
Symbol Contrast(SC): Measured Value	RSLT.BC_SC:MS	Available	1	0	-
Minimum Reflectance(MINR)	RSLT.BC_MINR	Available	1	0	-
Minimum Reflectance(MINR): Measured Value	RSLT.BC_MINR:MS	Available	1	0	-
Minimum Edge Contrast(MINE)	RSLT.BC_MINE	Available	1	0	-
Minimum Edge Contrast(MINE): Measured Value	RSLT.BC_MINE:MS	Available	1	0	-
Modulation(MOD)	RSLT.BC_MOD	Available	1	0	-
Modulation(MOD): Measured Value	RSLT.BC_MOD:MS	Available	1	0	-
Minimum Quiet Zone(QZ)	RSLT.BC_QZ	Available	1	0	-
Minimum Quiet Zone(QZ): Measured Value	RSLT.BC_QZ:MS	Available	1	0	-
Decodability(DCD)	RSLT.BC_DCD	Available	1	0	-
Decodability(DCD): Measured Value	RSLT.BC_DCD:MS	Available	1	0	-
Defects(DEF)	RSLT.BC_DEF	Available	1	0	-
Defects(DEF): Measured Value	RSLT.BC_DEF:MS	Available	1	0	-
ISO/IEC 15415 Value					
Edge Determination(EDGE) Value	RSLT.BC_EDG_VAL	Unsigned	1	2	-
Edge Determination(EDGE) Value: Measured Value	RSLT.BC_EDG_VAL:MS	Unsigned	1	2	-
Symbol Contrast(SC) Value	RSLT.BC_SC_VAL	Unsigned	1	2	-
Symbol Contrast(SC) Value: Measured Value	RSLT.BC_SC_VAL:MS	Unsigned	1	2	-
Minimum Reflectance(MINR) Value	RSLT.BC_MINR_VAL	Unsigned	1	2	-
Minimum Reflectance(MINR) Value: Measured Value	RSLT.BC_MINR_VAL:MS	Unsigned	1	2	-
Minimum Edge Contrast(MINE) Value	RSLT.BC_MINE_VAL	Unsigned	1	2	-
Minimum Edge Contrast(MINE) Value: Measured Value	RSLT.BC_MINE_VAL:MS	Unsigned	1	2	-
Modulation(MOD) Value	RSLT.BC_MOD_VAL	Unsigned	1	2	-
Modulation(MOD) Value: Measured Value	RSLT.BC_MOD_VAL:MS	Unsigned	1	2	-
Minimum Quiet Zone(QZ) Value	RSLT.BC_QZ_VAL	Unsigned	1	2	-
Minimum Quiet Zone(QZ) Value: Measured Value	RSLT.BC_QZ_VAL:MS	Unsigned	1	2	-
Decodability(DCD) Value	RSLT.BC_DCD_VAL	Unsigned	1	2	-
Decodability(DCD) Value: Measured Value	RSLT.BC_DCD_VAL:MS	Unsigned	1	2	-
Defects(DEF) Value	RSLT.BC_DEF_VAL	Unsigned	1	2	-
Defects(DEF) Value: Measured Value	RSLT.BC_DEF_VAL:MS	Unsigned	1	2	-

1D Code Reader Unit

Reference If in the [] is not specified, Readout (ID_DATA [*]) and Split Data (ID_DATA 1-8 [*]) are considered to be Readout text data.

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Code Length Result	RSLT.ID_LEN	Unsigned	3	0	-
Code Length Result: Measured value	RSLT.ID_LEN:MS	Unsigned	3	0	-
Code Length Result: Judgment value	RSLT.ID_LEN:JG	Unsigned	1	0	-
Readout Result	RSLT.ID_DATA[*]	Unsigned	3	0	-
Readout Result: Measured value	RSLT.ID_DATA[*]:MS	Unsigned	3	0	-
X Position Result	RSLT.X	Available	5	3	X
X Position Result: Measured value	RSLT.X:MS	Available	5	3	X
X Position Result: Absolute measured value	RSLT.X:AB	Available	5	3	-
X Position Result: Encoder measured value	RSLT.X:EC	Available	5	3	X
X Position Result: Judgment value	RSLT.X:JG	Unsigned	1	0	-
Y Position Result	RSLT.Y	Available	5	3	Y
Y Position Result: Measured value	RSLT.Y:MS	Available	5	3	Y
Y Position Result: Absolute measured value	RSLT.Y:AB	Available	5	3	-
Y Position Result: Encoder measured value	RSLT.Y:EC	Available	5	3	Y
Y Position Result: Judgment value	RSLT.Y:JG	Unsigned	1	0	-
XY and Deviation Angle Position	RSLT.XYT	Available	5	3	-
XY and Deviation Angle Position: Measured value	RSLT.XYT:MS	Available	5	3	-
XY and Deviation Angle Position: Absolute measured value	RSLT.XYT:AB	Available	5	3	-
XY and Detected Angle: Encoder measured value	RSLT.XYT:EC	Available	5	3	-
XY Position Result	RSLT.XY	Available	5	3	-
XY Position Result: Measured value	RSLT.XY:MS	Available	5	3	-
XY Position Result: Absolute measured value	RSLT.XY:AB	Available	5	3	-
XY Position Result: Encoder measured value	RSLT.XY:EC	Available	5	3	-
Deviation Angle Result	RSLT.T	Available	3	3	-
Deviation Angle Result: Measured value	RSLT.T:MS	Available	3	3	-
Deviation Angle Result: Absolute measured value	RSLT.T:AB	Available	3	3	-
Deviation Angle Result: Judgment value	RSLT.T:JG	Unsigned	1	0	-
Split 1 Length Result	RSLT.ID_LEN1	Unsigned	3	0	-
Split 1 Length Result: Measured value	RSLT.ID_LEN1:MS	Unsigned	3	0	-
.....				
Split 8 Length Result	RSLT.ID_LEN8	Unsigned	3	0	-
Split 8 Length Result: Measured value	RSLT.ID_LEN8:MS	Unsigned	3	0	-
Split 1 Readout Result	RSLT.ID_DATA1[*]	Unsigned	3	0	-
Split 1 Readout Result: Measured value	RSLT.ID_DATA1[*]:MS	Unsigned	3	0	-
.....				
Split 8 Readout Result	RSLT.ID_DATA8[*]	Unsigned	3	0	-
Split 8 Readout Result: Measured value	RSLT.ID_DATA8[*]:MS	Unsigned	3	0	-
Min. Bar Width	RSLT.ID_MSIZE	Unsigned	3	3	-
Min. Bar Width: Measured value	RSLT.ID_MSIZE:MS	Unsigned	3	3	-
Bar Color Result	RSLT.ID_CCLR	Unsigned	1	0	-
Bar Color Result: Measured value	RSLT.ID_CCLR:MS	Unsigned	1	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Angle Result	RSLT.ID_CDT	Available	3	3	-
Angle Result: Measured value	RSLT.ID_CDT:MS	Available	3	3	-
Angle Result: Absolute measured value	RSLT.ID_CDT:AB	Available	3	3	-
Total Code Length Result	RSLT.ID_CDL	Unsigned	4	0	-
Total Code Length Result: Measured value	RSLT.ID_CDL:MS	Unsigned	4	0	-
Stability	RSLT.STB	Unsigned	1	0	-
Stability: Measured value	RSLT.STB:MS	Unsigned	1	0	-
Error Result	RSLT.ID_ERR	Unsigned	1	0	-
Error Result: Measured value	RSLT.ID_ERR:MS	Unsigned	1	0	-
Error Reason	RSLT.ID_ERSN	Unsigned	1	0	-
Error Reason: Measured value	RSLT.ID_ERSN:MS	Unsigned	1	0	-
Multi Reference No. Result	RSLT.M_IDX	Unsigned	2	0	-
Multi Reference No. Result: Measured value	RSLT.M_IDX:MS	Unsigned	2	0	-
Reference 1	RSLT.M_DATA1[*]	Unsigned	3	0	-
Reference 1: Measured value	RSLT.M_DATA1[*]:MS	Unsigned	3	0	-
.....				
Reference 16	RSLT.M_DATA16[*]	Unsigned	3	0	-
Reference 16: Measured value	RSLT.M_DATA16[*]:MS	Unsigned	3	0	-
Reference Result	RSLT.M_RSLT	Unsigned	1	0	-
Reference Result: Judgment value	RSLT.M_RSLT:JG	Unsigned	1	0	-
Reference 1 Result	RSLT.M_RSLT1	Available	3	0	-
Reference 1 Result: Measured value	RSLT.M_RSLT1:MS	Available	3	0	-
.....				
Reference 16 Result	RSLT.M_RSLT16	Available	3	0	-
Reference 16 Result: Measured value	RSLT.M_RSLT16:MS	Available	3	0	-
Code Area: X1 Position Result	RSLT.DAX1	Available	5	0	X
Code Area: X1 Position Result: Measured value	RSLT.DAX1:MS	Available	5	0	X
Code Area: X1 Position Result: Absolute measured value	RSLT.DAX1:AB	Available	5	0	-
Code Area: X1 Position Result: Encoder measured value	RSLT.DAX1:EC	Available	5	0	X
Code Area: Y1 Position Result	RSLT.DAY1	Available	5	0	Y
Code Area: Y1 Position Result: Measured value	RSLT.DAY1:MS	Available	5	0	Y
Code Area: Y1 Position Result: Absolute measured value	RSLT.DAY1:AB	Available	5	0	-
Code Area: Y1 Position Result: Encoder measured value	RSLT.DAY1:EC	Available	5	0	Y
Code Area: XY1 Position Result	RSLT.DAXY1	Available	5	0	-
Code Area: XY1 Position Result: Measured value	RSLT.DAXY1:MS	Available	5	0	-
Code Area: XY1 Position Result: Absolute measured value	RSLT.DAXY1:AB	Available	5	0	-
Code Area: XY1 Position Result: Encoder measured value	RSLT.DAXY1:EC	Available	5	0	-
Code Area: X2 Position Result	RSLT.DAX2	Available	5	0	X
Code Area: X2 Position Result: Measured value	RSLT.DAX2:MS	Available	5	0	X
Code Area: X2 Position Result: Absolute measured value	RSLT.DAX2:AB	Available	5	0	-
Code Area: X2 Position Result: Encoder measured value	RSLT.DAX2:EC	Available	5	0	X

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Code Area: Y2 Position Result	RSLT.DAY2	Available	5	0	Y
Code Area: Y2 Position Result: Measured value	RSLT.DAY2:MS	Available	5	0	Y
Code Area: Y2 Position Result: Absolute measured value	RSLT.DAY2:AB	Available	5	0	-
Code Area: Y2 Position Result: Encoder measured value	RSLT.DAY2:EC	Available	5	0	Y
Code Area: XY2 Position Result	RSLT.DAXY2	Available	5	0	-
Code Area: XY2 Position Result: Measured value	RSLT.DAXY2:MS	Available	5	0	-
Code Area: XY2 Position Result: Absolute measured value	RSLT.DAXY2:AB	Available	5	0	-
Code Area: XY2 Position Result: Encoder measured value	RSLT.DAXY2:EC	Available	5	0	-
Code Area: X3 Position Result	RSLT.DAX3	Available	5	0	X
Code Area: X3 Position Result: Measured value	RSLT.DAX3:MS	Available	5	0	X
Code Area: X3 Position Result: Absolute measured value	RSLT.DAX3:AB	Available	5	0	-
Code Area: X3 Position Result: Encoder measured value	RSLT.DAX3:EC	Available	5	0	X
Code Area: Y3 Position Result	RSLT.DAY3	Available	5	0	Y
Code Area: Y3 Position Result: Measured value	RSLT.DAY3:MS	Available	5	0	Y
Code Area: Y3 Position Result: Absolute measured value	RSLT.DAY3:AB	Available	5	0	-
Code Area: Y3 Position Result: Encoder measured value	RSLT.DAY3:EC	Available	5	0	Y
Code Area: XY3 Position Result	RSLT.DAXY3	Available	5	0	-
Code Area: XY3 Position Result: Measured value	RSLT.DAXY3:MS	Available	5	0	-
Code Area: XY3 Position Result: Absolute measured value	RSLT.DAXY3:AB	Available	5	0	-
Code Area: XY3 Position Result: Encoder measured value	RSLT.DAXY3:EC	Available	5	0	-
Code Area: X4 Position Result	RSLT.DAX4	Available	5	0	X
Code Area: X4 Position Result: Measured value	RSLT.DAX4:MS	Available	5	0	X
Code Area: X4 Position Result: Absolute measured value	RSLT.DAX4:AB	Available	5	0	-
Code Area: X4 Position Result: Encoder measured value	RSLT.DAX4:EC	Available	5	0	X
Code Area: Y4 Position Result	RSLT.DAY4	Available	5	0	Y
Code Area: Y4 Position Result: Measured value	RSLT.DAY4:MS	Available	5	0	Y
Code Area: Y4 Position Result: Absolute measured value	RSLT.DAY4:AB	Available	5	0	-
Code Area: Y4 Position Result: Encoder measured value	RSLT.DAY4:EC	Available	5	0	Y
Code Area: XY4 Position Result	RSLT.DAXY4	Available	5	0	-
Code Area: XY4 Position Result: Measured value	RSLT.DAXY4:MS	Available	5	0	-
Code Area: XY4 Position Result: Absolute measured value	RSLT.DAXY4:AB	Available	5	0	-
Code Area: XY4 Position Result: Encoder measured value	RSLT.DAXY4:EC	Available	5	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
XY Position for Position Adjustment Reference	RSLT.ADJXY	Available	5	3	-
X Position for Position Adjustment Reference	RSLT.ADJX	Available	5	3	-
Y Position for Position Adjustment Reference	RSLT.ADJY	Available	5	3	-
Deviation Angle for Position Adjustment Reference	RSLT.ADJT	Available	3	3	-
ISO/IEC 15416 Grade					
Overall Symbol Grade	RSLT.BC_ALL	Available	1	1	-
Overall Symbol Grade: Measured Value	RSLT.BC_ALL:MS	Available	1	1	-
Overall Symbol Grade: Judgment Value	RSLT.BC_ALL:JG	Unsigned	1	0	-
Decode(DEC)	RSLT.BC_DEC	Available	1	0	-
Decode(DEC): Measured Value	RSLT.BC_DEC:MS	Available	1	0	-
Edge Determination(EDGE)	RSLT.BC_EDG	Available	1	0	-
Edge Determination(EDGE): Measured Value	RSLT.BC_EDG:MS	Available	1	0	-
Symbol Contrast(SC)	RSLT.BC_SC	Available	1	0	-
Symbol Contrast(SC): Measured Value	RSLT.BC_SC:MS	Available	1	0	-
Minimum Reflectance(MINR)	RSLT.BC_MINR	Available	1	0	-
Minimum Reflectance(MINR): Measured Value	RSLT.BC_MINR:MS	Available	1	0	-
Minimum Edge Contrast(MINE)	RSLT.BC_MINE	Available	1	0	-
Minimum Edge Contrast(MINE): Measured Value	RSLT.BC_MINE:MS	Available	1	0	-
Modulation(MOD)	RSLT.BC_MOD	Available	1	0	-
Modulation(MOD): Measured Value	RSLT.BC_MOD:MS	Available	1	0	-
Minimum Quiet Zone(QZ)	RSLT.BC_QZ	Available	1	0	-
Minimum Quiet Zone(QZ): Measured Value	RSLT.BC_QZ:MS	Available	1	0	-
Decodability(DCD)	RSLT.BC_DCD	Available	1	0	-
Decodability(DCD): Measured Value	RSLT.BC_DCD:MS	Available	1	0	-
Defects(DEF)	RSLT.BC_DEF	Available	1	0	-
Defects(DEF): Measured Value	RSLT.BC_DEF:MS	Available	1	0	-
Wide to Narrow Ratio(WNR)	RSLT.BC_WNR	Available	1	0	-
Wide to Narrow Ratio(WNR): Measured Value	RSLT.BC_WNR:MS	Available	1	0	-
Intercharacter Gap(CGAP)	RSLT.BC_CGAP	Available	1	0	-
Intercharacter Gap(CGAP): Measured Value	RSLT.BC_CGAP:MS	Available	1	0	-
ISO/IEC 15416 Value					
Edge Determination(EDGE) Value	RSLT.BC_EDG_VAL	Available	1	2	-
Edge Determination(EDGE) Value: Measured Value	RSLT.BC_EDG_VAL:MS	Available	1	2	-
Symbol Contrast(SC) Value	RSLT.BC_SC_VAL	Available	1	2	-
Symbol Contrast(SC) Value: Measured Value	RSLT.BC_SC_VAL:MS	Available	1	2	-
Minimum Reflectance(MINR) Value	RSLT.BC_MINR_VAL	Available	1	2	-
Minimum Reflectance(MINR) Value: Measured Value	RSLT.BC_MINR_VAL:MS	Available	1	2	-
Minimum Edge Contrast(MINE) Value	RSLT.BC_MINE_VAL	Available	1	2	-
Minimum Edge Contrast(MINE) Value: Measured Value	RSLT.BC_MINE_VAL:MS	Available	1	2	-
Modulation(MOD) Value	RSLT.BC_MOD_VAL	Available	1	2	-
Modulation(MOD) Value: Measured Value	RSLT.BC_MOD_VAL:MS	Available	1	2	-
Minimum Quiet Zone(QZ) Value	RSLT.BC_QZ_VAL	Available	1	2	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Minimum Quiet Zone(QZ) Value: Measured Value	RSLT.BC_QZ_VAL:MS	Available	1	2	-
Decodability(DCD) Value	RSLT.BC_DCD_VAL	Available	1	2	-
Decodability(DCD) Value: Measured Value	RSLT.BC_DCD_VAL:MS	Available	1	2	-
Defects(DEF) Value	RSLT.BC_DEF_VAL	Available	1	2	-
Defects(DEF) Value: Measured Value	RSLT.BC_DEF_VAL:MS	Available	1	2	-
Wide to Narrow Ratio(WNR) Value	RSLT.BC_WNR_VAL	Available	1	2	-
Wide to Narrow Ratio(WNR) Value: Measured Value	RSLT.BC_WNR_VAL:MS	Available	1	2	-
Intercharacter Gap(CGAP) Value	RSLT.BC_CGAP_VAL	Available	1	2	-
Intercharacter Gap(CGAP) Value: Measured Value	RSLT.BC_CGAP_VAL:MS	Available	1	2	-

Height Measurement Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Plane Formula Info. XYZ	RSLT.PPABC	Available	3	6	-
Plane Formula Info. XYZ: Measured Value	RSLT.PPABC:MS	Available	3	6	-
Plane Formula Info. XYZ: Absolute Value	RSLT.PPABC:AB	Available	3	6	-
X Slope	RSLT.PPA	Available	1	6	-
X Slope: Measured Value	RSLT.PPA:MS	Available	1	6	-
X Slope: Absolute Value	RSLT.PPA:AB	Available	1	6	-
Y Slope	RSLT.PPB	Available	1	6	-
Y Slope: Measured Value	RSLT.PPB:MS	Available	1	6	-
Y Slope: Absolute Value	RSLT.PPB:AB	Available	1	6	-
Z Intercept	RSLT.PPC	Available	3	3	-
Z Intercept: Measured Value	RSLT.PPC:MS	Available	3	3	-
Z Intercept: Absolute Value	RSLT.PPC:AB	Available	3	3	-
Count	RSLT.N	Unsigned	5	0	-
Count: Meas.	RSLT.N:MS	Unsigned	5	0	-
Count: Judge	RSLT.N:JG	Unsigned	1	0	-
Valid Inspection Region Count	RSLT.TRN	Unsigned	5	0	-
Valid Inspection Region Count: Meas.	RSLT.TRN:MS	Unsigned	5	0	-
Judge Per Region	RSLT.RGNJG[*]	Unsigned	1	0	-
Error Info. Per Region	RSLT.RGNERR[*]	Unsigned	1	0	-
Max. Height X Judge Per Region	RSLT.MXXJG[*]	Unsigned	1	0	-
Max. Height Y Judge Per Region	RSLT.MXYJG[*]	Unsigned	1	0	-
Max. Height Z Judge Per Region	RSLT.MXZJG[*]	Unsigned	1	0	-
Max. Height H Judge Per Region	RSLT.MXHJG[*]	Unsigned	1	0	-
Min. Height X Judge Per Region	RSLT.MNXJG[*]	Unsigned	1	0	-
Min. Height Y Judge Per Region	RSLT.MNYJG[*]	Unsigned	1	0	-
Min. Height Z Judge Per Region	RSLT.MNZJG[*]	Unsigned	1	0	-
Min. Height H Judge Per Region	RSLT.MNHJG[*]	Unsigned	1	0	-
Ave. Height Z Judge Per Region	RSLT.AVZJG[*]	Unsigned	1	0	-
Ave. Height H Judge Per Region	RSLT.AVHJG[*]	Unsigned	1	0	-
Valid Pix. Count Judge Per Region	RSLT.EPAJG[*]	Unsigned	1	0	-
Concave Area Judgment Value Per Region	RSLT.CONC_ARJG[*]	Unsigned	1	0	-
Convex Area Judgment Value Per Region	RSLT.CONV_ARJG[*]	Unsigned	1	0	-
Concave Volume Judgment Value Per Region	RSLT.CONC_VOLJG[*]	Unsigned	1	0	-
Convex Volume Judgment Value Per Region	RSLT.CONV_VOLJG[*]	Unsigned	1	0	-
Standard Deviation Z Judge Per Region	RSLT.DVZJG[*]	Unsigned	1	0	-
Standard Deviation H Judge Per Region	RSLT.DVHJG[*]	Unsigned	1	0	-
Maximum Height X	RSLT.MXX[*]	Available	5	3	X
Maximum Height X: Measured Value	RSLT.MXX[*]:MS	Available	5	3	X
Maximum Height X: Absolute Value	RSLT.MXX[*]:AB	Available	5	3	-
Maximum Height X: Encoder Pulse Count	RSLT.MXX[*]:EC	Available	5	3	X
Maximum Height X: Judgment Value	RSLT.MXX:JG	Unsigned	1	0	-
Maximum Height Y	RSLT.MXY[*]	Available	5	3	Y
Maximum Height Y: Measured Value	RSLT.MXY[*]:MS	Available	5	3	Y
Maximum Height Y: Absolute Value	RSLT.MXY[*]:AB	Available	5	3	-
Maximum Height Y: Encoder Pulse Count	RSLT.MXY[*]:EC	Available	5	3	Y
Maximum Height Y: Judgment Value	RSLT.MXY:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Maximum Height Z	RSLT.MXZ[*]	Available	5	3	-
Maximum Height Z: Measured Value	RSLT.MXZ[*]:MS	Available	5	3	-
Maximum Height Z: Absolute Value	RSLT.MXZ[*]:AB	Available	5	3	-
Maximum Height Z: Encoder Pulse Count	RSLT.MXZ[*]:EC	Available	5	3	-
Maximum Height Z: Judgment Value	RSLT.MXZ:JG	Unsigned	1	0	-
Maximum Height H	RSLT.MXH[*]	Available	5	3	-
Maximum Height H: Measured Value	RSLT.MXH[*]:MS	Available	5	3	-
Maximum Height H: Judgment Value	RSLT.MXH:JG	Unsigned	1	0	-
Maximum Height XYZ	RSLT.MXXYZ[*]	Available	5	3	-
Maximum Height XYZ: Measured Value	RSLT.MXXYZ[*]:MS	Available	5	3	-
Maximum Height XYZ: Absolute Value	RSLT.MXXYZ[*]:AB	Available	5	3	-
Maximum Height XYZ: Encoder Pulse Count	RSLT.MXXYZ[*]:EC	Available	5	3	-
Minimum Height X	RSLT.MNX[*]	Available	5	3	X
Minimum Height X: Measured Value	RSLT.MNX[*]:MS	Available	5	3	X
Minimum Height X: Absolute Value	RSLT.MNX[*]:AB	Available	5	3	-
Minimum Height X: Encoder Pulse Count	RSLT.MNX[*]:EC	Available	5	3	X
Minimum Height X: Judgment Value	RSLT.MNX:JG	Unsigned	1	0	-
Minimum Height Y	RSLT.MNY[*]	Available	5	3	Y
Minimum Height Y: Measured Value	RSLT.MNY[*]:MS	Available	5	3	Y
Minimum Height Y: Absolute Value	RSLT.MNY[*]:AB	Available	5	3	-
Minimum Height Y: Encoder Pulse Count	RSLT.MNY[*]:EC	Available	5	3	Y
Minimum Height Y: Judgment Value	RSLT.MNY:JG	Unsigned	1	0	-
Minimum Height Z	RSLT.MNZ[*]	Available	5	3	-
Minimum Height Z: Measured Value	RSLT.MNZ[*]:MS	Available	5	3	-
Minimum Height Z: Absolute Value	RSLT.MNZ[*]:AB	Available	5	3	-
Minimum Height Z: Encoder Pulse Count	RSLT.MNZ[*]:EC	Available	5	3	-
Minimum Height Z: Judgment Value	RSLT.MNZ:JG	Unsigned	1	0	-
Minimum Height H	RSLT.MNH[*]	Available	5	3	-
Minimum Height H: Measured Value	RSLT.MNH[*]:MS	Available	5	3	-
Minimum Height H: Judgment Value	RSLT.MNH:JG	Unsigned	1	0	-
Minimum Height XYZ	RSLT.MNXYZ[*]	Available	5	3	-
Minimum Height XYZ: Measured Value	RSLT.MNXYZ[*]:MS	Available	5	3	-
Minimum Height XYZ: Absolute Value	RSLT.MNXYZ[*]:AB	Available	5	3	-
Minimum Height XYZ: Encoder Pulse Count	RSLT.MNXYZ[*]:EC	Available	5	3	-
Average Height X	RSLT.AVX[*]	Available	5	3	X
Average Height X: Measured Value	RSLT.AVX[*]:MS	Available	5	3	X
Average Height X: Absolute Value	RSLT.AVX[*]:AB	Available	5	3	-
Average Height X: Encoder Pulse Count	RSLT.AVX[*]:EC	Available	5	3	X
Average Height Y	RSLT.AVY[*]	Available	5	3	Y
Average Height Y: Measured Value	RSLT.AVY[*]:MS	Available	5	3	Y
Average Height Y: Absolute Value	RSLT.AVY[*]:AB	Available	5	3	-
Average Height Y: Encoder Pulse Count	RSLT.AVY[*]:EC	Available	5	3	Y
Average Height Z	RSLT.AVZ[*]	Available	5	3	-
Average Height Z: Measured Value	RSLT.AVZ[*]:MS	Available	5	3	-
Average Height Z: Absolute Value	RSLT.AVZ[*]:AB	Available	5	3	-
Average Height Z: Encoder Pulse Count	RSLT.AVZ[*]:EC	Available	5	3	-
Average Height Z: Judgment Value	RSLT.AVZ:JG	Unsigned	1	0	-
Average Height H	RSLT.AVH[*]	Available	5	3	-
Average Height H: Measured Value	RSLT.AVH[*]:MS	Available	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Average Height H: Judgment Value	RSLT.AVH:JG	Unsigned	1	0	-
Average Height XYZ	RSLT.AVXYZ[*]	Available	5	3	-
Average Height XYZ: Measured Value	RSLT.AVXYZ[*]:MS	Available	5	3	-
Average Height XYZ: Absolute Value	RSLT.AVXYZ[*]:AB	Available	5	3	-
Average Height XYZ: Encoder Pulse Count	RSLT.AVXYZ[*]:EC	Available	5	3	-
Valid Pix. Count	RSLT.EPA[*]	Unsigned	8	0	-
Valid Pix. Count: Measured Value	RSLT.EPA[*]:MS	Unsigned	8	0	-
Valid Pix. Count: Judgment Value	RSLT.EPA:JG	Unsigned	1	0	-
Concave Area	RSLT.CONC_AR[*]	Unsigned	6	3	-
Concave Area: Measured Value	RSLT.CONC_AR[*]:MS	Unsigned	6	3	-
Concave Area: Judgment Value	RSLT.CONC_AR:JG	Unsigned	1	0	-
Convex Area	RSLT.CONV_AR[*]	Unsigned	6	3	-
Convex Area: Measured Value	RSLT.CONV_AR[*]:MS	Unsigned	6	3	-
Convex Area: Judgment Value	RSLT.CONV_AR:JG	Unsigned	1	0	-
Concave Volume	RSLT.CONC_VOL[*]	Unsigned	7	3	-
Concave Volume: Measured Value	RSLT.CONC_VOL[*]:MS	Unsigned	7	3	-
Concave Volume: Judgment Value	RSLT.CONC_VOL:JG	Unsigned	1	0	-
Convex Volume	RSLT.CONV_VOL[*]	Unsigned	7	3	-
Convex Volume: Measured Value	RSLT.CONV_VOL[*]:MS	Unsigned	7	3	-
Convex Volume: Judgment Value	RSLT.CONV_VOL:JG	Unsigned	1	0	-
Standard Deviation Z	RSLT.DVZ[*]	Unsigned	5	3	-
Standard Deviation Z: Measured Value	RSLT.DVZ[*]:MS	Unsigned	5	3	-
Standard Deviation Z: Judgment Value	RSLT.DVZ:JG	Unsigned	1	0	-
Standard Deviation H	RSLT.DVH[*]	Unsigned	5	3	-
Standard Deviation H: Measured Value	RSLT.DVH[*]:MS	Unsigned	5	3	-
Standard Deviation H: Judgment Value	RSLT.DVH:JG	Unsigned	1	0	-
Plane Formula Info. XYZ of Detected Plane	RSLT.DPPABC	Available	3	6	-
Plane Formula Info. XYZ of Detected Plane: Measured Value	RSLT.DPPABC:MS	Available	3	6	-
Plane Formula Info. XYZ of Detected Plane: Absolute Value	RSLT.DPPABC:AB	Available	3	6	-
X Slope of Detected Plane	RSLT.DPPA	Available	3	6	-
X Slope of Detected Plane: Measured Value	RSLT.DPPA:MS	Available	3	6	X
X Slope of Detected Plane: Absolute Value	RSLT.DPPA:AB	Available	3	6	-
Y Slope of Detected Plane	RSLT.DPPB	Available	3	6	-
Y Slope of Detected Plane: Measured Value	RSLT.DPPB:MS	Available	3	6	Y
Y Slope of Detected Plane: Absolute Value	RSLT.DPPB:AB	Available	3	6	-
Z Intercept of Det. Plane	RSLT.DPPC	Available	3	3	-
Z Intercept of Det. Plane: Measured Value	RSLT.DPPC:MS	Available	3	3	-
Z Intercept of Det. Plane: Absolute Value	RSLT.DPPC:AB	Available	3	3	-

Profile Measurement Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Plane equation info. XYZ of zero plane	RSLT.PPABC	Available	3	6	-
Plane equation info. XYZ of zero plane: Measured value	RSLT.PPABC:MS	Available	3	6	-
Plane equation info. XYZ of zero plane: Absolute measured value	RSLT.PPABC:AB	Available	3	6	-
X slope of zero plane	RSLT.PPA	Available	1	6	-
X slope of zero plane: Measured value	RSLT.PPA:MS	Available	1	6	-
X slope of zero plane: Absolute measured value	RSLT.PPA:AB	Available	1	6	-
Y slope of zero plane	RSLT.PPB	Available	1	6	-
Y slope of zero plane: Measured value	RSLT.PPB:MS	Available	1	6	-
Y slope of zero plane: Absolute measured value	RSLT.PPB:AB	Available	1	6	-
Z intercept of zero plane	RSLT.PPC	Available	3	3	-
Z intercept of zero plane: Measured value	RSLT.PPC:MS	Available	3	3	-
Z intercept of zero plane: Absolute measured value	RSLT.PPC:AB	Available	3	3	-
Height	RSLT.PMSR[0].HGT	Available	5	3	-
Height: Measured value	RSLT.PMSR[0].HGT:MS	Available	5	3	-
Height: Judgment value	RSLT.PMSR[0].HGT:JG	Unsigned	1	0	-
Level distance	RSLT.PMSR[0].DIFF	Available	5	3	-
Level distance: Measured value	RSLT.PMSR[0].DIFF:MS	Available	5	3	-
Level distance: Judgment value	RSLT.PMSR[0].DIFF:JG	Unsigned	1	0	-
Level distance: Reference height	RSLT.PMSR[0].DHGTR	Available	5	3	-
Level distance: Reference height: Measured value	RSLT.PMSR[0].DHGTR:MS	Available	5	3	-
Level distance: Measurement height	RSLT.PMSR[0].DHGTM	Available	5	3	-
Level distance: Measurement height: Measured value	RSLT.PMSR[0].DHGTM:MS	Available	5	3	-
Position	RSLT.PMSR[0].POS	Available	5	3	X
Position: Measured value	RSLT.PMSR[0].POS:MS	Available	5	3	X
Position: Judgment value	RSLT.PMSR[0].POS:JG	Unsigned	1	0	-
Position XYZ	RSLT.PMSR[0].POSXYZ	Available	5	3	-
Position XYZ: Measured value	RSLT.PMSR[0].POSXYZ:MS	Available	5	3	-
Position XYZ: Absolute measured value	RSLT.PMSR[0].POSXYZ:AB	Available	5	3	-
Position XYZ: Encoder pulse count	RSLT.PMSR[0].POSXYZ:EC	Available	5	3	-
Position X	RSLT.PMSR[0].POSX	Available	5	3	X
Position X: Measured value	RSLT.PMSR[0].POSX:MS	Available	5	3	X
Position X: Absolute measured value	RSLT.PMSR[0].POSX:AB	Available	5	3	-
Position X: Encoder pulse count	RSLT.PMSR[0].POSX:EC	Available	5	3	X
Position Y	RSLT.PMSR[0].POSY	Available	5	3	Y
Position Y: Measured value	RSLT.PMSR[0].POSY:MS	Available	5	3	Y
Position Y: Absolute measured value	RSLT.PMSR[0].POSY:AB	Available	5	3	-
Position Y: Encoder pulse count	RSLT.PMSR[0].POSY:EC	Available	5	3	Y
Position Z	RSLT.PMSR[0].POSZ	Available	5	3	-
Position Z: Measured value	RSLT.PMSR[0].POSZ:MS	Available	5	3	-
Position Z: Absolute measured value	RSLT.PMSR[0].POSZ:AB	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Position Z: Encoder pulse count	RSLT.PMSR[0].POSZ:EC	Available	5	3	-
Center position	RSLT.PMSR[0].CTR	Available	5	3	X
Center position: Measured value	RSLT.PMSR[0].CTR:MS	Available	5	3	X
Center position: Judgment value	RSLT.PMSR[0].CTR:JG	Unsigned	1	0	-
Center position XYZ	RSLT.PMSR[0].CTRXYZ	Available	5	3	-
Center position XYZ: Measured value	RSLT.PMSR[0].CTRXYZ:MS	Available	5	3	-
Center position XYZ: Absolute measured value	RSLT.PMSR[0].CTRXYZ:AB	Available	5	3	-
Center position XYZ: Encoder pulse count	RSLT.PMSR[0].CTRXYZ:EC	Available	5	3	-
Center position X	RSLT.PMSR[0].CTRX	Available	5	3	X
Center position X: Measured value	RSLT.PMSR[0].CTRX:MS	Available	5	3	X
Center position X: Absolute measured value	RSLT.PMSR[0].CTRX:AB	Available	5	3	-
Center position X: Encoder pulse count	RSLT.PMSR[0].CTRX:EC	Available	5	3	X
Center position Y	RSLT.PMSR[0].CTRY	Available	5	3	Y
Center position Y: Measured value	RSLT.PMSR[0].CTRY:MS	Available	5	3	Y
Center position Y: Absolute measured value	RSLT.PMSR[0].CTRY:AB	Available	5	3	-
Center position Y: Encoder pulse count	RSLT.PMSR[0].CTRY:EC	Available	5	3	Y
Center position Z	RSLT.PMSR[0].CTRZ	Available	5	3	-
Center position Z: Measured value	RSLT.PMSR[0].CTRZ:MS	Available	5	3	-
Center position Z: Absolute measured value	RSLT.PMSR[0].CTRZ:AB	Available	5	3	-
Center position Z: Encoder pulse count	RSLT.PMSR[0].CTRZ:EC	Available	5	3	-
Center position: Position 1	RSLT.PMSR[0].CPOS1	Available	5	3	X
Center position: Position 1: Measured value	RSLT.PMSR[0].CPOS1:MS	Available	5	3	X
Center position: Position 2	RSLT.PMSR[0].CPOS2	Available	5	3	X
Center position: Position 2: Measured value	RSLT.PMSR[0].CPOS2:MS	Available	5	3	X
Width	RSLT.PMSR[0].WID	Available	5	3	X
Width: Measured value	RSLT.PMSR[0].WID:MS	Available	5	3	X
Width: Judgment value	RSLT.PMSR[0].WID:JG	Unsigned	1	0	-
Width: Position 1	RSLT.PMSR[0].WPOSR	Available	5	3	X
Width: Position 1: Measured value	RSLT.PMSR[0].WPOSR:MS	Available	5	3	X
Width: Position 2	RSLT.PMSR[0].WPOSM	Available	5	3	X
Width: Position 2: Measured value	RSLT.PMSR[0].WPOSM:MS	Available	5	3	X
Angle from horizontal	RSLT.PMSR[0].HANG	Available	3	3	-
Angle from horizontal: Measured value	RSLT.PMSR[0].HANG:MS	Available	3	3	-
Angle from horizontal: Judgment value	RSLT.PMSR[0].HANG:JG	Unsigned	1	0	-
Angle formed by two lines	RSLT.PMSR[0].LLANG	Available	3	3	-
Angle formed by two lines: Measured value	RSLT.PMSR[0].LLANG:MS	Available	3	3	-
Angle formed by two lines: Judgment value	RSLT.PMSR[0].LLANG:JG	Unsigned	1	0	-
Starting angle	RSLT.PMSR[0].LLANGR	Available	3	3	-
Starting angle: Measured value	RSLT.PMSR[0].LLANGR:MS	Available	3	3	-
Measured angle	RSLT.PMSR[0].LLANGM	Available	3	3	-
Measured angle: Measured value	RSLT.PMSR[0].LLANGM:MS	Available	3	3	-
Radius of circle	RSLT.PMSR[0].PRAD	Available	5	3	-
Radius of circle: Measured value	RSLT.PMSR[0].PRAD:MS	Available	5	3	-
Radius of circle: Judgment value	RSLT.PMSR[0].PRAD:JG	Unsigned	1	0	-
1-line Cross-Section area	RSLT.PMSR[0].LAR	Available	5	3	-
1-line Cross-Section area: Measured value	RSLT.PMSR[0].LAR:MS	Available	5	3	-
1-line Cross-Section area: Judgment value	RSLT.PMSR[0].LAR:JG	Unsigned	1	0	-
2-line Cross-Section area	RSLT.PMSR[0].DLAR	Available	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
2-line Cross-Section area: Measured value	RSLT.PMSR[0].DLAR:MS	Available	5	3	-
2-line Cross-Section area: Judgment value	RSLT.PMSR[0].DLAR:JG	Unsigned	1	0	-
Cross-Section area (Zero Plane reference)	RSLT.PMSR[0].ZAR	Available	5	3	-
Cross-Section area (Zero Plane reference): Measured value	RSLT.PMSR[0].ZAR:MS	Available	5	3	-
Cross-Section area (Zero Plane reference): Judgment value	RSLT.PMSR[0].ZAR:JG	Unsigned	1	0	-
Points distance	RSLT.PMSR[0].PPDST	Available	5	3	-
Points distance: Measured value	RSLT.PMSR[0].PPDST:MS	Available	5	3	-
Points distance: Judgment value	RSLT.PMSR[0].PPDST:JG	Unsigned	1	0	-
Point/line distance	RSLT.PMSR[0].LPDST	Available	5	3	-
Point/line distance: Measured value	RSLT.PMSR[0].LPDST:MS	Available	5	3	-
Point/line distance: Judgment value	RSLT.PMSR[0].LPDST:JG	Unsigned	1	0	-
Count	RSLT.PMSR[0].PCNT	Unsigned	5	0	-
Count: Measured value	RSLT.PMSR[0].PCNT:MS	Unsigned	5	0	-
Count: Judgment value	RSLT.PMSR[0].PCNT:JG	Unsigned	1	0	-
Defect area	RSLT.PMSR[0].STG	Available	5	3	-
Defect area: Measured value	RSLT.PMSR[0].STG:MS	Available	5	3	-
Defect area: Judgment value	RSLT.PMSR[0].STG:JG	Unsigned	1	0	-

