

YRC1000micro OPTIONS INSTRUCTIONS

FOR ETHERNET FUNCTION

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS

- MOTOMAN-□□□ INSTRUCTIONS
- YRC1000micro INSTRUCTIONS
- YRC1000micro OPERATOR'S MANUAL
- YRC1000micro MAINTENANCE MANUAL
- YRC1000micro ALARM CODES (MAJOR ALARMS) (MINOR ALARMS)

The YRC1000micro alarm codes above consists of "MAJOR ALARMS" and "MINOR ALARMS".

MANUAL NO.

HW1484452

1/291



DANGER

- This manual explains the Ethernet function of the YRC1000micro system. Read this manual carefully and be sure to understand its contents before handling the YRC1000micro. Any matter not described in this manual must be regarded as “prohibited” or “improper”.
- General information related to safety are described in “Chapter 1. Safety” of the YRC1000micro INSTRUCTIONS. To ensure correct and safe operation, carefully read “Chapter 1. Safety” of the YRC1000micro INSTRUCTIONS.



CAUTION

- In some drawings in this manual, protective covers or shields are removed to show details. Make sure that all the covers or shields are installed in place before operating this product.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids the product warranty.

NOTICE

- The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.
- YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.
- If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.

Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the YRC1000micro.

In this manual, the Notes for Safe Operation are classified as “DANGER”, “WARNING”, “CAUTION”, or “NOTICE”.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Safety Signs identified by the signal word DANGER should be used sparingly and only for those situations presenting the most serious hazards.



Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury. Hazards identified by the signal word WARNING present a lesser degree of risk of injury or death than those identified by the signal word DANGER.



Indicates a hazardous situation, which if not avoided, could result in minor or moderate injury. It may also be used without the safety alert symbol as an alternative to “NOTICE”.



NOTICE is the preferred signal word to address practices not related to personal injury. The safety alert symbol should not be used with this signal word. As an alternative to “NOTICE”, the word “CAUTION” without the safety alert symbol may be used to indicate a message not related to personal injury.

Even items described as “CAUTION” may result in a serious accident in some situations.

At any rate, be sure to follow these important items.



To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “DANGER”, “WARNING” and “CAUTION”.



DANGER

- Before operating the manipulator, make sure the servo power is turned OFF by performing the following operations. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.
 - Press the emergency stop button on the programming pendant or on the external control device, etc.
 - Disconnect the safety plug of the safety fence.
(when in the play mode or in the remote mode)

If operation of the manipulator cannot be stopped in an emergency, personal injury and/or equipment damage may result.

Fig. : Emergency Stop Button



- Before releasing the emergency stop, make sure to remove the obstacle or error caused the emergency stop, if any, and then turn the servo power ON.

Failure to observe this instruction may cause unintended movement of the manipulator, which may result in personal injury.

Fig. : Release of Emergency Stop



- Observe the following precautions when performing a teaching operation within the manipulator's operating range:
 - Be sure to perform lockout by putting a lockout device on the safety fence when going into the area enclosed by the safety fence. In addition, the operator of the teaching operation must display the sign that the operation is being performed so that no other person closes the safety fence.
 - View the manipulator from the front whenever possible.
 - Always follow the predetermined operating procedure.
 - Always keep in mind emergency response measures against the manipulator's unexpected movement toward a person.
 - Ensure a safe place to retreat in case of emergency.

Failure to observe this instruction may cause improper or unintended movement of the manipulator, which may result in personal injury.

- Confirm that no person is present in the manipulator's operating range and that the operator is in a safe location before:
 - Turning ON the YRC1000micro power
 - Moving the manipulator by using the programming pendant
 - Running the system in the check mode
 - Performing automatic operations

Personal injury may result if a person enters the manipulator's operating range during operation. Immediately press an emergency stop button whenever there is a problem. The emergency stop button is located on the right of the programming pendant.

- Read and understand the Explanation of the Warning Labels before operating the manipulator.



DANGER

- In the case of not using the programming pendant, be sure to supply the emergency stop button on the equipment. Then before operating the manipulator, check to be sure that the servo power is turned OFF by pressing the emergency stop button.
Connect the external emergency stop button to the 4-14 pin and 5-15 pin of the Safety connector (Safety).
- Upon shipment of the YRC1000micro, this signal is connected by a jumper cable in the dummy connector. To use the signal, make sure to supply a new connector, and then input it.
If the signal is input with the jumper cable connected, it does not function, which may result in personal injury or equipment damage.



WARNING

- Perform the following inspection procedures prior to conducting manipulator teaching. If there is any problem, immediately take necessary steps to solve it, such as maintenance and repair.
 - Check for a problem in manipulator movement.
 - Check for damage to insulation and sheathing of external wires.
- Return the programming pendant to a safe place after use.

If the programming pendant is left unattended on the manipulator, on a fixture, or on the floor, etc., the Enable Switch may be activated due to surface irregularities of where it is left, and the servo power may be turned ON. In addition, in case the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, which may result in personal injury and/or equipment damage.

Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, the YRC1000micro controller, manipulator cables, the YRC1000micro programming pendant (optional), and the YRC1000micro programming pendant dummy connector (optional).

In this manual, the equipment is designated as follows:

Equipment	Manual Designation
YRC1000micro controller	YRC1000micro
YRC1000micro programming pendant	Programming pendant (optional)
Cable between the manipulator and the controller	Manipulator cable
YRC1000micro programming pendant dummy connector	Programming pendant dummy connector (optional)

Descriptions of the programming pendant keys, buttons, and displays are shown as follows:

Equipment	Manual Designation
Programming Pendant	Character Keys /Symbol Keys The keys which have characters or symbols printed on them are denoted with []. ex. [ENTER]
	Axis Keys /Number Keys [Axis Key] and [Numeric Key] are generic names for the keys for axis operation and number input.
	Keys pressed simultaneously When two keys are to be pressed simultaneously, the keys are shown with a "+" sign between them, ex. [SHIFT]+[COORD]
	Mode Key Three kinds of modes that can be selected by the mode key are denoted as follows: REMOTE, PLAY, or TEACH
	Button Three buttons on the upper side of the programming pendant are denoted as follows: HOLD button START button EMERGENCY STOP button
	Displays The menu displayed in the programming pendant is denoted with { }. e.g. {JOB}
PC Keyboard	The name of the key is denoted. e.g. Ctrl key on the keyboard

Description of the Operation Procedure

In the explanation of the operation procedure, the expression “Select •••” means that the cursor is moved to the object item and [SELECT] is pressed, or that the item is directly selected by touching the screen.

Registered Trademark

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company or corporation. The indications of (R) and TM are omitted.

Contents

1	Outline	1-1
	1.1 Outline	1-1
	1.2 Command Remote Setting for YRC1000micro	1-4
	1.2.1 Remote Mode and Local Mode.....	1-4
	1.2.2 Switching the Function by Command Remote Setting	1-6
	1.2.3 Command Remote Setting Method	1-7
	1.2.4 Command Remote State Displayed Window.....	1-8
	1.3 Ethernet Cable Connections	1-9
	1.4 Notes When Loading the Data.....	1-10
2	LAN Interface Setting and Network Communication Confirmation	2-1
	2.1 LAN Interface Setting	2-1
	2.1.1 Setting procedure	2-1
	2.1.2 LAN Interface Setting Item.....	2-5
	2.1.2.1 Host Setting	2-5
	2.1.2.2 Setting the Domain.....	2-5
	2.1.2.3 IP Address.....	2-5
	2.1.2.4 Default Gateway.....	2-6
	2.1.2.5 DNS Setting.....	2-6
	2.1.2.6 SNTP Setting.....	2-7
	2.2 Daylight Saving Time Setting.....	2-8
	2.3 LAN Interface Setting Confirmation	2-12
	2.3.1 LAN Interface Setting Confirmation Method	2-12
	2.3.2 Information Displayed on the Network Service Window	2-12
	2.3.2.1 Host Setting	2-12
	2.3.2.2 Domain Setting.....	2-12
	2.3.2.3 IP Address.....	2-13
	2.3.2.4 Default Gateway.....	2-13
	2.3.2.5 DNS Setting.....	2-14
	2.3.2.6 SNTP Setting.....	2-14
	2.4 Network Communication Confirmation	2-15
	2.4.1 Network Communication Confirmation from Windows PC	2-15
	2.4.2 Network Communication Confirmation from the YRC1000micro.....	2-15
3	High-Speed Ethernet Server Function	3-1
	3.1 Outline	3-1
	3.1.1 System Configuration	3-1
	3.1.2 Communication Target	3-2

Contents

3.1.3	Restriction	3-2
3.2	Setting	3-3
3.2.1	Basic Setting	3-3
3.2.2	Batch Data Back-up Function Setting.....	3-3
3.2.3	Command Remote Setting	3-4
3.3	Communication Method.....	3-5
3.3.1	Packet Format	3-5
3.3.2	Transmission Procedure.....	3-9
3.3.2.1	Robot Control/Status Reading.....	3-9
3.3.2.2	Robot Control/Data Writing to Register.....	3-10
3.3.2.3	File Control (File Saving).....	3-11
3.3.2.4	File Control (File Loading).....	3-14
3.3.2.5	File Control (File List)	3-17
3.3.2.6	File Control (Deleting of file).....	3-21
3.3.3	Robot Control Command.....	3-22
3.3.3.1	Alarm Data Reading Command	3-24
3.3.3.2	Alarm History Reading Command.....	3-27
3.3.3.3	Status Information Reading Command	3-30
3.3.3.4	Executing Job Information Reading Command.....	3-31
3.3.3.5	Axis Configuration Information Reading Command	3-33
3.3.3.6	Robot Position Data Reading Command	3-35
3.3.3.7	Position Error Reading Command.....	3-38
3.3.3.8	Torque Data Reading Data	3-39
3.3.3.9	I/O Data Reading / Writing Command.....	3-40
3.3.3.10	Register Data Reading / Writing Command	3-41
3.3.3.11	Byte Variable (B) Reading / Writing Command	3-42
3.3.3.12	Integer Type Variable (I) Reading / Writing Command	3-43
3.3.3.13	Double Precision Integer Type Variable (D) Reading / Writing Command.....	3-44
3.3.3.14	Real Type Variable (R) Reading / Writing Command.....	3-45
3.3.3.15	16 Byte Character Type Variable (S) Reading Writing Command	3-46
3.3.3.16	Robot Position Type Variable (P) Reading / Writing Command.....	3-47
3.3.3.17	Base Position Type Variable (BP) Reading / Writing Command.....	3-50
3.3.3.18	External Axis Type Variable (EX) Reading / Writing Command.....	3-52
3.3.3.19	Alarm Reset / Error Cancel Command.....	3-54
3.3.3.20	Hold / Servo On/off Command	3-55
3.3.3.21	Step / Cycle / Auto Switching Command.....	3-56
3.3.3.22	Character String Display Command To The Programming Pendant ..	3-57
3.3.3.23	Start-up (Job Start) Command	3-58
3.3.3.24	Job Select Command	3-59
3.3.3.25	Management Time Acquiring Command.....	3-61
3.3.3.26	System Information Acquiring Command.....	3-62
3.3.3.27	Plural I/O Data Reading / Writing Command.....	3-63
3.3.3.28	Plural Register Data Reading / Writing Command	3-65

 Contents

3.3.3.29	Plural Byte Type Variable (B) Reading / Writing Command	3-66
3.3.3.30	Plural Integer Type Variable (I) Reading / Writing Command	3-68
3.3.3.31	Plural Double Precision Integer Type Variable (D) Reading / Writing Command	3-69
3.3.3.32	Plural Real Type Variable (R) Reading / Writing Command.....	3-70
3.3.3.33	Plural 16 Byte Character Type Variable (S) Reading / Writing Command	3-71
3.3.3.34	Plural Robot Position Type Variable (P) Reading / Writing Command	3-73
3.3.3.35	Plural Base Position Type Variable (BP) Reading / Writing Command	3-75
3.3.3.36	Plural Station Type Variable (EX) Reading / Writing Command.....	3-77
3.3.3.37	Alarm Data Reading Command (for Applying the Sub Code Character String)	3-79
3.3.3.38	Alarm History Reading Command (for Applying the Sub Code Character String)	3-82
3.3.3.39	Move instruction command (Type Cartesian Coordinate)	3-85
3.3.3.40	Move Instruction Command (Type Pulse)	3-88
3.3.3.41	32 Byte Character Type Variable (S) Reading Writing Command	3-91
3.3.3.42	Plural 32 Byte Character Type Variable (S) Reading / Writing Command	3-92
3.3.4	File Control Command.....	3-94
3.3.4.1	File Deleting Command	3-95
3.3.4.2	File Loading Command	3-96
3.3.4.3	File Saving Command	3-97
3.3.4.4	File List Acquiring Command.....	3-98
3.3.4.5	File Saving Command (Batch Data Backup)	3-100
3.4	Response Code	3-101
3.4.1	Status Code	3-101
3.4.2	Added Status Code	3-102
3.5	Troubleshooting	3-107
3.5.1	Network Communication Confirmation	3-107
3.5.2	Communication Setting Confirmation for Firewall and Security Software	3-107
3.5.3	Error Log Confirmation of High-speed Ethernet Server Communication.....	3-107
4	FTP Server Function	4-1
4.1	Outline	4-1
4.1.1	System Configuration	4-1
4.1.2	Communication Target	4-1
4.1.3	Function Mode.....	4-2
4.1.4	CMOS Saving Function via FTP.....	4-2
4.1.5	Restriction.....	4-3
4.2	Setting.....	4-4