Continuous Profile Measurement Unit

Result item		Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Measurement target	Start position XYZ of best fit line 1	RSLT.DLN1_PXYZ	Available	5	3	-
	Start position XYZ of best fit line 1: Measured value	RSLT.DLN1_PXYZ:MS	Available	5	3	-
	Start position XYZ of best fit line 1: Absolute measured value	RSLT.DLN1_PXYZ:AB	Available	5	3	-
	Start position X of best fit line 1	RSLT.DLN1_PX	Available	5	3	X
	Start position X of best fit line 1: Measured value	RSLT.DLN1_PX:MS	Available	5	3	X
	Start position X of best fit line 1: Absolute measured value	RSLT.DLN1_PX:AB	Available	5	3	-
	Start position Y of best fit line 1	RSLT.DLN1_PY	Available	5	3	Y
	Start position Y of best fit line 1: Measured value	RSLT.DLN1_PY:MS	Available	5	3	Y
	Start position Y of best fit line 1: Absolute measured value	RSLT.DLN1_PY:AB	Available	5	3	-
	Start position Z of best fit line 1	RSLT.DLN1_PZ	Available	5	3	-
	Start position Z of best fit line 1: Measured value	RSLT.DLN1_PZ:MS	Available	5	3	-
	Start position Z of best fit line 1: Absolute measured value	RSLT.DLN1_PZ:AB	Available	5	3	-
	Vector XYZ of best fit line 1	RSLT.DLN1_VXYZ	Available	5	3	-
	Vector XYZ of best fit line 1: Measured value	RSLT.DLN1_VXYZ:MS	Available	5	3	-
	Vector XYZ of best fit line 1: Absolute measured value	RSLT.DLN1_VXYZ:AB	Available	5	3	-
	Vector X of best fit line 1	RSLT.DLN1_VX	Available	5	3	X
	Vector X of best fit line 1: Measured value	RSLT.DLN1_VX:MS	Available	5	3	X
	Vector X of best fit line 1: Absolute measured value	RSLT.DLN1_VX:AB	Available	5	3	-
	Vector Y of best fit line 1	RSLT.DLN1_VY	Available	5	3	Y
	Vector Y of best fit line 1: Measured value	RSLT.DLN1_VY:MS	Available	5	3	Y
	Vector Y of best fit line 1: Absolute measured value	RSLT.DLN1_VY:AB	Available	5	3	-
	Vector Z of best fit line 1	RSLT.DLN1_VZ	Available	5	3	-
	Vector Z of best fit line 1: Measured value	RSLT.DLN1_VZ:MS	Available	5	3	-
	Vector Z of best fit line 1: Absolute measured value	RSLT.DLN1_VZ:AB	Available	5	3	-
	Start position XYZ of best fit line 2	RSLT.DLN2_PXYZ	Available	5	3	-
	Start position XYZ of best fit line 2: Measured value	RSLT.DLN2_PXYZ:MS	Available	5	3	-
	Start position XYZ of best fit line 2: Absolute measured value	RSLT.DLN2_PXYZ:AB	Available	5	3	-
	Start position X of best fit line 2	RSLT.DLN2_PX	Available	5	3	X
	Start position X of best fit line 2: Measured value	RSLT.DLN2_PX:MS	Available	5	3	X
	Start position X of best fit line 2: Absolute measured value	RSLT.DLN2_PX:AB	Available	5	3	-
	Start position Y of best fit line 2	RSLT.DLN2_PY	Available	5	3	Y
	Start position Y of best fit line 2: Measured value	RSLT.DLN2_PY:MS	Available	5	3	Y

Result item	Name	Numerical value format				
		Sign	No. of integer digits	No. of decimal places	Applicable scaling	
Measurement target (continued)	Start position Y of best fit line 2: Absolute measured value	RSLT.DLN2_PY:AB	Available	5	3	-
	Start position Z of best fit line 2	RSLT.DLN2_PZ	Available	5	3	-
	Start position Z of best fit line 2: Measured value	RSLT.DLN2_PZ:MS	Available	5	3	-
	Start position Z of best fit line 2: Absolute measured value	RSLT.DLN2_PZ:AB	Available	5	3	-
	Vector XYZ of best fit line 2	RSLT.DLN2_VXYZ	Available	5	3	-
	Vector XYZ of best fit line 2: Measured value	RSLT.DLN2_VXYZ:MS	Available	5	3	-
	Vector XYZ of best fit line 2: Absolute measured value	RSLT.DLN2_VXYZ:AB	Available	5	3	-
	Vector X of best fit line 2	RSLT.DLN2_VX	Available	5	3	X
	Vector X of best fit line 2: Measured value	RSLT.DLN2_VX:MS	Available	5	3	X
	Vector X of best fit line 2: Absolute measured value	RSLT.DLN2_VX:AB	Available	5	3	-
	Vector Y of best fit line 2	RSLT.DLN2_VY	Available	5	3	Y
	Vector Y of best fit line 2: Measured value	RSLT.DLN2_VY:MS	Available	5	3	Y
	Vector Y of best fit line 2: Absolute measured value	RSLT.DLN2_VY:AB	Available	5	3	-
	Vector Z of best fit line 2	RSLT.DLN2_VZ	Available	5	3	-
	Vector Z of best fit line 2: Measured value	RSLT.DLN2_VZ:MS	Available	5	3	-
	Vector Z of best fit line 2: Absolute measured value	RSLT.DLN2_VZ:AB	Available	5	3	-
	Start position XYZ of best fit line 3	RSLT.DLN3_PXYZ	Available	5	3	-
	Start position XYZ of best fit line 3: Measured value	RSLT.DLN3_PXYZ:MS	Available	5	3	-
	Start position XYZ of best fit line 3: Absolute measured value	RSLT.DLN3_PXYZ:AB	Available	5	3	-
	Start position X of best fit line 3	RSLT.DLN3_PX	Available	5	3	X
	Start position X of best fit line 3: Measured value	RSLT.DLN3_PX:MS	Available	5	3	X
	Start position X of best fit line 3: Absolute measured value	RSLT.DLN3_PX:AB	Available	5	3	-
	Start position Y of best fit line 3	RSLT.DLN3_PY	Available	5	3	Y
	Start position Y of best fit line 3: Measured value	RSLT.DLN3_PY:MS	Available	5	3	Y
	Start position Y of best fit line 3: Absolute measured value	RSLT.DLN3_PY:AB	Available	5	3	-
	Start position Z of best fit line 3	RSLT.DLN3_PZ	Available	5	3	-
	Start position Z of best fit line 3: Measured value	RSLT.DLN3_PZ:MS	Available	5	3	-
	Start position Z of best fit line 3: Absolute measured value	RSLT.DLN3_PZ:AB	Available	5	3	-
	Vector XYZ of best fit line 3	RSLT.DLN3_VXYZ	Available	5	3	-
	Vector XYZ of best fit line 3: Measured value	RSLT.DLN3_VXYZ:MS	Available	5	3	-
	Vector XYZ of best fit line 3: Absolute measured value	RSLT.DLN3_VXYZ:AB	Available	5	3	-
	Vector X of best fit line 3	RSLT.DLN3_VX	Available	5	3	X
	Vector X of best fit line 3: Measured value	RSLT.DLN3_VX:MS	Available	5	3	X
	Vector X of best fit line 3: Absolute measured value	RSLT.DLN3_VX:AB	Available	5	3	-
	Vector Y of best fit line 3	RSLT.DLN3_VY	Available	5	3	Y

Result item	Name	Numerical value format				Applicable scaling
		Sign	No. of integer digits	No. of decimal places		
Measurement target (continued)	Vector Y of best fit line 3: Measured value	RSLT.DLN3_VY:MS	Available	5	3	Y
	Vector Y of best fit line 3: Absolute measured value	RSLT.DLN3_VY:AB	Available	5	3	-
	Vector Z of best fit line 3	RSLT.DLN3_VZ	Available	5	3	-
	Vector Z of best fit line 3: Measured value	RSLT.DLN3_VZ:MS	Available	5	3	-
	Vector Z of best fit line 3: Absolute measured value	RSLT.DLN3_VZ:AB	Available	5	3	-
	Start position XYZ of best fit line 4	RSLT.DLN4_PXYZ	Available	5	3	-
	Start position XYZ of best fit line 4: Measured value	RSLT.DLN4_PXYZ:MS	Available	5	3	-
	Start position XYZ of best fit line 4: Absolute measured value	RSLT.DLN4_PXYZ:AB	Available	5	3	-
	Start position X of best fit line 4	RSLT.DLN4_PX	Available	5	3	X
	Start position X of best fit line 4: Measured value	RSLT.DLN4_PX:MS	Available	5	3	X
	Start position X of best fit line 4: Absolute measured value	RSLT.DLN4_PX:AB	Available	5	3	-
	Start position Y of best fit line 4	RSLT.DLN4_PY	Available	5	3	Y
	Start position Y of best fit line 4: Measured value	RSLT.DLN4_PY:MS	Available	5	3	Y
	Start position Y of best fit line 4: Absolute measured value	RSLT.DLN4_PY:AB	Available	5	3	-
	Start position Z of best fit line 4	RSLT.DLN4_PZ	Available	5	3	-
	Start position Z of best fit line 4: Measured value	RSLT.DLN4_PZ:MS	Available	5	3	-
	Start position Z of best fit line 4: Absolute measured value	RSLT.DLN4_PZ:AB	Available	5	3	-
	Vector XYZ of best fit line 4	RSLT.DLN4_VXYZ	Available	5	3	-
	Vector XYZ of best fit line 4: Measured value	RSLT.DLN4_VXYZ:MS	Available	5	3	-
	Vector XYZ of best fit line 4: Absolute measured value	RSLT.DLN4_VXYZ:AB	Available	5	3	-
	Vector X of best fit line 4	RSLT.DLN4_VX	Available	5	3	X
	Vector X of best fit line 4: Measured value	RSLT.DLN4_VX:MS	Available	5	3	X
	Vector X of best fit line 4: Absolute measured value	RSLT.DLN4_VX:AB	Available	5	3	-
	Vector Y of best fit line 4	RSLT.DLN4_VY	Available	5	3	Y
	Vector Y of best fit line 4: Measured value	RSLT.DLN4_VY:MS	Available	5	3	Y
	Vector Y of best fit line 4: Absolute measured value	RSLT.DLN4_VY:AB	Available	5	3	-
	Vector Z of best fit line 4	RSLT.DLN4_VZ	Available	5	3	-
	Vector Z of best fit line 4: Measured value	RSLT.DLN4_VZ:MS	Available	5	3	-
	Vector Z of best fit line 4: Absolute measured value	RSLT.DLN4_VZ:AB	Available	5	3	-
	Plane equation info. XYZ of zero plane	RSLT.PPABC	Available	3	6	-
	Plane equation info. XYZ of zero plane: Measured value	RSLT.PPABC:MS	Available	3	6	-
	Plane equation info. XYZ of zero plane: Absolute measured value	RSLT.PPABC:AB	Available	3	6	-
	X slope of zero plane	RSLT.PPA	Available	1	6	-
	X slope of zero plane: Measured value	RSLT.PPA:MS	Available	1	6	-
	X slope of zero plane: Absolute measured value	RSLT.PPA:AB	Available	1	6	-

Result item	Name	Numerical value format				
		Sign	No. of integer digits	No. of decimal places	Applicable scaling	
Measurement target (continued)	Y slope of zero plane	RSLT.PPB	Available	1	6	-
	Y slope of zero plane: Measured value	RSLT.PPB:MS	Available	1	6	-
	Y slope of zero plane: Absolute measured value	RSLT.PPB:AB	Available	1	6	-
	Z intercept of zero plane	RSLT.PPC	Available	3	3	-
	Z intercept of zero plane: Measured value	RSLT.PPC:MS	Available	3	3	-
	Z intercept of zero plane: Absolute measured value	RSLT.PPC:AB	Available	3	3	-
	Plane equation info. XYZ of best fit plane	RSLT.DPPABC	Available	3	6	-
	Plane equation info. XYZ of best fit plane: Measured value	RSLT.DPPABC:MS	Available	3	6	-
	Plane equation info. XYZ of best fit plane: Absolute measured value	RSLT.DPPABC:AB	Available	3	6	-
	X slope of best fit plane	RSLT.DPPA	Available	1	6	-
	X slope of best fit plane: Measured value	RSLT.DPPA:MS	Available	1	6	-
	X slope of best fit plane: Absolute measured value	RSLT.DPPA:AB	Available	1	6	-
	Y slope of best fit plane	RSLT.DPPB	Available	1	6	-
	Y slope of best fit plane: Measured value	RSLT.DPPB:MS	Available	1	6	-
	Y slope of best fit plane: Absolute measured value	RSLT.DPPB:AB	Available	1	6	-
	Z intercept of best fit plane	RSLT.DPPC	Available	3	3	-
	Z intercept of best fit plane: Measured value	RSLT.DPPC:MS	Available	3	3	-
	Z intercept of best fit plane: Absolute measured value	RSLT.DPPC:AB	Available	3	3	-
	Profiles	RSLT.PROFN	Unsigned	5	0	-
	Profiles: Measured value	RSLT.PROFN:MS	Unsigned	5	0	-
	Valid Profiles	RSLT.VPROFN	Unsigned	5	0	-
	Valid Profiles: Measured value	RSLT.VPROFN:MS	Unsigned	5	0	-
	Valid Profiles: Judgment value	RSLT.VPROFN:JG	Unsigned	1	0	-
	NG profiles	RSLT.NPROFN	Unsigned	5	0	-
	NG profiles: Measured value	RSLT.NPROFN:MS	Unsigned	5	0	-
	NG profiles: Judgment value	RSLT.NPROFN:JG	Unsigned	1	0	-
	Continuous NG profiles	RSLT.CNPROFN	Unsigned	5	0	-
	Continuous NG profiles: Measured value	RSLT.CNPROFN:MS	Unsigned	5	0	-
	Continuous NG profiles: Judgment value	RSLT.CNPROFN:JG	Unsigned	1	0	-
	Judgment value per profile	RSLT.PROFJG["*"]	Unsigned	1	0	-
	Valid/Invalid judgment per profile	RSLT.VPROF["*"]	Unsigned	1	0	-
	Result profile No. (condition 1)	RSLT.DC1PROFIDX["*"]	Unsigned	5	0	-
	Result profile No. (condition 1): Measured value	RSLT.DC1PROFIDX["*"]:MS	Unsigned	5	0	-
	Result profile No. (condition 2)	RSLT.DC2PROFIDX["*"]	Unsigned	5	0	-
	Result profile No. (condition 2): Measured value	RSLT.DC2PROFIDX["*"]:MS	Unsigned	5	0	-
	Result profile No. (condition 3)	RSLT.DC3PROFIDX["*"]	Unsigned	5	0	-
	Result profile No. (condition 3): Measured value	RSLT.DC3PROFIDX["*"]:MS	Unsigned	5	0	-
	Result profile No. (condition 4)	RSLT.DC4PROFIDX["*"]	Unsigned	5	0	-
	Result profile No. (condition 4): Measured value	RSLT.DC4PROFIDX["*"]:MS	Unsigned	5	0	-

			Numerical value format			
	Result item	Name	Sign	No. of integer digits	No. of decimal places	Applicable scaling
Profile measurement result for measurement 00	Profile measurement error presence	RSLT.PMSR[0].PRERR[*]	Unsigned	1	0	-
	Overall judgment value for each profile measurement setting	RSLT.PMSR[0].ITEMJG	Unsigned	1	0	-
Height	Height	RSLT.PMSR[0].HGT[*]	Available	5	3	-
	Height: Measured value	RSLT.PMSR[0].HGT[*]:MS	Available	5	3	-
Level difference	Level difference	RSLT.PMSR[0].DIFF[*]	Available	5	3	-
	Level difference: Measured value	RSLT.PMSR[0].DIFF[*]:MS	Available	5	3	-
	Level difference: Reference height	RSLT.PMSR[0].DHGTR[*]	Available	5	3	-
	Level difference: Reference height: Measured value	RSLT.PMSR[0].DHGTR[*]:MS	Available	5	3	-
	Level difference: Measurement height	RSLT.PMSR[0].DHGTM[*]	Available	5	3	-
	Level difference: Measurement height: Measured value	RSLT.PMSR[0].DHGTM[*]:MS	Available	5	3	-
Position	Position	RSLT.PMSR[0].POS[*]	Available	5	3	X
	Position: Measured value	RSLT.PMSR[0].POS[*]:MS	Available	5	3	X
	Position XYZ	RSLT.PMSR[0].POSXYZ[*]	Available	5	3	-
	Position XYZ: Measured value	RSLT.PMSR[0].POSXYZ[*]:MS	Available	5	3	-
	Position XYZ: Absolute measured value	RSLT.PMSR[0].POSXYZ[*]:AB	Available	5	3	-
	Position XYZ: Encoder pulse count	RSLT.PMSR[0].POSXYZ[*]:EC	Available	5	3	-
	Position X	RSLT.PMSR[0].POSX[*]	Available	5	3	X
	Position X: Measured value	RSLT.PMSR[0].POSX[*]:MS	Available	5	3	X
	Position X: Absolute measured value	RSLT.PMSR[0].POSX[*]:AB	Available	5	3	-
	Position X: Encoder pulse count	RSLT.PMSR[0].POSX[*]:EC	Available	5	3	X
	Position Y	RSLT.PMSR[0].POSY[*]	Available	5	3	Y
	Position Y: Measured value	RSLT.PMSR[0].POSY[*]:MS	Available	5	3	Y
	Position Y: Absolute measured value	RSLT.PMSR[0].POSY[*]:AB	Available	5	3	-
	Position Y: Encoder pulse count	RSLT.PMSR[0].POSY[*]:EC	Available	5	3	Y
	Position Z	RSLT.PMSR[0].POSZ[*]	Available	5	3	-
	Position Z: Measured value	RSLT.PMSR[0].POSZ[*]:MS	Available	5	3	-
	Position Z: Absolute measured value	RSLT.PMSR[0].POSZ[*]:AB	Available	5	3	-
	Position Z: Encoder pulse count	RSLT.PMSR[0].POSZ[*]:EC	Available	5	3	-
Center position	Center position	RSLT.PMSR[0].CTR[*]	Available	5	3	X
	Center position: Measured value	RSLT.PMSR[0].CTR[*]:MS	Available	5	3	X
	Center position XYZ	RSLT.PMSR[0].CTRXYZ[*]	Available	5	3	-
	Center position XYZ: Measured value	RSLT.PMSR[0].CTRXYZ[*]:MS	Available	5	3	-
	Center position XYZ: Absolute measured value	RSLT.PMSR[0].CTRXYZ[*]:AB	Available	5	3	-
	Center position XYZ: Encoder pulse count	RSLT.PMSR[0].CTRXYZ[*]:EC	Available	5	3	-
	Center position X	RSLT.PMSR[0].CTRX[*]	Available	5	3	X
	Center position X: Measured value	RSLT.PMSR[0].CTRX[*]:MS	Available	5	3	X
	Center position X: Absolute measured value	RSLT.PMSR[0].CTRX[*]:AB	Available	5	3	-
	Center position X: Encoder pulse count	RSLT.PMSR[0].CTRX[*]:EC	Available	5	3	X
	Center position Y	RSLT.PMSR[0].CTRY[*]	Available	5	3	Y
	Center position Y: Measured value	RSLT.PMSR[0].CTRY[*]:MS	Available	5	3	Y
	Center position Y: Absolute measured value	RSLT.PMSR[0].CTRY[*]:AB	Available	5	3	-
	Center position Y: Encoder pulse count	RSLT.PMSR[0].CTRY[*]:EC	Available	5	3	Y
	Center position Z	RSLT.PMSR[0].CTRZ[*]	Available	5	3	-
	Center position Z: Measured value	RSLT.PMSR[0].CTRZ[*]:MS	Available	5	3	-
	Center position Z: Absolute measured value	RSLT.PMSR[0].CTRZ[*]:AB	Available	5	3	-

Result item		Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Center position (continued)	Center position Z: Encoder pulse count	RSLT.PMSR[0].CTRZ[*]:EC	Available	5	3	-
	Center position: Position 1	RSLT.PMSR[0].CPOS1[*]	Available	5	3	X
	Center position: Position 1: Measured value	RSLT.PMSR[0].CPOS1[*]:MS	Available	5	3	X
	Center position: Position 2	RSLT.PMSR[0].CPOS2[*]	Available	5	3	X
	Center position: Position 2: Measured value	RSLT.PMSR[0].CPOS2[*]:MS	Available	5	3	X
Width	Width	RSLT.PMSR[0].WID[*]	Available	5	3	X
	Width: Measured value	RSLT.PMSR[0].WID[*]:MS	Available	5	3	X
	Width: Position 1	RSLT.PMSR[0].WPOSR[*]	Available	5	3	X
	Width: Position 1: Measured value	RSLT.PMSR[0].WPOSR[*]:MS	Available	5	3	X
	Width: Position 2	RSLT.PMSR[0].WPOSM[*]	Available	5	3	X
	Width: Position 2: Measured value	RSLT.PMSR[0].WPOSM[*]:MS	Available	5	3	X
Angle (Angle from horizontal)	Angle	RSLT.PMSR[0].HANG[*]	Available	3	3	-
	Angle: Measured value	RSLT.PMSR[0].HANG[*]:MS	Available	3	3	-
Angle (angle between 2 lines)	Angle	RSLT.PMSR[0].LLANG[*]	Available	3	3	-
	Angle: Measured value	RSLT.PMSR[0].LLANG[*]:MS	Available	3	3	-
	Starting angle	RSLT.PMSR[0].LLANGR[*]	Available	3	3	-
	Starting angle: Measured value	RSLT.PMSR[0].LLANGR[*]:MS	Available	3	3	-
	Measured angle	RSLT.PMSR[0].LLANGM[*]	Available	3	3	-
Radius of circle	Radius of circle	RSLT.PMSR[0].PRAD[*]	Available	5	3	-
	Radius of circle: Measured value	RSLT.PMSR[0].PRAD[*]:MS	Available	5	3	-
	1-line Cross-Section area	RSLT.PMSR[0].LAR[*]	Available	5	3	-
1-line Cross-Section area	1-line Cross-Section area: Measured value	RSLT.PMSR[0].LAR[*]:MS	Available	5	3	-
2-line Cross-Section area	2-line Cross-Section area	RSLT.PMSR[0].DLAR[*]	Available	5	3	-
	2-line Cross-Section area: Measured value	RSLT.PMSR[0].DLAR[*]:MS	Available	5	3	-
Cross-Section Area (Zero Plane reference)	Cross-Section Area (Zero Plane reference)	RSLT.PMSR[0].ZAR[*]	Available	5	3	-
	Cross-Section Area (Zero Plane reference): Measured value	RSLT.PMSR[0].ZAR[*]:MS	Available	5	3	-
	Measured value					
Points distance	Points distance	RSLT.PMSR[0].PPDST[*]	Available	5	3	-
	Points distance: Measured value	RSLT.PMSR[0].PPDST[*]:MS	Available	5	3	-
Point/line distance	Point/line distance	RSLT.PMSR[0].LPDST[*]	Available	5	3	-
	Point/line distance: Measured value	RSLT.PMSR[0].LPDST[*]:MS	Available	5	3	-
Count	Count	RSLT.PMSR[0].PCNT[*]	Unsigned	5	0	-
	Count: Measured value	RSLT.PMSR[0].PCNT[*]:MS	Unsigned	5	0	-
Defect detection	Defect area	RSLT.PMSR[0].STG[*]	Available	5	3	-
	Defect area: Measured value	RSLT.PMSR[0].STG[*]:MS	Available	5	3	-
	Distance from Reference Line	RSLT.PMSR[0].STD[*]	Available	5	3	-
	Distance from Reference Line: Measured value	RSLT.PMSR[0].STD[*]:MS	Available	5	3	-
Height	Height: Judgment value	RSLT.PMSR[0].HGT[*]:JG	Unsigned	1	0	-
Level difference	Level difference: Judgment value	RSLT.PMSR[0].DIFF[*]:JG	Unsigned	1	0	-
Position	Position: Judgment value	RSLT.PMSR[0].POS[*]:JG	Unsigned	1	0	-
Center position	Center position: Judgment value	RSLT.PMSR[0].CTR[*]:JG	Unsigned	1	0	-
Width	Width: Judgment value	RSLT.PMSR[0].WID[*]:JG	Unsigned	1	0	-
Angle from horizontal	Angle from horizontal: Judgment value	RSLT.PMSR[0].HANG[*]:JG	Unsigned	1	0	-
Angle formed by two lines	Angle formed by two lines: Judgment value	RSLT.PMSR[0].LLANG[*]:JG	Unsigned	1	0	-
Radius of circle	Radius of circle: Judgment value	RSLT.PMSR[0].PRAD[*]:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
1-line Cross-Section area	1-line Cross-Section area: Judgment value	RSLT.PMSR[0].LAR[*]:JG	Unsigned	1	0
2-line Cross-Section area	2-line Cross-Section area: Judgment value	RSLT.PMSR[0].DLAR[*]:JG	Unsigned	1	0
Cross-Section Area (Zero Plane reference): (Zero Plane reference)	Cross-Section Area (Zero Plane reference): Judgment value	RSLT.PMSR[0].ZAR[*]:JG	Unsigned	1	0
Points distance	Points distance: Judgment value	RSLT.PMSR[0].PPDST[*]:JG	Unsigned	1	0
Point/line distance	Point/line distance: Judgment value	RSLT.PMSR[0].LPDST[*]:JG	Unsigned	1	0
Count	Count: Judgment value	RSLT.PMSR[0].PCNT[*]:JG	Unsigned	1	0
Defect detection	Defect area: Judgment value	RSLT.PMSR[0].STG[*]:JG	Unsigned	1	0
Height	Height (maximum)	RSLT.PMSR[0].MXHGT	Available	5	3
	Height (maximum): Measured value	RSLT.PMSR[0].MXHGT:MS	Available	5	3
	Height (maximum): Judgment value	RSLT.PMSR[0].MXHGT:JG	Unsigned	1	0
	Height (minimum)	RSLT.PMSR[0].MNHGT	Available	5	3
	Height (minimum): Measured value	RSLT.PMSR[0].MNHGT:MS	Available	5	3
	Height (minimum): Judgment value	RSLT.PMSR[0].MNHGT:JG	Unsigned	1	0
	Height (average)	RSLT.PMSR[0].AVHGT	Available	5	3
	Height (average): Measured value	RSLT.PMSR[0].AVHGT:MS	Available	5	3
	Height (3σ)	RSLT.PMSR[0].DVHGT	Unsigned	5	3
	Height (3σ): Measured value	RSLT.PMSR[0].DVHGT:MS	Unsigned	5	3
	Height (condition 1)	RSLT.PMSR[0].DC1HGT[*]	Available	5	3
	Height (condition 1): Measured value	RSLT.PMSR[0].DC1HGT[*]:MS	Available	5	3
	Height (condition 1): Judgment value	RSLT.PMSR[0].DC1HGT[*]:JG	Unsigned	1	0
	Height (condition 2)	RSLT.PMSR[0].DC2HGT[*]	Available	5	3
	Height (condition 2): Measured value	RSLT.PMSR[0].DC2HGT[*]:MS	Available	5	3
	Height (condition 2): Judgment value	RSLT.PMSR[0].DC2HGT[*]:JG	Unsigned	1	0
	Height (condition 3)	RSLT.PMSR[0].DC3HGT[*]	Available	5	3
	Height (condition 3): Measured value	RSLT.PMSR[0].DC3HGT[*]:MS	Available	5	3
	Height (condition 3): Judgment value	RSLT.PMSR[0].DC3HGT[*]:JG	Unsigned	1	0
	Height (condition 4)	RSLT.PMSR[0].DC4HGT[*]	Available	5	3
	Height (condition 4): Measured value	RSLT.PMSR[0].DC4HGT[*]:MS	Available	5	3
	Height (condition 4): Judgment value	RSLT.PMSR[0].DC4HGT[*]:JG	Unsigned	1	0

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Level difference	Level difference (maximum)	RSLT.PMSR[0].MXDIFF	Available	5	3
	Level difference (maximum): Measured value	RSLT.PMSR[0].MXDIFF:MS	Available	5	3
	Level difference (maximum): Judgment value	RSLT.PMSR[0].MXDIFF:JG	Unsigned	1	0
	Level difference (minimum)	RSLT.PMSR[0].MNDIFF	Available	5	3
	Level difference (minimum): Measured value	RSLT.PMSR[0].MNDIFF:MS	Available	5	3
	Level difference (minimum): Judgment value	RSLT.PMSR[0].MNDIFF:JG	Unsigned	1	0
	Level difference (average)	RSLT.PMSR[0].AVDIFF	Available	5	3
	Level difference (average): Measured value	RSLT.PMSR[0].AVDIFF:MS	Available	5	3
	Level difference (3σ)	RSLT.PMSR[0].DVDIFF	Unsigned	5	3
	Level difference (3σ): Measured value	RSLT.PMSR[0].DVDIFF:MS	Unsigned	5	3
	Level difference (condition 1)	RSLT.PMSR[0].DC1DIFF[*]	Available	5	3
	Level difference (condition 1): Measured value	RSLT.PMSR[0].DC1DIFF[*]:MS	Available	5	3
	Level difference (condition 1): Judgment value	RSLT.PMSR[0].DC1DIFF[*]:JG	Unsigned	1	0
	Reference height (condition 1)	RSLT.PMSR[0].DC1DHGTR[*]	Available	5	3
	Reference height (condition 1): Measured value	RSLT.PMSR[0].DC1DHGTR[*]:MS	Available	5	3

		Numerical value format			
Result item	Name	Sign	No. of integer digits	No. of decimal places	Applicable scaling
Level difference (continued)	Measurement height (condition 1)	Available	5	3	-
	Measurement height (condition 1): Measured value	Available	5	3	-
	Level difference (condition 2)	Available	5	3	-
	Level difference (condition 2): Measured value	Available	5	3	-
	Level difference (condition 2): Judgment value	Unsigned	1	0	-
	Reference height (condition 2)	Available	5	3	-
	Reference height (condition 2): Measured value	Available	5	3	-
	Measurement height (condition 2)	Available	5	3	-
	Measurement height (condition 2): Measured value	Available	5	3	-
	Level difference (condition 3)	Available	5	3	-
	Level difference (condition 3): Measured value	Available	5	3	-
	Level difference (condition 3): Judgment value	Unsigned	1	0	-
	Reference height (condition 3)	Available	5	3	-
	Reference height (condition 3): Measured value	Available	5	3	-
	Measurement height (condition 3)	Available	5	3	-
	Measurement height (condition 3): Measured value	Available	5	3	-
	Level difference (condition 4)	Available	5	3	-
	Level difference (condition 4): Measured value	Available	5	3	-
	Level difference (condition 4): Judgment value	Unsigned	1	0	-
	Reference height (condition 4)	Available	5	3	-
	Reference height (condition 4): Measured value	Available	5	3	-
	Measurement height (condition 4)	Available	5	3	-
	Measurement height (condition 4): Measured value	Available	5	3	-
Position	Position (maximum)	Available	5	3	X
	Position (maximum): Measured value	Available	5	3	X
	Position (maximum): Judgment value	Unsigned	1	0	-
	Position (maximum) XYZ	Available	5	3	-
	Position (maximum) XYZ: Measured value	Available	5	3	-
	Position (maximum) XYZ: Absolute measured value	Available	5	3	-
	Position (maximum) XYZ: Encoder pulse count	Available	5	3	-
	Position (maximum) X	Available	5	3	X
	Position (maximum) X: Measured value	Available	5	3	X
	Position (maximum) X: Absolute measured value	Available	5	3	-
	Position (maximum) X: Encoder pulse count	Available	5	3	X
	Position (maximum) Y	Available	5	3	Y
	Position (maximum) Y: Measured value	Available	5	3	Y

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Position (continued)	Position (maximum) Y: Absolute measured value RSLT.PMSR[0].MXPOSY:AB	Available	5	3	-
	Position (maximum) Y: Encoder pulse count RSLT.PMSR[0].MXPOSY:EC	Available	5	3	Y
	Position (maximum) Z RSLT.PMSR[0].MXPOSZ	Available	5	3	-
	Position (maximum) Z: Measured value RSLT.PMSR[0].MXPOSZ:MS	Available	5	3	-
	Position (maximum) Z: Absolute measured value RSLT.PMSR[0].MXPOSZ:AB	Available	5	3	-
	Position (maximum) Z: Encoder pulse count RSLT.PMSR[0].MXPOSZ:EC	Available	5	3	-
	Position (minimum) RSLT.PMSR[0].MNPOS	Available	5	3	X
	Position (minimum): Measured value RSLT.PMSR[0].MNPOS:MS	Available	5	3	X
	Position (minimum): Judgment value RSLT.PMSR[0].MNPOS:JG	Unsigned	1	0	-
	Position (minimum) XYZ RSLT.PMSR[0].MNPOSXYZ	Available	5	3	-
	Position (minimum) XYZ: Measured value RSLT.PMSR[0].MNPOSXYZ:MS	Available	5	3	-
	Position (minimum) XYZ: Absolute measured value RSLT.PMSR[0].MNPOSXYZ:AB	Available	5	3	-
	Position (minimum) XYZ: Encoder pulse count RSLT.PMSR[0].MNPOSXYZ:EC	Available	5	3	-
	Position (minimum) X RSLT.PMSR[0].MNPOSX	Available	5	3	X
	Position (minimum) X: Measured value RSLT.PMSR[0].MNPOSX:MS	Available	5	3	X
	Position (minimum) X: Absolute measured value RSLT.PMSR[0].MNPOSX:AB	Available	5	3	-
	Position (minimum) X: Encoder pulse count RSLT.PMSR[0].MNPOSX:EC	Available	5	3	X
	Position (minimum) Y RSLT.PMSR[0].MNPOSY	Available	5	3	Y
	Position (minimum) Y: Measured value RSLT.PMSR[0].MNPOSY:MS	Available	5	3	Y
	Position (minimum) Y: Absolute measured value RSLT.PMSR[0].MNPOSY:AB	Available	5	3	-
	Position (minimum) Y: Encoder pulse count RSLT.PMSR[0].MNPOSY:EC	Available	5	3	Y
	Position (minimum) Z RSLT.PMSR[0].MNPOSZ	Available	5	3	-
	Position (minimum) Z: Measured value RSLT.PMSR[0].MNPOSZ:MS	Available	5	3	-
	Position (minimum) Z: Absolute measured value RSLT.PMSR[0].MNPOSZ:AB	Available	5	3	-
	Position (minimum) Z: Encoder pulse count RSLT.PMSR[0].MNPOSZ:EC	Available	5	3	-
	Position (average) RSLT.PMSR[0].AVPOS	Available	5	3	X
	Position (average): Measured value RSLT.PMSR[0].AVPOS:MS	Available	5	3	X
	Position (3σ) RSLT.PMSR[0].DVPOS	Unsigned	5	3	X
	Position (3σ): Measured value RSLT.PMSR[0].DVPOS:MS	Unsigned	5	3	X
	Position (condition 1) RSLT.PMSR[0].DC1POS[*]	Available	5	3	X
	Position (condition 1): Measured value RSLT.PMSR[0].DC1POS[*]:MS	Available	5	3	X
	Position (condition 1): Judgment value RSLT.PMSR[0].DC1POS[*]:JG	Unsigned	1	0	-
	Position (condition 2) RSLT.PMSR[0].DC2POS[*]	Available	5	3	X
	Position (condition 2): Measured value RSLT.PMSR[0].DC2POS[*]:MS	Available	5	3	X
	Position (condition 2): Judgment value RSLT.PMSR[0].DC2POS[*]:JG	Unsigned	1	0	-
	Position (condition 3) RSLT.PMSR[0].DC3POS[*]	Available	5	3	X
	Position (condition 3): Measured value RSLT.PMSR[0].DC3POS[*]:MS	Available	5	3	X
	Position (condition 3): Judgment value RSLT.PMSR[0].DC3POS[*]:JG	Unsigned	1	0	-
	Position (condition 4) RSLT.PMSR[0].DC4POS[*]	Available	5	3	X
	Position (condition 4): Measured value RSLT.PMSR[0].DC4POS[*]:MS	Available	5	3	X
	Position (condition 4): Judgment value RSLT.PMSR[0].DC4POS[*]:JG	Unsigned	1	0	-

Result item	Name	Numerical value format				Applicable scaling
		Sign	No. of integer digits	No. of decimal places		
Center position	Center position (maximum)	RSLT.PMSR[0].MXCTR	Available	5	3	X
	Center position (maximum): Measured value	RSLT.PMSR[0].MXCTR:MS	Available	5	3	X
	Center position (maximum): Judgment value	RSLT.PMSR[0].MXCTR:JG	Unsigned	1	0	-
	Center position (maximum) XYZ	RSLT.PMSR[0].MXCTRXYZ	Available	5	3	-
	Center position (maximum) XYZ: Measured value	RSLT.PMSR[0].MXCTRXYZ:MS	Available	5	3	-
	Center position (maximum) XYZ: Absolute measured value	RSLT.PMSR[0].MXCTRXYZ:AB	Available	5	3	-
	Center position (maximum) XYZ: Encoder pulse count	RSLT.PMSR[0].MXCTRXYZ:EC	Available	5	3	-
	Center position (maximum) X	RSLT.PMSR[0].MXCTRX	Available	5	3	X
	Center position (maximum) X: Measured value	RSLT.PMSR[0].MXCTRX:MS	Available	5	3	X
	Center position (maximum) X: Absolute measured value	RSLT.PMSR[0].MXCTRX:AB	Available	5	3	-
	Center position (maximum) X: Encoder pulse count	RSLT.PMSR[0].MXCTRX:EC	Available	5	3	X
	Center position (maximum) Y	RSLT.PMSR[0].MXCTRY	Available	5	3	Y
	Center position (maximum) Y: Measured value	RSLT.PMSR[0].MXCTRY:MS	Available	5	3	Y
	Center position (maximum) Y: Absolute measured value	RSLT.PMSR[0].MXCTRY:AB	Available	5	3	-
	Center position (maximum) Y: Encoder pulse count	RSLT.PMSR[0].MXCTRY:EC	Available	5	3	Y
	Center position (maximum) Z	RSLT.PMSR[0].MXCTRZ	Available	5	3	-
	Center position (maximum) Z: Measured value	RSLT.PMSR[0].MXCTRZ:MS	Available	5	3	-
	Center position (maximum) Z: Absolute measured value	RSLT.PMSR[0].MXCTRZ:AB	Available	5	3	-
	Center position (maximum) Z: Encoder pulse count	RSLT.PMSR[0].MXCTRZ:EC	Available	5	3	-
	Center position (minimum)	RSLT.PMSR[0].MNCTR	Available	5	3	X
	Center position (minimum): Measured value	RSLT.PMSR[0].MNCTR:MS	Available	5	3	X
	Center position (minimum): Judgment value	RSLT.PMSR[0].MNCTR:JG	Unsigned	1	0	-
	Center position (minimum) XYZ	RSLT.PMSR[0].MNCTRXYZ	Available	5	3	-
	Center position (minimum) XYZ: Measured value	RSLT.PMSR[0].MNCTRXYZ:MS	Available	5	3	-
	Center position (minimum) XYZ: Absolute measured value	RSLT.PMSR[0].MNCTRXYZ:AB	Available	5	3	-
	Center position (minimum) XYZ: Encoder pulse count	RSLT.PMSR[0].MNCTRXYZ:EC	Available	5	3	-
	Center position (minimum) X	RSLT.PMSR[0].MNCTRX	Available	5	3	X
	Center position (minimum) X: Measured value	RSLT.PMSR[0].MNCTRX:MS	Available	5	3	X
	Center position (minimum) X: Absolute measured value	RSLT.PMSR[0].MNCTRX:AB	Available	5	3	-
	Center position (minimum) X: Encoder pulse count	RSLT.PMSR[0].MNCTRX:EC	Available	5	3	X
	Center position (minimum) Y	RSLT.PMSR[0].MNCTRY	Available	5	3	Y
	Center position (minimum) Y: Measured value	RSLT.PMSR[0].MNCTRY:MS	Available	5	3	Y

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Center position (continued)	Center position (minimum) Y: Absolute measured value	RSLT.PMSR[0].MNCTRY:AB	Available	5	3 -
	Center position (minimum) Y: Encoder pulse count	RSLT.PMSR[0].MNCTRY:EC	Available	5	3 Y
	Center position (minimum) Z	RSLT.PMSR[0].MNCTRZ	Available	5	3 -
	Center position (minimum) Z: Measured value	RSLT.PMSR[0].MNCTRZ:MS	Available	5	3 -
	Center position (minimum) Z: Absolute measured value	RSLT.PMSR[0].MNCTRZ:AB	Available	5	3 -
	Center position (minimum) Z: Encoder pulse count	RSLT.PMSR[0].MNCTRZ:EC	Available	5	3 -
	Center position (average)	RSLT.PMSR[0].AVCTR	Available	5	3 X
	Center position (average): Measured value	RSLT.PMSR[0].AVCTR:MS	Available	5	3 X
	Center position (3σ)	RSLT.PMSR[0].DVCTR	Unsigned	5	3 X
	Center position (3σ): Measured value	RSLT.PMSR[0].DVCTR:MS	Unsigned	5	3 X
	Center position (condition 1)	RSLT.PMSR[0].DC1CTR[*]	Available	5	3 X
	Center position (condition 1): Measured value	RSLT.PMSR[0].DC1CTR[*]:MS	Available	5	3 X
	Center position (condition 1): Judgment value	RSLT.PMSR[0].DC1CTR[*]:JG	Unsigned	1	0 -
	Center position: Position 1 [condition 1]	RSLT.PMSR[0].DC1CPOS1[*]	Available	5	3 X
	Center position: Position 1 [condition 1]: Measured value	RSLT.PMSR[0].DC1CPOS1[*]:MS	Available	5	3 X
	Center position: Position 2 [condition 1]	RSLT.PMSR[0].DC1CPOS2[*]	Available	5	3 X
	Center position: Position 2 [condition 1]: Measured value	RSLT.PMSR[0].DC1CPOS2[*]:MS	Available	5	3 X
	Center position (condition 2)	RSLT.PMSR[0].DC2CTR[*]	Available	5	3 X
	Center position (condition 2): Measured value	RSLT.PMSR[0].DC2CTR[*]:MS	Available	5	3 X
	Center position (condition 2): Judgment value	RSLT.PMSR[0].DC2CTR[*]:JG	Unsigned	1	0 -
	Center position: Position 1 [condition 2]	RSLT.PMSR[0].DC2CPOS1[*]	Available	5	3 X
	Center position: Position 1 [condition 2]: Measured value	RSLT.PMSR[0].DC2CPOS1[*]:MS	Available	5	3 X
	Center position: Position 2 [condition 2]	RSLT.PMSR[0].DC2CPOS2[*]	Available	5	3 X
	Center position: Position 2 [condition 2]: Measured value	RSLT.PMSR[0].DC2CPOS2[*]:MS	Available	5	3 X
	Center position (condition 3)	RSLT.PMSR[0].DC3CTR[*]	Available	5	3 X
	Center position (condition 3): Measured value	RSLT.PMSR[0].DC3CTR[*]:MS	Available	5	3 X
	Center position (condition 3): Judgment value	RSLT.PMSR[0].DC3CTR[*]:JG	Unsigned	1	0 -
	Center position: Position 1 [condition 3]	RSLT.PMSR[0].DC3CPOS1[*]	Available	5	3 X
	Center position: Position 1 [condition 3]: Measured value	RSLT.PMSR[0].DC3CPOS1[*]:MS	Available	5	3 X
	Center position: Position 2 [condition 3]	RSLT.PMSR[0].DC3CPOS2[*]	Available	5	3 X
	Center position: Position 2 [condition 3]: Measured value	RSLT.PMSR[0].DC3CPOS2[*]:MS	Available	5	3 X
	Center position (condition 4)	RSLT.PMSR[0].DC4CTR[*]	Available	5	3 X
	Center position (condition 4): Measured value	RSLT.PMSR[0].DC4CTR[*]:MS	Available	5	3 X

			Numerical value format			
	Result item	Name	Sign	No. of integer digits	No. of decimal places	Applicable scaling
Center position (continued)	Center position (condition 4): Judgment value	RSLT.PMSR[0].DC4CTR[*]:JG	Unsigned	1	0	-
	Center position: Position 1 [condition 4]	RSLT.PMSR[0].DC4CPOS1[*]	Available	5	3	X
	Center position: Position 1 [condition 4]: Measured value	RSLT.PMSR[0].DC4CPOS1[*]:MS	Available	5	3	X
	Center position: Position 2 [condition 4]	RSLT.PMSR[0].DC4CPOS2[*]	Available	5	3	X
	Center position: Position 2 [condition 4]: Measured value	RSLT.PMSR[0].DC4CPOS2[*]:MS	Available	5	3	X
Width	Width (maximum)	RSLT.PMSR[0].MXWID	Available	5	3	X
	Width (maximum): Measured value	RSLT.PMSR[0].MXWID:MS	Available	5	3	X
	Width (maximum): Judgment value	RSLT.PMSR[0].MXWID:JG	Unsigned	1	0	-
	Width (minimum)	RSLT.PMSR[0].MNWID	Available	5	3	X
	Width (minimum): Measured value	RSLT.PMSR[0].MNWID:MS	Available	5	3	X
	Width (minimum): Judgment value	RSLT.PMSR[0].MNWID:JG	Unsigned	1	0	-
	Width (average)	RSLT.PMSR[0].AVWID	Available	5	3	X
	Width (average): Measured value	RSLT.PMSR[0].AVWID:MS	Available	5	3	X
	Width (3σ)	RSLT.PMSR[0].DVWID	Unsigned	5	3	X
	Width (3σ): Measured value	RSLT.PMSR[0].DVWID:MS	Unsigned	5	3	X
	Width (condition 1)	RSLT.PMSR[0].DC1WID[*]	Available	5	3	X
	Width (condition 1): Measured value	RSLT.PMSR[0].DC1WID[*]:MS	Available	5	3	X
	Width (condition 1): Judgment value	RSLT.PMSR[0].DC1WID[*]:JG	Unsigned	1	0	-
	Width: Reference position (condition 1)	RSLT.PMSR[0].DC1WPOS[*]	Available	5	3	X
	Width: Reference position (condition 1): Measured value	RSLT.PMSR[0].DC1WPOS[*]:MS	Available	5	3	X
	Width: Measurement position (condition 1)	RSLT.PMSR[0].DC1WPOSM[*]	Available	5	3	X
	Width: Measurement position (condition 1): Measured value	RSLT.PMSR[0].DC1WPOSM[*]:MS	Available	5	3	X
	Width (condition 2)	RSLT.PMSR[0].DC2WID	Available	5	3	X
	Width (condition 2): Measured value	RSLT.PMSR[0].DC2WID:MS	Available	5	3	X
	Width (condition 2): Judgment value	RSLT.PMSR[0].DC2WID:JG	Unsigned	1	0	-
	Width: Reference position (condition 2)	RSLT.PMSR[0].DC2WPOS[*]	Available	5	3	X
	Width: Reference position (condition 2): Measured value	RSLT.PMSR[0].DC2WPOS[*]:MS	Available	5	3	X
	Width: Measurement position (condition 2)	RSLT.PMSR[0].DC2WPOSM[*]	Available	5	3	X
	Width: Measurement position (condition 2): Measured value	RSLT.PMSR[0].DC2WPOSM[*]:MS	Available	5	3	X
	Width (condition 3)	RSLT.PMSR[0].DC3WID	Available	5	3	X
	Width (condition 3): Measured value	RSLT.PMSR[0].DC3WID:MS	Available	5	3	X
	Width (condition 3): Judgment value	RSLT.PMSR[0].DC3WID:JG	Unsigned	1	0	-
	Width: Reference position (condition 3)	RSLT.PMSR[0].DC3WPOS[*]	Available	5	3	X
	Width: Reference position (condition 3): Measured value	RSLT.PMSR[0].DC3WPOS[*]:MS	Available	5	3	X
	Width: Measurement position (condition 3)	RSLT.PMSR[0].DC3WPOSM[*]	Available	5	3	X
	Width: Measurement position (condition 3): Measured value	RSLT.PMSR[0].DC3WPOSM[*]:MS	Available	5	3	X
	Width (condition 4)	RSLT.PMSR[0].DC4WID	Available	5	3	X
	Width (condition 4): Measured value	RSLT.PMSR[0].DC4WID:MS	Available	5	3	X
	Width (condition 4): Judgment value	RSLT.PMSR[0].DC4WID:JG	Unsigned	1	0	-
	Width: Reference position (condition 4)	RSLT.PMSR[0].DC4WPOS[*]	Available	5	3	X
	Width: Reference position (condition 4): Measured value	RSLT.PMSR[0].DC4WPOS[*]:MS	Available	5	3	X

		Numerical value format			
Result item	Name	Sign	No. of integer digits	No. of decimal places	Applicable scaling
Width (continued)	Width: Measurement position (condition 4)	RSLT.PMSR[0].DC4WPOSM[*]	Available	5	3 X
	Width: Measurement position (condition 4): Measured value	RSLT.PMSR[0].DC4WPOSM[*]:MS	Available	5	3 X
Angle from horizontal	Angle from horizontal (maximum)	RSLT.PMSR[0].MXHANG	Available	3	3 -
	Angle from horizontal (maximum): Measured value	RSLT.PMSR[0].MXHANG:MS	Available	3	3 -
	Angle from horizontal (maximum): Judgment value	RSLT.PMSR[0].MXHANG:JG	Unsigned	1	0 -
	Angle from horizontal (minimum)	RSLT.PMSR[0].MNHANG	Available	3	3 -
	Angle from horizontal (minimum): Measured value	RSLT.PMSR[0].MNHANG:MS	Available	3	3 -
	Angle from horizontal (minimum): Judgment value	RSLT.PMSR[0].MNHANG:JG	Unsigned	1	0 -
	Angle from horizontal (average)	RSLT.PMSR[0].AVHANG	Available	3	3 -
	Angle from horizontal (average): Measured value	RSLT.PMSR[0].AVHANG:MS	Available	3	3 -
	Angle from horizontal (3σ)	RSLT.PMSR[0].DVHANG	Unsigned	3	3 -
	Angle from horizontal (3σ): Measured value	RSLT.PMSR[0].DVHANG:MS	Unsigned	3	3 -
	Angle from horizontal (condition 1)	RSLT.PMSR[0].DC1HANG[*]	Available	3	3 -
	Angle from horizontal (condition 1): Measured value	RSLT.PMSR[0].DC1HANG[*]:MS	Available	3	3 -
	Angle from horizontal (condition 1): Judgment value	RSLT.PMSR[0].DC1HANG[*]:JG	Unsigned	1	0 -
	Angle from horizontal (condition 2)	RSLT.PMSR[0].DC2HANG[*]	Available	3	3 -
	Angle from horizontal (condition 2): Measured value	RSLT.PMSR[0].DC2HANG[*]:MS	Available	3	3 -
Angle formed by two lines	Angle from horizontal (condition 2): Judgment value	RSLT.PMSR[0].DC2HANG[*]:JG	Unsigned	1	0 -
	Angle from horizontal (condition 3)	RSLT.PMSR[0].DC3HANG[*]	Available	3	3 -
	Angle from horizontal (condition 3): Measured value	RSLT.PMSR[0].DC3HANG[*]:MS	Available	3	3 -
	Angle from horizontal (condition 3): Judgment value	RSLT.PMSR[0].DC3HANG[*]:JG	Unsigned	1	0 -
	Angle from horizontal (condition 4)	RSLT.PMSR[0].DC4HANG[*]	Available	3	3 -
	Angle from horizontal (condition 4): Measured value	RSLT.PMSR[0].DC4HANG[*]:MS	Available	3	3 -
	Angle from horizontal (condition 4): Judgment value	RSLT.PMSR[0].DC4HANG[*]:JG	Unsigned	1	0 -
	Angle formed by two lines (maximum)	RSLT.PMSR[0].MXLLANG	Available	3	3 -
	Angle formed by two lines (maximum): Measured value	RSLT.PMSR[0].MXLLANG:MS	Available	3	3 -
	Angle formed by two lines (maximum): Judgment value	RSLT.PMSR[0].MXLLANG:JG	Unsigned	1	0 -
	Angle formed by two lines (minimum)	RSLT.PMSR[0].MNLLANG	Available	3	3 -
	Angle formed by two lines (minimum): Measured value	RSLT.PMSR[0].MNLLANG:MS	Available	3	3 -
	Angle formed by two lines (minimum): Judgment value	RSLT.PMSR[0].MNLLANG:JG	Unsigned	1	0 -
	Angle formed by two lines (average)	RSLT.PMSR[0].AVLLANG	Available	3	3 -
	Angle formed by two lines (average): Measured value	RSLT.PMSR[0].AVLLANG:MS	Available	3	3 -
	Angle formed by two lines (3σ)	RSLT.PMSR[0].DVLLANG	Unsigned	3	3 -

		Numerical value format				
	Result item	Name	Sign	No. of integer digits	No. of decimal places	Applicable scaling
Angle formed by two lines (continued)	Angle formed by two lines (3σ): Measured value	RSLT.PMSR[0].DVLLANG:MS	Unsigned	3	3	-
	Angle formed by two lines (condition 1)	RSLT.PMSR[0].DC1LLANG[*]	Available	3	3	-
	Angle formed by two lines (condition 1): Measured value	RSLT.PMSR[0].DC1LLANG[*]:MS	Available	3	3	-
	Angle formed by two lines (condition 1): Judgment value	RSLT.PMSR[0].DC1LLANG[*]:JG	Unsigned	1	0	-
	Starting angle (condition 1)	RSLT.PMSR[0].DC1LLANGR[*]	Available	3	3	-
	Starting angle (condition 1): Measured value	RSLT.PMSR[0].DC1LLANGR[*]:MS	Available	3	3	-
	Measured angle (condition 1)	RSLT.PMSR[0].DC1LLANGM[*]	Available	3	3	-
	Measured angle (condition 1): Measured value	RSLT.PMSR[0].DC1LLANGM[*]:MS	Available	3	3	-
	Angle (condition 2)	RSLT.PMSR[0].DC2LLANG[*]	Available	3	3	-
	Angle (condition 2): Measured value	RSLT.PMSR[0].DC2LLANG[*]:MS	Available	3	3	-
	Angle (condition 2): Judgment value	RSLT.PMSR[0].DC2LLANG[*]:JG	Unsigned	1	0	-
	Starting angle (condition 2)	RSLT.PMSR[0].DC2LLANGR[*]	Available	3	3	-
	Starting angle (condition 2): Measured value	RSLT.PMSR[0].DC2LLANGR[*]:MS	Available	3	3	-
	Measured angle (condition 2)	RSLT.PMSR[0].DC2LLANGM[*]	Available	3	3	-
	Measured angle (condition 2): Measured value	RSLT.PMSR[0].DC2LLANGM[*]:MS	Available	3	3	-
	Angle (condition 3)	RSLT.PMSR[0].DC3LLANG[*]	Available	3	3	-
	Angle (condition 3): Measured value	RSLT.PMSR[0].DC3LLANG[*]:MS	Available	3	3	-
	Angle (condition 3): Judgment value	RSLT.PMSR[0].DC3LLANG[*]:JG	Unsigned	1	0	-
	Starting angle (condition 3)	RSLT.PMSR[0].DC3LLANGR[*]	Available	3	3	-
	Starting angle (condition 3): Measured value	RSLT.PMSR[0].DC3LLANGR[*]:MS	Available	3	3	-
	Measured angle (condition 3)	RSLT.PMSR[0].DC3LLANGM[*]	Available	3	3	-
	Measured angle (condition 3): Measured value	RSLT.PMSR[0].DC3LLANGM[*]:MS	Available	3	3	-
	Angle (condition 4)	RSLT.PMSR[0].DC4LLANG[*]	Available	3	3	-
	Angle (condition 4): Measured value	RSLT.PMSR[0].DC4LLANG[*]:MS	Available	3	3	-
	Angle (condition 4): Judgment value	RSLT.PMSR[0].DC4LLANG[*]:JG	Unsigned	1	0	-
	Starting angle (condition 4)	RSLT.PMSR[0].DC4LLANGR[*]	Available	3	3	-
	Starting angle (condition 4): Measured value	RSLT.PMSR[0].DC4LLANGR[*]:MS	Available	3	3	-
	Measured angle (condition 4)	RSLT.PMSR[0].DC4LLANGM[*]	Available	3	3	-
	Measured angle (condition 4): Measured value	RSLT.PMSR[0].DC4LLANGM[*]:MS	Available	3	3	-
Radius of circle	Radius of circle (maximum)	RSLT.PMSR[0].MXPRAD	Available	5	3	-
	Radius of circle (maximum): Measured value	RSLT.PMSR[0].MXPRAD:MS	Available	5	3	-
	Radius of circle (maximum): Judgment value	RSLT.PMSR[0].MXPRAD:JG	Unsigned	1	0	-
	Radius of circle (minimum)	RSLT.PMSR[0].MNPRAD	Available	5	3	-
	Radius of circle (minimum): Measured value	RSLT.PMSR[0].MNPRAD:MS	Available	5	3	-
	Radius of circle (minimum): Judgment value	RSLT.PMSR[0].MNPRAD:JG	Unsigned	1	0	-
	Radius of circle (average)	RSLT.PMSR[0].AVPRAD	Available	5	3	-
	Radius of circle (average): Measured value	RSLT.PMSR[0].AVPRAD:MS	Available	5	3	-
	Radius of circle (3σ)	RSLT.PMSR[0].DVPRAD	Available	5	3	-
	Radius of circle (3σ): Measured value	RSLT.PMSR[0].DVPRAD:MS	Available	5	3	-
	Radius of circle (condition 1)	RSLT.PMSR[0].DC1PRAD[*]	Available	5	3	-
	Radius of circle (condition 1): Measured value	RSLT.PMSR[0].DC1PRAD[*]:MS	Available	5	3	-

Result item		Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
Radius of circle (continued)	Radius of circle (condition 1): Judgment value	RSLT.PMSR[0].DC1PRAD[*]:JG	Unsigned	1	0	-
	Radius of circle (condition 2)	RSLT.PMSR[0].DC2PRAD[*]	Available	5	3	-
	Radius of circle (condition 2): Measured value	RSLT.PMSR[0].DC2PRAD[*]:MS	Available	5	3	-
	Radius of circle (condition 2): Judgment value	RSLT.PMSR[0].DC2PRAD[*]:JG	Unsigned	1	0	-
	Radius of circle (condition 3)	RSLT.PMSR[0].DC3PRAD[*]	Available	5	3	-
	Radius of circle (condition 3): Measured value	RSLT.PMSR[0].DC3PRAD[*]:MS	Available	5	3	-
	Radius of circle (condition 3): Judgment value	RSLT.PMSR[0].DC3PRAD[*]:JG	Unsigned	1	0	-
	Radius of circle (condition 4)	RSLT.PMSR[0].DC4PRAD[*]	Available	5	3	-
	Radius of circle (condition 4): Measured value	RSLT.PMSR[0].DC4PRAD[*]:MS	Available	5	3	-
	Radius of circle (condition 4): Judgment value	RSLT.PMSR[0].DC4PRAD[*]:JG	Unsigned	1	0	-
1-line Cross-Section area	1-line Cross-Section area (maximum)	RSLT.PMSR[0].MXLAR	Available	5	3	-
	1-line Cross-Section area (maximum): Measured value	RSLT.PMSR[0].MXLAR:MS	Available	5	3	-
	1-line Cross-Section area (maximum): Judgment value	RSLT.PMSR[0].MXLAR:JG	Unsigned	1	0	-
	1-line Cross-Section area (minimum)	RSLT.PMSR[0].MNLAR	Available	5	3	-
	1-line Cross-Section area (minimum): Measured value	RSLT.PMSR[0].MNLAR:MS	Available	5	3	-
	1-line Cross-Section area (minimum): Judgment value	RSLT.PMSR[0].MNLAR:JG	Unsigned	1	0	-
	1-line Cross-Section area (average)	RSLT.PMSR[0].AVLAR	Available	5	3	-
	1-line Cross-Section area (average): Measured value	RSLT.PMSR[0].AVLAR:MS	Available	5	3	-
	1-line Cross-Section area (3σ)	RSLT.PMSR[0].DVLAR	Unsigned	5	3	-
	1-line Cross-Section area (3σ): Measured value	RSLT.PMSR[0].DVLAR:MS	Unsigned	5	3	-
	1-line Cross-Section area (condition 1)	RSLT.PMSR[0].DC1LAR[*]	Available	5	3	-
	1-line Cross-Section area (condition 1): Measured value	RSLT.PMSR[0].DC1LAR[*]:MS	Available	5	3	-
	1-line Cross-Section area (condition 1): Judgment value	RSLT.PMSR[0].DC1LAR[*]:JG	Unsigned	1	0	-
	1-line Cross-Section area (condition 2)	RSLT.PMSR[0].DC2LAR[*]	Available	5	3	-
	1-line Cross-Section area (condition 2): Measured value	RSLT.PMSR[0].DC2LAR[*]:MS	Available	5	3	-
	1-line Cross-Section area (condition 2): Judgment value	RSLT.PMSR[0].DC2LAR[*]:JG	Unsigned	1	0	-
	1-line Cross-Section area (condition 3)	RSLT.PMSR[0].DC3LAR[*]	Available	5	3	-
	1-line Cross-Section area (condition 3): Measured value	RSLT.PMSR[0].DC3LAR[*]:MS	Available	5	3	-
	1-line Cross-Section area (condition 3): Judgment value	RSLT.PMSR[0].DC3LAR[*]:JG	Unsigned	1	0	-
	1-line Cross-Section area (condition 4)	RSLT.PMSR[0].DC4LAR[*]	Available	5	3	-
	1-line Cross-Section area (condition 4): Measured value	RSLT.PMSR[0].DC4LAR[*]:MS	Available	5	3	-
	1-line Cross-Section area (condition 4): Judgment value	RSLT.PMSR[0].DC4LAR[*]:JG	Unsigned	1	0	-

	Result item	Name	Numerical value format			
			Sign	No. of integer digits	No. of decimal places	Applicable scaling
2-line Cross-Section area	2-line Cross-Section area (maximum)	RSLT.PMSR[0].MXDLAR	Available	5	3	-
	2-line Cross-Section area (maximum): Measured value	RSLT.PMSR[0].MXDLAR:MS	Available	5	3	-
	2-line Cross-Section area (maximum): Judgment value	RSLT.PMSR[0].MXDLAR:JG	Unsigned	1	0	-
	2-line Cross-Section area (minimum)	RSLT.PMSR[0].MNDLAR	Available	5	3	-
	2-line Cross-Section area (minimum): Measured value	RSLT.PMSR[0].MNDLAR:MS	Available	5	3	-
	2-line Cross-Section area (minimum): Judgment value	RSLT.PMSR[0].MNDLAR:JG	Unsigned	1	0	-
	2-line Cross-Section area (average)	RSLT.PMSR[0].AVDLAR	Available	5	3	-
	2-line Cross-Section area (average): Measured value	RSLT.PMSR[0].AVDLAR:MS	Available	5	3	-
	2-line Cross-Section area (3σ)	RSLT.PMSR[0].DVDLAR	Unsigned	5	3	-
	2-line Cross-Section area (3σ): Measured value	RSLT.PMSR[0].DVDLAR:MS	Unsigned	5	3	-
	2-line Cross-Section area (condition 1)	RSLT.PMSR[0].DC1DLAR[*]	Available	5	3	-
	2-line Cross-Section area (condition 1): Measured value	RSLT.PMSR[0].DC1DLAR[*]:MS	Available	5	3	-
	2-line Cross-Section area (condition 1): Judgment value	RSLT.PMSR[0].DC1DLAR[*]:JG	Unsigned	1	0	-
	2-line Cross-Section area (condition 2)	RSLT.PMSR[0].DC2DLAR[*]	Available	5	3	-
Cross-Section (Zero Plane reference)	2-line Cross-Section area (condition 2): Measured value	RSLT.PMSR[0].DC2DLAR[*]:MS	Available	5	3	-
	2-line Cross-Section area (condition 2): Judgment value	RSLT.PMSR[0].DC2DLAR[*]:JG	Unsigned	1	0	-
	2-line Cross-Section area (condition 3)	RSLT.PMSR[0].DC3DLAR[*]	Available	5	3	-
	2-line Cross-Section area (condition 3): Measured value	RSLT.PMSR[0].DC3DLAR[*]:MS	Available	5	3	-
	2-line Cross-Section area (condition 3): Judgment value	RSLT.PMSR[0].DC3DLAR[*]:JG	Unsigned	1	0	-
	2-line Cross-Section area (condition 4)	RSLT.PMSR[0].DC4DLAR[*]	Available	5	3	-
	2-line Cross-Section area (condition 4): Measured value	RSLT.PMSR[0].DC4DLAR[*]:MS	Available	5	3	-
	2-line Cross-Section area (condition 4): Judgment value	RSLT.PMSR[0].DC4DLAR[*]:JG	Unsigned	1	0	-
	Cross-Section (Zero Plane reference) [maximum]	RSLT.PMSR[0].MXZAR	Available	5	3	-
	Cross-Section (Zero Plane reference) [maximum]: Measured value	RSLT.PMSR[0].MXZAR:MS	Available	5	3	-
	Cross-Section (Zero Plane reference) [maximum]: Judgment value	RSLT.PMSR[0].MXZAR:JG	Unsigned	1	0	-
	Cross-Section (Zero Plane reference) [minimum]	RSLT.PMSR[0].MNZAR	Available	5	3	-
	Cross-Section (Zero Plane reference) [minimum]: Measured value	RSLT.PMSR[0].MNZAR:MS	Available	5	3	-
	Cross-Section (Zero Plane reference) [minimum]: Judgment value	RSLT.PMSR[0].MNZAR:JG	Unsigned	1	0	-
	Cross-Section (Zero Plane reference) [average]	RSLT.PMSR[0].AVZAR	Available	5	3	-
	Cross-Section (Zero Plane reference) [average]: Measured value	RSLT.PMSR[0].AVZAR:MS	Available	5	3	-
	Cross-Section (Zero Plane reference) [3σ]	RSLT.PMSR[0].DVZAR	Unsigned	5	3	-

Result item	Name	Numerical value format				
		Sign	No. of integer digits	No. of decimal places	Applicable scaling	
Cross-Section (Zero Plane reference) [continued]	Cross-Section (Zero Plane reference) [3σ]: Measured value	RSLT.PMSR[0].DVZAR:MS	Unsigned	5	3	-
	Cross-Section (Zero Plane reference) [condition 1]	RSLT.PMSR[0].DC1ZAR[*]	Available	5	3	-
	Cross-Section (Zero Plane reference) [condition 1]: Measured value	RSLT.PMSR[0].DC1ZAR[*]:MS	Available	5	3	-
	Cross-Section (Zero Plane reference) [condition 1]: Judgment value	RSLT.PMSR[0].DC1ZAR[*]:JG	Unsigned	1	0	-
	Cross-Section (Zero Plane reference) [condition 2]	RSLT.PMSR[0].DC2ZAR[*]	Available	5	3	-
	Cross-Section (Zero Plane reference) [condition 2]: Measured value	RSLT.PMSR[0].DC2ZAR[*]:MS	Available	5	3	-
	Cross-Section (Zero Plane reference) [condition 2]: Judgment value	RSLT.PMSR[0].DC2ZAR[*]:JG	Unsigned	1	0	-
	Cross-Section (Zero Plane reference) [condition 3]	RSLT.PMSR[0].DC3ZAR[*]	Available	5	3	-
	Cross-Section (Zero Plane reference) [condition 3]: Measured value	RSLT.PMSR[0].DC3ZAR[*]:MS	Available	5	3	-
	Cross-Section (Zero Plane reference) [condition 3]: Judgment value	RSLT.PMSR[0].DC3ZAR[*]:JG	Unsigned	1	0	-
Points distance	Cross-Section (Zero Plane reference) [condition 4]	RSLT.PMSR[0].DC4ZAR[*]	Available	5	3	-
	Cross-Section (Zero Plane reference) [condition 4]: Measured value	RSLT.PMSR[0].DC4ZAR[*]:MS	Available	5	3	-
	Cross-Section (Zero Plane reference) [condition 4]: Judgment value	RSLT.PMSR[0].DC4ZAR[*]:JG	Unsigned	1	0	-
	Points distance (maximum)	RSLT.PMSR[0].MXPPDST	Available	5	3	-
	Points distance (maximum): Measured value	RSLT.PMSR[0].MXPPDST:MS	Available	5	3	-
	Points distance (maximum): Judgment value	RSLT.PMSR[0].MXPPDST:JG	Unsigned	1	0	-
	Points distance (minimum)	RSLT.PMSR[0].MNPPDST	Available	5	3	-
	Points distance (minimum): Measured value	RSLT.PMSR[0].MNPPDST:MS	Available	5	3	-
	Points distance (minimum): Judgment value	RSLT.PMSR[0].MNPPDST:JG	Unsigned	1	0	-
	Points distance (average)	RSLT.PMSR[0].AVPPDST	Available	5	3	-
	Points distance (average): Measured value	RSLT.PMSR[0].AVPPDST:MS	Available	5	3	-
	Points distance (3σ)	RSLT.PMSR[0].DVPPDST	Available	5	3	-
	Points distance (3σ): Measured value	RSLT.PMSR[0].DVPPDST:MS	Available	5	3	-
	Points distance (condition 1)	RSLT.PMSR[0].DC1PPDST[*]	Available	5	3	-
	Points distance (condition 1): Measured value	RSLT.PMSR[0].DC1PPDST[*]:MS	Available	5	3	-
	Points distance (condition 1): Judgment value	RSLT.PMSR[0].DC1PPDST[*]:JG	Unsigned	1	0	-
	Points distance (condition 2)	RSLT.PMSR[0].DC2PPDST[*]	Available	5	3	-
	Points distance (condition 2): Measured value	RSLT.PMSR[0].DC2PPDST[*]:MS	Available	5	3	-
	Points distance (condition 2): Judgment value	RSLT.PMSR[0].DC2PPDST[*]:JG	Unsigned	1	0	-
	Points distance (condition 3)	RSLT.PMSR[0].DC3PPDST[*]	Available	5	3	-
	Points distance (condition 3): Measured value	RSLT.PMSR[0].DC3PPDST[*]:MS	Available	5	3	-