Contents

4.2.1	Enabling Setting for the FTP Function.....	4-4
4.2.2	Enabling the CMOS Saving Function via FTP.....	4-6
4.2.3	Command Remote Setting	4-11
4.3	Specification	4-12
4.3.1	Account	4-12
4.4	Communication Method.....	4-13
4.4.1	Example of Communication Procedure in Normal Operation Mode (When Using the Windows 7 Command Prompt).....	4-13
4.4.2	Example of Communication Procedure in Expand Mode (When Using FileZilla).....	4-14
4.4.3	Saving CMOS Data by Using CMOS Saving Function via FTP	4-21
4.5	Troubleshooting	4-22
4.5.1	Network Communication Confirmation.....	4-22
4.5.2	Confirming the Communication Setting for Firewall and Security Software	4-22
4.5.3	Confirming the Function Mode	4-22
5	DCI Function	5-1
5.1	Outline	5-1
5.1.1	System Configuration	5-1
5.1.2	Communication Target	5-1
5.2	Setting	5-2
5.2.1	Communication Target Setting	5-2
5.2.2	Command Remote OFF Setting	5-2
5.3	Preparation at the YRC1000micro Side.....	5-3
5.3.1	Command for Job Transmission.....	5-3
5.3.1.1	LOADJ.....	5-3
5.3.1.2	SAVEJ.....	5-4
5.3.1.3	DELETEJ	5-4
5.3.1.4	SWAIT	5-5
5.3.2	Command for Variable Transmission	5-5
5.3.2.1	LOADV	5-5
5.3.2.2	SAVEV	5-5
5.3.3	Registering DCI Command.....	5-6
5.3.4	Concurrent Task from Multiple Job.....	5-9
5.3.5	DCI Parallel Execution.....	5-10
5.3.5.1	Parallel Execution Using NWAIT	5-10
5.3.5.2	Parallel Execution Using PSTART (Optional)	5-11
5.3.6	Axis Data Transmission Format	5-11

Contents

5.4 Preparation at the PC Side	5-13
5.5 Executing the DCI Function	5-14
5.6 Alarm Code	5-15
5.7 Troubleshooting	5-17
5.7.1 Network Communication Confirmation	5-17
5.7.2 Communication Setting Confirmation for Firewall and Security Software	5-17
5.7.3 Confirming the Operation of the PC-side Application	5-17
5.7.4 Confirming That the Remote Setting is OFF.....	5-17
6 FTP Client Function	6-1
6.1 Outline	6-1
6.1.1 System Configuration	6-1
6.1.2 Communication Target	6-2
6.1.3 Restriction.....	6-2
6.2 Preparation at the PC Side	6-3
6.3 YRC1000micro-side Setting and Operation.....	6-4
6.3.1 Enabling Setting for the FTP Function.....	6-4
6.3.2 Setting for the FTP Connection Condition	6-6
6.3.3 Selecting the FTP Function	6-7
6.3.4 Save	6-7
6.3.4.1 Saving a Job.....	6-8
6.3.4.2 Saving Files Except for Job	6-9
6.3.5 Load.....	6-10
6.3.5.1 Loading a Job.....	6-10
6.3.5.2 Loading File Except for Job	6-10
6.3.6 Verification	6-11
6.3.6.1 Verifying a Job.....	6-11
6.3.6.2 Verifying File Except for Job	6-11
6.3.7 Selecting Job and Data File.....	6-12
6.4 Troubleshooting	6-18
6.4.1 Network Communication Confirmation	6-18
6.4.2 Communication Setting Confirmation for Firewall and Security Software	6-18
6.4.3 Confirming the FTP Server Operation	6-18
6.4.4 Confirming That the Remote Setting is OFF.....	6-18
7 Internal Data Browsing Function by Using a Web Browser	7-1
7.1 Outline	7-1

Contents

7.1.1	System Configuration	7-1
7.1.2	Communication Target	7-1
7.1.3	Restriction	7-1
7.2	Setting Method	7-2
7.2.1	Function Setting	7-2
7.2.2	Command Remote Setting	7-4
7.3	Transmission Procedure Example.....	7-5
7.4	Troubleshooting	7-7
7.4.1	Network Communication Confirmation	7-7
7.4.2	Communication Setting Confirmation for Firewall and Security Software	7-7
8	Ethernet Server Function.....	8-1
8.1	Outline	8-1
8.1.1	System Configuration	8-1
8.1.2	Communication Target	8-1
8.1.3	General Information for When Using the Ethernet Server Function	8-2
8.1.4	Restriction	8-2
8.2	Setting	8-4
8.2.1	Function Setting	8-4
8.2.2	Command Remote Setting	8-6
8.3	Communication Method.....	8-7
8.3.1	Transmission procedure	8-7
8.3.1.1	Socket Connection	8-7
8.3.1.2	START Request	8-8
8.3.1.3	Response to START Request.....	8-8
8.3.1.4	Command.....	8-8
8.3.1.5	Response to Command.....	8-8
8.3.1.6	Command Data	8-9
8.3.1.7	Answer	8-9
8.3.1.8	Closing of a Socket	8-9
8.3.2	Command Detail.....	8-10
8.3.2.1	Status Read Function.....	8-10
8.3.2.2	System Control Function.....	8-23
8.3.2.3	I/O Read/Write Function.....	8-44
8.3.3	Transmission Example	8-46
8.3.3.1	Read-Out of Status for Mode, Cycle, etc.....	8-46
8.3.3.2	Read-Out of I/O Signals for the YRC1000micro.....	8-46
8.3.3.3	Write-In of I/O Signals for the YRC1000micro.....	8-47
8.3.3.4	Continuous Execution of Multiple Command	8-48

Contents

8.4	Troubleshooting	8-49
	8.4.1 Network Communication Confirmation	8-49
	8.4.2 Communication Setting Confirmation for Firewall and Security Software	8-49
	8.4.3 Confirming the connection of the Ethernet Server Function	8-49
9	Host Control Function	9-1
	9.1 Outline	9-1
	9.1.1 System Configuration	9-1
	9.1.2 Communication Target	9-1
	9.1.3 General Information When Using the Host Control Function.....	9-1
	9.1.4 Restriction.....	9-2
	9.2 Setting.....	9-3
	9.2.1 Command Remote Setting	9-3
	9.3 Transmission Procedure.....	9-4
	9.3.1 File Data Transmission Function	9-4
	9.3.2 Manipulator Control Function.....	9-4
	9.4 Troubleshooting	9-5
	9.4.1 Network Communication Confirmation	9-5
	9.4.2 Communication Setting Confirmation of Firewall and Security Software.....	9-5
10	Standalone Function	10-1
	10.1 Outline	10-1
	10.1.1 System Configuration	10-1
	10.1.2 Communication Target	10-2
	10.2 Setting.....	10-3
	10.2.1 Communication Target Setting	10-3
	10.2.2 Command Remote to OFF Setting	10-4
	10.3 Preparation at the PC Side	10-5
	10.4 Executing the Standalone Function	10-6
	10.4.1 Selecting the Standalone Function	10-6
	10.4.2 Save	10-6
	10.4.2.1 Save Job	10-6
	10.4.2.2 Save a File Other Than Job.....	10-8
	10.4.3 Load.....	10-8
	10.4.3.1 Load the Job.....	10-8
	10.4.3.2 Load a File Other Than Job.....	10-9
	10.4.4 Verification.....	10-10

Contents

10.4.4.1	Verifying the Job	10-10
10.4.4.2	Verifying the File Other Than the Job.....	10-11
10.4.5	Selection Mode of the Job.....	10-11
10.4.5.1	Single Selection Mode	10-11
10.4.5.2	Related Selection Mode	10-11
10.4.5.3	Switching the Selection Mode	10-12
10.4.6	Selecting a Job or Data File	10-12
10.4.6.1	Individual Selection	10-12
10.4.6.2	SELECT ALL	10-12
10.5	Troubleshooting	10-13
10.5.1	Network Communication Confirmation	10-13
10.5.2	Communication Setting Confirmation for Firewall and Security Software	10-13
10.5.3	Confirming the Operation of the PC-side Application.....	10-13
10.5.4	Confirming That the Remote Setting is OFF	10-13
11	Related Information.....	11-1
11.1	General Information About the Host Control System Function.....	11-1
11.1.1	List of Interlock for Command of Host Control Function.....	11-1
11.1.2	Command that Handle Axis Data	11-2
11.1.3	Response to MOV-type Command.....	11-3
11.1.4	Command for Multi-control Group and Independent Control Function.....	11-3
11.1.4.1	Command for Multi-control Group	11-3
11.1.4.2	Command for Independent Control Function	11-4
11.1.5	Interpreter Message	11-5
11.1.6	Alarm Code	11-7
11.2	Related Parameter.....	11-8
11.3	Communication Specification	11-10
11.4	Recommended Cable and Switching Hub.....	11-11

1 Outline

The YRC1000micro can perform data communication through Ethernet. Using this communication, monitoring, controlling, and saving / loading internal data of the YRC1000micro can be performed. This instruction manual describes the required settings and related information to use this communication function.

The YRC1000micro is installed with a LAN port (RJ45 connector) as standard, thus, no additional hardware when using this function is required.



The data communication in this instruction manual is the best effort type. Thus, the communication interval and response time cannot be guaranteed. Especially, when operating the function which uses a lot of the YRC1000micro's internal resources, compared with the status where such functions are not operating, the communication time may be longer.



This communication function is a charged software option.

1.1 Outline

The YRC1000micro can use the following functions as data communication through the Ethernet.

- High-speed Ethernet server communication function
- FTP server function
- DCI function
- FTP client function
- Internal data browsing function by using a Web browser.
- Ethernet server function
- Host control function
- Standalone function

These functions are categorized as follows, in accordance with the client of the communication, the remote settings, the communication target, etc.

For details about each function, refer to the descriptions in each chapter.

The functions highlighted gray in Table 1-1 are for maintaining compatibility with the old type controller. Do not use these functions for a newly constructed system communication.

Table 1-1: Function Comparison

Function	Communication client	Communication application	Command remote settings	Transmission target
High-speed Ethernet server	PC	MOTOCOM ES User-created application Panel computer supported this function	File: Necessary Non-file and move operation: Necessary Non-file and non-move operation: Not necessary	File Non-file
FTP server	PC	FTP client	Necessary	File (text data) File (batch data)
DCI	YRC1000micro (job)	MOTOCOM	Not possible	File (text data)
FTP client	YRC1000micro (external memory)	FTP server	Not possible	File (text data)
Internal data browsing by using a Web browser.	PC	WEB browser	Necessary	File (text data)
Ethernet server	PC	MOTOCOM User created application	Necessary	File (text data) Non-file
Host control	PC	MOTOCOM	Necessary	File (text data) Non-file
Standalone	YRC1000micro (external memory)	MOTOCOM	Not possible	File (text data)

[Details]

Communication client: Shows whether the communication is started from either the PC or the YRC1000micro.

- PC: The PC application starts the communication.
- YRC1000micro: The YRC1000micro starts the communication.
There are two ways of communication in this case.

Job: A job transmission command starts the communication (LOADV, SAVEV, etc.).

External memory: Operation at the external memory menu starts the communication.

Communication application: Shows the device or the PC application software which communicates with the YRC1000micro.

- MOTOCOM ES: Charged option
The PC software which is included in the sub-package of MOTOCOM, YASKAWA off-line software, or the PC software which is created by the customers by using the communication library included in this package.
- MOTOCOM: Charged option
The PC software which is included in the MOTOCOM package, YASKAWA off-line software, or the PC software which is created by the customers by using the communication library included in this package.

 1 Outline
 1.1 Outline

- Panel computer supported this function: Must be purchased separately. The high-speed Ethernet server function can communicate with a panel computer manufactured by Digital Electronics Corporation.
- FTP client:
PC software (client software) that can communicate via FTP (general file transfer protocol).
- FTP server:
PC software (server software) that can communicate via FTP (general file transfer protocol).
- WEB browser:
PC software (client software) to browse Web pages.
- User created application:
PC software for communication created by the customer in accordance with each communication procedure.

Command remote settings: Shows the availability in accordance with the command remote settings status of the YRC1000micro.

For details about the command remote settings and the confirmation method of the YRC1000micro, refer to *chapter 1.2 “Command Remote Setting for YRC1000micro”*.

- Necessary: To use this function, enable the command remote settings.
- Not necessary: This function can be used regardless of the command remote settings.
- Not possible: To use this function, disable the command remote settings.

Transmission target: Shows the target for transmission processing.

- File: Sends and receives files (job, condition file, etc.).
- Non-file and move operation: Executes the move operation or job of the YRC1000micro.
- Non-file and non-move operation: Performs the control or the state monitoring of the YRC1000micro without move operation.

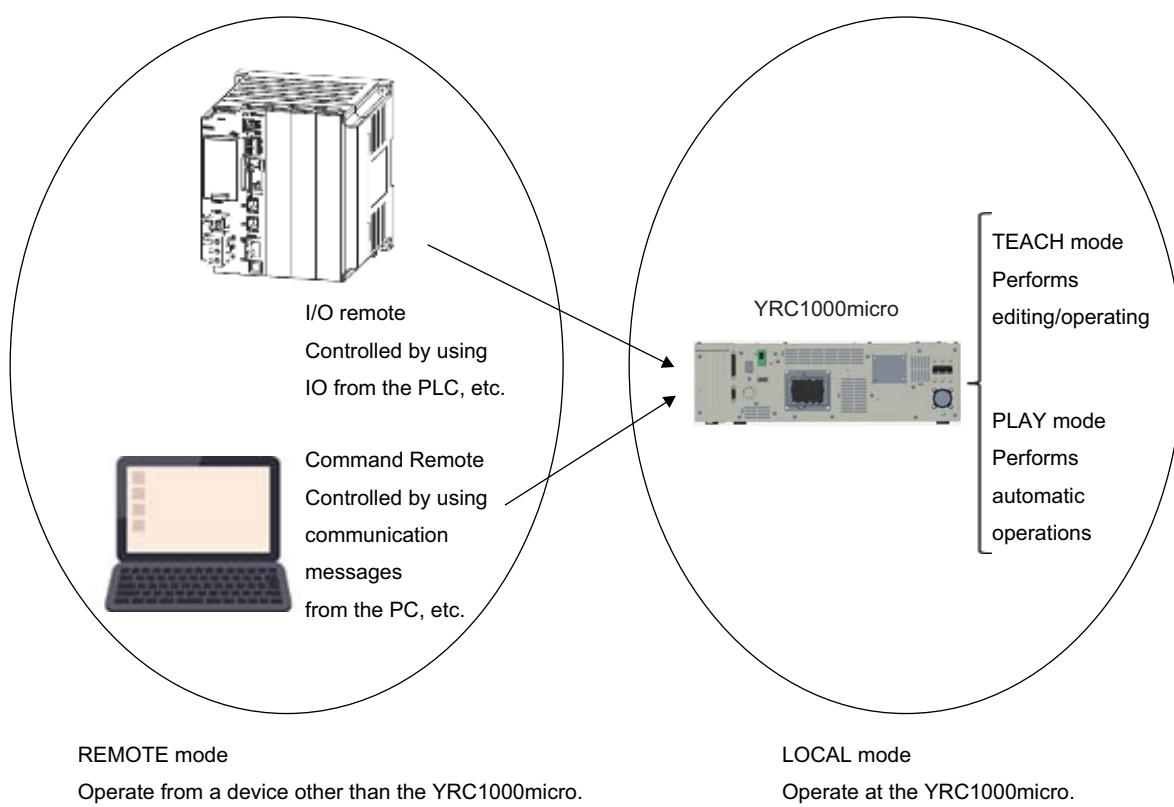
1.2 Command Remote Setting for YRC1000micro

1.2.1 Remote Mode and Local Mode

For the YRC1000micro, there are two modes depending on the operation location: the remote mode and the local mode. Performing operations using the YRC1000micro is called the local mode, and performing operations using equipment other than the YRC1000micro (host PLC or PC) is called the remote mode.