			Numerical value format			
	Result item	Name	Sign	No. of integer digits	No. of decimal places	Applicable scaling
Points distance (continued)	Points distance (condition 3): Judgment value	RSLT.PMSR[0].DC3PPDST[*]:JG	Unsigned	1	0	-
	Points distance (condition 4)	RSLT.PMSR[0].DC4PPDST[*]	Available	5	3	-
	Points distance (condition 4): Measured value	RSLT.PMSR[0].DC4PPDST[*]:MS	Available	5	3	-
	Points distance (condition 4): Judgment value	RSLT.PMSR[0].DC4PPDST[*]:JG	Unsigned	1	0	-
Point/line distance	Point/line distance (maximum)	RSLT.PMSR[0].MXLPDST	Available	5	3	-
	Point/line distance (maximum): Measured value	RSLT.PMSR[0].MXLPDST:MS	Available	5	3	-
	Point/line distance (maximum): Judgment value	RSLT.PMSR[0].MXLPDST:JG	Unsigned	1	0	-
	Point/line distance (minimum)	RSLT.PMSR[0].MNLPDST	Available	5	3	-
	Point/line distance (minimum): Measured value	RSLT.PMSR[0].MNLPDST:MS	Available	5	3	-
	Point/line distance (minimum): Judgment value	RSLT.PMSR[0].MNLPDST:JG	Unsigned	1	0	-
	Point/line distance (average)	RSLT.PMSR[0].AVLPDST	Available	5	3	-
	Point/line distance (average): Measured value	RSLT.PMSR[0].AVLPDST:MS	Available	5	3	-
	Point/line distance (3σ)	RSLT.PMSR[0].DVLPDST	Available	5	3	-
	Point/line distance (3σ): Measured value	RSLT.PMSR[0].DVLPDST:MS	Available	5	3	-
	Point/line distance (condition 1)	RSLT.PMSR[0].DC1LPDST[*]	Available	5	3	-
	Point/line distance (condition 1): Measured value	RSLT.PMSR[0].DC1LPDST[*]:MS	Available	5	3	-
	Point/line distance (condition 1): Judgment value	RSLT.PMSR[0].DC1LPDST[*]:JG	Unsigned	1	0	-
	Point/line distance (condition 2)	RSLT.PMSR[0].DC2LPDST[*]	Available	5	3	-
	Point/line distance (condition 2): Measured value	RSLT.PMSR[0].DC2LPDST[*]:MS	Available	5	3	-
	Point/line distance (condition 2): Judgment value	RSLT.PMSR[0].DC2LPDST[*]:JG	Unsigned	1	0	-
Count	Point/line distance (condition 3)	RSLT.PMSR[0].DC3LPDST[*]	Available	5	3	-
	Point/line distance (condition 3): Measured value	RSLT.PMSR[0].DC3LPDST[*]:MS	Available	5	3	-
	Point/line distance (condition 3): Judgment value	RSLT.PMSR[0].DC3LPDST[*]:JG	Unsigned	1	0	-
	Point/line distance (condition 4)	RSLT.PMSR[0].DC4LPDST[*]	Available	5	3	-
	Point/line distance (condition 4): Measured value	RSLT.PMSR[0].DC4LPDST[*]:MS	Available	5	3	-
	Point/line distance (condition 4): Judgment value	RSLT.PMSR[0].DC4LPDST[*]:JG	Unsigned	1	0	-
	Count (maximum)	RSLT.PMSR[0].MXPCNT	Unsigned	5	0	-
	Count (maximum): Measured value	RSLT.PMSR[0].MXPCNT:MS	Unsigned	5	0	-
	Count (maximum): Judgment value	RSLT.PMSR[0].MXPCNT:JG	Unsigned	1	0	-
	Count (minimum)	RSLT.PMSR[0].MNPCNT	Unsigned	5	0	-

			Numerical value format			
	Result item	Name	Sign	No. of integer digits	No. of decimal places	Applicable scaling
Count (continued)	Count (condition 1)	RSLT.PMSR[0].DC1PCNT[*]	Unsigned	5	0	-
	Count (condition 1): Measured value	RSLT.PMSR[0].DC1PCNT[*]:MS	Unsigned	5	0	-
	Count (condition 1): Judgment value	RSLT.PMSR[0].DC1PCNT[*]:JG	Unsigned	1	0	-
	Count (condition 2)	RSLT.PMSR[0].DC2PCNT[*]	Unsigned	5	0	-
	Count (condition 2): Measured value	RSLT.PMSR[0].DC2PCNT[*]:MS	Unsigned	5	0	-
	Count (condition 2): Judgment value	RSLT.PMSR[0].DC2PCNT[*]:JG	Unsigned	1	0	-
	Count (condition 3)	RSLT.PMSR[0].DC3PCNT[*]	Unsigned	5	0	-
	Count (condition 3): Measured value	RSLT.PMSR[0].DC3PCNT[*]:MS	Unsigned	5	0	-
	Count (condition 3): Judgment value	RSLT.PMSR[0].DC3PCNT[*]:JG	Unsigned	1	0	-
	Count (condition 4)	RSLT.PMSR[0].DC4PCNT[*]	Unsigned	5	0	-
Defect detection	Defect area (maximum)	RSLT.PMSR[0].MXSTG	Available	5	3	-
	Defect area (maximum): Measured value	RSLT.PMSR[0].MXSTG:MS	Available	5	3	-
	Defect area (maximum): Judgment value	RSLT.PMSR[0].MXSTG:JG	Unsigned	1	0	-
	Defect area (minimum)	RSLT.PMSR[0].MNSTG	Available	5	3	-
	Defect area (minimum): Measured value	RSLT.PMSR[0].MNSTG:MS	Available	5	3	-
	Defect area (minimum): Judgment value	RSLT.PMSR[0].MNSTG:JG	Unsigned	1	0	-
	Defect area (average)	RSLT.PMSR[0].AVSTG	Available	5	3	-
	Defect area (average): Measured value	RSLT.PMSR[0].AVSTG:MS	Available	5	3	-
	Defect area (3σ)	RSLT.PMSR[0].DVSTG	Available	5	3	-
	Defect area (3σ): Measured value	RSLT.PMSR[0].DVSTG:MS	Available	5	3	-
Distance from Reference Line	Defect area (condition 1)	RSLT.PMSR[0].DC1STG[*]	Available	5	3	-
	Defect area (condition 1): Measured value	RSLT.PMSR[0].DC1STG[*]:MS	Available	5	3	-
	Defect area (condition 1): Judgment value	RSLT.PMSR[0].DC1STG[*]:JG	Unsigned	1	0	-
	Distance from Reference Line (condition 1)	RSLT.PMSR[0].DC1STD[*]	Available	5	3	-
	Distance from Reference Line (condition 1): Measured value	RSLT.PMSR[0].DC1STD[*]:MS	Available	5	3	-
	Defect area (condition 2)	RSLT.PMSR[0].DC2STG[*]	Available	5	3	-
	Defect area (condition 2): Measured value	RSLT.PMSR[0].DC2STG[*]:MS	Available	5	3	-
	Defect area (condition 2): Judgment value	RSLT.PMSR[0].DC2STG[*]:JG	Unsigned	1	0	-
	Distance from Reference Line (condition 2)	RSLT.PMSR[0].DC2STD[*]	Available	5	3	-
	Distance from Reference Line (condition 2): Measured value	RSLT.PMSR[0].DC2STD[*]:MS	Available	5	3	-
Distance from Reference Line	Defect area (condition 3)	RSLT.PMSR[0].DC3STG[*]	Available	5	3	-
	Defect area (condition 3): Measured value	RSLT.PMSR[0].DC3STG[*]:MS	Available	5	3	-
	Defect area (condition 3): Judgment value	RSLT.PMSR[0].DC3STG[*]:JG	Unsigned	1	0	-
	Distance from Reference Line (condition 3)	RSLT.PMSR[0].DC3STD[*]	Available	5	3	-
	Distance from Reference Line (condition 3): Measured value	RSLT.PMSR[0].DC3STD[*]:MS	Available	5	3	-
	Defect area (condition 4)	RSLT.PMSR[0].DC4STG[*]	Available	5	3	-
	Defect area (condition 4): Measured value	RSLT.PMSR[0].DC4STG[*]:MS	Available	5	3	-
	Defect area (condition 4): Judgment value	RSLT.PMSR[0].DC4STG[*]:JG	Unsigned	1	0	-
	Distance from Reference Line (condition 4)	RSLT.PMSR[0].DC4STD[*]	Available	5	3	-
	Distance from Reference Line (condition 4): Measured value	RSLT.PMSR[0].DC4STD[*]:MS	Available	5	3	-

List of result data

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Profile measurement result for measurement 01	RSLT.PMSR[1].***	:	:	:	
Profile measurement result for measurement 31	RSLT.PMSR[31].***	:	:	:	

3D Geometry Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Distance	RSLT.TDST	Unsigned	5	3	-
Distance: Measured value	RSLT.TDST:MS	Unsigned	5	3	-
Distance: Absolute measured value	RSLT.TDST:AB	Unsigned	5	3	-
Distance: Judgment value	RSLT.TDST:JG	Unsigned	1	0	-
Angle	RSLT.TANG	Unsigned	3	3	-
Angle: Measured value	RSLT.TANG:MS	Unsigned	3	3	-
Angle: Absolute measured value	RSLT.TANG:AB	Unsigned	3	3	-
Angle: Judgment value	RSLT.TANG:JG	Unsigned	1	0	-
Point XYZ	RSLT.TPXYZ	Available	5	3	-
Point XYZ: Measured value	RSLT.TPXYZ:MS	Available	5	3	-
Point XYZ: Absolute measured value	RSLT.TPXYZ:AB	Available	5	3	-
Point XYX: Encoder pulse count	RSLT.TPXYZ:EC	Available	5	3	-
Point X	RSLT.TPX	Available	5	3	X
Point X: Measured value	RSLT.TPX:MS	Available	5	3	X
Point X: Absolute measured value	RSLT.TPX:AB	Available	5	3	X
Point X: Encoder pulse count	RSLT.TPX:EC	Available	5	3	X
Point Y	RSLT.TPY	Available	5	3	Y
Point Y: Measured value	RSLT.TPY:MS	Available	5	3	Y
Point Y: Absolute measured value	RSLT.TPY:AB	Available	5	3	Y
Point Y: Encoder pulse count	RSLT.TPY:EC	Available	5	3	Y
Point Z	RSLT.TPZ	Available	5	3	-
Point Z: Measured value	RSLT.TPZ:MS	Available	5	3	-
Point Z: Absolute measured value	RSLT.TPZ:AB	Available	5	3	-
Point Z: Encoder pulse count	RSLT.TPZ:EC	Available	5	3	-
Line start point XYZ	RSLT.LPXYZ	Available	5	3	-
Line start point XYZ: Measured value	RSLT.LPXYZ:MS	Available	5	3	-
Line start point XYZ: Absolute measured value	RSLT.LPXYZ:AB	Available	5	3	-
Line start point X	RSLT.LPX	Available	5	3	X
Line start point X: Measured value	RSLT.LPX:MS	Available	5	3	X
Line start point X: Absolute measured value	RSLT.LPX:AB	Available	5	3	X
Line start point Y	RSLT.LPY	Available	5	3	Y
Line start point Y: Measured value	RSLT.LPY:MS	Available	5	3	Y
Line start point Y: Absolute measured value	RSLT.LPY:AB	Available	5	3	Y
Line start point Z	RSLT.LPZ	Available	5	3	-
Line start point Z: Measured value	RSLT.LPZ:MS	Available	5	3	-
Line start point Z: Absolute measured value	RSLT.LPZ:AB	Available	5	3	-
Line vector XYZ	RSLT.LVXYZ	Available	5	3	-
Line vector XYZ: Measured value	RSLT.LVXYZ:MS	Available	5	3	-
Line vector XYZ: Absolute measured value	RSLT.LVXYZ:AB	Available	5	3	-
Line vector X	RSLT.LVX	Available	5	3	X
Line vector X: Measured value	RSLT.LVX:MS	Available	5	3	X
Line vector X: Absolute measured value	RSLT.LVX:AB	Available	5	3	X
Line vector Y	RSLT.LVY	Available	5	3	Y
Line vector Y: Measured value	RSLT.LVY:MS	Available	5	3	Y
Line vector Y: Absolute measured value	RSLT.LVY:AB	Available	5	3	Y

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Line vector Z	RSLT.LVZ	Available	5	3	-
Line vector Z: Measured value	RSLT.LVZ:MS	Available	5	3	-
Line vector Z: Absolute measured value	RSLT.LVZ:AB	Available	5	3	-
Plane equation XYZ	RSLT.PPABC	Available	3	6	-
Plane equation XYZ: Measured value	RSLT.PPABC:MS	Available	3	6	-
Plane equation XYZ: Absolute measured value	RSLT.PPABC:AB	Available	3	6	-
Plane X slope	RSLT.PPA	Available	1	6	-
Plane X slope: Measured value	RSLT.PPA:MS	Available	1	6	-
Plane X slope: Absolute measured value	RSLT.PPA:AB	Available	1	6	-
Plane Y slope	RSLT.PPB	Available	1	6	-
Plane Y slope: Measured value	RSLT.PPB:MS	Available	1	6	-
Plane Y slope: Absolute measured value	RSLT.PPB:AB	Available	1	6	-
Plane Z intercept	RSLT.PPC	Available	3	3	-
Plane Z intercept: Measured value	RSLT.PPC:MS	Available	3	3	-
Plane Z intercept: Absolute measured value	RSLT.PPC:AB	Available	3	3	-
Sphere center XYZ	RSLT.TCXYZ	Available	5	3	-
Sphere center XYZ: Measured value	RSLT.TCXYZ:MS	Available	5	3	-
Sphere center XYZ: Absolute measured value	RSLT.TCXYZ:AB	Available	5	3	-
Sphere center XYZ: Encoder pulse count	RSLT.TCXYZ:EC	Available	5	3	-
Sphere center X	RSLT.TCX	Available	5	3	X
Sphere center X: Measured value	RSLT.TCX:MS	Available	5	3	X
Sphere center X: Absolute measured value	RSLT.TCX:AB	Available	5	3	X
Sphere center X: Encoder pulse count	RSLT.TCX:EC	Available	5	3	X
Sphere center Y	RSLT.TCY	Available	5	3	Y
Sphere center Y: Measured value	RSLT.TCY:MS	Available	5	3	Y
Sphere center Y: Absolute measured value	RSLT.TCY:AB	Available	5	3	Y
Sphere center Y: Encoder pulse count	RSLT.TCY:EC	Available	5	3	Y
Sphere center Z	RSLT.TCZ	Available	5	3	-
Sphere center Z: Measured value	RSLT.TCZ:MS	Available	5	3	-
Sphere center Z: Absolute measured value	RSLT.TCZ:AB	Available	5	3	-
Sphere center Z: Encoder pulse count	RSLT.TCZ:EC	Available	5	3	-
Sphere radius	RSLT.TRAD	Unsigned	5	3	-
Sphere radius: Measured value	RSLT.TRAD:MS	Unsigned	5	3	-
Sphere radius: Absolute measured value	RSLT.TRAD:AB	Unsigned	5	3	-
Sphere radius: Judgment value	RSLT.TRAD:JG	Unsigned	1	0	-
Input 1: Point XYZ	RSLT.IN1.TPXYZ	Available	5	3	-
Input 1: Point XYZ: Measured value	RSLT.IN1.TPXYZ:MS	Available	5	3	-
Input 1: Point XYZ: Absolute measured value	RSLT.IN1.TPXYZ:AB	Available	5	3	-
Input 1: Point XYZ: Encoder pulse count	RSLT.IN1.TPXYZ:EC	Available	5	3	-
Input 1: Point X	RSLT.IN1.TPX	Available	5	3	X
Input 1: Point X: Measured value	RSLT.IN1.TPX:MS	Available	5	3	X
Input 1: Point X: Absolute measured value	RSLT.IN1.TPX:AB	Available	5	3	X
Input 1: Point X: Encoder pulse count	RSLT.IN1.TPX:EC	Available	5	3	X
Input 1: Point Y	RSLT.IN1.TPY	Available	5	3	Y
Input 1: Point Y: Measured value	RSLT.IN1.TPY:MS	Available	5	3	Y
Input 1: Point Y: Absolute measured value	RSLT.IN1.TPY:AB	Available	5	3	Y
Input 1: Point Y: Encoder pulse count	RSLT.IN1.TPY:EC	Available	5	3	Y

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Input 1: Point Z	RSLT.IN1.TPZ	Available	5	3	-
Input 1: Point Z: Measured value	RSLT.IN1.TPZ:MS	Available	5	3	-
Input 1: Point Z: Absolute measured value	RSLT.IN1.TPZ:AB	Available	5	3	-
Input 1: Point Z: Encoder pulse count	RSLT.IN1.TPZ:EC	Available	5	3	-
Input 1: Line start point XYZ	RSLT.IN1.LPXYZ	Available	5	3	-
Input 1: Line start point XYZ: Measured value	RSLT.IN1.LPXYZ:MS	Available	5	3	-
Input 1: Line start point XYZ: Absolute measured value	RSLT.IN1.LPXYZ:AB	Available	5	3	-
Input 1: Line start point X	RSLT.IN1.LPX	Available	5	3	X
Input 1: Line start point X: Measured value	RSLT.IN1.LPX:MS	Available	5	3	X
Input 1: Line start point X: Absolute measured value	RSLT.IN1.LPX:AB	Available	5	3	X
Input 1: Line start point Y	RSLT.IN1.LPY	Available	5	3	Y
Input 1: Line start point Y: Measured value	RSLT.IN1.LPY:MS	Available	5	3	Y
Input 1: Line start point Y: Absolute measured value	RSLT.IN1.LPY:AB	Available	5	3	Y
Input 1: Line start point Z	RSLT.IN1.LPZ	Available	5	3	-
Input 1: Line start point Z: Measured value	RSLT.IN1.LPZ:MS	Available	5	3	-
Input 1: Line start point Z: Absolute measured value	RSLT.IN1.LPZ:AB	Available	5	3	-
Input 1: Line vector XYZ	RSLT.IN1.LVXYZ	Available	5	3	-
Input 1: Line vector XYZ: Measured value	RSLT.IN1.LVXYZ:MS	Available	5	3	-
Input 1: Line vector XYZ: Absolute measured value	RSLT.IN1.LVXYZ:AB	Available	5	3	-
Input 1: Line vector X	RSLT.IN1.LVX	Available	5	3	X
Input 1: Line vector X: Measured value	RSLT.IN1.LVX:MS	Available	5	3	X
Input 1: Line vector X: Absolute measured value	RSLT.IN1.LVX:AB	Available	5	3	X
Input 1: Line vector Y	RSLT.IN1.LVY	Available	5	3	Y
Input 1: Line vector Y: Measured value	RSLT.IN1.LVY:MS	Available	5	3	Y
Input 1: Line vector Y: Absolute measured value	RSLT.IN1.LVY:AB	Available	5	3	Y
Input 1: Line vector Z	RSLT.IN1.LVZ	Available	5	3	-
Input 1: Line vector Z: Measured value	RSLT.IN1.LVZ:MS	Available	5	3	-
Input 1: Line vector Z: Absolute measured value	RSLT.IN1.LVZ:AB	Available	5	3	-
Input 1: Plane equation XYZ	RSLT.IN1.PPABC	Available	3	6	-
Input 1: Plane equation XYZ: Measured value	RSLT.IN1.PPABC:MS	Available	3	6	-
Input 1: Plane equation XYZ: Absolute measured value	RSLT.IN1.PPABC:AB	Available	3	6	-
Input 1: Plane X slope	RSLT.IN1.PPA	Available	1	6	-
Input 1: Plane X slope: Measured value	RSLT.IN1.PPA:MS	Available	1	6	-
Input 1: Plane X slope: Absolute measured value	RSLT.IN1.PPA:AB	Available	1	6	-
Input 1: Plane Y slope	RSLT.IN1.PPB	Available	1	6	-
Input 1: Plane Y slope: Measured value	RSLT.IN1.PPB:MS	Available	1	6	-
Input 1: Plane Y slope: Absolute measured value	RSLT.IN1.PPB:AB	Available	1	6	-
Input 1: Plane Z intercept	RSLT.IN1.PPC	Available	3	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Input 1: Plane Z intercept: Measured value	RSLT.IN1.PPC:MS	Available	3	3	-
Input 1: Plane Z intercept: Absolute measured value	RSLT.IN1.PPC:AB	Available	3	3	-
Input 1: Sphere center XYZ	RSLT.IN1.TCXYZ	Available	5	3	-
Input 1: Sphere center XYZ: Measured value	RSLT.IN1.TCXYZ:MS	Available	5	3	-
Input 1: Sphere center XYZ: Absolute measured value	RSLT.IN1.TCXYZ:AB	Available	5	3	-
Input 1: Sphere center XYZ: Encoder pulse count	RSLT.IN1.TCXYZ:EC	Available	5	3	-
Input 1: Sphere center X	RSLT.IN1.TCX	Available	5	3	X
Input 1: Sphere center X: Measured value	RSLT.IN1.TCX:MS	Available	5	3	X
Input 1: Sphere center X: Absolute measured value	RSLT.IN1.TCX:AB	Available	5	3	X
Input 1: Sphere center X: Encoder pulse count	RSLT.IN1.TCX:EC	Available	5	3	X
Input 1: Sphere center Y	RSLT.IN1.TCY	Available	5	3	Y
Input 1: Sphere center Y: Measured value	RSLT.IN1.TCY:MS	Available	5	3	Y
Input 1: Sphere center Y: Absolute measured value	RSLT.IN1.TCY:AB	Available	5	3	Y
Input 1: Sphere center Y: Encoder pulse count	RSLT.IN1.TCY:EC	Available	5	3	Y
Input 1: Sphere center Z	RSLT.IN1.TCZ	Available	5	3	-
Input 1: Sphere center Z: Measured value	RSLT.IN1.TCZ:MS	Available	5	3	-
Input 1: Sphere center Z: Absolute measured value	RSLT.IN1.TCZ:AB	Available	5	3	-
Input 1: Sphere center Z: Encoder pulse count	RSLT.IN1.TCZ:EC	Available	5	3	-
Input 1: Radius of sphere	RSLT.IN1.TRAD	Unsigned	5	3	-
Input 1: Radius of sphere: Measured value	RSLT.IN1.TRAD:MS	Unsigned	5	3	-
Input 1: Radius of sphere: Absolute measured value	RSLT.IN1.TRAD:AB	Unsigned	5	3	-
Input 1: Input error information	RSLT.IN1.ELERR	Unsigned	1	0	-
Input 1: User specified point XYZ	RSLT.IN1.DPXYZ[s]	Available	5	3	-
Input 1: User specified point XYZ: Measured value	RSLT.IN1.DPXYZ[s]:MS	Available	5	3	-
Input 1: User specified point XYZ: Absolute measured value	RSLT.IN1.DPXYZ[s]:AB	Available	5	3	-
Input 1: User specified point XYZ: Encoder pulse count	RSLT.IN1.DPXYZ[s]:EC	Available	5	3	-
Input 1: User specified point X	RSLT.IN1.DPX[s]	Available	5	3	X
Input 1: User specified point X: Measured value	RSLT.IN1.DPX[s]:MS	Available	5	3	X
Input 1: User specified point X: Absolute measured value	RSLT.IN1.DPX[s]:AB	Available	5	3	X
Input 1: User specified point X: Encoder pulse count	RSLT.IN1.DPX[s]:EC	Available	5	3	X
Input 1: User specified point Y	RSLT.IN1.DPY[s]	Available	5	3	Y
Input 1: User specified point Y: Measured value	RSLT.IN1.DPY[s]:MS	Available	5	3	Y
Input 1: User specified point Y: Absolute measured value	RSLT.IN1.DPY[s]:AB	Available	5	3	Y

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Input 1: User specified point Y: Encoder pulse count	RSLT.IN1.DPY[s]:EC	Available	5	3	Y
Input 1: User specified point Z	RSLT.IN1.DPZ[s]	Available	5	3	-
Input 1: User specified point Z: Measured value	RSLT.IN1.DPZ[s]:MS	Available	5	3	-
Input 1: User specified point Z: Absolute measured value	RSLT.IN1.DPZ[s]:AB	Available	5	3	-
Input 1: User specified point Z: Encoder pulse count	RSLT.IN1.DPZ[s]:EC	Available	5	3	-
Input 1: User specified point enabled	RSLT.IN1.DPVLD[s]	Unsigned	1	0	-
Input 2: Point XYZ	RSLT.IN2.TPXYZ	Available	5	3	-
Input 2: Point XYZ: Measured value	RSLT.IN2.TPXYZ:MS	Available	5	3	-
Input 2: Point XYZ: Absolute measured value	RSLT.IN2.TPXYZ:AB	Available	5	3	-
Input 2: Point XYZ: Encoder pulse count	RSLT.IN2.TPXYZ[s]:EC	Available	5	3	-
Input 2: Point X	RSLT.IN2.TPX	Available	5	3	X
Input 2: Point X: Measured value	RSLT.IN2.TPX:MS	Available	5	3	X
Input 2: Point X: Absolute measured value	RSLT.IN2.TPX:AB	Available	5	3	X
Input 2: Point X: Encoder pulse count	RSLT.IN2.TPX[s]:EC	Available	5	3	X
Input 2: Point Y	RSLT.IN2.TPY	Available	5	3	Y
Input 2: Point Y: Measured value	RSLT.IN2.TPY:MS	Available	5	3	Y
Input 2: Point Y: Absolute measured value	RSLT.IN2.TPY:AB	Available	5	3	Y
Input 2: Point Y: Encoder pulse count	RSLT.IN2.TPY[s]:EC	Available	5	3	Y
Input 2: Point Z	RSLT.IN2.TPZ	Available	5	3	-
Input 2: Point Z: Measured value	RSLT.IN2.TPZ:MS	Available	5	3	-
Input 2: Point Z: Absolute measured value	RSLT.IN2.TPZ:AB	Available	5	3	-
Input 2: Point Z: Encoder pulse count	RSLT.IN2.TPZ[s]:EC	Available	5	3	-
Input 2: Line start point XYZ	RSLT.IN2.LPXYZ	Available	5	3	-
Input 2: Line start point XYZ: Measured value	RSLT.IN2.LPXYZ:MS	Available	5	3	-
Input 2: Line start point XYZ: Absolute measured value	RSLT.IN2.LPXYZ:AB	Available	5	3	-
Input 2: Line start point X	RSLT.IN2.LPX	Available	5	3	X
Input 2: Line start point X: Measured value	RSLT.IN2.LPX:MS	Available	5	3	X
Input 2: Line start point X: Absolute measured value	RSLT.IN2.LPX:AB	Available	5	3	X
Input 2: Line start point Y	RSLT.IN2.LPY	Available	5	3	Y
Input 2: Line start point Y: Measured value	RSLT.IN2.LPY:MS	Available	5	3	Y
Input 2: Line start point Y: Absolute measured value	RSLT.IN2.LPY:AB	Available	5	3	Y
Input 2: Line start point Z	RSLT.IN2.LPZ	Available	5	3	-
Input 2: Line start point Z: Measured value	RSLT.IN2.LPZ:MS	Available	5	3	-
Input 2: Line start point Z: Absolute measured value	RSLT.IN2.LPZ:AB	Available	5	3	-
Input 2: Line vector XYZ	RSLT.IN2.LVXYZ	Available	5	3	-
Input 2: Line vector XYZ: Measured value	RSLT.IN2.LVXYZ:MS	Available	5	3	-
Input 2: Line vector XYZ: Absolute measured value	RSLT.IN2.LVXYZ:AB	Available	5	3	-
Input 2: Line vector X	RSLT.IN2.LVX	Available	5	3	X
Input 2: Line vector X: Measured value	RSLT.IN2.LVX:MS	Available	5	3	X

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Input 2: Line vector X: Absolute measured value	RSLT.IN2.LVX:AB	Available	5	3	X
Input 2: Line vector Y	RSLT.IN2.LVY	Available	5	3	Y
Input 2: Line vector Y: Measured value	RSLT.IN2.LVY:MS	Available	5	3	Y
Input 2: Line vector Y: Absolute measured value	RSLT.IN2.LVY:AB	Available	5	3	Y
Input 2: Line vector Z	RSLT.IN2.LVZ	Available	5	3	-
Input 2: Line vector Z: Measured value	RSLT.IN2.LVZ:MS	Available	5	3	-
Input 2: Line vector Z: Absolute measured value	RSLT.IN2.LVZ:AB	Available	5	3	-
Input 2: Plane equation XYZ	RSLT.IN2.PPABC	Available	3	6	-
Input 2: Plane equation XYZ: Measured value	RSLT.IN2.PPABC:MS	Available	3	6	-
Input 2: Plane equation XYZ: Absolute measured value	RSLT.IN2.PPABC:AB	Available	3	6	-
Input 2: Plane X slope	RSLT.IN2.PPA	Available	1	6	-
Input 2: Plane X slope: Measured value	RSLT.IN2.PPA:MS	Available	1	6	-
Input 2: Plane X slope: Absolute measured value	RSLT.IN2.PPA:AB	Available	1	6	-
Input 2: Plane Y slope	RSLT.IN2.PPB	Available	1	6	-
Input 2: Plane Y slope: Measured value	RSLT.IN2.PPB:MS	Available	1	6	-
Input 2: Plane Y slope: Absolute measured value	RSLT.IN2.PPB:AB	Available	1	6	-
Input 2: Plane Z intercept	RSLT.IN2.PPC	Available	3	3	-
Input 2: Plane Z intercept: Measured value	RSLT.IN2.PPC:MS	Available	3	3	-
Input 2: Plane Z intercept: Absolute measured value	RSLT.IN2.PPC:AB	Available	3	3	-
Input 2: Input error information	RSLT.IN2.ELERR	Unsigned	1	0	-
Input 2: User specified point XYZ	RSLT.IN2.DPXYZ[s]	Available	5	3	-
Input 2: User specified point XYZ: Measured value	RSLT.IN2.DPXYZ[s]:MS	Available	5	3	-
Input 2: User specified point XYZ: Absolute measured value	RSLT.IN2.DPXYZ[s]:AB	Available	5	3	-
Input 2: User specified point XYZ: Encoder pulse count	RSLT.IN2.DPXYZ[s]:EC	Available	5	3	-
Input 2: User specified point X	RSLT.IN2.DPX[s]	Available	5	3	X
Input 2: User specified point X: Measured value	RSLT.IN2.DPX[s]:MS	Available	5	3	X
Input 2: User specified point X: Absolute measured value	RSLT.IN2.DPX[s]:AB	Available	5	3	X
Input 2: User specified point X: Encoder pulse count	RSLT.IN2.DPX[s]:EC	Available	5	3	X
Input 2: User specified point Y	RSLT.IN2.DPY[s]	Available	5	3	Y
Input 2: User specified point Y: Measured value	RSLT.IN2.DPY[s]:MS	Available	5	3	Y
Input 2: User specified point Y: Absolute measured value	RSLT.IN2.DPY[s]:AB	Available	5	3	Y
Input 2: User specified point Y: Encoder pulse count	RSLT.IN2.DPY[s]:EC	Available	5	3	Y
Input 2: User specified point Z	RSLT.IN2.DPZ[s]	Available	5	3	-
Input 2: User specified point Z: Measured value	RSLT.IN2.DPZ[s]:MS	Available	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Input 2: User specified point Z: Absolute measured value	RSLT.IN2.DPZ[s]:AB	Available	5	3	-
Input 2: User specified point Z: Encoder pulse count	RSLT.IN2.DPZ[s]:EC	Available	5	3	-
Input 2: User specified point enabled	RSLT.IN2.DPVLD[s]	Unsigned	1	0	-

3D Comparison Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Match Degree	RSLT.TDSUB_MTC	Unsigned	3	3	-
Match Degree: Judgment Value	RSLT.TDSUB_MTC:JG	Unsigned	1	0	-
Total Area	RSLT.TDSUB_TA	Unsigned	6	3	-
Total Area: Judgment Value	RSLT.TDSUB_TA:JG	Unsigned	1	0	-
Total Volume	RSLT.TDSUB_TV	Unsigned	7	3	-
Total Volume: Judgment Value	RSLT.TDSUB_TV:JG	Unsigned	1	0	-
Maximum Area	RSLT.TDSUB_MXA	Unsigned	6	3	-
Maximum Area: Judgment Value	RSLT.TDSUB_MXA:JG	Unsigned	1	0	-
Maximum Volume	RSLT.TDSUB_MXV	Unsigned	7	3	-
Maximum Volume: Judgment Value	RSLT.TDSUB_MXV:JG	Unsigned	1	0	-
Concave Parts Total Area	RSLT.TDSUB_TCCA	Unsigned	6	3	-
Concave Parts Total Area: Judgment Value	RSLT.TDSUB_TCCA:JG	Unsigned	1	0	-
Concave Parts Total Volume	RSLT.TDSUB_TCCV	Unsigned	7	3	-
Concave Parts Total Volume: Judgment Value	RSLT.TDSUB_TCCV:JG	Unsigned	1	0	-
Convex Parts Total Area	RSLT.TDSUB_TCVA	Unsigned	6	3	-
Convex Parts Total Area: Judgment Value	RSLT.TDSUB_TCVA:JG	Unsigned	1	0	-
Convex Parts Total Volume	RSLT.TDSUB_TCVV	Unsigned	7	3	-
Convex Parts Total Volume: Judgment Value	RSLT.TDSUB_TCVV:JG	Unsigned	1	0	-

3D blob Unit

 When using a Multi-point Region, ARSLT[*] is assigned to the name of the result data of each region to indicate this is the result data of a Multi-point Region (example with the number of detections set to the measured value: RSLT.N:MS→RSLT.ARSLT[0]N:MS).

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Number of Labels	RSLT.N	Unsigned	4	0	-
Number of Labels: Measured value	RSLT.N:MS	Unsigned	4	0	-
Number of Labels: Judgment value	RSLT.N:JG	Unsigned	1	0	-
Total Area	RSLT.TAR	Unsigned	5	4	-
Total Area: Measured value	RSLT.TAR:MS	Unsigned	5	4	-
Total Area: Judgment value	RSLT.TAR:JG	Unsigned	1	0	-
Total Volume	RSLT.TVOL	Unsigned	7	5	-
Total Volume: Measured value	RSLT.TVOL:MS	Unsigned	7	5	-
Total Volume: Judgment value	RSLT.TVOL:JG	Unsigned	1	0	-
Plane Equation Info. XYZ of Zero Plane	RSLT.PPABC	Signed	3	6	-
Plane Equation Info. XYZ of Zero Plane: Measured value	RSLT.PPABC:MS	Signed	3	6	-
Plane Equation Info. XYZ of Zero Plane: Judgment value	RSLT.PPABC:AB	Signed	3	6	-
X Slope of Zero Plane	RSLT.PPA	Signed	1	6	-
X Slope of Zero Plane: Measured value	RSLT.PPA:MS	Signed	1	6	-
X Slope of Zero Plane: Absolute measured value	RSLT.PPA:AB	Signed	1	6	-
Y Slope of Zero Plane	RSLT.PPB	Signed	1	6	-
Y Slope of Zero Plane: Measured value	RSLT.PPB:MS	Signed	1	6	-
Y Slope of Zero Plane: Absolute measured value	RSLT.PPB:AB	Signed	1	6	-
Z Intercept of Zero Plane	RSLT.PPC	Signed	3	3	-
Z Intercept of Zero Plane: Measured value	RSLT.PPC:MS	Signed	3	3	-
Z Intercept of Zero Plane: Absolute measured value	RSLT.PPC:AB	Signed	3	3	-
Area	RSLT.AR[*]	Unsigned	5	4	-
Area: Measured value	RSLT.AR[*]:MS	Unsigned	5	4	-
Area: Judgment value	RSLT.AR[*]:JG	Unsigned	1	0	-
Area (Max.)	RSLT.ARH	Unsigned	5	4	-
Area (Max.): Measured value	RSLT.ARH:MS	Unsigned	5	4	-
Area (Max.): Judgment value	RSLT.ARH:JG	Unsigned	1	0	-
Area (Min.)	RSLT.ARL	Unsigned	5	4	-
Area (Min.): Measured value	RSLT.ARL:MS	Unsigned	5	4	-
Area (Min.): Judgment value	RSLT.ARL:JG	Unsigned	1	0	-
Position X	RSLT.X[*]	Signed	5	3	X
Position X: Measured value	RSLT.X[*]:MS	Signed	5	3	X
Position X: Absolute measured value	RSLT.X[*]:AB	Signed	5	3	-
Position X: Judgment value	RSLT.X[*]:JG	Unsigned	1	0	-
Position X (Max.)	RSLT.XH	Unsigned	5	3	X
Position X (Max.): Measured value	RSLT.XH:MS	Unsigned	5	3	X
Position X (Max.): Judgment value	RSLT.XH:JG	Unsigned	1	0	-
Position X (Min.)	RSLT.XL	Unsigned	5	3	X
Position X (Min.): Measured value	RSLT.XL:MS	Unsigned	5	3	X
Position X (Min.): Judgment value	RSLT.XL:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Position Y	RSLT.Y[*]	Signed	5	3	Y
Position Y: Measured value	RSLT.Y[*]:MS	Signed	5	3	Y
Position Y: Absolute measured value	RSLT.Y[*]:AB	Signed	5	3	-
Position Y: Judgment value	RSLT.Y[*]:JG	Unsigned	1	0	-
Position Y (Max.)	RSLT.YH	Unsigned	5	3	Y
Position Y (Max.): Measured value	RSLT.YH:MS	Unsigned	5	3	Y
Position Y (Max.): Judgment value	RSLT.YH:JG	Unsigned	1	0	-
Position Y (Min.)	RSLT.YL	Unsigned	5	3	Y
Position Y (Min.): Measured value	RSLT.YL:MS	Unsigned	5	3	Y
Position Y (Min.): Judgment value	RSLT.YL:JG	Unsigned	1	0	-
Feret D.BOX X Upper Left	RSLT.SRLUX[*]	Signed	5	3	X
Feret D.BOX X Upper Left: Measured value	RSLT.SRLUX[*]:MS	Signed	5	3	X
Feret D.BOX X Upper Left: Absolute measured value	RSLT.SRLUX[*]:AB	Signed	5	3	-
Feret D.BOX Y Upper Left	RSLT.SRLUY[*]	Signed	5	3	Y
Feret D.BOX Y Upper Left: Measured value	RSLT.SRLUY[*]:MS	Signed	5	3	Y
Feret D.BOX Y Upper Left: Absolute measured value	RSLT.SRLUY[*]:AB	Signed	5	3	-
Feret D.BOX X Lower Left	RSLT.SRLDX[*]	Signed	5	3	X
Feret D.BOX X Lower Left: Measured value	RSLT.SRLDX[*]:MS	Signed	5	3	X
Feret D.BOX X Lower Left: Absolute measured value	RSLT.SRLDX[*]:AB	Signed	5	3	-
Feret D.BOX Y Lower Left	RSLT.SRLDY[*]	Signed	5	3	Y
Feret D.BOX Y Lower Left: Measured value	RSLT.SRLDY[*]:MS	Signed	5	3	Y
Feret D.BOX Y Lower Left: Absolute measured value	RSLT.SRLDY[*]:AB	Signed	5	3	-
Feret D.BOX X Upper Right	RSLT.SRRUX[*]	Signed	5	3	X
Feret D.BOX X Upper Right: Measured value	RSLT.SRRUX[*]:MS	Signed	5	3	X
Feret D.BOX X Upper Right: Absolute measured value	RSLT.SRRUX[*]:AB	Signed	5	3	-
Feret D.BOX Y Upper Right	RSLT.SRRUY[*]	Signed	5	3	Y
Feret D.BOX Y Upper Right: Measured value	RSLT.SRRUY[*]:MS	Signed	5	3	Y
Feret D.BOX Y Upper Right: Absolute measured value	RSLT.SRRUY[*]:AB	Signed	5	3	-
Feret D.BOX X Lower Right	RSLT.SRRDX[*]	Signed	5	3	X
Feret D.BOX X Lower Right: Measured value	RSLT.SRRDX[*]:MS	Signed	5	3	X
Feret D.BOX X Lower Right: Absolute measured value	RSLT.SRRDX[*]:AB	Signed	5	3	-
Feret D.BOX Y Lower Right	RSLT.SRRDY[*]	Signed	5	3	Y
Feret D.BOX Y Lower Right: Measured value	RSLT.SRRDY[*]:MS	Signed	5	3	Y
Feret D.BOX Y Lower Right: Absolute measured value	RSLT.SRRDY[*]:AB	Signed	5	3	-
Perimeter	RSLT.CL[*]	Unsigned	5	3	L
Perimeter: Measured value	RSLT.CL[*]:MS	Unsigned	5	3	L
Perimeter: Absolute measured value	RSLT.CL[*]:AB	Unsigned	5	3	-
Perimeter: Judgment value	RSLT.CL[*]:JG	Unsigned	1	0	-
Perimeter (Max.)	RSLT.CLH	Unsigned	5	3	L
Perimeter (Max.): Measured value	RSLT.CLH:MS	Unsigned	5	3	L
Perimeter (Max.): Judgment value	RSLT.CLH:JG	Unsigned	1	0	-
Perimeter (Min.)	RSLT.CLL	Unsigned	5	3	L
Perimeter (Min.): Measured value	RSLT.CLL:MS	Unsigned	5	3	L

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Perimeter (Min.): Judgment value	RSLT.CLL:JG	Unsigned	1	0	-
Feret X	RSLT.FX[*]	Unsigned	5	3	L
Feret X: Measured value	RSLT.FX[*]:MS	Unsigned	5	3	L
Feret X: Absolute measured value	RSLT.FX[*]:AB	Unsigned	5	3	-
Feret X: Judgment value	RSLT.FX[*]:JG	Unsigned	1	0	-
Feret X (Max.)	RSLT.FXH	Unsigned	5	3	L
Feret X (Max.): Measured value	RSLT.FXH:MS	Unsigned	5	3	L
Feret X (Max.): Judgment value	RSLT.FXH:JG	Unsigned	1	0	-
Feret X (Min.)	RSLT.FXL	Unsigned	5	3	L
Feret X (Min.): Measured value	RSLT.FXL:MS	Unsigned	5	3	L
Feret X (Min.): Judgment value	RSLT.FXL:JG	Unsigned	1	0	-
Feret Y	RSLT.FY[*]	Unsigned	5	3	L
Feret Y: Measured value	RSLT.FY[*]:MS	Unsigned	5	3	L
Feret Y: Absolute measured value	RSLT.FY[*]:AB	Unsigned	5	3	-
Feret Y: Judgment value	RSLT.FY[*]:JG	Unsigned	1	0	-
Feret Y (Max.)	RSLT.FYH	Unsigned	5	3	L
Feret Y (Max.): Measured value	RSLT.FYH:MS	Unsigned	5	3	L
Feret Y (Max.): Judgment value	RSLT.FYH:JG	Unsigned	1	0	-
Feret Y (Min.)	RSLT.FYL	Unsigned	5	3	L
Feret Y (Min.): Measured value	RSLT.FYL:MS	Unsigned	5	3	L
Feret Y (Min.): Judgment value	RSLT.FYL:JG	Unsigned	1	0	-
Roundness	RSLT.CD[*]	Unsigned	1	3	-
Roundness: Measured value	RSLT.CD[*]:MS	Unsigned	1	3	-
Roundness: Judgment value	RSLT.CD[*]:JG	Unsigned	1	0	-
Roundness (Max.)	RSLT.CDH	Unsigned	1	3	-
Roundness (Max.): Measured value	RSLT.CDH:MS	Unsigned	1	3	-
Roundness (Max.): Judgment value	RSLT.CDH:JG	Unsigned	1	0	-
Roundness (Min.)	RSLT.CDL	Unsigned	1	3	-
Roundness (Min.): Measured value	RSLT.CDL:MS	Unsigned	1	3	-
Roundness (Min.): Judgment value	RSLT.CDL:JG	Unsigned	1	0	-
Rectangularity	RSLT.RTD[*]	Unsigned	1	3	-
Rectangularity: Measured value	RSLT.RTD[*]:MS	Unsigned	1	3	-
Rectangularity: Judgment value	RSLT.RTD[*]:JG	Unsigned	1	0	-
Rectangularity (Max.)	RSLT.RTDH	Unsigned	1	3	-
Rectangularity (Max.): Measured value	RSLT.RTDH:MS	Unsigned	1	3	-
Rectangularity (Max.): Judgment value	RSLT.RTDH:JG	Unsigned	1	0	-
Rectangularity (Min.)	RSLT.RTDL	Unsigned	1	3	-
Rectangularity (Min.): Measured value	RSLT.RTDL:MS	Unsigned	1	3	-
Rectangularity (Min.): Judgment value	RSLT.RTDL:JG	Unsigned	1	0	-
Maj. Axis Angle	RSLT.T[*]	Signed	3	3	-
Maj. Axis Angle: Measured value	RSLT.T[*]:MS	Signed	3	3	-
Maj. Axis Angle: Absolute measured value	RSLT.T[*]:AB	Signed	3	3	-
Maj. Axis Angle: Judgment value	RSLT.T[*]:JG	Unsigned	1	0	-
Maj. Axis Angle (Max.)	RSLT.TH	Signed	3	3	-
Maj. Axis Angle (Max.): Measured value	RSLT.TH:MS	Signed	3	3	-
Maj. Axis Angle (Max.): Judgment value	RSLT.TH:JG	Unsigned	1	0	-
Maj. Axis Angle (Min.)	RSLT.TL	Signed	3	3	-
Maj. Axis Angle (Min.): Measured value	RSLT.TL:MS	Signed	3	3	-
Maj. Axis Angle (Min.): Judgment value	RSLT.TL:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Major Axis	RSLT.MAA[*]	Unsigned	5	3	L
Major Axis: Measured value	RSLT.MAA[*]:MS	Unsigned	5	3	L
Major Axis: Absolute measured value	RSLT.MAA[*]:AB	Unsigned	5	3	-
Major Axis: Judgment value	RSLT.MAA[*]:JG	Unsigned	1	0	-
Major Axis (Max.)	RSLT.MAAH	Unsigned	5	3	L
Major Axis (Max.): Measured value	RSLT.MAAH:MS	Unsigned	5	3	L
Major Axis (Max.): Judgment value	RSLT.MAAH:JG	Unsigned	1	0	-
Major Axis (Min.)	RSLT.MAAL	Unsigned	5	3	L
Major Axis (Min.): Measured value	RSLT.MAAL:MS	Unsigned	5	3	L
Major Axis (Min.): Judgment value	RSLT.MAAL:JG	Unsigned	1	0	-
Minor Axis	RSLT.MIA[*]	Unsigned	5	3	L
Minor Axis: Measured value	RSLT.MIA[*]:MS	Unsigned	5	3	L
Minor Axis: Absolute measured value	RSLT.MIA[*]:AB	Unsigned	5	3	-
Minor Axis: Judgment value	RSLT.MIA[*]:JG	Unsigned	1	0	-
Minor Axis (Max.)	RSLT.MIAH	Unsigned	5	3	L
Minor Axis (Max.): Measured value	RSLT.MIAH:MS	Unsigned	5	3	L
Minor Axis (Max.): Judgment value	RSLT.MIAH:JG	Unsigned	1	0	-
Minor Axis (Min.)	RSLT.MIAL	Unsigned	5	3	L
Minor Axis (Min.): Measured value	RSLT.MIAL:MS	Unsigned	5	3	L
Minor Axis (Min.): Judgment value	RSLT.MIAL:JG	Unsigned	1	0	-
Axes Ratio	RSLT.RTO[*]	Unsigned	5	3	-
Axes Ratio: Measured value	RSLT.RTO[*]:MS	Unsigned	5	3	-
Axes Ratio: Judgment value	RSLT.RTO[*]:JG	Unsigned	1	0	-
Axes Ratio (Max.)	RSLT.RTOH	Unsigned	5	3	-
Axes Ratio (Max.): Measured value	RSLT.RTOH:MS	Unsigned	5	3	-
Axes Ratio (Max.): Judgment value	RSLT.RTOH:JG	Unsigned	1	0	-
Axes Ratio (Min.)	RSLT.RTOL	Unsigned	5	3	-
Axes Ratio (Min.): Measured value	RSLT.RTOL:MS	Unsigned	5	3	-
Axes Ratio (Min.): Judgment value	RSLT.RTOL:JG	Unsigned	1	0	-
Oval Maj. Axis	RSLT.MAA2[*]	Unsigned	5	3	L
Oval Maj. Axis: Measured value	RSLT.MAA2[*]:MS	Unsigned	5	3	L
Oval Maj. Axis: Absolute measured value	RSLT.MAA2[*]:AB	Unsigned	5	3	-
Oval Maj. Axis: Judgment value	RSLT.MAA2[*]:JG	Unsigned	1	0	-
Oval Maj. Axis (Max.)	RSLT.MAA2H	Unsigned	5	3	L
Oval Maj. Axis (Max.): Measured value	RSLT.MAA2H:MS	Unsigned	5	3	L
Oval Maj. Axis (Max.): Judgment value	RSLT.MAA2H:JG	Unsigned	1	0	-
Oval Maj. Axis (Min.)	RSLT.MAA2L	Unsigned	5	3	L
Oval Maj. Axis (Min.): Measured value	RSLT.MAA2L:MS	Unsigned	5	3	L
Oval Maj. Axis (Min.): Judgment value	RSLT.MAA2L:JG	Unsigned	1	0	-
Oval Min. Axis	RSLT.MIA2[*]	Unsigned	5	3	L
Oval Min. Axis: Measured value	RSLT.MIA2[*]:MS	Unsigned	5	3	L
Oval Min. Axis: Absolute measured value	RSLT.MIA2[*]:AB	Unsigned	5	3	-
Oval Min. Axis: Judgment value	RSLT.MIA2[*]:JG	Unsigned	1	0	-
Oval Min. Axis (Max.)	RSLT.MIA2H	Unsigned	5	3	L
Oval Min. Axis (Max.): Measured value	RSLT.MIA2H:MS	Unsigned	5	3	L
Oval Min. Axis (Max.): Judgment value	RSLT.MIA2H:JG	Unsigned	1	0	-
Oval Min. Axis (Min.)	RSLT.MIA2L	Unsigned	5	3	L
Oval Min. Axis (Min.): Measured value	RSLT.MIA2L:MS	Unsigned	5	3	L
Oval Min. Axis (Min.): Judgment value	RSLT.MIA2L:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Asp. Ratio	RSLT.RTO2[*]	Unsigned	5	3	-
Asp. Ratio: Measured value	RSLT.RTO2[*]:MS	Unsigned	5	3	-
Asp. Ratio: Judgment value	RSLT.RTO2[*]:JG	Unsigned	1	0	-
Asp. Ratio (Max.)	RSLT.RTO2H	Unsigned	5	3	-
Asp. Ratio (Max.): Measured value	RSLT.RTO2H:MS	Unsigned	5	3	-
Asp. Ratio (Max.): Judgment value	RSLT.RTO2H:JG	Unsigned	1	0	-
Asp. Ratio (Min.)	RSLT.RTO2L	Unsigned	5	3	-
Asp. Ratio (Min.): Measured value	RSLT.RTO2L:MS	Unsigned	5	3	-
Asp. Ratio (Min.): Judgment value	RSLT.RTO2L:JG	Unsigned	1	0	-
Long Side	RSLT.MRLS[*]	Unsigned	5	3	L
Long Side: Measured value	RSLT.MRLS[*]:MS	Unsigned	5	3	L
Long Side: Absolute measured value	RSLT.MRLS[*]:AB	Unsigned	5	3	-
Long Side: Judgment value	RSLT.MRLS[*]:JG	Unsigned	1	0	-
Long Side (Max.)	RSLT.MRLSH	Unsigned	5	3	L
Long Side (Max.): Measured value	RSLT.MRLSH:MS	Unsigned	5	3	L
Long Side (Max.): Judgment value	RSLT.MRLSH:JG	Unsigned	1	0	-
Long Side (Min.)	RSLT.MRLSL	Unsigned	5	3	L
Long Side (Min.): Measured value	RSLT.MRLSL:MS	Unsigned	5	3	L
Long Side (Min.): Judgment value	RSLT.MRLSL:JG	Unsigned	1	0	-
Short Side	RSLT.MRSS[*]	Unsigned	5	3	L
Short Side: Measured value	RSLT.MRSS[*]:MS	Unsigned	5	3	L
Short Side: Absolute measured value	RSLT.MRSS[*]:AB	Unsigned	5	3	-
Short Side: Judgment value	RSLT.MRSS[*]:JG	Unsigned	1	0	-
Short Side (Max.)	RSLT.MRSSH	Unsigned	5	3	L
Short Side (Max.): Measured value	RSLT.MRSSH:MS	Unsigned	5	3	L
Short Side (Max.): Judgment value	RSLT.MRSSH:JG	Unsigned	1	0	-
Short Side (Min.)	RSLT.MRSSL	Unsigned	5	3	L
Short Side (Min.): Measured value	RSLT.MRSSL:MS	Unsigned	5	3	L
Short Side (Min.): Judgment value	RSLT.MRSSL:JG	Unsigned	1	0	-
Rectangle Axes Ratio	RSLT.MBRA[*]	Unsigned	5	3	-
Rectangle Axes Ratio: Measured value	RSLT.MBRA[*]:MS	Unsigned	5	3	-
Rectangle Axes Ratio: Judgment value	RSLT.MBRA[*]:JG	Unsigned	1	0	-
Rectangle Axes Ratio (Max.)	RSLT.MBRAH	Unsigned	5	3	-
Rectangle Axes Ratio (Max.): Measured value	RSLT.MBRAH:MS	Unsigned	5	3	-
Rectangle Axes Ratio (Max.): Judgment value	RSLT.MBRAH:JG	Unsigned	1	0	-
Rectangle Axes Ratio (Min.)	RSLT.MBRAXL	Unsigned	5	3	-
Rectangle Axes Ratio (Min.): Measured value	RSLT.MBRAXL:MS	Unsigned	5	3	-
Rectangle Axes Ratio (Min.): Judgment value	RSLT.MBRAXL:JG	Unsigned	1	0	-
Minimum Bounding Rectangle Angle	RSLT.MRT[*]	Signed	3	3	-
Minimum Bounding Rectangle Angle: Measured value	RSLT.MRT[*]:MS	Signed	3	3	-
Minimum Bounding Rectangle Angle: Absolute measured value	RSLT.MRT[*]:AB	Signed	3	3	-
Minimum Bounding Rectangle Angle (Max.)	RSLT.MRTH	Signed	3	3	-
Minimum Bounding Rectangle Angle (Max.): Measured value	RSLT.MRTH:MS	Signed	3	3	-
Minimum Bounding Rectangle Angle (Min.)	RSLT.MRTL	Signed	3	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Minimum Bounding Rectangle Angle (Min.): RSLT.MRTL:MS Measured value		Signed	3	3	-
Minimum Bounding Rectangle Center Coordinate X	RSLT.MRCX[*]	Signed	5	3	X
Minimum Bounding Rectangle Center Coordinate X: Measured value	RSLT.MRCX[*]:MS	Signed	5	3	X
Minimum Bounding Rectangle Center Coordinate X: Absolute measured value	RSLT.MRCX[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Center Coordinate X (Max.)	RSLT.MRCXH	Signed	5	3	X
Minimum Bounding Rectangle Center Coordinate X (Max.): Measured value	RSLT.MRCXH:MS	Signed	5	3	X
Minimum Bounding Rectangle Center Coordinate X (Min.)	RSLT.MRCXL	Signed	5	3	X
Minimum Bounding Rectangle Center Coordinate X (Min.): Measured value	RSLT.MRCXL:MS	Signed	5	3	X
Minimum Bounding Rectangle Center Coordinate Y	RSLT.MRCY[*]	Signed	5	3	Y
Minimum Bounding Rectangle Center Coordinate Y: Measured value	RSLT.MRCY[*]:MS	Signed	5	3	Y
Minimum Bounding Rectangle Center Coordinate Y: Absolute measured value	RSLT.MRCY[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Center Coordinate Y (Max.)	RSLT.MRCYH	Signed	5	3	Y
Minimum Bounding Rectangle Center Coordinate Y (Max.): Measured value	RSLT.MRCYH:MS	Signed	5	3	Y
Minimum Bounding Rectangle Center Coordinate Y (Min.)	RSLT.MRCYL	Signed	5	3	Y
Minimum Bounding Rectangle Center Coordinate Y (Min.): Measured value	RSLT.MRCYL:MS	Signed	5	3	Y
Minimum Bounding Rectangle Upper Left X	RSLT.MRLUX[*]	Signed	5	3	X
Minimum Bounding Rectangle Upper Left X: RSLT.MRLUX[*]:MS Measured value		Signed	5	3	X
Minimum Bounding Rectangle Upper Left X: RSLT.MRLUX[*]:AB Absolute measured value		Signed	5	3	-
Minimum Bounding Rectangle Upper Left Y	RSLT.MRLUY[*]	Signed	5	3	Y
Minimum Bounding Rectangle Upper Left Y: RSLT.MRLUY[*]:MS Measured value		Signed	5	3	Y
Minimum Bounding Rectangle Upper Left Y: RSLT.MRLUY[*]:AB Absolute measured value		Signed	5	3	-
Minimum Bounding Rectangle Lower Left X	RSLT.MRLDX[*]	Signed	5	3	X
Minimum Bounding Rectangle Lower Left X: RSLT.MRLDX[*]:MS Measured value		Signed	5	3	X
Minimum Bounding Rectangle Lower Left X: RSLT.MRLDX[*]:AB Absolute measured value		Signed	5	3	-
Minimum Bounding Rectangle Lower Left Y	RSLT.MRLDY[*]	Signed	5	3	Y
Minimum Bounding Rectangle Lower Left Y: RSLT.MRLDY[*]:MS Measured value		Signed	5	3	Y
Minimum Bounding Rectangle Lower Left Y: RSLT.MRLDY[*]:AB Absolute measured value		Signed	5	3	-
Minimum Bounding Rectangle Upper Right X	RSLT.MRRUX[*]	Signed	5	3	X
Minimum Bounding Rectangle Upper Right X: Measured value	RSLT.MRRUX[*]:MS	Signed	5	3	X
Minimum Bounding Rectangle Upper Right X: Absolute measured value	RSLT.MRRUX[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Upper Right Y	RSLT.MRRUY[*]	Signed	5	3	Y
Minimum Bounding Rectangle Upper Right Y: Measured value	RSLT.MRRUY[*]:MS	Signed	5	3	Y