In the local mode, there are the teach mode which enables the operation of setting/editing, and the play mode which enables to perform the automatic operation. In the remote mode, there are the IO remote which is controlled by IO, and the command remote which is controlled using communication messages.

Fig. 1-1: Remote Mode and Local Mode



Operation-Mode	Operation-Location	Condition to Enable the Operation
Local Mode	Programming pendant	The key switch of the programming pendant is set to “TEACH” or “PLAY”, or “INHIBIT PP/PANEL” in the pseudo input window is set to invalid.
Remote Mode	I/O remote enabled	The key switch of the programming pendant is set to “REMOTE”, and “INHIBIT IO” in the pseudo input window is set to invalid.
	Command remote enabled	The key switch of the programming pendant is set to “REMOTE”, and “CMD REMOTE SEL” in the pseudo input display is set to valid.

1 Outline

1.2 Command Remote Setting for YRC1000micro



- In the remote mode, usually operations of the programming pendant is disabled, but they can be also enabled.
- To enable all operations, refer to *chapter 1.2.3 “Command Remote Setting Method”*.
- To enable each operation by selecting, change the setting of the parameter S2C230. For details, refer to *chapter 11.2 “Related Parameter”*.

In the remote mode, even if the input from the programming pendant operation is prohibited, other operations are available.

This holds true in “I/O remote enable” and “Command remote enable” submodes. The concept is based on the conventional I/O control introduced to command control.

Note that the edit-related operations cannot be entered from more than one operating device.

1.2.2 Switching the Function by Command Remote Setting

Availability of each function of data transmission differs depending on the command remote setting (Enabled / Disabled).

When the command remote is set invalid, the read/monitor system commands (hereinafter called read-only function) in the host control function in addition to the DCI function and standalone function can be used.



For the details of read/monitor system commands, refer to *chapter 11.1.1 “List of Interlock for Command of Host Control Function”*.

Command Remote Setting	Function Availability
Invalid	DCI function available FTP client function available Standalone function available Host control function (only read-only function) available
Valid	Host control function (all commands) available

When the read-only function is enabled, set the pendant key switch to “REMOTE”, and if the command remote mode is enabled, it becomes the command remote status and all commands can be used. Also, set the programming pendant key switch to “PLAY” or “TEACH”, and if the command remote is disabled, it is returned to the read-only function enabled status.

Parameter	Contents and Set Value	Initial Value
RS005	BSC port function specification when the command remote is invalidated 0 : DCI or standalone function 1 : Read-only function in host control	0



Read-only is a restricted command remote status. In the read-only status, following functions cannot be used by the remote settings, such as the DCI function, the FTP client function, and the standalone function.

1.2.3 Command Remote Setting Method

Whether I/O remote control or command remote control should be enabled can be set in the pseudo input display when selecting the remote mode in the management mode.

1. Select {IN/OUT} under the Main Menu.
2. Select {PSEUDO INPUT SIG}.
3. Select an item.

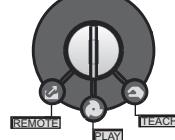
- Select “INHIBIT IO” or “CMD REMOTE SEL”.

The item enabled is marked with “●” while the item disabled is marked with “○”.



- When INHIBIT IO is marked with ○ (disabled), the I/O remote function is enabled. When CMD REMOTE SEL is marked with ● (enabled), the command remote function is enabled.
- When INHIBIT IO is marked with ○ (disabled), the I/O remote function is enabled, and by setting [REMOTE] of the mode key for the programming pendant, the operation from external I/O is enabled.
- When INHIBIT IO is marked with ● (enabled), the operation from external I/O is disabled.
- When CMD REMOTE SEL is marked with ● (enabled), the host control function is enabled, and by setting [REMOTE] of the mode key for the programming pendant, the host control is enabled.
- When CMD REMOTE SEL is marked with ○ (disabled), the host control function is disabled.
- When INHIBIT P.P/PANEL is marked with ○ (disabled), the operation from P.P/PANEL is enabled even in the remote mode. When INHIBIT P.P/PANEL is marked with ● (enabled), the operation from P.P/PANEL is disabled. However, the emergency stop button, the hold key, and the mode key can be operated while inhibit.

4. Set the mode key on the programming pendant to [REMOTE].



1.2.4 Command Remote State Displayed Window

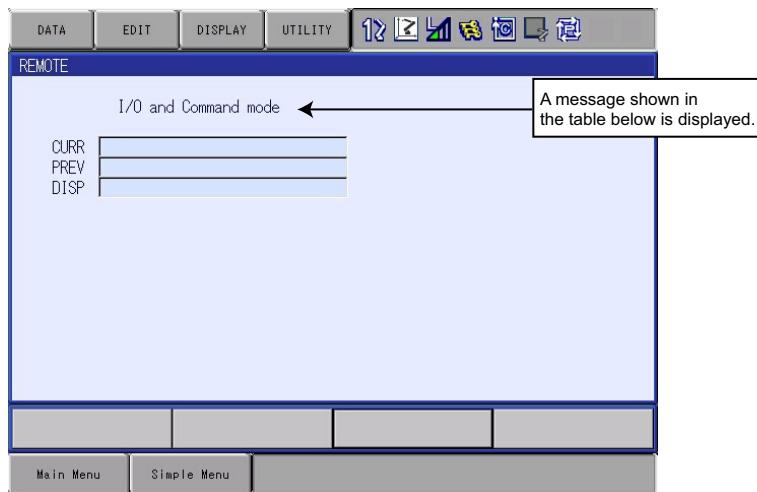
When the command remote is enabled, the operation from the YRC1000micro can be performed, therefore, the command remote display window does not automatically to be shown.

To call the command remote window, select “REMOTE” from {IN/OUT} under the Main Menu.

This window is used in common with the I/O remote mode window.

The message of the remote window changes according to the remote function select status as shown following.

(Refer to chapter 1.2.3 “Command Remote Setting Method”.)



Remote Select Status		Message	Remarks
I/O Remote	Command Remote		
×	×	“Remote mode not specified”	
○	×	“I/O mode”	
×	○	“Command mode”	
○	○	“I/O and Command mode”	
Read-only Function Valid		“Remote mode not specified”	“CURR” and “PREV” are displayed.

○ : Valid, × : Invalid

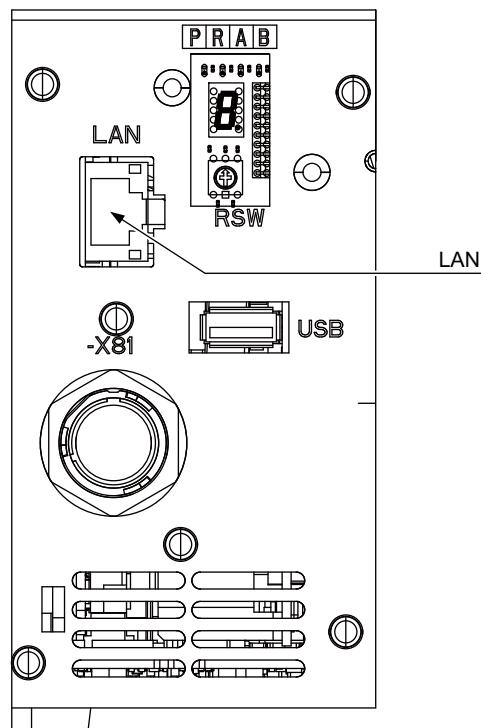
1.3 Ethernet Cable Connections

Connect the Ethernet cable (shielded cable: category 5 or more) to the LAN connector, which is located on the front panel of the YRC1000micro. For the details of the recommended Ethernet cable and the switching hub, refer to *chapter 11.4 “Recommended Cable and Switching Hub”*.



To the enabled LAN interface, the YRC1000micro confirms the presence or the type of the connected cable when starting. To avoid performing an unnecessary check process, enable the interface only when an Ethernet cable is actually connected.

Fig. 1-2: Front View of the YRC1000micro (LAN Connector Part)



1.4 Notes When Loading the Data

When loading the data, take extra care about the following notes.



PARAMETER, SYSTEM DATA, I/O DATA, and SYSTEM BACKUP (CMOS.BIN) including the information of the former three data, contain unique information of the controller. These data are prepared as backups for reloading into the same controller where the data have been saved.

If the data saved in a different controller is loaded, the system data may be damaged or lost, or the system may perform an unexpected operation or may not start up normally.

Do not load the backup data into a different controller.

Even if the same job is loaded into two different controllers, paths of the manipulators will be different because of the differences in their home positions and mechanical components.

Make sure to check the operation with due care before actual operations.

Be careful in managing the saved data.



- When the ladder program of the DX200 is tried to be loaded into the YRC1000micro, the confirmation dialog “Load the CIOPRG of past product?” is displayed. Select “YES” to load the ladder program of the DX200. If [CAN-CEL] is pressed or “NO” is selected while this dialog is displayed, the ladder program is not loaded.
- Before loading the ladder program of the DX200 into the YRC1000micro, make sure to confirm that the application(s) of the DX200 and the application(s) of the YRC1000micro are the same.
Load the ladder program only when the kinds and the numbers of the application(s) of the DX200 and the YRC1000micro are the same. (For example, “Material handling, press tending, cutting, and other applications” and “Material handling, press tending, cutting, and other applications + Material handling, press tending, cutting, and other applications” are recognized as different applications.)
- The ladder program of the DX100 can also be loaded into the YRC1000micro.
- In order to use a new function added for the DX200 or later, reflect the content edited in the DX100/DX200 in the ladder program of the YRC1000micro. Do not load the ladder program of the DX100/DX200 into the YRC1000micro.

 2 LAN Interface Setting and Network Communication Confirmation
 2.1 LAN Interface Setting

2 LAN Interface Setting and Network Communication Confirmation

2.1 LAN Interface Setting

2.1.1 Setting procedure

For performing the data communication by using the Ethernet, first perform the LAN interface settings. These settings are required for using the data communication described in this manual.



- Perform the settings in the management mode.
- For the operation mode or the editing mode, the only reference for the settings status is available.

1. Turn ON the power supply while pressing {Main Menu}. Maintenance mode starts.



2. Set the security mode to the "MANAGEMENT MODE".

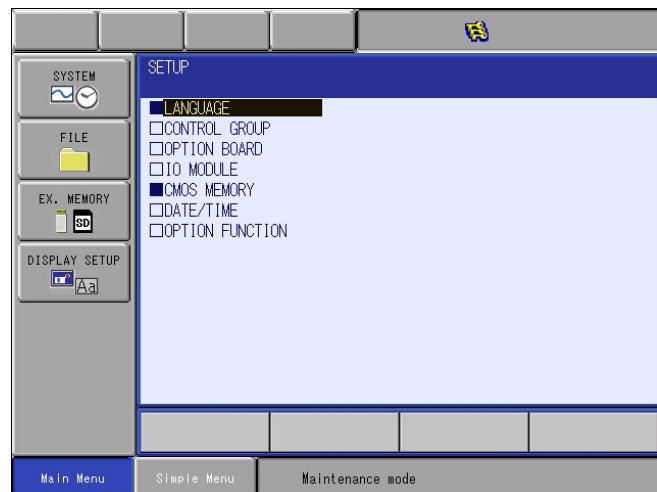


2 LAN Interface Setting and Network Communication Confirmation
2.1 LAN Interface Setting

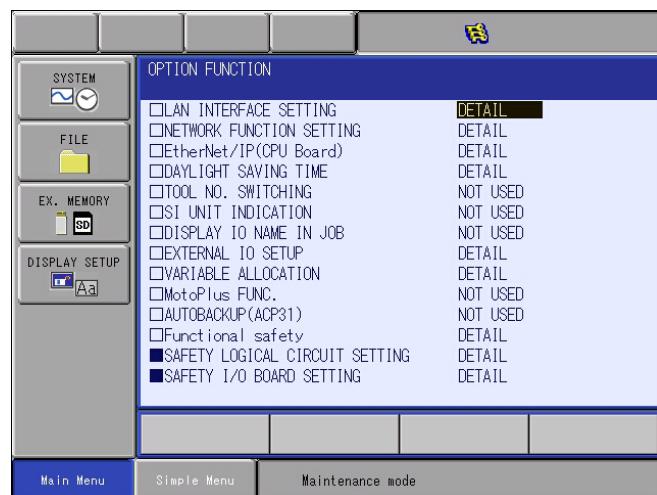
3. Select {SYSTEM} under the Main Menu.
 Sub menu appears.