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Minimum Bounding Rectangle Upper Right Y: Absolute measured value	RSLT.MRRUY[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Lower Right X	RSLT.MRRDX[*]	Signed	5	3	X
Minimum Bounding Rectangle Lower Right X: Measured value	RSLT.MRRDX[*]:MS	Signed	5	3	X
Minimum Bounding Rectangle Lower Right X: Absolute measured value	RSLT.MRRDX[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Lower Right Y	RSLT.MRRDY[*]	Signed	5	3	Y
Minimum Bounding Rectangle Lower Right Y: Measured value	RSLT.MRRDY[*]:MS	Signed	5	3	Y
Minimum Bounding Rectangle Lower Right Y: Absolute measured value	RSLT.MRRDY[*]:AB	Signed	5	3	-
Major Axis Bounding Box Upper Left X	RSLT.R2LUX[*]	Signed	5	3	X
Major Axis Bounding Box Upper Left X: Measured value	RSLT.R2LUX[*]:MS	Signed	5	3	X
Major Axis Bounding Box Upper Left X: Absolute measured value	RSLT.R2LUX[*]:AB	Signed	5	3	-
Major Axis Bounding Box Upper Left Y	RSLT.R2LUY[*]	Signed	5	3	Y
Major Axis Bounding Box Upper Left Y: Measured value	RSLT.R2LUY[*]:MS	Signed	5	3	Y
Major Axis Bounding Box Upper Left Y: Absolute measured value	RSLT.R2LUY[*]:AB	Signed	5	3	-
Major Axis Bounding Box Upper Right X	RSLT.R2RUX[*]	Signed	5	3	X
Major Axis Bounding Box Upper Right X: Measured value	RSLT.R2RUX[*]:MS	Signed	5	3	X
Major Axis Bounding Box Upper Right X: Absolute measured value	RSLT.R2RUX[*]:AB	Signed	5	3	-
Major Axis Bounding Box Upper Right Y	RSLT.R2RUY[*]	Signed	5	3	Y
Major Axis Bounding Box Upper Right Y: Measured value	RSLT.R2RUY[*]:MS	Signed	5	3	Y
Major Axis Bounding Box Upper Right Y: Absolute measured value	RSLT.R2RUY[*]:AB	Signed	5	3	-
Major Axis Bounding Box Lower Left X	RSLT.R2LDX[*]	Signed	5	3	X
Major Axis Bounding Box Lower Left X: Measured value	RSLT.R2LDX[*]:MS	Signed	5	3	X
Major Axis Bounding Box Lower Left X: Absolute measured value	RSLT.R2LDX[*]:AB	Signed	5	3	-
Major Axis Bounding Box Lower Left Y	RSLT.R2LDY[*]	Signed	5	3	Y
Major Axis Bounding Box Lower Left Y: Measured value	RSLT.R2LDY[*]:MS	Signed	5	3	Y
Major Axis Bounding Box Lower Left Y: Absolute measured value	RSLT.R2LDY[*]:AB	Signed	5	3	-
Major Axis Bounding Box Lower Right X	RSLT.R2RDX[*]	Signed	5	3	X
Major Axis Bounding Box Lower Right X: Measured value	RSLT.R2RDX[*]:MS	Signed	5	3	X
Major Axis Bounding Box Lower Right X: Absolute measured value	RSLT.R2RDX[*]:AB	Signed	5	3	-
Major Axis Bounding Box Lower Right Y	RSLT.R2RDY[*]	Signed	5	3	Y
Major Axis Bounding Box Lower Right Y: Measured value	RSLT.R2RDY[*]:MS	Signed	5	3	Y
Major Axis Bounding Box Lower Right Y: Absolute measured value	RSLT.R2RDY[*]:AB	Signed	5	3	-
Max. Height X	RSLT.MXX[*]	Signed	5	3	X
Max. Height X: Measured value	RSLT.MXX[*]:MS	Signed	5	3	X
Max. Height X: Absolute measured value	RSLT.MXX[*]:AB	Signed	5	3	-
Max. Height X: Judgment value	RSLT.MXX[*]:JG	Unsigned	1	0	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Max. Height X (Max.)	RSLT.MXXH	Signed	5	3	X
Max. Height X (Max.): Measured value	RSLT.MXXH:MS	Signed	5	3	X
Max. Height X (Max.): Judgment value	RSLT.MXXH:JG	Unsigned	1	0	-
Max. Height X (Min.)	RSLT.MXXL	Signed	5	3	X
Max. Height X (Min.): Measured value	RSLT.MXXL:MS	Signed	5	3	X
Max. Height X (Min.): Judgment value	RSLT.MXXL:JG	Unsigned	1	0	-
Max. Height Y	RSLT.MXY[*]	Signed	5	3	Y
Max. Height Y: Measured value	RSLT.MXY[*]:MS	Signed	5	3	Y
Max. Height Y: Absolute measured value	RSLT.MXY[*]:AB	Signed	5	3	-
Max. Height Y: Judgment value	RSLT.MXY[*]:JG	Unsigned	1	0	-
Max. Height Y (Max.)	RSLT.MXYH	Signed	5	3	Y
Max. Height Y (Max.): Measured value	RSLT.MXYH:MS	Signed	5	3	Y
Max. Height Y (Max.): Judgment value	RSLT.MXYH:JG	Unsigned	1	0	-
Max. Height Y (Min.)	RSLT.MXYL	Signed	5	3	Y
Max. Height Y (Min.): Measured value	RSLT.MXYL:MS	Signed	5	3	Y
Max. Height Y (Min.): Judgment value	RSLT.MXYL:JG	Unsigned	1	0	-
Max. Height Z	RSLT.MXZ[*]	Signed	5	3	-
Max. Height Z: Measured value	RSLT.MXZ[*]:MS	Signed	5	3	-
Max. Height Z: Absolute measured value	RSLT.MXZ[*]:AB	Signed	5	3	-
Max. Height Z: Judgment value	RSLT.MXZ[*]:JG	Unsigned	1	0	-
Max. Height Z (Max.)	RSLT.MXZH	Signed	5	3	-
Max. Height Z (Max.): Measured value	RSLT.MXZH:MS	Signed	5	3	-
Max. Height Z (Max.): Judgment value	RSLT.MXZH:JG	Unsigned	1	0	-
Max. Height Z (Min.)	RSLT.MXZL	Signed	5	3	-
Max. Height Z (Min.): Measured value	RSLT.MXZL:MS	Signed	5	3	-
Max. Height Z (Min.): Judgment value	RSLT.MXZL:JG	Unsigned	1	0	-
Max. Height H	RSLT.MXH[*]	Signed	5	3	-
Max. Height H: Measured value	RSLT.MXH[*]:MS	Signed	5	3	-
Max. Height H: Absolute measured value	RSLT.MXH[*]:AB	Signed	5	3	-
Max. Height H: Judgment value	RSLT.MXH[*]:JG	Unsigned	1	0	-
Max. Height H (Max.)	RSLT.MXHH	Signed	5	3	-
Max. Height H (Max.): Measured value	RSLT.MXHH:MS	Signed	5	3	-
Max. Height H (Max.): Judgment value	RSLT.MXHH:JG	Unsigned	1	0	-
Max. Height H (Min.)	RSLT.MXHL	Signed	5	3	-
Max. Height H (Min.): Measured value	RSLT.MXHL:MS	Signed	5	3	-
Max. Height H (Min.): Judgment value	RSLT.MXHL:JG	Unsigned	1	0	-
Min. Height X	RSLT.MNX[*]	Signed	5	3	X
Min. Height X: Measured value	RSLT.MNX[*]:MS	Signed	5	3	X
Min. Height X: Absolute measured value	RSLT.MNX[*]:AB	Signed	5	3	-
Min. Height X: Judgment value	RSLT.MNX[*]:JG	Unsigned	1	0	-
Min. Height X (Max.)	RSLT.MNXH	Signed	5	3	X
Min. Height X (Max.): Measured value	RSLT.MNXH:MS	Signed	5	3	X
Min. Height X (Max.): Judgment value	RSLT.MNXH:JG	Unsigned	1	0	-
Min. Height X (Min.)	RSLT.MNXL	Signed	5	3	X
Min. Height X (Min.): Measured value	RSLT.MNXL:MS	Signed	5	3	X
Min. Height X (Min.): Judgment value	RSLT.MNXL:JG	Unsigned	1	0	-
Min. Height Y	RSLT.MNY[*]	Signed	5	3	Y
Min. Height Y: Measured value	RSLT.MNY[*]:MS	Signed	5	3	Y
Min. Height Y: Absolute measured value	RSLT.MNY[*]:AB	Signed	5	3	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Min. Height Y: Judgment value	RSLT.MNY[*]:JG	Unsigned	1	0	-
Min. Height Y (Max.)	RSLT.MNYH	Signed	5	3	Y
Min. Height Y (Max.): Measured value	RSLT.MNYH:MS	Signed	5	3	Y
Min. Height Y (Max.): Judgment value	RSLT.MNYH:JG	Unsigned	1	0	-
Min. Height Y (Min.)	RSLT.MNYL	Signed	5	3	Y
Min. Height Y (Min.): Measured value	RSLT.MNYL:MS	Signed	5	3	Y
Min. Height Y (Min.): Judgment value	RSLT.MNYL:JG	Unsigned	1	0	-
Min. Height Z	RSLT.MNZ[*]	Signed	5	3	-
Min. Height Z: Measured value	RSLT.MNZ[*]:MS	Signed	5	3	-
Min. Height Z: Absolute measured value	RSLT.MNZ[*]:AB	Signed	5	3	-
Min. Height Z: Judgment value	RSLT.MNZ[*]:JG	Unsigned	1	0	-
Min. Height Z (Max.)	RSLT.MNZH	Signed	5	3	-
Min. Height Z (Max.): Measured value	RSLT.MNZH:MS	Signed	5	3	-
Min. Height Z (Max.): Judgment value	RSLT.MNZH:JG	Unsigned	1	0	-
Min. Height Z (Min.)	RSLT.MNZL	Signed	5	3	-
Min. Height Z (Min.): Measured value	RSLT.MNZL:MS	Signed	5	3	-
Min. Height Z (Min.): Judgment value	RSLT.MNZL:JG	Unsigned	1	0	-
Min. Height H	RSLT.MNH[*]	Signed	5	3	-
Min. Height H: Measured value	RSLT.MNH[*]:MS	Signed	5	3	-
Min. Height H: Judgment value	RSLT.MNH[*]:JG	Unsigned	1	0	-
Min. Height H (Max.)	RSLT.MNHH	Signed	5	3	-
Min. Height H (Max.): Measured value	RSLT.MNHH:MS	Signed	5	3	-
Min. Height H (Max.): Judgment value	RSLT.MNHH:JG	Unsigned	1	0	-
Min. Height H (Min.)	RSLT.MNHL	Signed	5	3	-
Min. Height H (Min.): Measured value	RSLT.MNHL:MS	Signed	5	3	-
Min. Height H (Min.): Judgment value	RSLT.MNHL:JG	Unsigned	1	0	-
Ave. Height Z	RSLT.AVHZ[*]	Signed	5	3	-
Ave. Height Z: Measured value	RSLT.AVHZ[*]:MS	Signed	5	3	-
Ave. Height Z: Absolute measured value	RSLT.AVHZ[*]:AB	Signed	5	3	-
Ave. Height Z: Judgment value	RSLT.AVHZ[*]:JG	Unsigned	1	0	-
Ave. Height Z (Max.)	RSLT.AVHZH	Signed	5	3	-
Ave. Height Z (Max.): Measured value	RSLT.AVHZH:MS	Signed	5	3	-
Ave. Height Z (Max.): Judgment value	RSLT.AVHZH:JG	Unsigned	1	0	-
Ave. Height Z (Min.)	RSLT.AVHZL	Signed	5	3	-
Ave. Height Z (Min.): Measured value	RSLT.AVHZL:MS	Signed	5	3	-
Ave. Height Z (Min.): Judgment value	RSLT.AVHZL:JG	Unsigned	1	0	-
Ave. Height H	RSLT.AVH[*]	Signed	5	3	-
Ave. Height H: Measured value	RSLT.AVH[*]:MS	Signed	5	3	-
Ave. Height H: Judgment value	RSLT.AVH[*]:JG	Unsigned	1	0	-
Ave. Height H (Max.)	RSLT.AVHH	Signed	5	3	-
Ave. Height H (Max.): Measured value	RSLT.AVHH:MS	Signed	5	3	-
Ave. Height H (Max.): Judgment value	RSLT.AVHH:JG	Unsigned	1	0	-
Ave. Height H (Min.)	RSLT.AVHL	Signed	5	3	-
Ave. Height H (Min.): Measured value	RSLT.AVHL:MS	Signed	5	3	-
Ave. Height H (Min.): Judgment value	RSLT.AVHL:JG	Unsigned	1	0	-
Height	RSLT.BLZ[*]	Signed	5	3	-
Height: Measured value	RSLT.BLZ[*]:MS	Signed	5	3	-
Height: Judgment value	RSLT.BLZ[*]:JG	Unsigned	1	0	-
Height (Max.)	RSLT.BLZH	Signed	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Height (Max.): Measured value	RSLT.BLZH:MS	Signed	5	3	-
Height (Max.): Judgment value	RSLT.BLZH:JG	Unsigned	1	0	-
Height (Min.)	RSLT.BLZL	Signed	5	3	-
Height (Min.): Measured value	RSLT.BLZL:MS	Signed	5	3	-
Height (Min.): Judgment value	RSLT.BLZL:JG	Unsigned	1	0	-
Standard Dev. Z	RSLT.DVZ[*]	Unsigned	5	3	-
Standard Dev. Z: Measured value	RSLT.DVZ[*]:MS	Unsigned	5	3	-
Standard Dev. Z: Judgment value	RSLT.DVZ[*]:JG	Unsigned	1	0	-
Standard Dev. Z (Max.)	RSLT.DVZH	Unsigned	5	3	-
Standard Dev. Z (Max.): Measured value	RSLT.DVZH:MS	Unsigned	5	3	-
Standard Dev. Z (Max.): Judgment value	RSLT.DVZH:JG	Unsigned	1	0	-
Standard Dev. Z (Min.)	RSLT.DVZL	Unsigned	5	3	-
Standard Dev. Z (Min.): Measured value	RSLT.DVZL:MS	Unsigned	5	3	-
Standard Dev. Z (Min.): Judgment value	RSLT.DVZL:JG	Unsigned	1	0	-
Standard Dev. H	RSLT.DVH[*]	Unsigned	5	3	-
Standard Dev. H: Measured value	RSLT.DVH[*]:MS	Unsigned	5	3	-
Standard Dev. H: Judgment value	RSLT.DVH[*]:JG	Unsigned	1	0	-
Standard Dev. H (Max.)	RSLT.DVHH	Unsigned	5	3	-
Standard Dev. H (Max.): Measured value	RSLT.DVHH:MS	Unsigned	5	3	-
Standard Dev. H (Max.): Judgment value	RSLT.DVHH:JG	Unsigned	1	0	-
Standard Dev. H (Min.)	RSLT.DVHL	Unsigned	5	3	-
Standard Dev. H (Min.): Measured value	RSLT.DVHL:MS	Unsigned	5	3	-
Standard Dev. H (Min.): Judgment value	RSLT.DVHL:JG	Unsigned	1	0	-
Volume	RSLT.VOL[*]	Unsigned	7	5	-
Volume: Measured value	RSLT.VOL[*]:MS	Unsigned	7	5	-
Volume: Judgment value	RSLT.VOL[*]:JG	Unsigned	1	0	-
Volume (Max.)	RSLT.VOLH	Unsigned	7	5	-
Volume (Max.): Measured value	RSLT.VOLH:MS	Unsigned	7	5	-
Volume (Max.): Judgment value	RSLT.VOLH:JG	Unsigned	1	0	-
Volume (Min.)	RSLT.VOLL	Unsigned	7	5	-
Volume (Min.): Measured value	RSLT.VOLL:MS	Unsigned	7	5	-
Volume (Min.): Judgment value	RSLT.VOLL:JG	Unsigned	1	0	-
Convex Volume	RSLT.CONV_VOL[*]	Unsigned	7	5	-
Convex Volume: Measured value	RSLT.CONV_VOL[*]:MS	Unsigned	7	5	-
Convex Volume: Judgment value	RSLT.CONV_VOL[*]:JG	Unsigned	1	0	-
Convex Volume (Max.)	RSLT.CONV_VOLH	Unsigned	7	5	-
Convex Volume (Max.): Measured value	RSLT.CONV_VOLH:MS	Unsigned	7	5	-
Convex Volume (Max.): Judgment value	RSLT.CONV_VOLH:JG	Unsigned	1	0	-
Convex Volume (Min.)	RSLT.CONV_VOLL	Unsigned	7	5	-
Convex Volume (Min.): Measured value	RSLT.CONV_VOLL:MS	Unsigned	7	5	-
Convex Volume (Min.): Judgment value	RSLT.CONV_VOLL:JG	Unsigned	1	0	-
Concave Volume	RSLT.CONC_VOL[*]	Unsigned	7	5	-
Concave Volume: Measured value	RSLT.CONC_VOL[*]:MS	Unsigned	7	5	-
Concave Volume: Judgment value	RSLT.CONC_VOL[*]:JG	Unsigned	1	0	-
Concave Volume (Max.)	RSLT.CONC_VOLH	Unsigned	7	5	-
Concave Volume (Max.): Measured value	RSLT.CONC_VOLH:MS	Unsigned	7	5	-
Concave Volume (Max.): Judgment value	RSLT.CONC_VOLH:JG	Unsigned	1	0	-
Concave Volume (Min.)	RSLT.CONC_VOLL	Unsigned	7	5	-
Concave Volume (Min.): Measured value	RSLT.CONC_VOLL:MS	Unsigned	7	5	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Concave Volume (Min.): Judgment value	RSLT.CONC_VOLL:JG	Unsigned	1	0	-
Convex Area	RSLT.CONV_AR[*]	Unsigned	5	4	-
Convex Area: Measured value	RSLT.CONV_AR[*]:MS	Unsigned	5	4	-
Convex Area: Judgment value	RSLT.CONV_AR[*]:JG	Unsigned	1	0	-
Convex Area (Max.)	RSLT.CONV_ARH	Unsigned	5	4	-
Convex Area (Max.): Measured value	RSLT.CONV_ARH:MS	Unsigned	5	4	-
Convex Area (Max.): Judgment value	RSLT.CONV_ARH:JG	Unsigned	1	0	-
Convex Area (Min.)	RSLT.CONV_ARL	Unsigned	5	4	-
Convex Area (Min.): Measured value	RSLT.CONV_ARL:MS	Unsigned	5	4	-
Convex Area (Min.): Judgment value	RSLT.CONV_ARL:JG	Unsigned	1	0	-
Concave Area	RSLT.CONC_AR[*]	Unsigned	5	4	-
Concave Area: Measured value	RSLT.CONC_AR[*]:MS	Unsigned	5	4	-
Concave Area: Judgment value	RSLT.CONC_AR[*]:JG	Unsigned	1	0	-
Concave Area (Max.)	RSLT.CONC_ARH	Unsigned	5	4	-
Concave Area (Max.): Measured value	RSLT.CONC_ARH:MS	Unsigned	5	4	-
Concave Area (Max.): Judgment value	RSLT.CONC_ARH:JG	Unsigned	1	0	-
Concave Area (Min.)	RSLT.CONC_ARL	Unsigned	5	4	-
Concave Area (Min.): Measured value	RSLT.CONC_ARL:MS	Unsigned	5	4	-
Concave Area (Min.): Judgment value	RSLT.CONC_ARL:JG	Unsigned	1	0	-
Valid Pix. Count	RSLT.EPA[*]	Unsigned	7	0	-
Valid Pix. Count: Measured value	RSLT.EPA[*]:MS	Unsigned	7	0	-
Valid Pix. Count: Judgment value	RSLT.EPA[*]:JG	Unsigned	1	0	-
Valid Pix. Count (Max.)	RSLT.EPAH	Unsigned	7	0	-
Valid Pix. Count (Max.): Measured value	RSLT.EPAH:MS	Unsigned	7	0	-
Valid Pix. Count (Max.): Judgment value	RSLT.EPAH:JG	Unsigned	1	0	-
Valid Pix. Count (Min.)	RSLT.EPAL	Unsigned	7	0	-
Valid Pix. Count (Min.): Measured value	RSLT.EPAL:MS	Unsigned	7	0	-
Valid Pix. Count (Min.): Judgment value	RSLT.EPAL:JG	Unsigned	1	0	-
X Slope	RSLT.DPPA[*]	Signed	2	6	-
X Slope: Measured value	RSLT.DPPA[*]:MS	Signed	2	6	-
X Slope: Absolute measured value	RSLT.DPPA[*]:AB	Signed	2	6	-
X Slope: Judgment value	RSLT.DPPA[*]:JG	Unsigned	1	0	-
X Slope (Max.)	RSLT.DPPAH	Signed	2	6	-
X Slope (Max.): Measured value	RSLT.DPPAH:MS	Signed	2	6	-
X Slope (Max.): Judgment value	RSLT.DPPAH:JG	Unsigned	1	0	-
X Slope (Min.)	RSLT.DPPAL	Signed	2	6	-
X Slope (Min.): Measured value	RSLT.DPPAL:MS	Signed	2	6	-
X Slope (Min.): Judgment value	RSLT.DPPAL:JG	Unsigned	1	0	-
Y Slope	RSLT.DPPB[*]	Signed	2	6	-
Y Slope: Measured value	RSLT.DPPB[*]:MS	Signed	2	6	-
Y Slope: Absolute measured value	RSLT.DPPB[*]:AB	Signed	2	6	-
Y Slope: Judgment value	RSLT.DPPB[*]:JG	Unsigned	1	0	-
Y Slope (Max.)	RSLT.DPPBH	Signed	2	6	-
Y Slope (Max.): Measured value	RSLT.DPPBH:MS	Signed	2	6	-
Y Slope (Max.): Judgment value	RSLT.DPPBH:JG	Unsigned	1	0	-
Y Slope (Min.)	RSLT.DPPBL	Signed	2	6	-
Y Slope (Min.): Measured value	RSLT.DPPBL:MS	Signed	2	6	-
Y Slope (Min.): Judgment value	RSLT.DPPBL:JG	Unsigned	1	0	-
Z Intercept	RSLT.DPPC[*]	Signed	3	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Z Intercept: Measured value	RSLT.DPPC[*]:MS	Signed	3	3	-
Z Intercept: Absolute measured value	RSLT.DPPC[*]:AB	Signed	3	3	-
Z Intercept: Judgment value	RSLT.DPPC[*]:JG	Unsigned	1	0	-
Z Intercept (Max.)	RSLT.DPPCH	Signed	3	3	-
Z Intercept (Max.): Measured value	RSLT.DPPCH:MS	Signed	3	3	-
Z Intercept (Max.): Judgment value	RSLT.DPPCH:JG	Unsigned	1	0	-
Z Intercept (Min.)	RSLT.DPPCL	Signed	3	3	-
Z Intercept (Min.): Measured value	RSLT.DPPCL:MS	Signed	3	3	-
Z Intercept (Min.): Judgment value	RSLT.DPPCL:JG	Unsigned	1	0	-
Plane Angle:	RSLT.DPPT[*]	Signed	2	3	-
Plane Angle: Measured value	RSLT.DPPT[*]:MS	Signed	2	3	-
Plane Angle: Judgment value	RSLT.DPPT[*]:JG	Unsigned	1	0	-
Plane Angle (Max.)	RSLT.DPPTH	Signed	2	3	-
Plane Angle (Max.): Measured value	RSLT.DPPTH:MS	Signed	2	3	-
Plane Angle (Max.): Judgment value	RSLT.DPPTH:JG	Unsigned	1	0	-
Plane Angle (Min.)	RSLT.DPPTL	Signed	2	3	-
Plane Angle (Min.): Measured value	RSLT.DPPTL:MS	Signed	2	3	-
Plane Angle (Min.): Judgment value	RSLT.DPPTL:JG	Unsigned	1	0	-
Position XY	RSLT.XY[*]	Signed	5	3	-
Position XY: Measured value	RSLT.XY[*]:MS	Signed	5	3	-
Position XY: Absolute measured value	RSLT.XY[*]:AB	Signed	5	3	-
Position XY/Major Axis Angle	RSLT.XYT[*]	Signed	5	3	-
Position XY/Major Axis Angle: Measured value	RSLT.XYT[*]:MS	Signed	5	3	-
Position XY/Major Axis Angle: Absolute measured value	RSLT.XYT[*]:AB	Signed	5	3	-
Major Axis Bounding Box Upper Left XY	RSLT.R2LUXY[*]	Signed	5	3	-
Major Axis Bounding Box Upper Left XY: Measured value	RSLT.R2LUXY[*]:MS	Signed	5	3	-
Major Axis Bounding Box Upper Left XY: Absolute measured value	RSLT.R2LUXY[*]:AB	Signed	5	3	-
Major Axis Bounding Box Lower Left XY	RSLT.R2LDXY[*]	Signed	5	3	-
Major Axis Bounding Box Lower Left XY: Measured value	RSLT.R2LDXY[*]:MS	Signed	5	3	-
Major Axis Bounding Box Lower Left XY: Absolute measured value	RSLT.R2LDXY[*]:AB	Signed	5	3	-
Major Axis Bounding Box Upper Right XY	RSLT.R2RUXY[*]	Signed	5	3	-
Major Axis Bounding Box Upper Right XY: Measured value	RSLT.R2RUXY[*]:MS	Signed	5	3	-
Major Axis Bounding Box Upper Right XY: Absolute measured value	RSLT.R2RUXY[*]:AB	Signed	5	3	-
Major Axis Bounding Box Lower Right XY	RSLT.R2RDXY[*]	Signed	5	3	-
Major Axis Bounding Box Lower Right XY: Measured value	RSLT.R2RDXY[*]:MS	Signed	5	3	-
Major Axis Bounding Box Lower Right XY: Absolute measured value	RSLT.R2RDXY[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Upper Left XY	RSLT.MRLUXY[*]	Signed	5	3	-
Minimum Bounding Rectangle Upper Left XY: Measured value	RSLT.MRLUXY[*]:MS	Signed	5	3	-
Minimum Bounding Rectangle Upper Left XY: Absolute measured value	RSLT.MRLUXY[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Lower Left XY	RSLT.MRLDXY[*]	Signed	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Minimum Bounding Rectangle Lower Left XY: Measured value	RSLT.MRLDXY[*]:MS	Signed	5	3	-
Minimum Bounding Rectangle Lower Left XY: Absolute measured value	RSLT.MRLDXY[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Upper Right XY	RSLT.MRRUXY[*]	Signed	5	3	-
Minimum Bounding Rectangle Upper Right XY: Measured value	RSLT.MRRUXY[*]:MS	Signed	5	3	-
Minimum Bounding Rectangle Upper Right XY: Absolute measured value	RSLT.MRRUXY[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Lower Right XY	RSLT.MRRDXY[*]	Signed	5	3	-
Minimum Bounding Rectangle Lower Right XY: Measured value	RSLT.MRRDXY[*]:MS	Signed	5	3	-
Minimum Bounding Rectangle Lower Right XY: Absolute measured value	RSLT.MRRDXY[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Center Coordinate XY/Angle	RSLT.MRCXYT[*]	Signed	5	3	-
Minimum Bounding Rectangle Center Coordinate XY/Angle: Measured value	RSLT.MRCXYT[*]:MS	Signed	5	3	-
Minimum Bounding Rectangle Center Coordinate XY/Angle: Absolute measured value	RSLT.MRCXYT[*]:AB	Signed	5	3	-
Minimum Bounding Rectangle Center Coordinate XY	RSLT.MRCXY[*]	Signed	5	3	-
Minimum Bounding Rectangle Center Coordinate XY: Measured value	RSLT.MRCXY[*]:MS	Signed	5	3	-
Minimum Bounding Rectangle Center Coordinate XY: Absolute measured value	RSLT.MRCXY[*]:AB	Signed	5	3	-
Feret D. Box XY Upper Left	RSLT.SRLUXY[*]	Signed	5	3	-
Feret D. Box XY Upper Left: Measured value	RSLT.SRLUXY[*]:MS	Signed	5	3	-
Feret D. Box XY Upper Left: Absolute measured value	RSLT.SRLUXY[*]:AB	Signed	5	3	-
Feret D. Box XY Lower Left	RSLT.SRLDXY[*]	Signed	5	3	-
Feret D. Box XY Lower Left: Measured value	RSLT.SRLDXY[*]:MS	Signed	5	3	-
Feret D. Box XY Lower Left: Absolute measured value	RSLT.SRLDXY[*]:AB	Signed	5	3	-
Feret D. Box XY Upper Right	RSLT.SRRUXY[*]	Signed	5	3	-
Feret D. Box XY Upper Right: Measured value	RSLT.SRRUXY[*]:MS	Signed	5	3	-
Feret D. Box XY Upper Right: Absolute measured value	RSLT.SRRUXY[*]:AB	Signed	5	3	-
Feret D. Box XY Lower Right	RSLT.SRRDXY[*]	Signed	5	3	-
Feret D. Box XY Lower Right: Measured value	RSLT.SRRDXY[*]:MS	Signed	5	3	-
Feret D. Box XY Lower Right: Absolute measured value	RSLT.SRRDXY[*]:AB	Signed	5	3	-
Max. Height XYZ	RSLT.MXXYZ[*]	Signed	5	3	-
Max. Height XYZ: Measured value	RSLT.MXXYZ[*]:MS	Signed	5	3	-
Max. Height XYZ: Absolute measured value	RSLT.MXXYZ[*]:AB	Signed	5	3	-
Min. Height XYZ	RSLT.MNXYZ[*]	Signed	5	3	-
Min. Height XYZ: Measured value	RSLT.MNXYZ[*]:MS	Signed	5	3	-
Min. Height XYZ: Absolute measured value	RSLT.MNXYZ[*]:AB	Signed	5	3	-
Plane Equation Info. XYZ of Detected Plane	RSLT.DPPABC[*]	Signed	2	6	-
Plane Equation Info. XYZ of Detected Plane: Measured value	RSLT.DPPABC[*]:MS	Signed	5	3	-
Plane Equation Info. XYZ of Detected Plane: Absolute measured value	RSLT.DPPABC[*]:AB	Signed	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Judgment Result by Target	RSLT.LJG[*]	Unsigned	1	0	-
XY Position for Position Adjustment Reference	RSLT.ADJXY	Signed	5	3	-
X Position for Position Adjustment Reference	RSLT.ADJX	Signed	5	3	-
Y Position for Position Adjustment Reference	RSLT.ADJY	Signed	5	3	-
Angle for Position Adjustment Reference	RSLT.ADJT	Signed	3	3	-

Branch Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Reference value	RSLT.EVAL	Available	9	3	-
Processed branch	RSLT.BRNO	Unsigned	2	0	-

Join Unit

There are no result data specific to the Join unit.

Loop Function Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Number of loops processed	RSLT.TMS	Unsigned	7	0	-

Loop End Unit

There are no result data specific to the Loop End unit.

Break Unit

There are no result data specific to the Break unit.

Start Unit

There are no result data specific to the Start unit.

End Unit

There are no result data specific to the End unit.

Calculation Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Calculation result	RSLT.ANS	Available	7	3	-
Calculation result: Judgment value	RSLT.ANS.JG	Unsigned	1	0	-
Error Code	RSLT.ERRC	Unsigned	7	0	-
Error line	RSLT.ERRL	Unsigned	7	0	-

Group Judgment Unit (Start)

There are no result data specific to the Group Judgment Unit (Start).

Group Judgment Unit (End)

There are no result data specific to the Group Judgment Unit (End).

Image Operation Unit

There are no result data specific to the Image Operation unit.

C PlugIn Unit

There are no result data specific to the PlugIn unit.

Calibration Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Source origin XY	RSLT.SOGXY	Available	5	3	-
Source origin X	RSLT.SOGX	Available	5	3	-
Source origin Y	RSLT.SOGY	Available	5	3	-
Destination origin XY	RSLT.DOGXY	Available	5	3	-
Destination origin X	RSLT.DOGX	Available	5	3	-
Destination origin Y	RSLT.DOGY	Available	5	3	-
Pattern spacing after calibration	RSLT.PTH	Unsigned	5	3	-
Corrected angle	RSLT.CANG	Unsigned	3	3	-
X scaling value	RSLT.SLVX	Available	4	6	-
Y scaling value	RSLT.SLVY	Available	4	6	-
Length scaling value	RSLT.SLVL	Unsigned	4	6	-
Model parameter	RSLT.CALIB[*]	Available	10	6	-

Contour Region Generator Unit

Result item	Name	Numerical value format			Scaling target
		Sign	No. of integer digits	No. of decimal places	
Total Detected Segments	RSLT.TDSGN	Unsigned	6	0	-
Total Detected Segments: Measured value	RSLT.TDSGN:MS	Unsigned	6	0	-
Detected Segments(Min)	RSLT.DSGNL	Unsigned	6	0	-
Detected Segments(Min): Measured value	RSLT.DSGNL:MS	Unsigned	6	0	-
Inspection Region 0: No. Points for Target Model	RSLT.FLEX[0].BMN	Unsigned	1	0	-
Inspection Region 0: No. Points for Target Model: Measured value	RSLT.FLEX[0].BMN:MS	Unsigned	1	0	-
Inspection Region 0: Circle Model Radius	RSLT.FLEX[0].BCR	Unsigned	6	3	L
Inspection Region 0: Circle Model Radius: Measured value	RSLT.FLEX[0].BCR:MS	Unsigned	6	3	L
Inspection Region 0: Circle Model Radius: Absolute measured value	RSLT.FLEX[0].BCR:AB	Unsigned	6	3	-
Inspection Region 0: Circle Model Center XY	RSLT.FLEX[0].BCXY	Available	6	3	-
Inspection Region 0: Circle Model Center XY: Measured value	RSLT.FLEX[0].BCXY:MS	Available	6	3	-
Inspection Region 0: Circle Model Center XY: Absolute measured value	RSLT.FLEX[0].BCXY:AB	Available	6	3	-
Inspection Region 0: Circle Model Center XY: Encoder pulse count	RSLT.FLEX[0].BCXY:EC	Available	6	3	-
Inspection Region 0: Circle Model Center X	RSLT.FLEX[0].BCX	Available	6	3	X
Inspection Region 0: Circle Model Center X: Measured value	RSLT.FLEX[0].BCX:MS	Available	6	3	X
Inspection Region 0: Circle Model Center X: Absolute measured value	RSLT.FLEX[0].BCX:AB	Available	6	3	-
Inspection Region 0: Circle Model Center X: Encoder pulse count	RSLT.FLEX[0].BCX:EC	Available	6	3	X
Inspection Region 0: Circle Model Center Y	RSLT.FLEX[0].BCY	Available	6	3	Y
Inspection Region 0: Circle Model Center Y: Measured value	RSLT.FLEX[0].BCY:MS	Available	6	3	Y
Inspection Region 0: Circle Model Center Y: Absolute measured value	RSLT.FLEX[0].BCY:AB	Available	6	3	-
Inspection Region 0: Circle Model Center Y: Encoder pulse count	RSLT.FLEX[0].BCY:EC	Available	6	3	Y
Inspection Region 0: Circle Model Center XY / radius	RSLT.FLEX[0].BCXYR	Available	6	3	-
Inspection Region 0: Circle Model Center XY / radius: Measured value	RSLT.FLEX[0].BCXYR:MS	Available	6	3	-
Inspection Region 0: Circle Model Center XY / radius: Absolute measured value	RSLT.FLEX[0].BCXYR:AB	Available	6	3	-
Inspection Region 0: Circle Model Center XY / radius: Encoder pulse count	RSLT.FLEX[0].BCXYR:EC	Available	6	3	-
Inspection Region 0: Oval Model Radius 1	RSLT.FLEX[0].BER1	Unsigned	6	3	L
Inspection Region 0: Oval Model Radius 1: Measured value	RSLT.FLEX[0].BER1:MS	Unsigned	6	3	L
Inspection Region 0: Oval Model Radius 1: Absolute measured value	RSLT.FLEX[0].BER1:AB	Unsigned	6	3	-
Inspection Region 0: Oval Model Radius 2	RSLT.FLEX[0].BER2	Unsigned	6	3	L
Inspection Region 0: Oval Model Radius 2: Measured value	RSLT.FLEX[0].BER2:MS	Unsigned	6	3	L
Inspection Region 0: Oval Model Radius 2: Absolute measured value	RSLT.FLEX[0].BER2:AB	Unsigned	6	3	-
Inspection Region 0: Oval Model Center XY	RSLT.FLEX[0].BEXY	Available	6	3	-
Inspection Region 0: Oval Model Center XY: Measured value	RSLT.FLEX[0].BEXY:MS	Available	6	3	-
Inspection Region 0: Oval Model Center XY: Absolute measured value	RSLT.FLEX[0].BEXY:AB	Available	6	3	-
Inspection Region 0: Oval Model Center XY: Encoder pulse count	RSLT.FLEX[0].BEXY:EC	Available	6	3	-
Inspection Region 0: Oval Model Center X	RSLT.FLEX[0].BEX	Available	6	3	X

Result item	Name	Numerical value format			Scaling target
		Sign	No. of integer digits	No. of decimal places	
Inspection Region 0: Oval Model Center X: Measured value	RSLT.FLEX[0].BEXY:MS	Available	6	3	X
Inspection Region 0: Oval Model Center X: Absolute measured value	RSLT.FLEX[0].BEX:AB	Available	6	3	-
Inspection Region 0: Oval Model Center X: Encoder pulse count	RSLT.FLEX[0].BEX:EC	Available	6	3	X
Inspection Region 0: Oval Model Center Y Measured value	RSLT.FLEX[0].BEY	Available	6	3	Y
Inspection Region 0: Oval Model Center Y: Measured value	RSLT.FLEX[0].BEY:MS	Available	6	3	Y
Inspection Region 0: Oval Model Center Y: Absolute measured value	RSLT.FLEX[0].BEY:AB	Available	6	3	-
Inspection Region 0: Oval Model Center Y: Encoder pulse count	RSLT.FLEX[0].BEY:EC	Available	6	3	Y
Inspection Region 0: Oval Model Angle	RSLT.FLEX[0].BET	Available	3	3	-
Inspection Region 0: Oval Model Angle: Measured value	RSLT.FLEX[0].BET:MS	Available	3	3	-
Inspection Region 0: Oval Model Angle: Absolute measured value	RSLT.FLEX[0].BET:AB	Available	3	3	-
Inspection Region 0: Line Model XY Position 1 1: Measured value	RSLT.FLEX[0].BLXY1	Available	5	3	-
Inspection Region 0: Line Model XY Position 1: 1: Absolute measured value	RSLT.FLEX[0].BLXY1:MS	Available	5	3	-
Inspection Region 0: Line Model XY Position 1: 1: Encoder pulse count	RSLT.FLEX[0].BLXY1:AB	Available	5	3	-
Inspection Region 0: Line Model XY Position 1: 1: Encoder pulse count	RSLT.FLEX[0].BLXY1:EC	Available	5	3	-
Inspection Region 0: Line Model X Position 1 Measured value	RSLT.FLEX[0].BLX1	Available	5	3	X
Inspection Region 0: Line Model X Position 1: Measured value	RSLT.FLEX[0].BLX1:MS	Available	5	3	X
Inspection Region 0: Line Model X Position 1: Absolute measured value	RSLT.FLEX[0].BLX1:AB	Available	5	3	-
Inspection Region 0: Line Model X Position 1: Encoder pulse count	RSLT.FLEX[0].BLX1:EC	Available	5	3	X
Inspection Region 0: Line Model Y Position 1	RSLT.FLEX[0].BLY1	Available	5	3	Y
Inspection Region 0: Line Model Y Position 1: Measured value	RSLT.FLEX[0].BLY1:MS	Available	5	3	Y
Inspection Region 0: Line Model Y Position 1: Absolute measured value	RSLT.FLEX[0].BLY1:AB	Available	5	3	-
Inspection Region 0: Line Model Y Position 1: Encoder pulse count	RSLT.FLEX[0].BLY1:EC	Available	5	3	Y
Inspection Region 0: Line Model XY Position 2 2: Measured value	RSLT.FLEX[0].BLXY2	Available	5	3	-
Inspection Region 0: Line Model XY Position 2: 2: Absolute measured value	RSLT.FLEX[0].BLXY2:MS	Available	5	3	-
Inspection Region 0: Line Model XY Position 2: 2: Encoder pulse count	RSLT.FLEX[0].BLXY2:AB	Available	5	3	-
Inspection Region 0: Line Model XY Position 2: 2: Encoder pulse count	RSLT.FLEX[0].BLXY2:EC	Available	5	3	-
Inspection Region 0: Line Model X Position 2 Measured value	RSLT.FLEX[0].BLX2	Available	5	3	X
Inspection Region 0: Line Model X Position 2: Measured value	RSLT.FLEX[0].BLX2:MS	Available	5	3	X
Inspection Region 0: Line Model X Position 2: Absolute measured value	RSLT.FLEX[0].BLX2:AB	Available	5	3	-
Inspection Region 0: Line Model X Position 2: Encoder pulse count	RSLT.FLEX[0].BLX2:EC	Available	5	3	X
Inspection Region 0: Line Model Y Position 2	RSLT.FLEX[0].BLY2	Available	5	3	Y
Inspection Region 0: Line Model Y Position 2: Measured value	RSLT.FLEX[0].BLY2:MS	Available	5	3	Y
Inspection Region 0: Line Model Y Position 2: Absolute measured value	RSLT.FLEX[0].BLY2:AB	Available	5	3	-
Inspection Region 0: Line Model Y Position 2: Encoder pulse count	RSLT.FLEX[0].BLY2:EC	Available	5	3	Y
Inspection Region 0: Line Model Center XY Measured value	RSLT.FLEX[0].BLXY	Available	5	3	-
Inspection Region 0: Line Model Center XY: Measured value	RSLT.FLEX[0].BLXY:MS	Available	5	3	-

Result item	Name	Numerical value format			Scaling target
		Sign	No. of integer digits	No. of decimal places	
Inspection Region 0: Line Model Center XY: Absolute measured value	RSLT.FLEX[0].BLXY:AB	Available	5	3	-
Inspection Region 0: Line Model Center XY: Encoder pulse count	RSLT.FLEX[0].BLXY:EC	Available	5	3	-
Inspection Region 0: Line Model Center X Measured value	RSLT.FLEX[0].BLX	Available	5	3	X
Inspection Region 0: Line Model Center X: Measured value	RSLT.FLEX[0].BLX:MS	Available	5	3	X
Inspection Region 0: Line Model Center X: Absolute measured value	RSLT.FLEX[0].BLX:AB	Available	5	3	-
Inspection Region 0: Line Model Center X: Encoder pulse count	RSLT.FLEX[0].BLX:EC	Available	5	3	X
Inspection Region 0: Line Model Center Y Measured value	RSLT.FLEX[0].BLY	Available	5	3	Y
Inspection Region 0: Line Model Center Y: Measured value	RSLT.FLEX[0].BLY:MS	Available	5	3	Y
Inspection Region 0: Line Model Center Y: Absolute measured value	RSLT.FLEX[0].BLY:AB	Available	5	3	-
Inspection Region 0: Line Model Center Y: Encoder pulse count	RSLT.FLEX[0].BLY:EC	Available	5	3	Y
Inspection Region 0: Line Model Angle Measured value	RSLT.FLEX[0].BLT	Available	3	3	-
Inspection Region 0: Line Model Angle: Measured value	RSLT.FLEX[0].BLT:MS	Available	3	3	-
Inspection Region 0: Line Model Angle: Absolute measured value	RSLT.FLEX[0].BLT:AB	Available	3	3	-
Inspection Region 0: Rho and Theta of Reference Line	RSLT.FLEX[0].BLRTH	Available	5	3	-
Inspection Region 0: Rho and Theta of Reference Line: Measured value	RSLT.FLEX[0].BLRTH:MS	Available	5	3	-
Inspection Region 0: Rho and Theta of Reference Line: Absolute measured value	RSLT.FLEX[0].BLRTH:AB	Available	5	3	-
Inspection Region 0: Rho and Theta of Reference Line: Encoder pulse count	RSLT.FLEX[0].BLRTH:EC	Available	5	3	-
Inspection Region 0: Rho of Reference Line Measured value	RSLT.FLEX[0].BLR	Available	5	3	-
Inspection Region 0: Rho of Reference Line: Measured value	RSLT.FLEX[0].BLR:MS	Available	5	3	-
Inspection Region 0: Rho of Reference Line: Absolute measured value	RSLT.FLEX[0].BLR:AB	Available	5	3	-
Inspection Region 0: Rho of Reference Line: Encoder pulse count	RSLT.FLEX[0].BLR:EC	Available	5	3	-
Inspection Region 0: Theta of Reference Line Measured value	RSLT.FLEX[0].BLTH	Available	3	3	-
Inspection Region 0: Theta of Reference Line: Measured value	RSLT.FLEX[0].BLTH:MS	Available	3	3	-
Inspection Region 0: Theta of Reference Line: Absolute measured value	RSLT.FLEX[0].BLTH:AB	Available	3	3	-
Inspection Region 0: Theta of Reference Line: Encoder pulse count	RSLT.FLEX[0].BLTH:EC	Available	3	3	-
Inspection Region 0: Segment Start Position of overall	RSLT.FLEX[0].EGID	Unsigned	3	0	-
Inspection Region 0: Segment Start Position of Model Line Calculation Region	RSLT.FLEX[0].CEGID	Unsigned	3	0	-
Inspection Region 0: Number of Segments of Model Line Calculation Region	RSLT.FLEX[0].CEGN	Unsigned	3	0	-
Inspection Region 0 (edge-related result): Segment XY Edge Position	RSLT.FLEX[0].XY[s]	Available	5	3	-
Inspection Region 0 (edge-related result): Segment XY Edge Position: Measured value	RSLT.FLEX[0].XY[s]:MS	Available	5	3	-
Inspection Region 0 (edge-related result): Segment XY Edge Position: Absolute measured value	RSLT.FLEX[0].XY[s]:AB	Available	5	3	-
Inspection Region 0 (edge-related result): Segment XY Edge Position: Encoder pulse count	RSLT.FLEX[0].XY[s]:EC	Available	5	3	-
Inspection Region 0 (edge-related result): Segment X Edge Position	RSLT.FLEX[0].X[s]	Available	5	3	X

Result item	Name	Numerical value format			Scaling target
		Sign	No. of integer digits	No. of decimal places	
Inspection Region 0 (edge-related result): Segment X Edge Position: Measured value	RSLT.FLEX[0].X[s]:MS	Available	5	3	X
Inspection Region 0 (edge-related result): Segment X Edge Position: Absolute measured value	RSLT.FLEX[0].X[s]:AB	Available	5	3	-
Inspection Region 0 (edge-related result): Segment X Edge Position: Encoder pulse count	RSLT.FLEX[0].X[s]:EC	Available	5	3	X
Inspection Region 0 (edge-related result): Segment Y Edge Position	RSLT.FLEX[0].Y[s]	Available	5	3	Y
Inspection Region 0 (edge-related result): Segment Y Edge Position: Measured value	RSLT.FLEX[0].Y[s]:MS	Available	5	3	Y
Inspection Region 0 (edge-related result): Segment Y Edge Position: Absolute measured value	RSLT.FLEX[0].Y[s]:AB	Available	5	3	-
Inspection Region 0 (edge-related result): Segment Y Edge Position: Encoder pulse count	RSLT.FLEX[0].Y[s]:EC	Available	5	3	Y
Inspection Region 0 (edge-related result): Segment Edge Angle	RSLT.FLEX[0].T[s]	Available	3	3	-
Inspection Region 0 (edge-related result): Segment Edge Angle : Measured value	RSLT.FLEX[0].T[s]:MS	Available	3	3	-
Inspection Region 0 (edge-related result): Segment Edge Angle : Absolute measured value	RSLT.FLEX[0].T[s]:AB	Available	3	3	-
Inspection Region 0 (edge-related result): Distance	RSLT.FLEX[0].P[s]	Unsigned	5	3	L
Inspection Region 0 (edge-related result): Distance: Measured value	RSLT.FLEX[0].P[s]:MS	Unsigned	5	3	L
Inspection Region 0 (edge-related result): Distance: Absolute measured value	RSLT.FLEX[0].P[s]:AB	Unsigned	5	3	-
Inspection Region 0 (edge-related result): Intensity	RSLT.FLEX[0].I[s]	Unsigned	3	3	-
Inspection Region 0 (edge-related result): Intensity: Measured value	RSLT.FLEX[0].I[s]:MS	Unsigned	3	3	-
Inspection Region 0 (edge-related result): Defect to Threshold Difference	RSLT.FLEX[0].DIFF[s]	Available	5	3	-
Inspection Region 0 (edge-related result): Defect to Threshold Difference: Measured value	RSLT.FLEX[0].DIFF[s]:MS	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual XY	RSLT.FLEX[0].BFXY[s]	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual XY: Measured value	RSLT.FLEX[0].BFXY[s]:MS	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual XY: Absolute measured value	RSLT.FLEX[0].BFXY[s]:AB	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual XY: Encoder pulse count	RSLT.FLEX[0].BFXY[s]:EC	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual X	RSLT.FLEX[0].BFX[s]	Available	5	3	X
Inspection Region 0 (free curve-related result): Free Curve Model Individual X: Measured value	RSLT.FLEX[0].BFX[s]:MS	Available	5	3	X
Inspection Region 0 (free curve-related result): Free Curve Model Individual: Absolute measured value	RSLT.FLEX[0].BFX[s]:AB	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual: Encoder pulse count	RSLT.FLEX[0].BFX[s]:EC	Available	5	3	X
Inspection Region 0 (free curve-related result): Free Curve Model Individual Y	RSLT.FLEX[0].BFY[s]	Available	5	3	Y

Result item	Name	Numerical value format			Scaling target
		Sign	No. of integer digits	No. of decimal places	
Inspection Region 0 (free curve-related result): Free Curve Model Individual Y: Measured value	RSLT.FLEX[0].BFY[s]:MS	Available	5	3	Y
Inspection Region 0 (free curve-related result): Free Curve Model Individual Y: Absolute measured value	RSLT.FLEX[0].BFY[s]:AB	Available	5	3	-
Inspection Region 0 (free curve-related result): Free Curve Model Individual Y: Encoder pulse count	RSLT.FLEX[0].BFY[s]:EC	Available	5	3	Y
Inspection Region 1	RSLT.FLEX[1].***				
:	:				
Inspection Region 127	RSLT.FLEX[127].***				

Defect Extraction Operation Unit

No specific result data is provided for the defect extraction operation unit.