4. Select {SETUP}.
 The SETUP window appears.

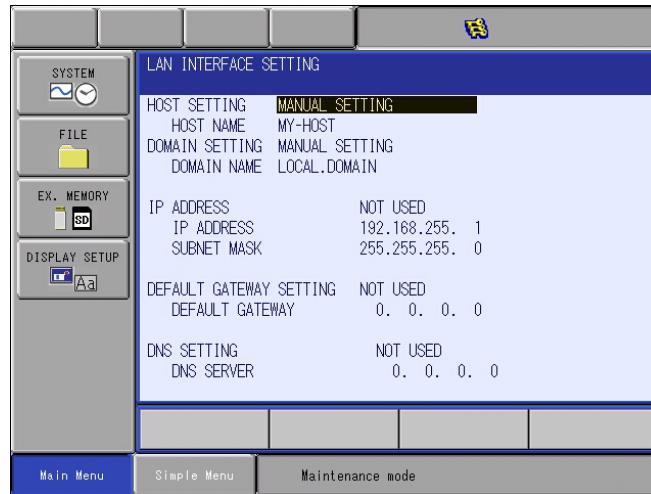


5. Select "OPTION FUNCTION".
 The OPTION FUNCTION window appears.

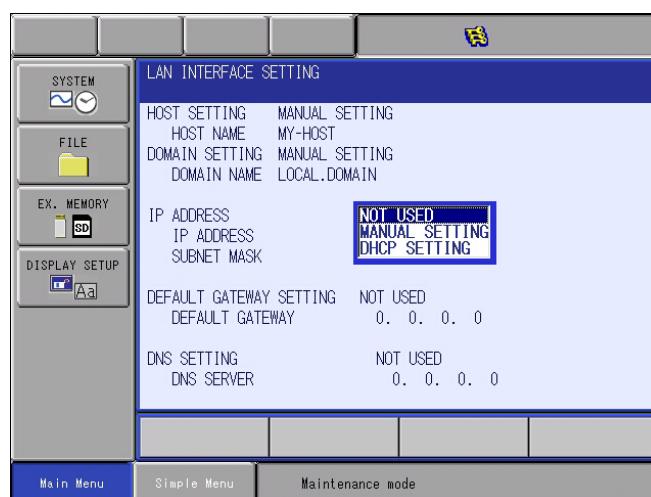


2 LAN Interface Setting and Network Communication Confirmation
2.1 LAN Interface Setting

6. Select “DETAIL” of the “LAN INTERFACE SETTING”.
The LAN INTERFACE SETTING window appears.



7. Select “IP ADDRESS”.
The pull-down menu appears, and then select either “MANUAL SETTING” or “DHCP SETTING”.

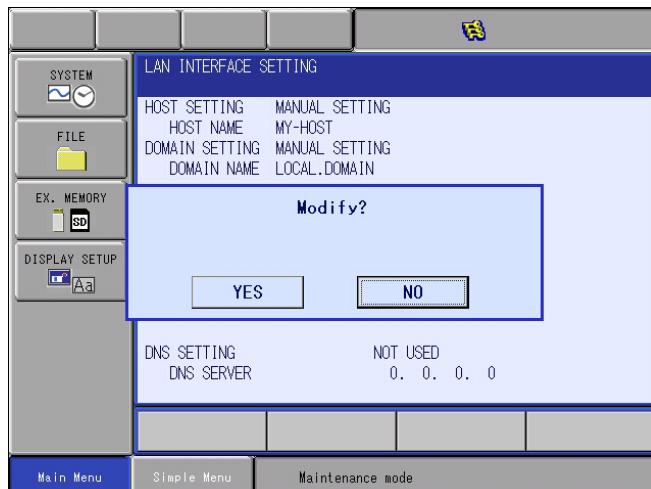


2 LAN Interface Setting and Network Communication Confirmation
2.1 LAN Interface Setting

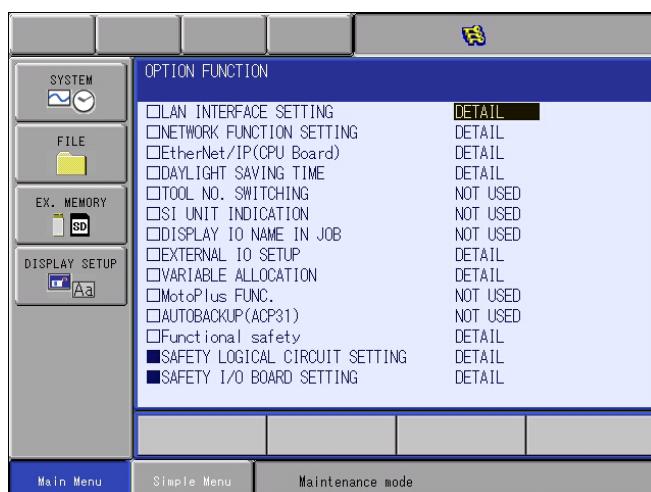
8. Select the communication parameter which requires changing.
 After “IP ADDRESS” is enabled, select other communication parameters that require changing.
 If using the pull-down menu, the parameters can be selected.
 For direct input, the virtual keyboard can be used.



9. Press [Enter].
 The confirmation dialog box appears.



10. Select {YES}.
 Select {YES} to return to the OPTION FUNCTION window.



	2	LAN Interface Setting and Network Communication Confirmation
	2.1	LAN Interface Setting

11. Turn OFF/ON the power supply again.
Turn OFF/ON the power supply again to start the normal operation mode.

2.1.2 LAN Interface Setting Item

In the LAN interface settings, perform the following settings.

2.1.2.1 Host Setting

Select the host name setting method of the YRC1000micro from the pull-down menu.

MANUAL SETTING: The character string set in the following item is used as the host name.

DCHP SETTING: The host name is acquired from the DCHP server.

■ HOST NAME

If "MANUAL SETTING" is set for host setting method, enter the host name by using the character string.

Characters which can be used for the host name are half-width alphanumeric characters, hyphens (-) and underscores (_).

Include one or more alphabetic character, and set the name to within 32 characters.

2.1.2.2 Setting the Domain

Select the domain name of the YRC1000micro setting method from the pull-down menu.

MANUAL SETTING: The character string set in the following item is used as the domain name.

DCHP SETTING: The domain name is acquired from the DCHP server.

■ DOMAIN NAME

If "MANUAL SETTING" is set for domain setting method, enter the domain name by using the character string.

Characters which can be used for the domain name are half-width alphanumeric characters, hyphens (-) and underscores (_).

Include one or more alphabetic character, and set the name to within 32 characters.

2.1.2.3 IP Address

Select the IP address setting method from the pull-down menu.

NOT USED: LAN is not used.

MANUAL SETTING: The value set in the following item is used as the IP address/subnet mask.

DCHP SETTING: The IP address is acquired from the DCHP server.

 2 LAN Interface Setting and Network Communication Confirmation
 2.1 LAN Interface Setting

■ **IP ADDRESS**

If “MANUAL SETTING” is set for IP address setting method, set the IP address to this item. Use half-width numbers and periods (.) for the IP address, and set “xx.xx.xx.xx” using the following format: xx is decimal number from 0 to 255.

(Example) 192.168.255.1



YRC1000micro supports only IPv4 and does not support IPv6.

[10.0.0.xx] (xx: 0 to 255) cannot be used for the IP address.

■ **SUBNET MASK**

If “MANUAL SETTING” is set for IP address setting method, set the subnet mask to this item. Use half-width numbers and periods (.) for the subnet mask, and set “xx.xx.xx.xx” using the following format: xx is decimal number from 0 to 255.

(Example) 255.255.255.0

2.1.2.4 Default Gateway

Select the default gateway of the YRC1000micro setting method from the pull-down menu.

NOT USED: The default gateway is not used.

MANUAL SETTING: The value set in the following item is used as the default gateway.

DCHP SETTING: The default gateway is acquired from the DCHP server.

■ **DEFAULT GATEWAY**

If “MANUAL SETTING” is set for default gateway setting method, set the default gateway to this item. Use half-width numbers and periods (.) for the default gateway, and set “xx.xx.xx.xx” using the following format: xx is decimal number from 0 to 255.

(Example) 192.168.255.200

2.1.2.5 DNS Setting

For using the DNS (Domain Name System) client function, and for the setting method of DNS server when using the DNS client function, select from the pull-down menu.

NOT USED: The DNS is not used.

MANUAL SETTING: The value set in the following item is used as the DNS server.

DCHP SETTING: The DNS Server is acquired from the DCHP server.

■ **DNS SERVER**

If “MANUAL SETTING” is set for DNS setting method, set the IP address of the DNS server to this item. Use half-width numbers and periods (.) for the IP address of the DNS server, and set “xx.xx.xx.xx” using the following format: xx is decimal number from 0 to 255.

2 LAN Interface Setting and Network Communication Confirmation
2.1 LAN Interface Setting

2.1.2.6 SNTP Setting

For using the SNTP (Simple Network Time Protocol) client function, and for the setting method of SNTP server when using the SNTP client function, select from the pull-down menu.

NOT USED: The SNTP is not used.

MANUAL SETTING: The value set in the following item is used as the SNTP server.

DCHP SETTING: The SNTP Server is acquired from the DCHP server.

■ **SNTP SERVER**

If “MANUAL SETTING” is set for SNTP setting method, set the SNTP setting to this item. Use half-width numbers and periods (.) for the SNTP server IP address, and set “xx.xx.xx.xx” using the following format: xx is decimal number from 0 to 255.

Note that if the DNS client function is enabled, the FQDN (Fully Qualified Domain Name: “Hostname@domainname” name format) can also be set. Characters which can be used for the FQDN are half-width alphanumeric characters, hyphens (-), underscores (_) and the at-sign (@) which is the character boundary between the host name and the domain name. Set it within 128 characters or less.

■ **TIME DIFFERENCE FROM UTC**

The time that can be acquired by using SNTP is UTC (Coordinated Universal Time). To calculate the local time from UTC, enter the time difference between UTC and the local time.

Every time a symbol is selected, “+” and “-” switches. Enter half-width numeric characters for each hour and minute. The settable range is from -12:00 to +14:00.

■ **INQUIRY INTERVAL (H)**

Enter a time interval for making an inquiry to the SNTP server. Enter the hour (H) using half-width numeric characters. The settable range is 10 to 99.

2.2 Daylight Saving Time Setting

If the SNTP client function is enabled, Daylight Savings Time can be used. When performing the Daylight Savings Time settings, in continuation from the LAN interface settings, perform the following settings in maintenance mode.

1. Select {SYSTEM} under the Main Menu.
Sub menu appears.

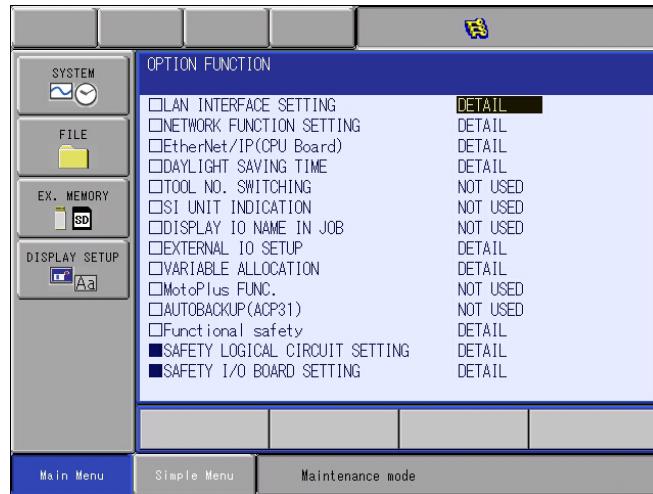


2. Select {SETUP}
- The SETUP window appears.

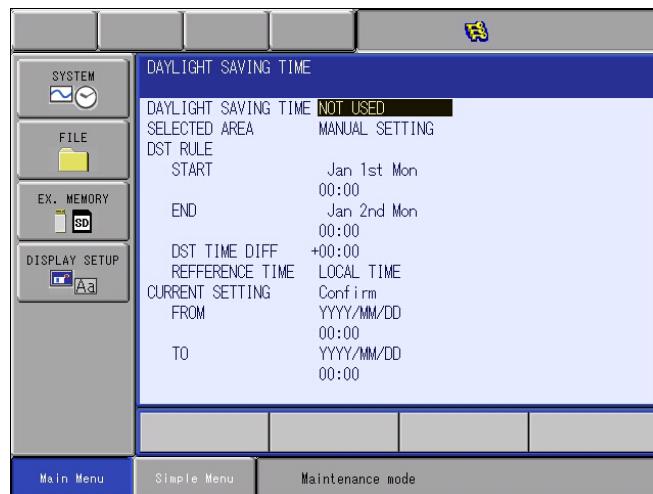


2 LAN Interface Setting and Network Communication Confirmation
2.2 Daylight Saving Time Setting

3. Select “OPTION FUNCTION”.
The OPTION FUNCTION window appears.



4. Select “DETAIL” of the “DAYLIGHT SAVING TIME”.
The DAYLIGHT SAVING TIME setting window appears.



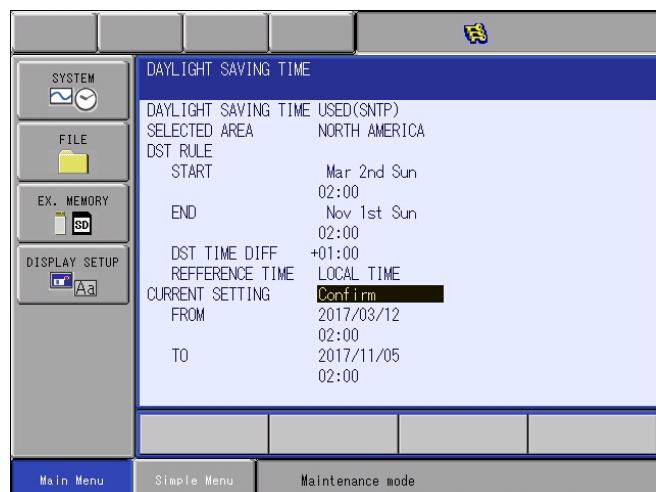
5. Select “NOT USED” of the “DAYLIGHT SAVING TIME”.
Every time this item is selected, “USED” and “NOT USED(SNTP)” switches.

2 LAN Interface Setting and Network Communication Confirmation
2.2 Daylight Saving Time Setting

6. Select “MANUAL SETTING” of the “SELECTED AREA”.
The pull-down menu appears, then select either MANUAL SETTING or the area to apply.
When selecting the manual setting, also set “START” / “END” / “DST TIME DIFF” / “PREFERENCE TIME”.



7. Select “Confirm” of the “CURRENT SETTING”.
The results of the setting are displayed, confirm that the items are selected correctly.

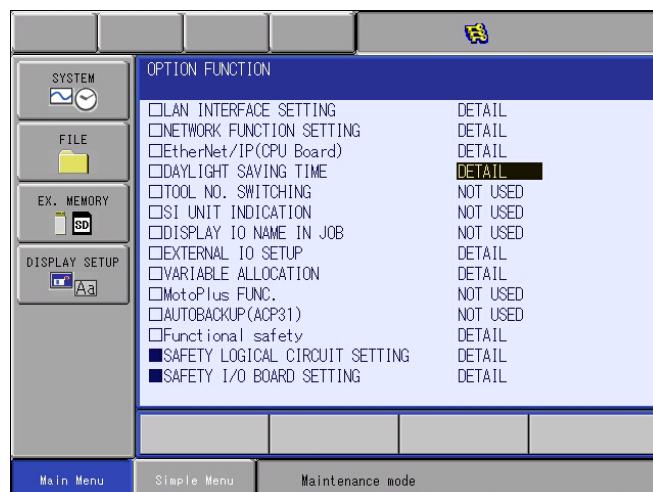


2 LAN Interface Setting and Network Communication Confirmation
2.2 Daylight Saving Time Setting

8. Press [ENTER].
The confirmation dialog box appears.



9. Select {YES}.
- Return to the OPTION FUNCTION window.



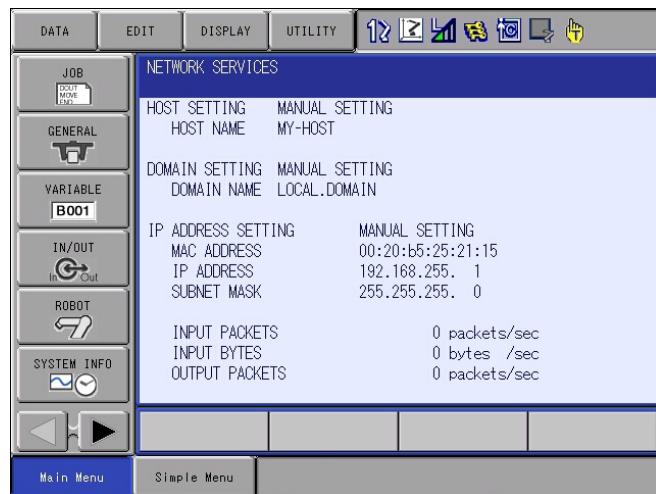
-
- 2 LAN Interface Setting and Network Communication Confirmation
2.3 LAN Interface Setting Confirmation
-

2.3 LAN Interface Setting Confirmation

LAN interface setting content and operation state can be confirmed on the network service window of the normal operation mode.

2.3.1 LAN Interface Setting Confirmation Method

1. Set the security mode to the “MANAGEMENT MODE”.
2. Select {SYSTEM INFO} - {NETWORK SERVICE}.
The following window appears.



2.3.2 Information Displayed on the Network Service Window

On the network service window, the following information appears.

2.3.2.1 Host Setting

Shows the setting method of the current host name.

■ HOST NAME

Shows the current host name.

In case failed to acquire the host name from the specified DHCP server, the previous setting value appears.

2.3.2.2 Domain Setting

Shows the setting method of the current domain name.

■ DOMAIN NAME

Shows the current domain name.

In case failed to acquire the domain name from the specified DHCP server, this item is not displayed.

	2	LAN Interface Setting and Network Communication Confirmation
	2.3	LAN Interface Setting Confirmation

2.3.2.3 IP Address

Shows the setting method of the current IP address.

■ MAC ADDRESS

Shows the LAN interface MAC address.

If “NOT USED” is set for the LAN interface, “00:00:00:00:00:00” is displayed.

■ IP ADDRESS

Shows the current LAN interface IP address.

■ SUBNET MASK

Shows the current LAN interface subnet mask.

■ INPUT PACKETS

Shows the number of received packets of the LAN interface during the latest one second period.

■ INPUT BYTES

Shows the number of received bytes from the LAN interface during the latest one second period.

■ OUTPUT PACKETS

Shows the number of sent packets of the LAN interface during the latest one second period.

■ OUTPUT BYTES

Shows the number of sent bytes from the LAN interface during the latest one second period.

■ LEASE OBTAINED

If the DHCP resource is assigned to the LAN interface, shows the start date and time of the lease for the resource.

■ LEASE EXPIRES

If the DHCP resource is assigned to the LAN interface, shows the duration of that lease for the resource.

2.3.2.4 Default Gateway

Shows the setting method of the current default gateway.

■ DEFAULT GATEWAY

Shows the current default gateway.

2	LAN Interface Setting and Network Communication Confirmation
2.3	LAN Interface Setting Confirmation

2.3.2.5 DNS Setting

Shows the setting method of the current DNS.

- **DNS SERVER**

Shows the current DNS server.

2.3.2.6 SNTP Setting

Shows the setting method of the current SNTP.

- **SNTP SERVER**

Shows the current SNTP server.

- **TIME DIFFERENCE FROM UTC**

Shows the time difference from UTC.

- **INQUIRY INTERVAL (H)**

Shows the inquiry interval.

-
- 2 LAN Interface Setting and Network Communication Confirmation
2.4 Network Communication Confirmation
-

2.4 Network Communication Confirmation

The device that supports the TCP/IP network usually supports “ping” commands. By using this command, the fundamental network communication can be confirmed. If there is no response to the “ping” command, or the response is extremely slow, there is a possibility that either a wiring problem, a hardware defect, or a network setting error is occurring. Thus investigate the cause and take measures.

2.4.1 Network Communication Confirmation from Windows PC

For a Windows PC, at the command prompt, “ping” command can be executed with “ping ‘communication target IP address’”.

Fig. 2-1: Ping Execution Example

C:/>ping 192.168.255.100

Pinging 192.168.255.100 with 32 bytes of data:

Reply from 192.168.255.100: bytes=32 time=1ms TTL=254
Reply from 192.168.255.100: bytes=32 time=1ms TTL=254
Reply from 192.168.255.100: bytes=32 time=1ms TTL=254
Reply from 192.168.255.100: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.255.100:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

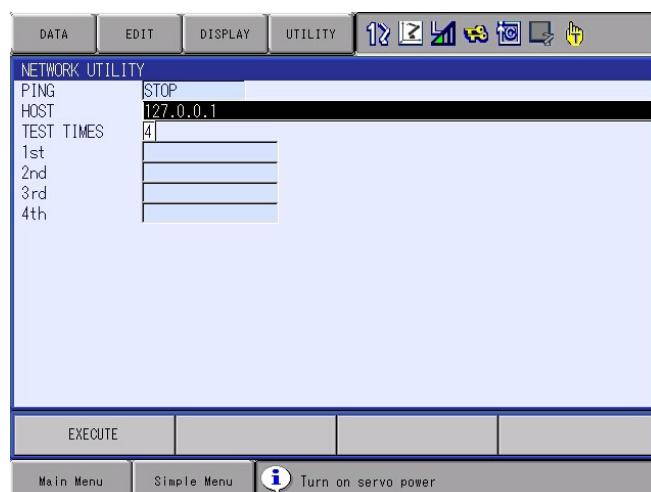
Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:/>

2.4.2 Network Communication Confirmation from the YRC1000micro

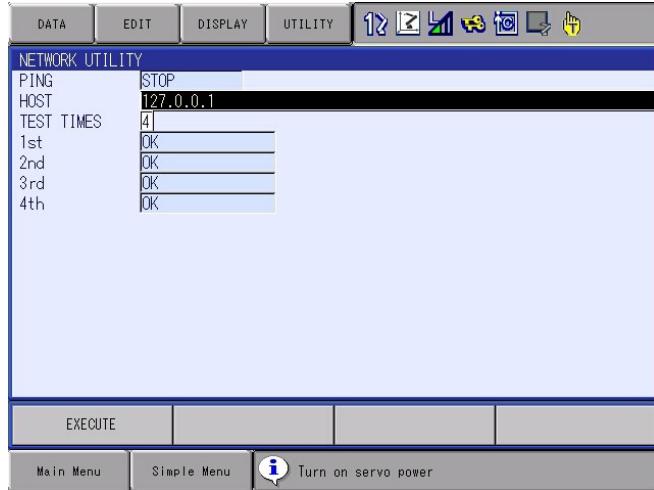
For the YRC1000micro, a “ping” command can be executed in accordance with the following procedure.

1. Select {SYSTEM INFO} - {NETWORK UTILITY} under the Main Menu.
The following window appears.

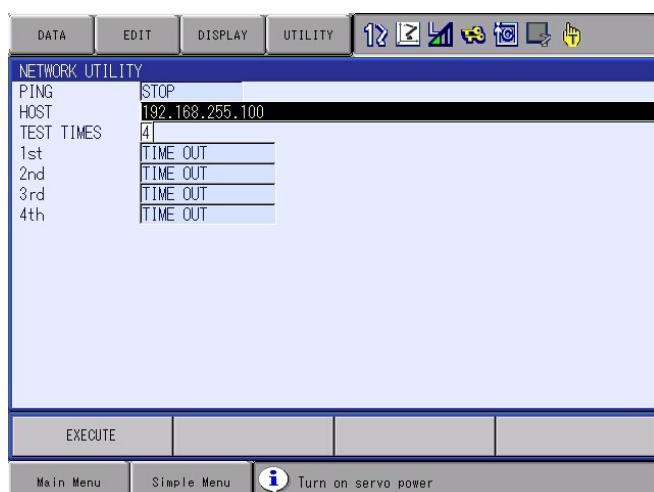


2 LAN Interface Setting and Network Communication Confirmation
2.4 Network Communication Confirmation

2. Set the IP address of the communication target in “HOST”, and set the number of ping command sending times (1 to 4) in “TEST TIMES”, and then select {EXECUTE}.
3. If a ping command response is received, “OK” appears.



4. If sending or receiving fails, a comment appears in response to the situation.
 - The connection timed out: “TIME OUT”
 - DNS error: “HOST NAME ERROR”
 - Other error: “OTHER ERROR”
 - Suspended: “ ”



3 High-Speed Ethernet Server Function

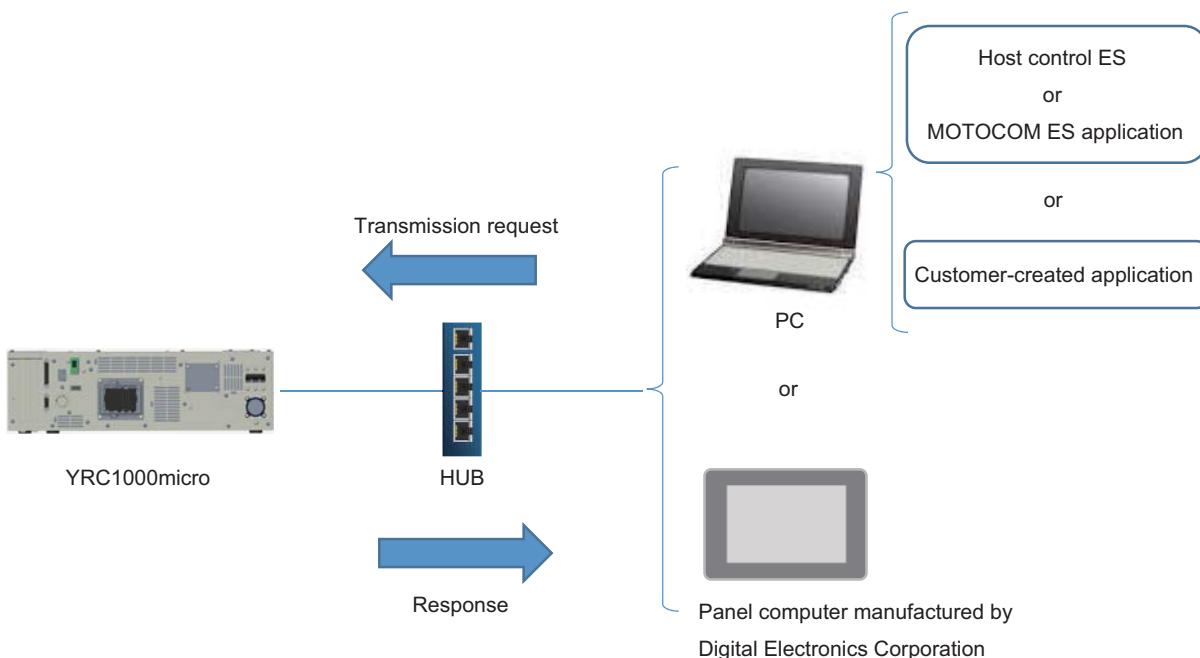
3.1 Outline

The high-speed Ethernet server function, by using a simple and high-speed YASKAWA original communication protocol, can send / receive the YRC1000micro internal data, monitor the manipulator status, and control the manipulator, by operating from the PC, etc. The YRC1000micro internal data batch file (CMOSBK.BIN) can also be saved.

3.1.1 System Configuration

The high-speed Ethernet server function can be used with the following configuration.