Image Stitching Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Stitched Image Area: XY: Upper Left	RSLT.RLUXY	Available	5	3	-
Stitched Image Area: XY: Upper Left: Measured value	RSLT.RLUXY:MS	Available	5	3	-
Stitched Image Area: XY: Upper Left: Absolute measured value	RSLT.RLUXY:AB	Available	5	3	-
Stitched Image Area: XY: Upper Left: Encoder measured value	RSLT.RLUXY:EC	Available	5	3	-
Stitched Image Area: X: Upper Left	RSLT.RLUX	Available	5	3	X
Stitched Image Area: X: Upper Left: Measured value	RSLT.RLUX:MS	Available	5	3	X
Stitched Image Area: X: Upper Left: Absolute measured value	RSLT.RLUX:AB	Available	5	3	-
Stitched Image Area: X: Upper Left: Encoder measured value	RSLT.RLUX:EC	Available	5	3	X
Stitched Image Area: Y: Upper Left	RSLT.RLUY	Available	5	3	Y
Stitched Image Area: Y: Upper Left: Measured value	RSLT.RLUY:MS	Available	5	3	Y
Stitched Image Area: Y: Upper Left: Absolute measured value	RSLT.RLUY:AB	Available	5	3	-
Stitched Image Area: Y: Upper Left: Encoder measured value	RSLT.RLUY:EC	Available	5	3	Y
Stitched Image Area: XY: Lower Left	RSLT.RLDXY	Available	5	3	-
Stitched Image Area: XY: Lower Left: Measured value	RSLT.RLDXY:MS	Available	5	3	-
Stitched Image Area: XY: Lower Left: Absolute measured value	RSLT.RLDXY:AB	Available	5	3	-
Stitched Image Area: XY: Lower Left: Encoder measured value	RSLT.RLDXY:EC	Available	5	3	-
Stitched Image Area: X: Lower Left	RSLT.RLDX	Available	5	3	X
Stitched Image Area: X: Lower Left: Measured value	RSLT.RLDX:MS	Available	5	3	X
Stitched Image Area: X: Lower Left: Absolute measured value	RSLT.RLDX:AB	Available	5	3	-

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Stitched Image Area: X: Lower Left: Encoder measured value	RSLT.RLDX:EC	Available	5	3	X
Stitched Image Area: Y: Lower Left	RSLT.RLDY	Available	5	3	Y
Stitched Image Area: Y: Lower Left: Measured value	RSLT.RLDY:MS	Available	5	3	Y
Stitched Image Area: Y: Lower Left: Absolute measured value	RSLT.RLDY:AB	Available	5	3	-
Stitched Image Area: Y: Lower Left: Encoder measured value	RSLT.RLDY:EC	Available	5	3	Y
Stitched Image Area: XY: Upper Right	RSLT.RRUXY	Available	5	3	-
Stitched Image Area: XY: Upper Right: Measured value	RSLT.RRUXY:MS	Available	5	3	-
Stitched Image Area: XY: Upper Right: Absolute measured value	RSLT.RRUXY:AB	Available	5	3	-
Stitched Image Area: XY: Upper Right: Encoder measured value	RSLT.RRUXY:EC	Available	5	3	-
Stitched Image Area: X: Upper Right	RSLT.RRUX	Available	5	3	X
Stitched Image Area: X: Upper Right: Measured value	RSLT.RRUX:MS	Available	5	3	X
Stitched Image Area: X: Upper Right: Absolute measured value	RSLT.RRUX:AB	Available	5	3	-
Stitched Image Area: X: Upper Right: Encoder measured value	RSLT.RRUX:EC	Available	5	3	X
Stitched Image Area: Y: Upper Right	RSLT.RRUUY	Available	5	3	Y
Stitched Image Area: Y: Upper Right: Measured value	RSLT.RRUUY:MS	Available	5	3	Y
Stitched Image Area: Y: Upper Right: Absolute measured value	RSLT.RRUUY:AB	Available	5	3	-
Stitched Image Area: Y: Upper Right: Encoder measured value	RSLT.RRUUY:EC	Available	5	3	Y
Stitched Image Area: XY: Lower Right	RSLT.RRDXY	Available	5	3	-
Stitched Image Area: XY: Lower Right: Measured value	RSLT.RRDXY:MS	Available	5	3	-
Stitched Image Area: XY: Lower Right: Absolute measured value	RSLT.RRDXY:AB	Available	5	3	-
Stitched Image Area: XY: Lower Right: Encoder measured value	RSLT.RRDXY:EC	Available	5	3	-
Stitched Image Area: X: Lower Right	RSLT.RRDX	Available	5	3	X
Stitched Image Area: X: Lower Right: Measured value	RSLT.RRDX:MS	Available	5	3	X
Stitched Image Area: X: Lower Right: Absolute measured value	RSLT.RRDX:AB	Available	5	3	-
Stitched Image Area: X: Lower Right: Encoder measured value	RSLT.RRDX:EC	Available	5	3	X
Stitched Image Area: Y: Lower Right	RSLT.RRDY	Available	5	3	Y
Stitched Image Area: Y: Lower Right: Measured value	RSLT.RRDY:MS	Available	5	3	Y
Stitched Image Area: Y: Lower Right: Absolute measured value	RSLT.RRDY:AB	Available	5	3	-
Stitched Image Area: Y: Lower Right: Encoder measured value	RSLT.RRDY:EC	Available	5	3	Y

Robot Coordinate Conversion Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Maximum Count	RSLT.MXN	Unsigned	4	0	-
Count	RSLT.N	Unsigned	4	0	-
Count: Measured Value	RSLT.N:MS	Unsigned	4	0	-
X Shift from Master	RSLT.RB_X[s]	Available	4	3	-
X Shift from Master: Measured Value	RSLT.RB_X[s]:MS	Available	4	3	-
X Shift from Master: Judgment Value	RSLT.RB_X:JG	Unsigned	1	0	-
Y Shift from Master	RSLT.RB_Y[s]	Available	4	3	-
Y Shift from Master: Measured Value	RSLT.RB_Y[s]:MS	Available	4	3	-
Y Shift from Master: Judgment Value	RSLT.RB_Y:JG	Unsigned	1	0	-
Angle Shift from Master	RSLT.RB_T[s]	Available	3	1	-
Angle Shift from Master: Measured Value	RSLT.RB_T[s]:MS	Available	3	1	-
Angle Shift from Master: Judgment Value	RSLT.RB_T:JG	Unsigned	1	0	-
XY Shift from Master	RSLT.RB_XY[s]	Available	4	3	-
XY Shift from Master: Measured Value	RSLT.RB_XY[s]:MS	Available	4	3	-
XY/Angle Shift from Master	RSLT.RB_XYT[s]	Available	4	3	-
XY/Angle Shift from Master: Measured Value	RSLT.RB_XYT[s]:MS	Available	4	3	-
Robot Coordinate X	RSLT.RB_XAB[s]	Available	4	3	-
Robot Coordinate X: Measured Value	RSLT.RB_XAB[s]:MS	Available	4	3	-
Robot Coordinate Y	RSLT.RB_YAB[s]	Available	4	3	-
Robot Coordinate Y: Measured Value	RSLT.RB_YAB[s]:MS	Available	4	3	-
Robot Coordinate Z	RSLT.RB_ZAB[s]	Available	4	3	-
Robot Coordinate Z: Measured Value	RSLT.RB_ZAB[s]:MS	Available	4	3	-
Robot Coordinate Rx	RSLT.RB_RXAB[s]	Available	3	1	-
Robot Coordinate Rx: Measured Value	RSLT.RB_RXAB[s]:MS	Available	3	1	-
Robot Coordinate Ry	RSLT.RB_RYAB[s]	Available	3	1	-
Robot Coordinate Ry: Measured Value	RSLT.RB_RYAB[s]:MS	Available	3	1	-
Robot Coordinate Rz	RSLT.RB_RZAB[s]	Available	3	1	-
Robot Coordinate Rz: Measured Value	RSLT.RB_RZAB[s]:MS	Available	3	1	-
Robot Coordinates XYZRz	RSLT.RB_XYZRZAB[s]	Available	4	3	-
Robot Coordinates XYZRz: Measured Value	RSLT.RB_XYZRZAB[s]:MS	Available	4	3	-
Robot Coordinates XYZRxRyRz	RSLT.RB_XYZRXRYRZAB[s]	Available	4	3	-
Robot Coordinates XYZRxRyRz: Measured Value	RSLT.RB_XYZRXRYRZAB[s]:MS	Available	4	3	-
Max. X Shift from Master	RSLT.RB_XMX	Available	4	3	-
Max. X Shift from Master: Measured Value	RSLT.RB_XMX:MS	Available	4	3	-
Max. X Shift from Master: Judgment Value	RSLT.RB_XMX:JG	Unsigned	1	0	-
Min. X Shift from Master	RSLT.RB_XMN	Available	4	3	-
Min. X Shift from Master: Measured Value	RSLT.RB_XMN:MS	Available	4	3	-
Min. X Shift from Master: Judgment Value	RSLT.RB_XMN:JG	Unsigned	1	0	-
Max. Y Shift from Master	RSLT.RB_YMX	Available	4	3	-
Max. Y Shift from Master: Measured Value	RSLT.RB_YMX:MS	Available	4	3	-
Max. Y Shift from Master: Judgment Value	RSLT.RB_YMX:JG	Unsigned	1	0	-
Min. Y Shift from Master	RSLT.RB_YMN	Available	4	3	-
Min. Y Shift from Master: Measured Value	RSLT.RB_YMN:MS	Available	4	3	-
Min. Y Shift from Master: Judgment Value	RSLT.RB_YMN:JG	Unsigned	1	0	-
Max. Angle Shift from Master	RSLT.RB_TMX	Available	3	1	-
Max. Angle Shift from Master: Measured Value	RSLT.RB_TMX:MS	Available	3	1	-
Max. Angle Shift from Master: Judgment Value	RSLT.RB_TMX:JG	Unsigned	1	0	-
Min. Angle Shift from Master	RSLT.RB_TMN	Available	3	1	-

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Min. Angle Shift from Master: Measured Value	RSLT.RB_TMN:MS	Available	3	1	-
Min. Angle Shift from Master: Judgment Value	RSLT.RB_TMN:JG	Unsigned	1	0	-
Max. Robot Coordinate X	RSLT.RB_XABMX	Available	4	3	-
Max. Robot Coordinate X: Measured Value	RSLT.RB_XABMX:MS	Available	4	3	-
Min. Robot Coordinate X	RSLT.RB_XABMN	Available	4	3	-
Min. Robot Coordinate X: Measured Value	RSLT.RB_XABMN:MS	Available	4	3	-
Max. Robot Coordinate Y	RSLT.RB_YABMX	Available	4	3	-
Max. Robot Coordinate Y: Measured Value	RSLT.RB_YABMX:MS	Available	4	3	-
Min. Robot Coordinate Y	RSLT.RB_YABMN	Available	4	3	-
Min. Robot Coordinate Y: Measured Value	RSLT.RB_YABMN:MS	Available	4	3	-
Max. Robot Coordinate Z	RSLT.RB_ZABMX	Available	4	3	-
Max. Robot Coordinate Z: Measured Value	RSLT.RB_ZABMX:MS	Available	4	3	-
Min. Robot Coordinate Z	RSLT.RB_ZABMN	Available	4	3	-
Min. Robot Coordinate Z: Measured Value	RSLT.RB_ZABMN:MS	Available	4	3	-
Max. Robot Coordinate Rx	RSLT.RB_RXABMX	Available	3	1	-
Max. Robot Coordinate Rx: Measured Value	RSLT.RB_RXABMX:MS	Available	3	1	-
Min. Robot Coordinate Rx	RSLT.RB_RXABMN	Available	3	1	-
Min. Robot Coordinate Rx: Measured Value	RSLT.RB_RXABMN:MS	Available	3	1	-
Max. Robot Coordinate Ry	RSLT.RB_RYABMX	Available	3	1	-
Max. Robot Coordinate Ry: Measured Value	RSLT.RB_RYABMX:MS	Available	3	1	-
Min. Robot Coordinate Ry	RSLT.RB_RYABMN	Available	3	1	-
Min. Robot Coordinate Ry: Measured Value	RSLT.RB_RYABMN:MS	Available	3	1	-
Max. Robot Coordinate Rz	RSLT.RB_RZABMX	Available	3	1	-
Max. Robot Coordinate Rz: Measured Value	RSLT.RB_RZABMX:MS	Available	3	1	-
Min. Robot Coordinate Rz	RSLT.RB_RZABMN	Available	3	1	-
Min. Robot Coordinate Rz: Measured Value	RSLT.RB_RZABMN:MS	Available	3	1	-
Robot Coordinate X (Registered Value)	RSLT.RBRP_X	Available	4	3	-
Robot Coordinate X (Registered Value): Measured Value	RSLT.RBRP_X:MS	Available	4	3	-
Robot Coordinate Y (Registered Value)	RSLT.RBRP_Y	Available	4	3	-
Robot Coordinate Y (Registered Value): Measured Value	RSLT.RBRP_Y:MS	Available	4	3	-
Robot Coordinate Z (Registered Value)	RSLT.RBRP_Z	Available	4	3	-
Robot Coordinate Z (Registered Value): Measured Value	RSLT.RBRP_Z:MS	Available	4	3	-
Robot Coordinate Rx (Registered Value)	RSLT.RBRP_RX	Available	3	1	-
Robot Coordinate Rx (Registered Value): Measured Value	RSLT.RBRP_RX:MS	Available	3	1	-
Robot Coordinate Ry (Registered Value)	RSLT.RBRP_RY	Available	3	1	-
Robot Coordinate Ry (Registered Value): Measured Value	RSLT.RBRP_RY:MS	Available	3	1	-
Robot Coordinate Rz (Registered Value)	RSLT.RBRP_RZ	Available	3	1	-
Robot Coordinate Rz (Registered Value): Measured Value	RSLT.RBRP_RZ:MS	Available	3	1	-
Robot Coordinate XYZRz (Registered Value)	RSLT.RBRP_XYZRZ	Available	4	3	-
Robot Coordinate XYZRz (Registered Value): Measured Value	RSLT.RBRP_XYZRZ:MS	Available	4	3	-
Robot Coordinate XYZRxRyRz((Registered Value)	RSLT.RBRP_XYZRXRYRZ	Available	4	3	-
Robot Coordinate XYZRxRyRz((Registered Value): Measured Value	RSLT.RBRP_XYZRXRYRZ:MS	Available	4	3	-
Reference Detection Position X	RSLT.RBR_RGX	Available	4	3	-
Reference Detection Position X : Measured Value	RSLT.RBR_RGX:MS	Available	4	3	-
Reference Detection Position Y	RSLT.RBR_RGY	Available	4	3	-
Reference Detection Position Y : Measured Value	RSLT.RBR_RGY:MS	Available	4	3	-
Reference Detection Position Rz	RSLT.RBR_RGT	Available	3	1	-
Reference Detection Position Rz : Measured Value	RSLT.RBR_RGT:MS	Available	3	1	-
Calibration Information	RSLT.CALIB[s]	Available	10	6	-
Calibration Information : Measured Val.	RSLT.CALIB[s]:MS	Available	10	6	-

Robot Coordinate Operation Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
X Shift from Master	RSLT.RB_X	Available	4	3	-
X Shift from Master: Measured Value	RSLT.RB_X:MS	Available	4	3	-
X Shift from Master: Judgment Value	RSLT.RB_X:JG	Unsigned	1	0	-
Y Shift from Master	RSLT.RB_Y	Available	4	3	-
Y Shift from Master: Measured Value	RSLT.RB_Y:MS	Available	4	3	-
Y Shift from Master: Judgment Value	RSLT.RB_Y:JG	Unsigned	1	0	-
XY Shift from Master	RSLT.RB_XY	Available	4	3	-
XY Shift from Master: Measured Value	RSLT.RB_XY:MS	Available	4	3	-
Angle Shift from Master	RSLT.RB_T	Available	3	1	-
Angle Shift from Master: Measured Value	RSLT.RB_T:MS	Available	3	1	-
Angle Shift from Master: Judgment Value	RSLT.RB_T:JG	Unsigned	1	0	-
XY/Angle Shift from Master	RSLT.RB_XYT	Available	4	3	-
XY/Angle Shift from Master: Measured Value	RSLT.RB_XYT:MS	Available	4	3	-
Robot Coordinate X	RSLT.RB_XAB	Available	4	3	-
Robot Coordinate X: Measured Value	RSLT.RB_XAB:MS	Available	4	3	-
Robot Coordinate Y	RSLT.RB_YAB	Available	4	3	-
Robot Coordinate Y: Measured Value	RSLT.RB_YAB:MS	Available	4	3	-
Robot Coordinate Z	RSLT.RB_ZAB	Available	4	3	-
Robot Coordinate Z: Measured Value	RSLT.RB_ZAB:MS	Available	4	3	-
Robot Coordinate Rx	RSLT.RB_RXAB	Available	3	1	-
Robot Coordinate Rx: Measured Value	RSLT.RB_RXAB:MS	Available	3	1	-
Robot Coordinate Ry	RSLT.RB_RYAB	Available	3	1	-
Robot Coordinate Ry: Measured Value	RSLT.RB_RYAB:MS	Available	3	1	-
Robot Coordinate Rz	RSLT.RB_RZAB	Available	3	1	-
Robot Coordinate Rz: Measured Value	RSLT.RB_RZAB:MS	Available	3	1	-
Robot Coordinates XYZRz	RSLT.RB_XYZRZAB	Available	4	3	-
Robot Coordinates XYZRz: Measured Value	RSLT.RB_XYZRZAB:MS	Available	3	1	-
Robot Coordinates XYZRxRyRz	RSLT.RB_XYZRXRYRZAB	Available	4	3	-
Robot Coordinates XYZRxRyRz: Measured Value	RSLT.RB_XYZRXRYRZAB:MS	Available	3	1	-

String Generator Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
String Length	RSLT.CMSTR_LEN	Unsigned	3	0	-
String	RSLT.CMSTR	-	-	-	-
Trimmed String	RSLT.CMSTRQ	-	-	-	-

Position Adjustment Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Offset X	RSLT.OFX	Available	5	3	-
Offset Y	RSLT.OFY	Available	5	3	-
Rotation center X	RSLT.RCX	Available	5	3	-
Rotation center Y	RSLT.RCY	Available	5	3	-
Rotation angle	RSLT.RCT	Available	3	3	-
Base position 1 X	RSLT.RX1	Available	5	3	-
Base position 1 Y	RSLT.RY1	Available	5	3	-
Base position 1 angle	RSLT.RT1	Available	3	3	-
Base position 2 X	RSLT.RX2	Available	5	3	-
Base position 2 Y	RSLT.RY2	Available	5	3	-

Pause Unit

There are no result data specific to the Pause unit.

Timer Start Unit

There are no result data specific to the Timer unit.

Timer End Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Status	RSLT.STAT	Unsigned	1	0	-

Terminal I/O Delay Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Status	RSLT.STAT	Unsigned	1	0	-
Judgment No.	RSLT.JNO	Available	2	0	-
Logical OR of satisfied conditions	RSLT.MBTOR	Unsigned	7	0	-

Variable Delay Unit

Result item	Name	Numerical value format			Applicable scaling
		Sign	No. of integer digits	No. of decimal places	
Status	RSLT.STAT	Unsigned	1	0	-
Judgment No.	RSLT.JNO	Available	2	0	-
Logical OR of satisfied conditions	RSLT.MBTOR	Unsigned	7	0	-

User Menu Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Status	RSLT.STATUS	Unsigned	1	0	-

On-screen Graphics Unit

There are no result data specific to the On-screen Graphics unit.

Parallel Terminal Output Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Remaining output buffer	RSLT.MBS	Unsigned	3	0	-
Output buffer overflow	RSLT.BFFL	Unsigned	1	0	-
Data transferred	RSLT.HPOD	Unsigned	1	0	-

Data Output Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Remaining output buffer	RSLT.MBS	Unsigned	3	0	-
Output buffer overflow	RSLT.BFFL	Unsigned	1	0	-
Data transferred	RSLT.HPOD	Unsigned	1	0	-

Image Output Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Remaining output buffer	RSLT.MBS	Unsigned	3	0	-
Output buffer overflow	RSLT.BFFL	Unsigned	1	0	-
Data transferred	RSLT.HPOD	Unsigned	1	0	-

Command Execution Unit

Result item	Name	Numerical value format			
		Sign	No. of integer digits	No. of decimal places	Applicable scaling
Command response	RSLT.CMD:JG	Unsigned	1	0	-

Error Code

Unit Error Codes (UEIDs)

This section shows the list of error codes (UEIDs) which are output as result data for a unit which has encountered an execution error.

In addition to these error codes, calculation units output calculation error codes (ERRCs) for more detailed causes of errors. Refer to "Calculation Error Codes (ERRCs)" (Page 3-447) for more details.

UEID value	Message (shown in execution log and unit listing)
0	(Blank due to successful processing of the unit)
12010	An index specification error occurred in the image setting.
13002	A range error occurred in the region setting.
13010	An index specification error occurred in the region setting.
13025	The inspection region has exceeded the measurable range.
14002	A range error occurred in the search region setting.
14010	An index specification error occurred in the search region setting.
15002	A range error occurred in the pattern region setting.
16002	A setting range error occurred in the color extraction setting.
17002	A range error occurred in the image enhancement setting.
18010	An index specification error occurred in the image setting of source image 1.
19002	A range error occurred in the color extraction setting of source image 1.
20002	A range error occurred in the image enhancement of source image 1.
21002	A range error occurred in the conversion setting of source image 1.
22008	Could not open a menu specified in the condition setting.
23010	An index specification error occurred in the image setting of source image 2.
24002	A range error occurred in the color extraction setting of source image 2.
25002	A range error occurred in the image enhancement of source image 2.
26002	A range error occurred in the conversion setting of source image 2.
27010	An index specification error occurred in the image capture setting.
31010	An index specification error occurred in the result image setting.
34001	An invalid setting is found.
34002	A range error occurred.
34004	Insufficient processing memory
34012	Failed to replay archive.
34014	Failed to generate a region.

UEID value	Message (shown in execution log and unit listing)
34016	Failed to generate a pattern region.
34018	An error is found in the scale factor reference setting.
34020	A range error occurred in the scale factor.
34022	A reference error was found. Use the check function or see the referenced status for more details.
35002	A range error occurred in the unit setting.
36001	Calculation failed because the current image is too complex.
36002	The inspection region extends off the image region.
36003	Calculation failed because the current image is too complex.
36004	Circle/line detection failed.
36005	(Indicates a calculation unit execution error. A message corresponding to each calculation error code (ERRC) will be displayed.)
36006	A timeout error occurred.
36007	Failed to obtain a position adjustment value.
36011	An index specification error occurred.
36013	An error occurred during unit execution.
36014	No library data is registered.
36015	Valid segment not found.
36016	Blob filter application failed because the current image for source image 1 is too complex.
36017	Blob filter application failed because the current image for source image 2 is too complex.
36018	Failed to detect a base model line.
36019	Reference file for the PlugIn unit does not exist.
36023	Teaching has not been executed or is invalid.
36024	Conversion failed because the trapezoid correction shape for source image 1 is invalid.
36025	Conversion failed because the trapezoid correction shape for source image 2 is invalid.
36026	Image enhancement using the blob filter failed because the current image is too complex.
36030	Calculation failed because the inspection region is too large.
36031	An index specification error occurred in Resultant Image of the Image settings.
36032	Run time memory can not be allocated.
36033	Index of image variables of source 3 is beyond the range.
36034	Index of image variables of source 4 is beyond the range.
36035	Height extraction/height binarization failed.
36036	There is 1 or more regions that cannot be measured in Height Measurement.
36037	Failed to calculate the Zero Plane.
36038	Failed to track the moving object.
36039	The setting of the moving object tracking region is invalid.
36040	Best fit plane detection failed.
36042	The result for detected position could not be obtained.
36043	Calculation failed.
36050	Detection failed.

UEID value	Message (shown in execution log and unit listing)
36051	Calculation failed.
36052	The result of the reference could not be obtained.
36053	The scale factor is invalid.
36054	A plane perpendicular to the Z plane can not be depicted.
36055	Input 1 and input 2 are too close.
36056	Input 1 and input 2 are parallel.
36057	Input 1 and input 2 are perpendicular.
36058	Best fit line/plane detection failed.
36059	Generation of Profile failed.
36060	Reference line detection failed.
36061	None of the set measurement items could be measured.
36062	Some parameters in defect extraction settings are beyond the range.
36063	Not a single intersection was found.
36064	Image region generation failed.
36065	The setting of the moving object tracking region for MultiSpectrum Mode is invalid.
36066	Could not find a primary candidate.
36067	Failed to track the moving object for MultiSpectrum Mode.
36068	Tilt correction failed.
36069	Texture Cut failed because the image is complex.
36070	The convex hull operation in the preprocessing failed because the current image is too complex.
36071	Fill hole suppression failed because the image is too complex.
36072	With the current X-direction pixels, Segment Size=1 cannot be used in the Image Extraction (3D) filter.
36073	With the current image size, Level=16 or more cannot be used in the Invalid Pixel Suppression filter.
36074	With the current image size, the Outline Interpolation Suppression cannot be turned ON in the Invalid Pixel Suppression filter.
36075	With the current image size, Segment Size=1 cannot be used in the Image Extraction (3D) filter.
38002	Some parameters in image enhancement settings in source 3 are beyond the range.

Calculation Error Codes (ERRCs)

This section shows a list of calculation error codes (ERRCs) output as detailed error information for a calculation unit when the execution of the calculation unit fails and "36005 (Invalid calculation was executed.)" is stored in UEID.

When an execution error for a calculation unit occurs, the location and type of error can be determined by checking the calculation error code and referencing the error line output (ERRL) which indicates the line containing the error.

ERRC value	Description
1000	The divisor is zero (0).
1002	A value exceeding 64-bit floating-point decimal number was detected during calculation.
2000	Failed to obtain a value of a scalar type local variable.
2001	Failed to obtain a value of a position type local variable.
2002	Failed to obtain a value of a line type local variable.
2003	Failed to obtain a value of a circle type local variable.
2004	Failed to obtain a value of a 3D position type local variable.
2005	Failed to obtain a value of a plane type local variable.
2010	Failed to obtain a value of a scalar type global variable.
2011	Failed to obtain a value of a position type global variable.
2012	Failed to obtain a value of a line type global variable.
2013	Failed to obtain a value of a circle type global variable.
2014	Failed to obtain a value of a 3D position type global variable.
2015	Failed to obtain a value of a plane type global variable.
2020	Failed to obtain a value of a system variable.
2030	Failed to obtain a value of a scalar type setting parameter/result data.
2031	Failed to obtain a value of a position type setting parameter/result data.
2032	Failed to obtain a value of a line type setting parameter/result data.
2033	Failed to obtain a value of a circle type setting parameter/result data.
2034	Failed to obtain a value of a 3D position type setting parameter/result data.
2035	Failed to obtain a value of a plane type setting parameter/result data.
2100	Failed to obtain a value of a scalar type local array variable.

ERRC value	Description
2101	Failed to obtain a value of a position type local array variable.
2102	Failed to obtain a value of a line type local array variable.
2103	Failed to obtain a value of a circle type local array variable.
2104	Failed to obtain a value of a 3D position type local array variable.
2105	Failed to obtain a value of a plane type local array variable.
2110	Failed to obtain a value of a scalar type global array variable.
2111	Failed to obtain a value of a position type global array variable.
2112	Failed to obtain a value of a line type global array variable.
2113	Failed to obtain a value of a circle type global array variable.
2114	Failed to obtain a value of a 3D position type global array variable.
2115	Failed to obtain a value of a plane type global array variable.
2120	Failed to obtain a value of a scalar type system array variable.
3000	Failed to set a value of a scalar type local variable.
3001	Failed to set a value of a position type local variable.
3002	Failed to set a value of a line type local variable.
3003	Failed to set a value of a circle type local variable.
3004	Failed to set a value of a 3D position type local variable.
3005	Failed to set a value of a plane type local variable.
3010	Failed to set a value of a scalar type global variable.
3011	Failed to set a value of a position type global variable.
3012	Failed to set a value of a line type global variable.
3013	Failed to set a value of a circle type global variable.
3014	Failed to set a value of a 3D position type global variable.
3015	Failed to set a value of a plane type global variable.
3100	Failed to set a value of a scalar type local array variable.
3101	Failed to set a value of a position type local array variable.
3102	Failed to set a value of a line type local array variable.
3103	Failed to set a value of a circle type local array variable.
3104	Failed to set a value of a 3D position type local array variable.
3105	Failed to set a value of a plane type local array variable.

ERRC value	Description
3110	Failed to set a value of a scalar type global array variable.
3111	Failed to set a value of a position type global array variable.
3112	Failed to set a value of a line type global array variable.
3113	Failed to set a value of a circle type global array variable.
3114	Failed to set a value of a 3D position type global array variable.
3115	Failed to set a value of a plane type global array variable.
4000	Unexpected termination during execution of the Max function
4001	Unexpected termination during execution of the Min function
4002	Unexpected termination during execution of the Ave function
4003	Unexpected termination during execution of the Abs function
4004	Unexpected termination during execution of the Sqr function
4005	Unexpected termination during execution of the Sqrt function
4006	Unexpected termination during execution of the AveR function
4007	Unexpected termination during execution of the Int function
4008	Unexpected termination during execution of the Floor function
4009	Unexpected termination during execution of the Round function
4010	Unexpected termination during execution of the Ceil function
4011	Unexpected termination during execution of the MaxN function
4012	Unexpected termination during execution of the MinN function
4013	Unexpected termination during execution of the Max2 function
4014	Unexpected termination during execution of the Min2 function
4015	Unexpected termination during execution of the Ave2 function
4016	Unexpected termination during execution of the AveR2 function
4017	Unexpected termination during execution of the MaxN2 function
4018	Unexpected termination during execution of the MinN2 function
4019	Unexpected termination during execution of the Log function
4020	Unexpected termination during execution of the Sum function
4021	Unexpected termination during execution of the Sort function

ERRC value	Description
4022	Unexpected termination during execution of the Exp function
4023	Unexpected termination during execution of the Ln function
4024	Unexpected termination during execution of the Cos function
4025	Unexpected termination during execution of the Acos function
4026	Unexpected termination during execution of the Sin function
4027	Unexpected termination during execution of the Asin function
4028	Unexpected termination during execution of the Tan function
4029	Unexpected termination during execution of the Atan function
4030	Unexpected termination during execution of the Atan2 function
4031	Unexpected termination during execution of the AngC function
4032	Unexpected termination during execution of the AngW function
4033	Unexpected termination during execution of the Rad function
4034	Unexpected termination during execution of the Deg function
4035	Unexpected termination during execution of the Pi function
4036	Unexpected termination during execution of the B_And function
4037	Unexpected termination during execution of the B_Or function
4038	Unexpected termination during execution of the B_Xor function
4039	Unexpected termination during execution of the B_Not function
4040	Unexpected termination during execution of the Bind function
4041	Unexpected termination during execution of the Dist function
4042	Unexpected termination during execution of the Line function
4043	Unexpected termination during execution of the ISect function
4044	Unexpected termination during execution of the LnDist function
4045	Unexpected termination during execution of the LnDistP function
4046	Unexpected termination during execution of the LnDistXY function
4047	Unexpected termination during execution of the Angle function
4048	Unexpected termination during execution of the LnAngle function
4049	Unexpected termination during execution of the LLAngle function

ERRC value	Description
4050	Unexpected termination during execution of the ConvCrd function
4051	Unexpected termination during execution of the MidXY function
4052	Unexpected termination during execution of the VMidLine function
4053	Unexpected termination during execution of the Circle3 function
4054	Unexpected termination during execution of the CircleLs function
4055	Unexpected termination during execution of the I2Circle function
4056	Unexpected termination during execution of the CircleTangent function
4057	Unexpected termination during execution of the ILineCircle function
4058	Unexpected termination during execution of the LineLs function
4059	Unexpected termination during execution of the MidLine function
4060	Unexpected termination during execution of the ConvCrd2 function
4061	Unexpected termination during execution of the Rotate function
4062	Unexpected termination during execution of the Atoi function
4063	Unexpected termination during execution of the ShiftYear function
4064	Unexpected termination during execution of the ShiftMonth function
4065	Unexpected termination during execution of the ShiftDay function
4066	Unexpected termination during execution of the AsPoint function
4067	Unexpected termination during execution of the AsLine function
4068	Unexpected termination during execution of the AsCircle function
4069	Unexpected termination during execution of the ConvPixToWld function
4070	Unexpected termination during execution of the ConvWldToPix function
4071	Unexpected termination during execution of the MultiPtCalib function
4072	Unexpected termination during execution of the RotCenter function
4073	Unexpected termination during execution of the InnerProd function
4074	Unexpected termination during execution of the OuterProd function
4075	Unexpected termination during execution of the AddVector function
4076	Unexpected termination during execution of the SubVector function
4077	Abnormal end occurred by execution of the CalibInfo function.

ERRC value	Description
4078	Abnormal end occurred by execution of the AngleTrans function.
4079	Abnormal end occurred by execution of the UVWTrans function.
4080	Abnormal end occurred by execution of the ClearVariableS function.
4081	Abnormal end occurred by execution of the ClearVariableP function.
4082	Abnormal end occurred by execution of the ClearVariableL function.
4083	Abnormal end occurred by execution of the ClearVariableC function.
4084	Abnormal end occurred by execution of the ClearVariableArrayS function.
4085	Abnormal end occurred by execution of the ClearVariableArrayP function.
4086	Abnormal end occurred by execution of the ClearVariableArrayL function.
4087	Abnormal end occurred by execution of the ClearVariableArrayC function.
4088	Abnormal end occurred by execution of the ResetVariableS function.
4089	Abnormal end occurred by execution of the ResetVariableP function.
4090	Abnormal end occurred by execution of the ResetVariableL function.
4091	Abnormal end occurred by execution of the ResetVariableC function.
4092	Abnormal end occurred by execution of the ResetVariableArrayS function.
4093	Abnormal end occurred by execution of the ResetVariableArrayP function.
4094	Abnormal end occurred by execution of the ResetVariableArrayL function.
4095	Abnormal end occurred by execution of the ResetVariableArrayC function.
4096	Abnormal end occurred by execution of the MultiPtCalib2 function.
4100	As3DPoint function failed to execute.
4101	AsPlane function failed to execute.
4102	ClearVariableT function failed to execute.
4103	ClearVariableArrayT function failed to execute.
4104	ResetVariableT function failed to execute.
4105	ResetVariableArrayT function failed to execute.
4106	ClearVariablePL function failed to execute.
4107	ClearVariableArrayPL function failed to execute.
4108	ResetVariablePL function failed to execute.
4109	ResetVariableArrayPL function failed to execute.
4110	Dist3D function failed to execute.
4111	PlaneLs function failed to execute.

ERRC value	Description
4112	PlanePassPt function failed to execute.
4113	PIDist function failed to execute.
4114	PIDistN function failed to execute.
4115	PIDistP function failed to execute.
4116	PIDistPN function failed to execute.
4117	SortPos function failed to execute.
4118	Sort3DPos function failed to execute.
4119	Stdev function failed to execute.
4120	Stdev2 function failed to execute.
4121	CopyVariableArrayS function failed to execute.
4122	CopyVariableArrayP function failed to execute.
4123	CopyVariableArrayL function failed to execute.
4124	CopyVariableArrayC function failed to execute.
4125	CopyVariableArrayT function failed to execute.
4126	CopyVariableArrayPL function failed to execute.
4127	I4XY function failed to execute.
4128	I4Line function failed to execute.
4129	AddVector function failed to execute.
4130	SubVector function failed to execute.
4131	ILine3DPlane function failed to execute.
4132	I2Plane function failed to execute.
4133	Line3DDist function failed to execute.
4134	Line3DDistXYZ function failed to execute.
4135	PIDistXYZ function failed to execute.
4136	LnLn3DDist function failed to execute.
4137	Plane2Angle function failed to execute.
4138	SphereLs function failed to execute.
4139	Line3DLs function failed to execute.
4140	PlaneContact function failed to execute.
4141	Itoa function failed to execute.
4146	Stoa function failed to execute.
5000	A timeout occurred.