Fig. 3-1: System Configuration When Using the High-Speed Ethernet Server Function



3.1.2 Communication Target

The following can be used as a communication target of the high-speed Ethernet server function.

Table 3-1: High-speed Ethernet Server Function Communication Target

Device	Software	Details
Windows PC	Host control ES	Application software included with the MOTOCOM32 which is an optional function.
	MOTOCOMES application	Customer-created communication application software by using the communication DLL included in the MOTOCOM32 which is an optional function.
	Customer-created application	A communication application software created by customer by referring to the procedures described later.
Panel computer manufactured by Digital Electronics Corporation	YRC1000micro cockpit parts, etc.	For details, contact Digital Electronics Corporation.
Device with which Ethernet communication is available	Customer-created application	By referring the communication procedure described later, a customer-created communication application software

3.1.3 Restriction

① Restriction of the function by the remote mode

Sending and Receiving of the file can be executed only when the command remote is enabled.

For command remote, refer to *chapter 1.2 “Command Remote Setting for YRC1000micro”*.

② Restriction of the function by parameters

If inputting the variables and I/O during the play mode and the edit-lock status, permission from the parameter is required. For details, refer to *chapter 11.2 “Related Parameter”*.

③ Simultaneous use with other transmission functions

No error may occur when other communication function is performed simultaneously with the High Speed Ethernet Server function, however it would not be performed until the process of other communication function is completed.

 3 High-Speed Ethernet Server Function
 3.2 Setting

3.2 Setting

3.2.1 Basic Setting

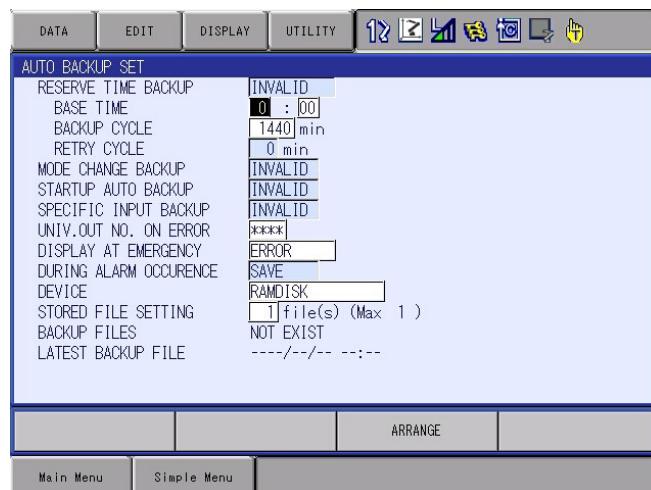
The YRC1000micro purchased with the Ethernet function is shipped after the basic settings of the high-speed Ethernet server function is completed.

3.2.2 Batch Data Back-up Function Setting

Batch data backup is a function which backs up the data saved in the YRC1000micro such as system settings or operation conditions via the high-speed Ethernet server function's commands by using the YRC1000micro automatic backup function.

When using this function, perform the following settings.

1. Set the security mode to the “MANAGEMENT MODE”.
2. Select {SETUP} - {AUTO BACKUP SET}.
The AUTO BACKUP SET window appears.
3. Set the “DEVICE” to “RAMDISK”.



- For details of the automatic backup function, refer to “Chap. 9.6 Automatic Backup Function” in “YRC1000micro INSTRUCTIONS (RE-CTO-A222)”.
- The backup batch data that uses the high-speed Ethernet server function is not created by the automatic backup function in advance, transmit the data which are created at the transmitting request.
- For operations which the backed-up batch data that uses the high-speed Ethernet server function is written to the YRC1000micro, refer to “Chap. 9.7 Loading the Backup Data from the SD Card” in “YRC1000micro INSTRUCTIONS (RE-CTO-A222)”.
- While an alarm is occurring, the device cannot be changed on the AUTO BACKUP SET window. In this case, cancel the alarm, and then change the device first.
- For the parameter S2C680=0, “RAMDISK” will not appear on the DEVICE in the “AUTO BACKUP SET” window. In this case, confirm the setting of the parameter S2C680.



NOTE

When performing this setting, the automatic backup to the SD Card is not performed. Also, this setting cannot be used together with the CMOS saving function via FTP, which is described later.

- When using this function, the maximum number of files to be saved is one. (The saved file name must be "CMOSBK.BIN".)

3.2.3 Command Remote Setting

When sending and receiving files, set the command remote to "VALID".

For procedures to enable the command remote, refer to *chapter 1.2.3 "Command Remote Setting Method"*.

3.3 Communication Method

3.3.1 Packet Format

Transmission packet of the high-speed Ethernet server function is composed of header part (32 Byte) + data part (changeable: 479 Byte at max.)

The transmission packet consists of “request”, which transmits the data from the PC to the YRC1000micro, and “answer”, which transmits the data from the YRC1000micro to the PC.

The sub-header setting composition of “request” and “answer” are different. And the setting value of the “answer” varies in accordance with the replying contents.

Followings are the format of each packet.

Request (the PC to the YRC1000micro)



A table showing the structure of a request packet. The first four columns (Byte 0 to Byte 3) are highlighted in green and labeled "4 Byte". A bracket on the right side of the table groups these four columns and is labeled "Header part (fixed to 32Byte)".

Type	Byte 0	Byte 1	Byte 2	Byte 3
Identifier	Fixed character strings for identification (YERC)			
Data size	Header part size (fixed to 0x20)		Data part size (variable value)	
Reserve 1 / processing division	Reserve 1 (fixed to “3”)	Processing division	ACK	Request ID
Block No.				
Reserve 2	Reserve2 (fixed to “99999999”)			
Sub-header	Command No.		Instance	
	Attribute	Service (when requested)	Padding	
Data division	Data division (variable:479Byte at maximum)			

Answer (the YRC1000micro to the PC)

4 Byte

Type	Byte 0	Byte 1	Byte 2	Byte 3
Identifier	Fixed character strings for identification (YERC)			
Data size	Header part size (fixed to 0x20)		Data part size (variable value)	
Reserve 1 / processing division	Reserve 1 (fixed to "3")	Processing division	ACK	Request ID
Block No.	Allocate the block number from 0 to 0x7fff_ffff Add 0x8000_0000 to the last block			
Reserve 2	Reserve 2 (fixed to "99999999")			
Sub-header	Service (when replying)	Status: When normal operation: 0x00 When abnormal operation: 0x1f other than 0x1f ¹⁾	Added status size	Padding
	Added status size		Padding	
Data division	Data division (variable: 479Byte at maximum)			

Header part
(fixed to 32Byte)

1 For details of the status and the added status, refer to chapter 3.4 "Response Code".

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Details of the Settings for the Header

Item	Data size	Settings
Identifier	4Byte	Fixed to "YERC"
Header part size	2Byte	Size of header part (fixed to 0x20)
Data part size	2Byte	Size of data part (variable)
Reserve 1	1Byte	Fixed to "3"
Processing division	1Byte	1: robot control 2: file control
ACK	1Byte	0: Request 1: Other than request
Request ID	1Byte	Identifying ID for command session (increment this ID every time the client side outputs a new command. In reply to this, server side answers the received value.)
Block No.	4Byte	Request: 0 Answer: add 0x8000_0000 to the last packet. Data transmission other than above: add 1 (max: 0x7fff_ffff)
Reserve 2	8Byte	Fixed to "99999999"
Sub-header (request)	Command No.	Execute processing by this command. (conforms to "Class" of CIP communication protocol)
	Instance	Define SECTION to execute a command. (conforms to "Instance" of CIP communication protocol)
	Attribute	Define SUB SECTION for executing a command. Attribute: (conforms to "Attribute" of CIP communication protocol)
	Service (request)	Define data accessing method.
Sub-header (answer)	Service (answer)	Add 0x80 to service (request).
	Status	0x00: normal reply 0x1f: abnormal reply (size of added status: 1 or 2) Other than 0x1f: abnormal reply (size of added status: 0) Refer to <i>chapter 3.4.1 "Status Code"</i>
	Added status size	Size of added status (0: not specified / 1: 1 WORD data / 2: 2 WORD data)
	Added status	Error code specified by added status size For details, refer to <i>chapter 3.4.2 "Added Status Code"</i>
Padding	Variable	Reserve area

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Details of sub-header

- Sub header (request)

Sub header (request)	Command No.		Instance
	Attribute	Service (request)	

- Sub header (answer/ normal)

Sub header (answer)	Service (answer)	Status: normal: 0x00	Added status: size: 0x00	Padding
	For details, refer to <i>chapter 3.4.2 “Added Status Code”.</i>			Padding

- Sub header (answer/ with added status at abnormal)

Sub header (answer)	Service (answer)	Status: abnormal: 0x1f	Added status: size:0x01	Padding
	For details, refer to <i>chapter 3.4.2</i> .			Padding

- Sub header (answer/ no added status at abnormal)

Sub header (answer)	Service (answer)	Status: abnormal: other than 0x1f	Added status: size: 0x00	Padding
	Added status:0x00000000			Padding

In the following cases, even though the YRC1000micro replies normal, there might be an added status.

- ① Added status 0xE2A7: the requested file does not exist.
- ② Added status 0xE29C: the requested file size is “0”.



For example; as for the ① and ② , the YRC1000micro returns the added status by the following cases.

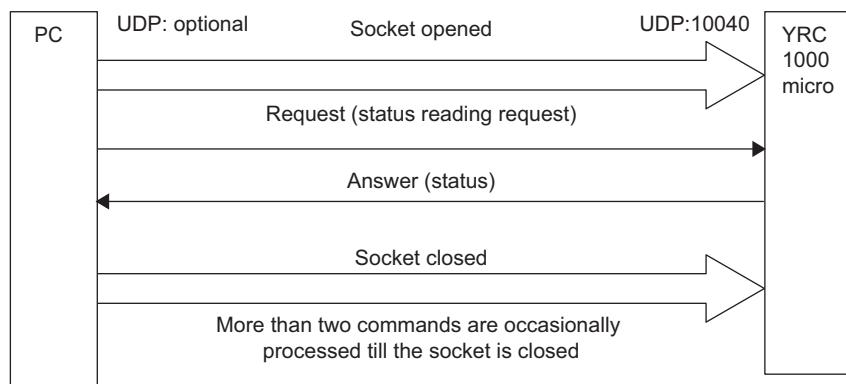
- The file list of the JOB data is requested even though there is no JOB data.
- There is no requested JOB.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.2 Transmission Procedure

The sending/receiving flow of the transmission packet is divided into robot control and file control. Please refer to *chapter 3.3.3 “Robot Control Command”* for the details of respective robot control commands (request/answer) and *chapter 3.3.4 “File Control Command”* for the details of respective file control commands.

[Ex. When Reading]

3.3.2.1 Robot Control/Status Reading


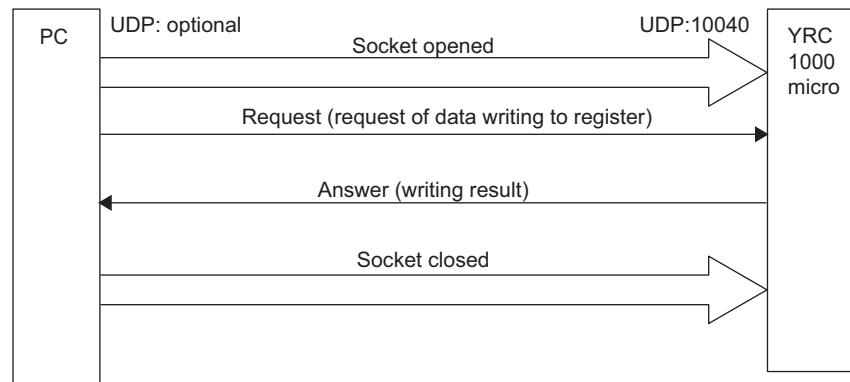
Request		<Format>					
"YERC"		Identifier					
0x0020	0x0000	Header part size		Data part size		ACK	Request ID
0x03	0x01	0x00	0x00	Reserve 1	Processing division		
0x0000_0000				Block No.			
"99999999"				Reserve 2			
0x0072	0x0001	Command No.		Instance			
0x00	0x01	0x0000	Attribute	Service		Padding	

Answer		<Format>									
"YERC"		Identifier									
0x0020	0x0000	Header part size		Data part size		ACK	Request ID				
0x03	0x01	0x01	0x00	Reserve 1	Processing division						
0x8000_0000				Block No.							
"99999999"				Reserve 2							
0x81	0x00	0x00	0x00	Service	Status	Added status size	Padding				
0x0000	0x0000	Added status		Padding							
Status data 1				Reading value 1							
Status data 2				Reading value 2							

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

[Ex. When Writing]

3.3.2.2 Robot Control/Data Writing to Register



Request

<Format>

"YERC"				Identifier			
0x0020		0x0002		Header part size		Data part size	
0x03	0x01	0x00	0x01	Reserve 1	Processing division	ACK	Request ID
0x0000_0000				Block No.			
'99999999'				Reserve 2			
0x0079		Register No.		Command No.		Instance	
0x00	0x02	0x0000		Attribute	Service	Padding	
Register data		Writing value					

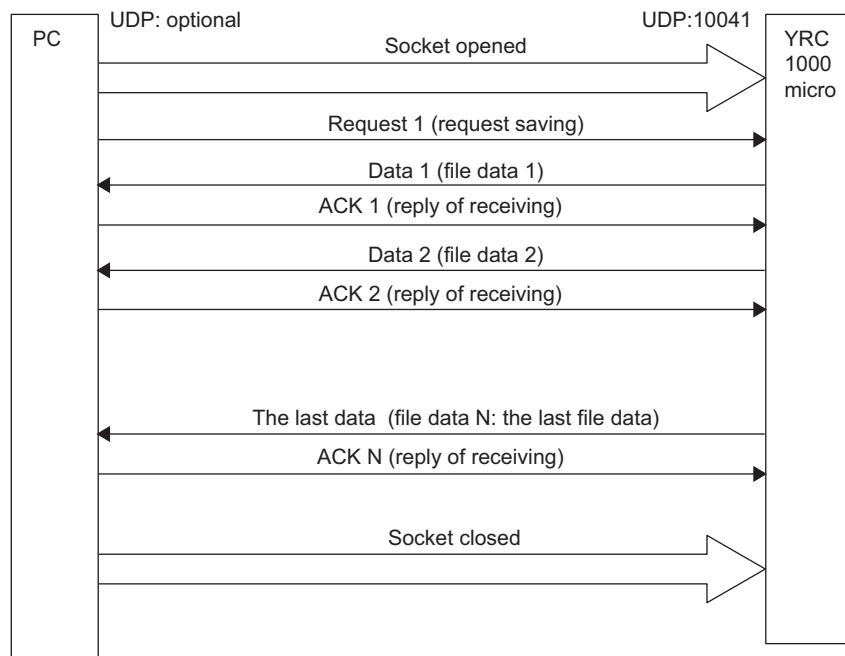
Answer

<Format>

'YERC'				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x01	0x01	0x01	Reserve 1	Processing division	ACK	Request ID
0x8000_0000				Block No.			
'99999999'				Reserve 2			
0x82	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	

3 High-Speed Ethernet Server Function
3.3 Communication Method

3.3.2.3 File Control (File Saving)



Request 1 <Format>

"YERC"				Identifier					
0x0020		0x000B		Header part size		Data part size			
0x03	0x02	0x00	0x02	Reserve 1	Processing division	ACK	Request ID		
0x0000_0000				Block No.					
"99999999"				Reserve 2					
0x00		0x0000		Command No.		Instance			
0x00	0x16	0x00		Attribute	Service	Padding			
T	E	S	T	File name					
J	O	B	.						
J	B	I							

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Data 1

<Format>

“YERC”				Identifier			
0x0020		0x01d f		Header part size		Data part size	
0x03	0x02	0x01	0x02	Reserve 1	Processing division	ACK	Request ID
0x0000_0001				Block No.			
“99999999”				Reserve 2			
0x96	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	
File data 1				File data 1			

ACK1

<Format>

“YERC”				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x02	Reserve 1	Processing division	ACK	Request ID
0x0000_0001				Block No.			
“99999999”				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x00	0x16	0x00		Attribute	Service	Padding	

Data 2

<Format>

“YERC”				Identifier			
0x0020		0x01df		Header part size		Data part size	
0x03	0x02	0x01	0x02	Reserve 1	Processing division	ACK	Request ID
0x0000_0002				Block No.			
“99999999”				Reserve 2			
0x96	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	
File data 2				File data 2			

3 High-Speed Ethernet Server Function
3.3 Communication Method

ACK2

<Format>

"YERC"				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x02	Reserve 1	Processing division	ACK	Request ID
0x0000_0002				Block No.			
"99999999"				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x00	0x16	0x00		Attribute	Service	Padding	

The last data (N)

<Format>

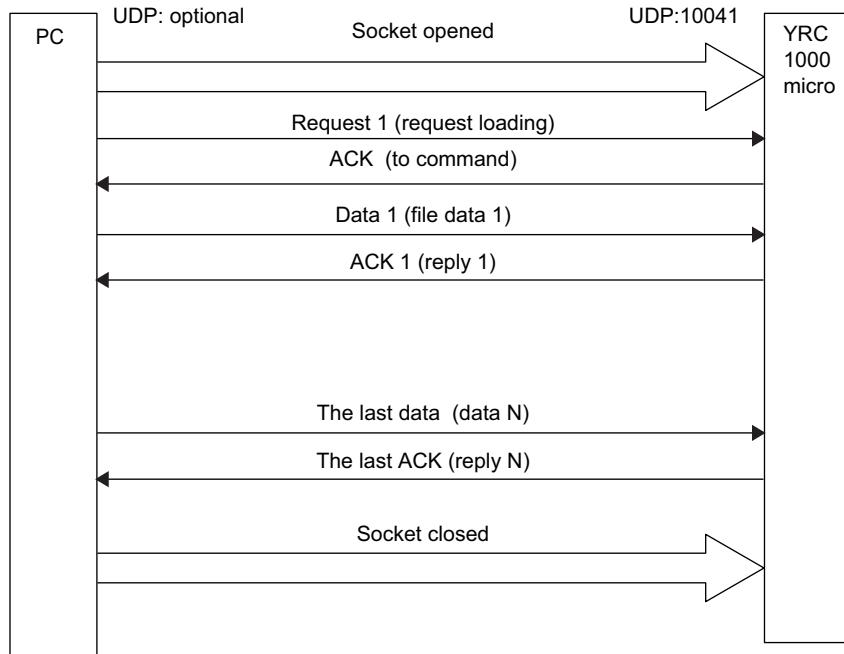
"YERC"				Identifier			
0x0020		0x0008		Header part size		Data part size	
0x03	0x02	0x01	0x02	Reserve 1	Processing division	ACK	Request ID
0x8000_000N				Block No.			
"99999999"				Reserve 2			
0x96	0x00	0x00	0x00	Service	status	Added status size	Padding
0x0000		0x0000		Added status		Padding	
File data N				File data N			

The last ACK (N)

<Format>

"YERC"				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x02	Reserve 1	Processing division	ACK	Request ID
0x8000_000N				Block No.			
"99999999"				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x00	0x16	0x00		Attribute	Service	Padding	

3.3.2.4 File Control (File Loading)



Request 1

<Format>

"YERC"				Identifier					
0x0020		0x000B		Header part size		Data part size			
0x03	0x02	0x00	0x03	Reserve 1	Processing division	ACK	Request ID		
0x0000_0000				Block No.					
"99999999"				Reserve 2					
0x00		0x0000		Command No.		Instance			
0x0000	0x15	0x00		Attribute	Service	Padding			
T	E	S	T	File name					
J	O	B	.						
J	B	I							

ACK (to request)

<Format>

"YERC"				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x03	Reserve 1	Processing division	ACK	Request ID
0x0000_0000				Block No.			
"99999999"				Reserve 2			
0x95	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Data 1

<Format>

"YERC"				Identifier			
0x0020		0x01df		Header part size		Data part size	
0x03	0x02	0x01	0x03	Reserve 1	Processing division	ACK	Request ID
0x0000_0001				Block No.			
"99999999"				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x0000	0x15	0x00		Attribute	Service	Padding	
File data 1				File data 1			

ACK1

<Format>

"YERC"				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x03	Reserve 1	Processing division	ACK	Request ID
0x0000_0001				Block No.			
"99999999"				Reserve 2			
0x95	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	

The last data (N)

<Format>

"YERC"				Identifier			
0x0020		0x0008		Header part size		Data part size	
0x03	0x02	0x01	0x03	Reserve 1	Processing division	ACK	Request ID
0x8000_000N				Block No.			
"99999999"				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x0000	0x15	0x00		Attribute	Service	Padding	
File data N				File data N			

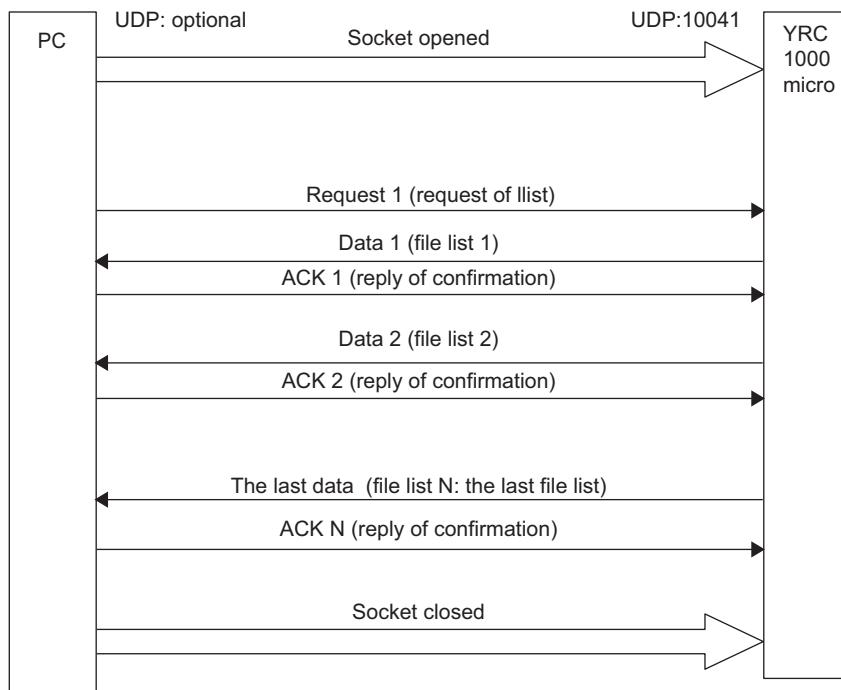
The last ACK (N)

<Format>

“YERC”				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x03	Reserve 1	Processing division	ACK	Request ID
0x8000_000N				Block No.			
“99999999”				Reserve 2			
0x95	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	

3 High-Speed Ethernet Server Function
3.3 Communication Method

3.3.2.5 File Control (File List)



Request 1

<Format>

"YERC"				Identifier			
0x0020		0x0005		Header part size		Data part size	
0x03	0x02	0x00	0x04	Reserve 1	Processing division	ACK	Request ID
0x0000_0000				Block No.			
"99999999"				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x00	0x32	0x0000		Attribute	Service	Padding	
*	.	J	B	File identification (refer to data details)			
I							

Data 1

<Format>

"YERC"				Identifier			
0x0020		0x01df		Header part size		Data part size	
0x03	0x02	0x01	0x04	Reserve 1	Processing division	ACK	Request ID
0x0000_0001				Block No.			
"99999999"				Reserve 2			
0xB2	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	
File list 1				File list 1 (refer to "Details of data")			

ACK1

<Format>

“YERC”				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x04	Reserve 1	Processing division	ACK	Request ID
0x0000_0001				Block No.			
“99999999”				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x00	0x32	0x0000		Attribute	Service	Padding	

Data 2

<Format>

“YERC”				Identifier			
0x0020		0x01df		Header part size		Data part size	
0x03	0x02	0x01	0x04	Reserve 1	Processing division	ACK	Request ID
0x0000_0002				Block No.			
“99999999”				Reserve 2			
0xB2	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	
File list 2				File list 2			

ACK2

<Format>

“YERC”				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x04	Reserve 1	Processing division	ACK	Request ID
0x0000_0002				Block No.			
“99999999”				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x00	0x32	0x0000		Attribute	Service	Padding	

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

The last data (N)

<Format>

“YERC”				Identifier			
0x0020		0x0008		Header part size		Data part size	
0x03	0x02	0x01	0x04	Reserve 1	Processing division	ACK	Request ID
0x8000_000N				Block No.			
“99999999”				Reserve 2			
0xB2	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	
File list N				File list N			

The last ACK (N)

<Format>

“YERC”				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x04	Reserve 1	Processing division	ACK	Request ID
0x8000_000N				Block No.			
“99999999”				Reserve 2			
0x00		0x0000		Command No.		Instance	
0x00	0x32	0x0000		Attribute	Service	Padding	

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Detail of data

Not specified	JBI list
.	JBI list
*.JBI	JBI list
*.DAT	DAT file list
*.CND	CND file list
*.PRM	PRM file list
*.SYS	SYS file list
*.LST	LST file list

Output form of the list

The list is described in the form of “file name” + <CR> + <LF> consecutively.

<Ex.>

'1'	'.'	'J'	'B'
'1'	<CR>	<LF>	'2'
'2'	'.'	'J'	'B'
'1'	<CR>	<LF>	'3'
'3'	'3'	'.'	'J'
'B'	'1'	<CR>	<LF>
'4'	'4'	'4'	'4'
'.'	'J'	'B'	'1'
<CR>	<LF>		

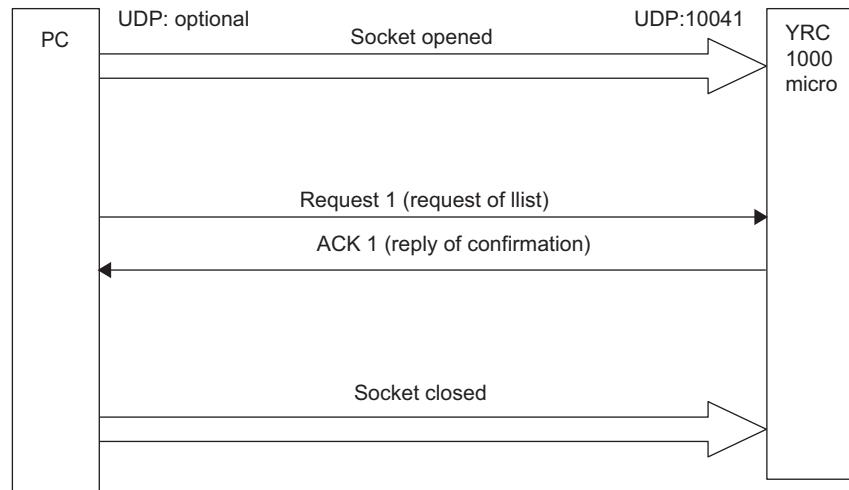
<CR><LF> means end-of -line

<CR> : Carriage Return

<LF> : Line Feed

3 High-Speed Ethernet Server Function
3.3 Communication Method

3.3.2.6 File Control (Deleting of file)



Request 1

<Format>

"YERC"				Identifier					
0x0020		0x000B		Header part size		Data part size			
0x03	0x02	0x00	0x05	Reserve 1	Processing division	ACK	Request ID		
0x0000_0000				Block No.					
"99999999"				Reserve 2					
0x00		0x0000		Command No.		Instance			
0x00	0x09	0x00		Attribute	Service	Padding			
T	E	S	T	File name					
J	O	B	.						
J	B	I							

ACK 1

<Format>

'YERC'				Identifier			
0x0020		0x0000		Header part size		Data part size	
0x03	0x02	0x01	0x05	Reserve 1	Processing division	ACK	Request ID
0x8000_0000				Block No.			
"99999999"				Reserve 2			
0x89	0x00	0x00	0x00	Service	Status	Added status size	Padding
0x0000		0x0000		Added status		Padding	

3.3.3 Robot Control Command

Follows are robot controlling commands which can use in the high-speed Ethernet communication.