List of System Variables

List of Setting Parameters/
Result Data

► List of System Variables

Overview of System Variables

This section provides a list of variables reserved and used by the system.

- System variables are read-only variables and prefixed by `$`. They can be referenced by dragging and dropping from the parts list, or by entering the name in directly.
- To check the status of or control a system variable it can be assigned to an external terminal via the [Global] menu.

Measurement-Related System Variables

Category	System Variable	Description	Function	External terminal assignment	Rewriting						
					Controller	Edit Simulation	Simulator				
				Terminal (when input assignment, CC-Link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set)	Image archive replay	Command	CC-Link, EtherNet/IP, PROFINET, EtherCAT	Command	View (Unit Result View)	Command	View (Operation panel)
Measurement	%PrcCount	Process count	Counts the number of times the program is Incremented after the start unit has been processed. Cleared to 0 by resetting system.		<input type="radio"/>						
	%NgCount	NG count	Counts the number of NG results generated during the execution of the program.		<input type="radio"/>						
	%TrgTime	Trigger interval	Minimum trigger input interval derived from the latest %PrcTime (msec)		<input type="radio"/>						
	%PrcTime	Process time	The time it takes the program to go from the Start unit to the End unit (msec)*1		<input type="radio"/>						
	%SettingDrv	Program storage media ID	ID of the media which stores the current program (1: SD1, 2: SD2)								
	%SettingNo	Program No.	Current program number								
	%RecipeSettingNo	Recipe No.	Recipe No. during measurement -1: Recipe settings are not used (program settings are in use) 0-999: Recipe No.								
	%UserTimer0	User timer 0	Current elapsed after user timer 0 started (msec)								
	%UserTimer1	User timer 1	Current elapsed after user timer 1 started (msec)								
	%UserTimer2	User timer 2	Current elapsed after user timer 2 started (msec)								
	%UserTimer3	User timer 3	Current elapsed after user timer 3 started (msec)								
	%UserTimer4	User timer 4	Current elapsed after user timer 4 started (msec)								
	%UserTimer5	User timer 5	Current elapsed after user timer 5 started (msec)								
	%UserTimer6	User timer 6	Current elapsed after user timer 6 started (msec)								
	%UserTimer7	User timer 7	Current elapsed after user timer 7 started (msec)								
Sectional inspection	%NumOfSections	Number of sections	The setting value for the number of sections to use in completing one Sectional Inspection.		<input type="radio"/>						
	%SectionNo	Inspection No.in Sectional Insp.	The number of measurements executed in one Sectional Inspection. This count is incremented after the start unit has been processed with Sectional Inspection enabled. After one Sectional Inspection completes, this count is initialized when transitioning to the next.		<input type="radio"/>						
	%TotObjects	Number of targets	The number of times that Sectional Inspection has been executed. After one Sectional Inspection completes, this count is incremented when transitioning to the next Sectional Inspection.		<input type="radio"/>						
	%TotNgObjects	Number of NG targets	The number of NG results that have occurred in Sectional Inspection. This count is incremented if the Sectional Inspection Total Status is NG when the end unit with the measurement count that completes one Sectional Inspection is reached.		<input type="radio"/>						

Category	System Variable	Description	Function	External terminal assignment	Rewriting		
					Controller	Edit Simulation	Simulator
Sectional inspection (continued)	%SectionJgl[]	Sectional Inspection status	The judgment result for each measurement count in one sectional inspection. 0:OK 1:NG Number of elements: 0 to 63 After one sectional inspection completes, this status is initialized when transitioning to the next sectional inspection.	Terminal (when Input assignment, CC-Link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set) Image archive replay	Command CC-Link, EtherNet/IP, PROFINET, EtherCAT	Command View (Unit Result View)	Command View (Operation panel)
System information	%PrcYear	Process start time (year)	The year the capture unit is processed. * ¹	O			
	%PrcMonth	Process start time (month)	The month the capture unit is processed. * ¹	O			
	%PrcDay	Process start time (day)	The day the capture unit is processed. * ¹	O			
	%PrcHour	Process start time (hour)	The time (in hours) the capture unit is processed. * ¹	O			
	%PrcMinute	Process start time (minute)	The time (in minutes) the capture unit is processed. * ¹	O			
	%PrcSecond	Process start time (second)	The time (in seconds) the capture unit is processed. * ¹	O			
	%UserAccount	User account	The account number of the user currently logged in. * ⁴				O
	%KeyStatus	Key input status	Handheld controller button input status Each button is assigned to a different bit in the variable (refer to the separate table for the assignment). * ²				
	%OpLogStatus	Modification logging status	Status of modification logging (0: Stopped, 1: Logging)				
	%Hist0Status	Status of image archive 0	<ul style="list-style-type: none"> Bit 0: Image archive 0 status (0: Paused, 1: Active) Bit 1: Image / data present (0: No, 1: Yes) Bit 2: Hold status (0: Off, 1: On) 	OUT	OUT		
	%Hist1Status	Status of image archive 1	<ul style="list-style-type: none"> Bit 0: Image archive 1 status (0: Paused, 1: Active) Bit 1: Image / data present (0: No, 1: Yes) Bit 2: Hold status (0: Off, 1: On) 	OUT	OUT		
	⋮						
	%Hist31Status	Status of image archive 31	<ul style="list-style-type: none"> Bit 0: Image archive 31 status (0: Paused, 1: Active) Bit 1: Image / data present (0: No, 1: Yes) Bit 2: Hold status (0: Off, 1: On) 	OUT	OUT		
	%Platform	Runtime environment	Runtime environment for the program (0: Controller, 1: XG-X VisionEditor, 2: XG-X Simulator)				
	%ControllerId	Controller ID	MAC address expressed as a 9-digit decimal number (24 bits - lower order). This can be referenced as a unique ID specific to the controller. * ³				
	%UnitEditStatus	Unit edit status	The unit edit status on the controller (1: Setup mode and Edit Unit in Run mode (after the top menu), 0: Status other than the above) * ⁵	OUT	OUT		

Category	System Variable	Description	Function	External terminal assignment	Rewriting		
					Controller		Edit Simulation
					Command	CC-Link, EtherNet/IP, PROFINET, EtherCAT	Simulator
System information (continued)	%RetestStatus	Retest status	The retest status on the controller (0: Not in Retest mode , 1: Retest mode 2: Retest mode (offline), (online))	OUT	OUT		
	%ClsNum00	Number of classifications for type No.00	Number of targets classified into type No.00 (accumulated for each flow execution)	OUT	OUT		
	%ClsNum01	Number of classifications for type No.01	Number of targets classified into type No.01 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum02	Number of classifications for type No.02	Number of targets classified into type No.02 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum03	Number of classifications for type No.03	Number of targets classified into type No.03 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum04	Number of classifications for type No.04	Number of targets classified into type No.04 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum05	Number of classifications for type No.05	Number of targets classified into type No.05 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum06	Number of classifications for type No.06	Number of targets classified into type No.06 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum07	Number of classifications for type No.07	Number of targets classified into type No.07 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum08	Number of classifications for type No.08	Number of targets classified into type No.08 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum09	Number of classifications for type No.09	Number of targets classified into type No.09 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum10	Number of classifications for type No.10	Number of targets classified into type No.10 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum11	Number of classifications for type No.11	Number of targets classified into type No.11 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum12	Number of classifications for type No.12	Number of targets classified into type No.12 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum13	Number of classifications for type No.13	Number of targets classified into type No.13 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum14	Number of classifications for type No.14	Number of targets classified into type No.14 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum15	Number of classifications for type No.15	Number of targets classified into type No.15 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum16	Number of classifications for type No.16	Number of targets classified into type No.16 (accumulation from each inspection processed)	OUT	OUT		
	%ClsNum17	Number of classifications for type No.17	Number of targets classified into type No.17 (accumulation from each inspection processed)	OUT	OUT		

Category	System Variable	Description	Function	External terminal assignment	Rewriting			
					Controller		Edit Simulation	Simulator
					Command	CC-Link, EtherNet/IP, PROFINET, EtherCAT	Command	View (Unit Result View)
System information (continued)	%ClsNum18	Number of classifications for type No.18	Number of targets classified into type No.18 (accumulation from each inspection processed)	OUT	OUT			
	%ClsNum19	Number of classifications for type No.19	Number of targets classified into type No.19 (accumulation from each inspection processed)	OUT	OUT			
	%ClsJg00	Target classification judgment result for type No.00	Judgment result (0: OK, 1: NG) of classification type No.00 based on number of classifications.	OUT	OUT	O		
	%ClsJg01	Target classification judgment result for type No.01	Judgment result (0: OK, 1: NG) of classification type No.01 based on number of classifications.	OUT	OUT	O		
	%ClsJg02	Target classification judgment result for type No.02	Judgment result (0: OK, 1: NG) of classification type No.02 based on number of classifications.	OUT	OUT	O		
	%ClsJg03	Target classification judgment result for type No.03	Judgment result (0: OK, 1: NG) of classification type No.03 based on number of classifications.	OUT	OUT	O		
	%ClsJg04	Target classification judgment result for type No.04	Judgment result (0: OK, 1: NG) of classification type No.04 based on number of classifications.	OUT	OUT	O		
	%ClsJg05	Target classification judgment result for type No.05	Judgment result (0: OK, 1: NG) of classification type No.05 based on number of classifications.	OUT	OUT	O		
	%ClsJg06	Target classification judgment result for type No.06	Judgment result (0: OK, 1: NG) of classification type No.06 based on number of classifications.	OUT	OUT	O		
	%ClsJg07	Target classification judgment result for type No.07	Judgment result (0: OK, 1: NG) of classification type No.07 based on number of classifications.	OUT	OUT	O		
	%ClsJg08	Target classification judgment result for type No.08	Judgment result (0: OK, 1: NG) of classification type No.08 based on number of classifications.	OUT	OUT	O		
	%ClsJg09	Target classification judgment result for type No.09	Judgment result (0: OK, 1: NG) of classification type No.09 based on number of classifications.	OUT	OUT	O		
	%ClsJg10	Target classification judgment result for type No.10	Judgment result (0: OK, 1: NG) of classification type No.10 based on number of classifications.	OUT	OUT	O		
	%ClsJg11	Target classification judgment result for type No.11	Judgment result (0: OK, 1: NG) of classification type No.11 based on number of classifications.	OUT	OUT	O		
	%ClsJg12	Target classification judgment result for type No.12	Judgment result (0: OK, 1: NG) of classification type No.12 based on number of classifications.	OUT	OUT	O		

Category	System Variable	Description	Function	External terminal assignment	Rewriting			
					Controller		Edit Simulation	Simulator
					Command	CC-Link, EtherNet/IP, PROFINET, EtherCAT	Command	View (Unit Result View)
System information (continued)	%ClsJg13	Target classification judgment result for type No.13	Judgment result (0: OK, 1: NG) of classification type No.13 based on number of classifications.	OUT	OUT	○		
	%ClsJg14	Target classification judgment result for type No.14	Judgment result (0: OK, 1: NG) of classification type No.14 based on number of classifications.	OUT	OUT	○		
	%ClsJg15	Target classification judgment result for type No.15	Judgment result (0: OK, 1: NG) of classification type No.15 based on number of classifications.	OUT	OUT	○		
	%ClsJg16	Target classification judgment result for type No.16	Judgment result (0: OK, 1: NG) of classification type No.16 based on number of classifications.	OUT	OUT	○		
	%ClsJg17	Target classification judgment result for type No.17	Judgment result (0: OK, 1: NG) of classification type No.17 based on number of classifications.	OUT	OUT	○		
	%ClsJg18	Target classification judgment result for type No.18	Judgment result (0: OK, 1: NG) of classification type No.18 based on number of classifications.	OUT	OUT	○		
	%ClsJg19	Target classification judgment result for type No.19	Judgment result (0: OK, 1: NG) of classification type No.19 based on number of classifications.	OUT	OUT	○		
	%RBCalibExec	Execute Auto Calibration Status	0: Auto calibration not executed 1: Auto calibration executing	OUT				
	%RBCalibCamID	Auto calibration executing camera ID	The ID of the camera executing auto calibration. Auto calibration not being executed is always -1.	OUT				
	%RBCalibUnitID	Auto calibration executing capture unit ID	The ID of the capture unit executing auto calibration. Auto calibration not being executed is always -1.	OUT				
	%RBCalibStep	Execute Auto Calibration Step	Detection point numbers being measured in auto calibration. Auto calibration not being executed is always -1.	OUT				
	%RBCtrlStatus	Robot control status	0: Not in a dialog box that can be operated by the robot 1: In a dialog box that can be operated by the robot	OUT				

*1 Start point of measurement time used for %PrcTime and other variables

For system variables prefixed by %Prc, the time registered is when the capture unit is first executed. If no capture units exist the time recorded is will begin when the start unit is executed.



The processing time for units between start and capture units does not affect the measurement time system variables.

*2 Table of %KeyStatus bit assignment

The bits of %KeyStatus indicate the ON/OFF status of the corresponding USB console buttons.

USB console button (OP-87983)	%KeyStatus(lower 16 bits)				%KeyStatus (decimal number)
Up	0000	0000	0000	0001	1
Down	0000	0000	0000	0010	2
Right	0000	0000	0000	0100	4
Left	0000	0000	0000	1000	8
0	0000	0000	0001	0000	16
1 (FUNCTION)	0000	0000	0010	0000	32
2 (ESCAPE)	0000	0000	0100	0000	64
3 (TRIGGER)	0000	0000	1000	0000	128
4 (SCREEN)	0000	0001	0000	0000	256
5 (VIEW)	0000	0010	0000	0000	512
6 (MENU)	0000	0100	0000	0000	1024
7 (FUNCTION)	0000	1000	0000	0000	2048
8 (RUN/STOP)	0001	0000	0000	0000	4096

*3 The decimal value is always "-1" during editing and simulation.

*4 When [Register personal user IDs to the user accounts] is ON in the account settings, the user account number to which the currently logged in user ID is registered is stored.

*5 Excluding retesting (online).

Terminal Control-Related System Variables

Category	System variable	Description	Function	External terminal assignment	Terminal (when input assignment, CC-Link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set)	Image archive	Rewriting		
							Controller	Edit Simulation	Simulator
Control	%Trg1	Trigger 1	Capture unit trigger 1 signal (leading edge)	IN	IN		<input type="radio"/>		
	%Trg2	Trigger 2	Capture unit trigger 2 signal (leading edge)	IN	IN		<input type="radio"/>		
	%Trg3	Trigger 3	Capture unit trigger 3 signal (leading edge)	IN	IN		<input type="radio"/>		
	%Trg4	Trigger 4	Capture unit trigger 4 signal (leading edge)	IN	IN		<input type="radio"/>		
	%Ext	Disable trigger	Suppresses internal and external triggers (level input).	IN	IN		<input type="radio"/>		
	%Test	Test	Holds total status result, parallel terminal output, data output, forced normal status of %Sto and clears subsequent output data (level input).	IN	IN		<input type="radio"/>		
	%Reset	Reset	Reset operation (leading edge)	IN	IN		<input type="radio"/>		
	%Flash1	Strobe light 1	System variable used for terminal assignment only (remains at 0)	OUT					
	%Flash2	Strobe light 2	System variable used for terminal assignment only (remains at 0)	OUT					
	%Flash3	Strobe light 3	System variable used for terminal assignment only (remains at 0)	OUT					
	%Flash4	Strobe light 4	System variable used for terminal assignment only (remains at 0)	OUT					
	%Trg1Ready	Trigger 1 input permission	Turns on when trigger 1 input is accepted.	OUT	OUT				
	%Trg2Ready	Trigger 2 input permission	Turns on when trigger 2 input is accepted.	OUT	OUT				
	%Trg3Ready	Trigger 3 input permission	Turns on when trigger 3 input is accepted.	OUT	OUT				
	%Trg4Ready	Trigger 4 input permission	Turns on when trigger 4 input is accepted.	OUT	OUT				
Status	%Error0	Status of error 0	Status of error 0 caused by assigned error types	OUT	OUT				
	%Error1	Status of error 1	Status of error 1 caused by assigned error types	OUT	OUT				
	%Error0Code	Cause of error 0	Error code for the cause of error assigned to %Error0 which occurred last (9 bits max.)	OUT	OUT		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	%Error1Code	Cause of error 1	Error code for the cause of error assigned to %Error1 which occurred last (9 bits max.)	OUT	OUT		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	%Error0Clear	Error 0 clear	Reset error 0 (leading edge)	IN	IN		<input type="radio"/>		
	%Error1Clear	Error 1 clear	Reset error 1 (leading edge)	IN	IN		<input type="radio"/>		
	%Run	Run mode status	Controller mode (0:Setup mode, 1: Run mode)	OUT	OUT				
	%WaitReady	Delay timing unit status	Status of delay timing unit (I/O delay, variable delay, menu delay) waiting for condition to be satisfied.	OUT	OUT				
	%Busy	Busy	System processing data / instruction	OUT	OUT				

Category	System variable	Description	Function	External terminal assignment	Rewriting			
					Controller		Edit Simulation	Simulator
					Command	CC-Link, EtherNet/IP, PROFINET, EtherCAT	Command	View (Unit Result View)
Data/I/O	%Pst	Terminal output data change	Forces next set of output data to be presented (handshaking) used (leading/trailing edge)	IN			○	
	%InDataAsyncA	Terminal data input	asynchronous data input set A (32 bits max., level input)	IN	IN		○	○
	%InDataAsyncB	Terminal data input	asynchronous data input set B (32 bits max., level input)	IN	IN		○	○
	%InDataAsyncC	Terminal data input	asynchronous data input set C (32 bits max., level input)	IN	IN		○	○
	%InDataAsyncD	Terminal data input	asynchronous data input set D (32 bits max., level input)	IN	IN		○	○
	%InDataAsyncE	Terminal data input	asynchronous data input set E (32 bits max., level input)	IN	IN		○	○
	%InDataAsyncF	Terminal data input	asynchronous data input set F (32 bits max., level input)	IN	IN		○	○
	%InDataAsyncG	Terminal data input	asynchronous data input set G (32 bits max., level input)	IN	IN		○	○
	%InDataAsyncH	Terminal data input	asynchronous data input set H (32 bits max., level input)	IN	IN		○	○
	%OutDataA	Terminal data output (synchronous with %Sto)	Terminal data output set A, synchronous with %Sto (32 bits max.)	OUT				
	%OutDataB	Terminal data output (synchronous with %Sto)	Terminal data output set B, synchronous with %Sto (32 bits max.)	OUT				
	%OutDataC	Terminal data output (synchronous with %Sto)	Terminal data output set C, synchronous with %Sto (32 bits max.)	OUT				
	%OutDataD	Terminal data output (synchronous with %Sto)	Terminal data output set D, synchronous with %Sto (32 bits max.)	OUT				
	%OutDataE	Terminal data output (synchronous with %Sto)	Terminal data output set E, synchronous with %Sto (32 bits max.)	OUT				
	%OutDataF	Terminal data output (synchronous with %Sto)	Terminal data output set F, synchronous with %Sto (32 bits max.)	OUT				
	%OutDataG	Terminal data output (synchronous with %Sto)	Terminal data output set G, synchronous with %Sto (32 bits max.)	OUT				
	%OutDataH	Terminal data output (synchronous with %Sto)	Terminal data output set H, synchronous with %Sto (32 bits max.)	OUT				
	%OutDataAsyncA	Terminal data output (asynchronous with %Sto)	Terminal data output set A, asynchronous with %Sto (32 bits max.)	OUT	OUT	○*2	○*2	○*2
	%OutDataAsyncB	Terminal data output (asynchronous with %Sto)	Terminal data output set B, asynchronous with %Sto (32 bits max.)	OUT	OUT	○*2	○*2	○*2

Category	System variable	Description	Function	External terminal assignment	Terminal (when input assignment, CC-Link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set)	Image archive	Rewriting			
							Controller		Edit Simulation	Simulator
							Command	CC-Link, EtherNet/IP, PROFINET, EtherCAT	Command	View (Unit Result View)
Data/O (continued)	%OutDataAsyncC	Terminal data output (asynchronous with %Sto)	Terminal data output set C, asynchronous with %Sto (32 bits max.)	OUT	OUT	O ^{*2}	O ^{*2}	O ^{*2}	O ^{*2}	
	%OutDataAsyncD	Terminal data output (asynchronous with %Sto)	Terminal data output set D, asynchronous with %Sto (32 bits max.)	OUT	OUT	O ^{*2}	O ^{*2}	O ^{*2}	O ^{*2}	
	%OutDataAsyncE	Terminal data output (asynchronous with %Sto)	Terminal data output set E, asynchronous with %Sto (32 bits max.)	OUT	OUT	O ^{*2}	O ^{*2}	O ^{*2}	O ^{*2}	
	%OutDataAsyncF	Terminal data output (asynchronous with %Sto)	Terminal data output set F, asynchronous with %Sto (32 bits max.)	OUT	OUT	O ^{*2}	O ^{*2}	O ^{*2}	O ^{*2}	
	%OutDataAsyncG	Terminal data output (asynchronous with %Sto)	Terminal data output set G, asynchronous with %Sto (32 bits max.)	OUT	OUT	O ^{*2}	O ^{*2}	O ^{*2}	O ^{*2}	
	%OutDataAsyncH	Terminal data output (asynchronous with %Sto)	Terminal data output set H, asynchronous with %Sto (32 bits max.)	OUT	OUT	O ^{*2}	O ^{*2}	O ^{*2}	O ^{*2}	
	%JgAll	Total status	Total assigned unit judgment result (OK: 0, NG: 1)		O					
	%JAHold	Total judgment status result (Latching/Sync with STO/One shot selectable)	Total assigned unit judgment result (OK: 0, NG: 1) Output type can be selected in the global settings.	OUT	OUT ^{*3}					
	%SectionJgAll	Sectional Inspection Total Status	The total judgment result for one Sectional Inspection. The judgment status is checked and updated each time a unit is executed. 0:OK 1:NG After one Sectional Inspection completes, this status is initialized when transitioning to the next Sectional Inspection.							
%SectionJAHold	Total Sectional Inspection judgment result (Latching/Sync with STO/One shot selectable)		The output type can be selected in the global settings for the Sectional Inspection Total Status.	OUT	OUT					
			Output type: Latching The result is updated when the flowchart that completes one sectional inspection ends. The result is latched for the next Sectional Inspection and beyond. To unlatch, reset the controller, change the inspection, or turn the outputs off.							
			Output type: Sync with STO The output is turned on and off in synchronization with %Sto when the output of the terminal output unit is on.							
			Output type: One shot The output is turned on just for the time specified in [One shot time] when the flowchart that completes one Sectional Inspection ends.							

Category	System variable	Description	Function	External terminal assignment	Rewriting			
					Controller	Edit Simulation	Simulator	
Data/I/O (continued)	%Cam1Jg	Camera 1 judgment status	Judgment results for the unit connected to Camera 1 (image variables) (0: OK, 1: NG). Updated each time the unit is executed (0 when the process flow starts)	Terminal (when input assignment, CC-Link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set)				
	%Cam2Jg	Camera 2 judgment status	Judgment results for the unit connected to Camera 2 (image variables) (0: OK, 1: NG). Updated each time the unit is executed (0 when the process flow starts)					
	%Cam3Jg	Camera 3 judgment status	Judgment results for the unit connected to Camera 3 (image variables) (0: OK, 1: NG). Updated each time the unit is executed (0 when the process flow starts)					
	%Cam4Jg	Camera 4 judgment status	Judgment results for the unit connected to Camera 4 (image variables) (0: OK, 1: NG). Updated each time the unit is executed (0 when the process flow starts)					
	%UnitError	Unit error status	Assigned unit error output. OK output when no unit executed		O			
	%Sto	Strobe signal for parallel terminal output unit	Strobe signal used for sequencing parallel terminal output unit data		OUT			
Command	%CmdCode	Custom command No.	Custom command number input (7 bits max., level input)	IN	IN		O	
	%CmdParam	Custom command parameter	Custom command parameter value input (32 bits max., level input)	IN	IN		O	
	%CmdParamOffset	Custom command parameter offset	Command parameter offset value input			O ^{*4}	O ^{*4}	O ^{*4}
	%Plc	Custom command execution (PLC)	Execute command input (PLC Link) (leading edge)	IN			O	
	%CmdStrobe	Custom command execution (terminal)	Execute command input (leading edge)	IN	IN		O	
	%CmdReady	Custom command ready	Execute command ready output	OUT	OUT			
	%Ack	Command success	Successful completion of custom command	OUT	OUT			
	%Nack	Command failure	Unsuccessful completion of custom command	OUT	OUT			

*1 Except for units waiting for time dependent conditions to be satisfied.

*2 When the WP command is used as the write command, the MW command cannot be used.

*3 When the output type is [Sync with STO], this value is the same as %JgAll.

*4 When the WO command is used as the write command the MW command cannot be used.

System Variables for Device Status Confirmation

Category	System variable	Description	Function	External terminal assignment	Terminal (when input assignment, CC-Link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set) Image archive replay	Rewriting			
						Controller		Edit Simulation	Simulator
						Command	CC-Link, EtherNet/IP, PROFINET, EtherCAT	Command	View (Unit Result View)
SD card status	%Sd1Exist	SD1 card present	SD card in SD1 slot (1: Yes, 0: No)						
	%Sd1FreeSpace	Free space on SD1	Free space on SD card in SD1 slot (KB)						
	%Sd2Exist	SD2 card present	SD card in SD2 slot (1: Yes, 0: No)						
	%Sd2FreeSpace	Free space on SD2	Free space on SD card in SD2 slot (KB)						
USB HDD Status	%USBExist	USB HDD present	Whether a USB HDD is currently attached or not (1: Attached, 0: Not attached)						
Fieldbus	%InDataFieldbus[]	Fieldbus-specific input data	An array-type system variable for input updated during fixed cycle Fieldbus (CCLink, EtherNet/IP, PROFINET, and EtherCAT) communications (32-bit integer, and a maximum of 400 elements). The start index corresponds to the start address of the system variable assignment for RWw.		IN				O
Retest	%BatchRetestBusy	Retest Images execution status	Execution status of Retest Images (0: Retest Images is not being run, 1: Retesting images)	OUT	OUT				
	%BatchRetestStatus	Retest Images execution result	Execution result of Retest Images (0: Matched with expected values, 1: Did not match with expected values, 2: Error or canceled, 3: Not run)	OUT	OUT				
Image capture buffer status	%Cam1Ready	Camera 1 is ready	Output when Camera 1 can begin capture	OUT	OUT				
	%Cam2Ready	Camera 2 is ready	Output when Camera 2 can begin capture	OUT	OUT				
	%Cam3Ready	Camera 3 is ready	Output when Camera 3 can begin capture	OUT	OUT				
	%Cam4Ready	Camera 4 is ready	Output when Camera 4 can begin capture	OUT	OUT				
	%Cam1Status	Camera 1 Image capture buffer status	<ul style="list-style-type: none"> Bit 0: Buffer contains image data (0: Yes, 1: No) Bit 1: Image capture buffer full*¹ (0: Free space, 1: Full) Bit 2: Image capture buffer overload (0: No, 1: Yes) 	OUT	OUT				
	%Cam2Status	Camera 2 Image capture buffer status	<ul style="list-style-type: none"> Bit 0: Buffer contains image data (0: Yes, 1: No) Bit 1: Image capture buffer full*¹ (0: Free space, 1: Full) Bit 2: Image capture buffer overload (0: No, 1: Yes) 	OUT	OUT				
	%Cam3Status	Camera 3 Image capture buffer status	<ul style="list-style-type: none"> Bit 0: Buffer contains image data (0: Yes, 1: No) Bit 1: Image capture buffer full*¹ (0: Free space, 1: Full) Bit 2: Image capture buffer overload (0: No, 1: Yes) 	OUT	OUT				
	%Cam4Status	Camera 4 Image capture buffer status	<ul style="list-style-type: none"> Bit 0: Buffer contains image data (0: Yes, 1: No) Bit 1: Image capture buffer full*¹ (0: Free space, 1: Full) Bit 2: Image capture buffer overload (0: No, 1: Yes) 	OUT	OUT				
	%Cam1Num	Camera 1 Image capture buffer No. of images	No. of images currently stored in the image capture buffer (0 to 1024)	OUT	OUT				

Category	System variable	Description	Function	External terminal assignment	Rewriting			
					Controller		Edit Simulation	Simulator
					Command	CC-Link, EtherNet/IP, PROFINET, EtherCAT	Command	View (Unit Result View)
Image capture buffer status (continued)	%Cam2Num	Camera 2 Image capture buffer No. of images	No. of images currently stored in the image capture buffer (0 to 1024)	OUT OUT				
	%Cam3Num	Camera 3 Image capture buffer No. of images	No. of images currently stored in the image capture buffer (0 to 1024)	OUT OUT				
	%Cam4Num	Camera 4 Image capture buffer No. of images	No. of images currently stored in the image capture buffer (0 to 1024)	OUT OUT				
	%CamExpBusy	Camera exposure in progress	Output during exposure of any one of the cameras*2	OUT OUT				
	%Cam1ExpBusy	Camera 1 exposure in progress	Output during exposure of Camera 1*2	OUT OUT				
	%Cam2ExpBusy	Camera 2 exposure in progress	Output during exposure of Camera 2*2	OUT OUT				
	%Cam3ExpBusy	Camera 3 exposure in progress	Output during exposure of Camera 3*2	OUT OUT				
	%Cam4ExpBusy	Camera 4 exposure in progress	Output during exposure of Camera 4*2	OUT OUT				
	%Trg1CurrentUnit	Trigger 1 capture flow status	The capture unit number that capture conditions are currently applied to when Trigger 1 is input.	OUT OUT				
	%Trg2CurrentUnit	Trigger 2 capture flow status	The capture unit number that capture conditions are currently applied to when Trigger 2 is input.	OUT OUT				
	%Trg3CurrentUnit	Trigger 3 capture flow status	The capture unit number that capture conditions are currently applied to when Trigger 3 is input.	OUT OUT				
	%Trg4CurrentUnit	Trigger 4 capture flow status	The capture unit number that capture conditions are currently applied to when Trigger 4 is input.	OUT OUT				
Status of VisionDatabase Output	%VdbImg0Status	Status of VisionDatabase Output 0	This output turns on when output data remains in VisionDatabase Output 0.	OUT OUT				
	%VdbImg1Status	Status of VisionDatabase Output 1	This output turns on when output data remains in VisionDatabase Output 1.	OUT OUT				
	%VdbImg2Status	Status of VisionDatabase Output 2	This output turns on when output data remains in VisionDatabase Output 2.	OUT OUT				
	%VdbImg3Status	Status of VisionDatabase Output 3	This output turns on when output data remains in VisionDatabase Output 3.	OUT OUT				
	%VdbImg4Status	Status of VisionDatabase Output 4	This output turns on when output data remains in VisionDatabase Output 4.	OUT OUT				
	%VdbImg5Status	Status of VisionDatabase Output 5	This output turns on when output data remains in VisionDatabase Output 5.	OUT OUT				
	%VdbImg6Status	Status of VisionDatabase Output 6	This output turns on when output data remains in VisionDatabase Output 6.	OUT OUT				

Category	System variable	Description	Function	External terminal assignment	Terminal (when input assignment, CC-link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set)	Image archive replay	Rewriting				
							Controller	Edit Simulation	Simulator	Command	View (Operation panel)
Status of VisionDatabase Output (continued)	%VdbImg7Status	Status of VisionDatabase Output 7	This output turns on when output data remains in VisionDatabase Output 7.	OUT	OUT						
	%OutputVdbImgBusy	VisionDatabase image output in progress	Output during VisionDatabase image output	OUT	OUT						

*1 If "Full" is detected the possibility of overwriting the oldest captured image in the buffer can be handled.

*2 Not supported by a linescan camera and LJ-X/LJ-V.

Display-Related System Variables

Category	System variable	Description	Function	External terminal assignment	Terminal (when input assignment, CC-Link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set)	Image archive replay	Rewriting		
							Controller	Edit Simulation	Simulator
Menus	%TopDialogId	Top menu ID	Menu ID which opens on top of the other menus. (-1 if the dialog box is not open.)						
Screen display	%DispPtnId	Screen ID	ID of the screen currently displayed						
Display units	%DispUnitId	Display unit ID	ID of the unit currently displayed						
Image focus	%DispImgNo	Image focus No.	Number of the image display focused on the current display screen						
Display image type	%DispImgType	Display image type	Display image currently selected <ul style="list-style-type: none"> • 0: Raw image 1 • 1: Raw image 2 • 2: Grayed image • 3: Filtered image • 4: Contrast image • 8: Grayscale image • 9: Zero plane image • 10: Normal image (displays a LumiTrax normal image) • 11: Average Grayscale image • 12: Color-Difference image • 13: Subtracted image 						
Display page	%DispPageNo	Page No.	Number of the page currently displayed						

System Image Variable

Category	System variable	Description	Function	External terminal assignment	Rewriting		
					Controller	Edit Simulation	Simulator
Image variable	&Cam1Img	Image variable for camera 1	Default image variable for camera 1 (does not need to be specified)	Terminal (when Input assignment, CC-Link assignment, EtherNet/IP assignment, PROFINET, or EtherCAT assignment is set)			
	&Cam2Img	Image variable for camera 2	Default image variable for camera 2 (does not need to be specified)				
	&Cam3Img	Image variable for camera 3	Default image variable for camera 3 (does not need to be specified)				
	&Cam4Img	Image variable for camera 4	Default image variable for camera 4 (does not need to be specified)				

ASCII code table (hexadecimal/decimal notation)

When the detected character of the OCR/OCR2 unit is referred in the calculation, the ASCII code value of each character is returned. The ASCII code value (hexadecimal, decimal) is as follows:

Symbol	(*)*	+*	-	.	/	:								
Hexadecimal number	28	29	2B	2D	2E	2F	3A								
Decimal number	40	41	43	45	46	47	58								
Number	0	1	2	3	4	5	6	7	8	9					
Hexadecimal number	30	31	32	33	34	35	36	37	38	39					
Decimal number	48	49	50	51	52	53	54	55	56	57					
Alphabet	A	B	C	D	E	F	G	H	I	J	K	L	M		
Hexadecimal number	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D		
Decimal number	65	66	67	68	69	70	71	72	73	74	75	76	77		
	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
Hexadecimal number	4E	4F	50	51	52	53	54	55	56	57	58	59	5A		
Decimal number	78	79	80	81	82	83	84	85	86	87	88	89	90		
	a	b	c	d	e	f	g	h	i	j	k	l	m		
Hexadecimal number	61	62	63	64	65	66	67	68	69	6A	6B	6C	6D		
Decimal number	97	98	99	100	101	102	103	104	105	106	107	108	109		
	n	o	p	q	r	s	t	u	v	w	x	y	z		
Hexadecimal number	6E	6F	70	71	72	73	74	75	76	77	78	79	7A		
Decimal number	110	111	112	113	114	115	116	117	118	119	120	121	122		
Other	SPACE														
	Hexadecimal number	20													
	Decimal number	32													

* This is only supported by OCR2 units.

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Revision history

Date printed	Revision number	Revision contents
June 2016	Official release	
September 2016	2nd edition	
February 2017	3rd revision 1st edition	Ver. 1.1.0000 reflected
October 2017	4th revision 1st edition	Ver. 1.2.0000 reflected
March 2018	5th revision 1st edition	Ver. 1.3.0000 reflected
January 2019	6th revision 1st edition	Ver. 2.0.0000 reflected
April 2019	7th revision 1st edition	Ver. 2.1.0000 reflected
June 2019	7th revision 2nd edition	Addition of descriptions/Correction of errors
August 2019	8th revision 1st edition	Ver. 2.2.0000 reflected
December 2019	8th revision 2nd edition	Ver. 2.3.0000 reflected
March 2020	9th revision 1st edition	Ver. 2.4.0000 reflected
September 2020	10th revision 1st edition	Ver. 2.5.0000 reflected
June 2021	12th revision 1st edition	Ver. 2.7.0000 reflected
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March 2022	14th revision 1st edition	Ver. 2.9.0000 reflected
December 2022	14th revision 2nd edition	Ver. 3.0.0000 reflected
December 2022	14th revision 3rd edition	
May 2023	14th revision 4th edition	Ver. 3.1.0000 reflected
August 2023	14th revision 5th edition	Ver. 3.2.0000 reflected
March 2024	14th revision 6th edition	Ver. 3.3.0000 reflected

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