Table 3-2: List of Robot Control Command

No.	Command No.	Name	Reference chapter
1	0x70	Alarm data reading command	Refer to chapter 3.3.3.1 .
2	0x71	Alarm history reading command	Refer to chapter 3.3.3.2 .
3	0x72	Status information reading command	Refer to chapter 3.3.3.3 .
4	0x73	Executing job information reading command	Refer to chapter 3.3.3.4 .
5	0x74	Axis configuration information reading command	Refer to chapter 3.3.3.5 .
6	0x75	Robot position data reading command	Refer to chapter 3.3.3.6 .
7	0x76	Position error reading command	Refer to chapter 3.3.3.7 .
8	0x77	Torque data reading command	Refer to chapter 3.3.3.8 .
9	0x78	I/O data reading / writing command	Refer to chapter 3.3.3.9 .
10	0x79	Register data reading / writing command	Refer to chapter 3.3.3.10 .
11	0x7A	Byte type variable (B) reading / writing command	Refer to chapter 3.3.3.11 .
12	0x7B	Integer type variable (I) reading / writing command	Refer to chapter 3.3.3.12 .
13	0x7C	Double precision integer type variable (D) reading / writing command	Refer to chapter 3.3.3.13 .
14	0x7D	Real type variable (R) reading / writing command	Refer to chapter 3.3.3.14 .
15	0x7E	16-byte character type variable (S) reading / writing command ¹⁾	Refer to chapter 3.3.3.15 .
16	0x7F	Robot position type variable (P) reading / writing command	Refer to chapter 3.3.3.16 .
17	0x80	Base position type variable (BP) reading / writing command	Refer to chapter 3.3.3.17 .
18	0x81	Station type variable (EX) reading / writing command	Refer to chapter 3.3.3.18 .
19	0x82	Alarm reset / error cancel command	Refer to chapter 3.3.3.19 .
20	0x83	HOLD / servo ON/OFF command	Refer to chapter 3.3.3.20 .
21	0x84	Step / cycle / Auto switching command	Refer to chapter 3.3.3.21 .
22	0x85	Character string display command to the programming pendant	Refer to chapter 3.3.3.22 .
23	0x86	Start-up (job START) command	Refer to chapter 3.3.3.23 .
24	0x87	Job select command	Refer to chapter 3.3.3.24 .
25	0x88	Management time acquiring command	Refer to chapter 3.3.3.25 .
26	0x89	System information acquiring command	Refer to chapter 3.3.3.26 .
27	0x300	Plural I/O data reading / writing command	Refer to chapter 3.3.3.27 .
28	0x301	Plural register data reading / writing command	Refer to chapter 3.3.3.28 .
29	0x302	Plural byte type variable (B) reading / writing command	Refer to chapter 3.3.3.29 .
30	0x303	Plural integer type variable (I) reading / writing command	Refer to chapter 3.3.3.30 .
31	0x304	Plural double precision integer type variable (D) reading / writing command	Refer to chapter 3.3.3.31 .
32	0x305	Plural real type variable (R) reading / writing command	Refer to chapter 3.3.3.32 .
33	0x306	Plural 16byte character type variable (S) reading / writing command ¹⁾	Refer to chapter 3.3.3.33 .
34	0x307	Plural robot position type variable (P) reading / writing command	Refer to chapter 3.3.3.34 .

3 High-Speed Ethernet Server Function
3.3 Communication Method

Table 3-2: List of Robot Control Command

No.	Command No.	Name	Reference chapter
35	0x308	Plural base position type variable (BP) reading / writing command	Refer to <i>chapter 3.3.3.35</i> .
36	0x309	Plural station type variable (EX) reading / writing command	Refer to <i>chapter 3.3.3.36</i> .
37	0x30A	Alarm data reading command (for applying the sub code character strings)	Refer to <i>chapter 3.3.3.37</i>
38	0x30B	Alarm history reading command (for applying the sub character strings)	Refer to <i>chapter 3.3.3.38</i>
39	0x8A	Move instruction command (Type Cartesian coordinates)	Refer to <i>chapter 3.3.3.39</i>
40	0x8B	Move instruction command (Type Pulse)	Refer to <i>chapter 3.3.3.40</i>
41	0x8C	32-byte character type variable (S) reading / writing command ²⁾	Refer to <i>chapter 3.3.3.41</i>
42	0x30C	Plural 32-byte character type variable (S) reading / writing command ²⁾	Refer to <i>chapter 3.3.3.42</i>

1 The command for S variable 16byte.

2 The command for S variable 32byte.



The size of the S variable is expanded to 32byte from 16byte in the DX200, the YRC1000, and the YRC1000micro. Use the 32byte character type variable (S) reading / writing command or the plural 32byte character type variable (S) reading / writing command. If use the 16byte character type variable (S) reading / writing command or the plural 16byte character type variable (S) reading / writing command, the robot controller returns by 16byte.

3.3.3.1 Alarm Data Reading Command

Request

Sub header part

<Details>

Command No.	0x70
Instance	Specify one out of followings 1: The latest alarm 2: The second alarm from the latest 3: The third alarm from the latest 4: The fourth alarm from the latest
Attribute	Specify one out of followings 1: Alarm code 2: Alarm data 3: Alarm type 4: Alarm occurring time 5: Alarm character string name
Service	<ul style="list-style-type: none"> • Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01

Up to four alarms are displayed on the P.P display at the same time. Specify one out of them.

Alarm code means the alarm No.
Alarm data means the sub code which supports the alarm contents. Some alarms may not appear as the sub code.

Specify the accessing method to the data.
0x0E: Read out data of the specified element number
0x01: Read out data of all the element number
(In this case, specify 0 to the element number.)

Data part

No data part

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: not specified • 1: 1 WORD • 2: 2 WORD
Added status	Error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

3 High-Speed Ethernet Server Function
3.3 Communication Method

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Alarm code				Range is from 0x0001 to 0x270F(decimal value: 9999)
2	Alarm data				For sub code, setting values vary in accordance with the contents of the alarm type. Also, some alarms are not displayed with the sub code. In this case, the value is zero (0x0).
3	Alarm type				<ul style="list-style-type: none"> 0 : No alarm 1 : Decimal UNSIGNED SHORT type (display example: [1]) 2 : UNSIGNED CHAR bit pattern (display example: [0000_0001]) 3 : User axis type (display example: [SLURBT]) 4 : Spacial coordinate type (display example: [XYZ]) 5 : Robot coordinate type (display example: [XYZRxRyRz]) 6 : Conveyor characteristic file (display example: [123]) 8 : Control group type (display example: [R1R2S1S2]) robot & station 9 : Decimal SHORT type (display example: [-1]) 10 : UNSIGNED SHORT bit pattern (display example: [0000_0000_0000_0001]) 11 : Control group type (display example: [R1]) for robot only 12 : Control group type (display example:[R1S1B1]) for robot, station and base 20 : Control group LOW/HIGH logical axis (display example: [R1:LOW SLURBT, HIGH SLURBT]) 21 : Control group MIN/MAX logical axis (display example: [R1: MIN SLURBT, MAX SLURBT]) 22 : Control group MIN/MAX spacial coordinate (display example: [R1: MIN XYZ, MAX XYZ]) 23 : Logical axis of both control group 1 and control group 2 (display example: [R1: SLURBT, R2: SLURBT]) 24 : Logical axis 1 and 2 of the control group (display example: [R1: SLURBT, SLURBT]) 25 : Logical axis of the control group and UNSIGNED CHAR type (display example: [R1: SLURBT, 1]) 27 : Control group and UNSIGNED CHAR type (display example: [R1: 1])
4	Alarm occurring time (Character strings of 16 letters) Ex.2011/10/10 15:49				
5					
6					
7					
8	Alarm character strings name (character strings: 32 letters)				It is transmitted in the form of the character strings whose language code was selected by the programming pendant and half- and full-width characters are mixed.
9					
10					
11					
12					
13					
14					
15					

 NOTE

For the alarm character strings name, it is transmitted in the form of the character strings whose language code was selected by the programming pendant.

Use the same language code as the YRC1000micro.
The characters corrupt when the client side does not correspond to the same language code as the YRC1000micro.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.2 Alarm History Reading Command

Request

Sub header part

<Details>

Command No.	0x71
Instance	Specify one out of followings • 1 to 100 • 1001 to 1100 • 2001 to 2100 • 3001 to 3100 • 4001 to 4100
Attribute	Specify one out of followings 1: Alarm code 2: Alarm data 3: Alarm type 4: Alarm occurring time 5: Alarm character strings name
Service	• Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01

Specify the accessing method to the data.

0x0E: Read out data of the specified element number

0x01: Read out data of all the element number
(In this case, specify 0 to the element number.)

Data part

No data part

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: not specified • 1: 1 WORD • 2: 2 WORD
Added status	Error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

32bit Integer	Byte 0	Byte 1	Byte 2	Byte3
1	Alarm code			
2	Alarm data			
3	Alarm type			
4	Alarm occurring time (Character strings of 16 letters) Ex.2011/10/10 15:49			
5				
6				
7				
8	Alarm character strings name (character strings: 32 letters)			
9				
10				
11				
12				
13				
14				
15				

<Details>

Range is from 0x0001 to 0x270F(decimal value: 9999)

Setting values vary in accordance with the contents of the alarm type. Also, some alarm are not displayed with the sub code. In this case, the value is 0 :0x0).

- 0 : No alarm
- 1 : Decimal UNSIGNED SHORT type
(display example: [1])
- 2 : UNSIGNED CHAR bit pattern
(display example: [0000_0001])
- 3 : User axis type (display example: [SLURBT])
- 4 : Spacial coordinate type (display example: [XYZ])
- 5 : Robot coordinate type
(display example: [XYZRxRyRz])
- 6 : Conveyor characteristic file (display example: [123])
- 8 : Control group type
(display example: [R1R2S1S2])
robot & station
- 9 : Decimal SHORT type (display example: [-1])
- 10 : UNSIGNED SHORT bit pattern
(display example: [0000_0000_0000_0001])
- 11 : Control group type (display example: [R1])
for robot only
- 12 : Control group type (display example:[R1S1B1])
for robot, station and base
- 20 : Control group LOW/HIGH logical axis
(display example: [R1: LOW SLURBT, HIGH SLURBT])
- 21 : Control group MIN/MAX logical axis
(display example: [R1: MIN SLURBT, MAX SLURBT])
- 22 : Control group MIN/MAX spacial coordinate
(display example: [R1: MIN XYZ, MAX XYZ])
- 23 : Logical axis of both control group 1 and control group 2
(display example: [R1: SLURBT, R2: SLURBT])
- 24 : Logical axis 1 and 2 of the control group
(display example: [R1:SLURBT, SLURBT])
- 25 : Logical axis of the control group and UNSIGNED CHAR type
(display example: [R1: SLURBT, 1])
- 27 : Control group and UNSIGNED CHAR type
(display example: [R: 1])

It is transmitted in the form of the character strings whose language code was selected by the programming pendant and half- and full-width characters are mixed.

3 High-Speed Ethernet Server Function
3.3 Communication Method



For the alarm character strings name, it is transmitted in the form of the character strings whose language code was selected by the programming pendant.

Use the same language code as the YRC1000micro.
The characters corrupt when the client side does not correspond to the same language code as the YRC1000micro.

3.3.3.3 Status Information Reading Command

Request

Sub header part

<Details>

Command No.	0x72
Instance	Fixed to "1".
Attribute	Specify one out of followings 1: Data 1 2: Data 2
Service	<ul style="list-style-type: none"> • Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01

Specify "1".

Specify the status data number.

For the details of Data1 and Data 2, refer to "Details of data".

Specify the accessing method to the data.

0x0E: Read out data of the specified element number

0x01: Read out data of all the element number

(In this case, specify 0 to the element number.)

Data part

No data part

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: not specified • 1: 1 WORD • 2: 2 WORD
Added status	

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Data 1			
2	Data 2			

<Details>

Refer to "Details of data".

Refer to "Details of data".

Details of data

Data 1	bit0	Step	Data 2	bit0	
	bit1	1 cycle		bit1	In hold status (by programming pendant)
	bit2	Automatic and continuous		bit2	In hold status (externally)
	bit3	Running		bit3	In hold status (by command)
	bit4	In-guard safe operation		bit4	Alarming
	bit5	Teach		bit5	Error occurring
	bit6	Play		bit6	Servo ON
	bit7	Command remote		bit7	

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.4 Executing Job Information Reading Command

Request

Sub header part

<Details>

Command No.	0x73
Instance	Specify one out of followings 1: Master task 2: Sub task 1 3: Sub task 2 4: Sub task 3 5: Sub task 4 6: Sub task 5 7: Sub task 6 8: Sub task 7 9: Sub task 8 10: Sub task 9 11: Sub task 10 12: Sub task 11 13: Sub task 12 14: Sub task 13 15: Sub task 14 16: Sub task 15
Attribute	Specify one out of followings 1: Job name 2: Line number 3: Step number 4: Speed override value
Service	<ul style="list-style-type: none"> • Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01 <p>Specify the accessing method to the data. 0x0E: Read out data of the specified element number 0x01: Read out data of all the element number (In this case, specify 0 to the element number)</p>

Data part

No data part

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: not specified • 1: 1 WORD • 2: 2 WORD <p>“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.</p>
Added status	The error code specified by the added status size

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>			
1	Job name (character strings: 32 letters)				Job name Half-width character: 32 characters Full-width character: 16 characters			
2								
3								
4								
5								
6								
7								
8								
9	Line No. (0 to 9999)				Job line number			
10	Step No. (1 to 9998)				Job step number			
11	Speed override value				Speed override value			



For the job name, it is transmitted in the form of the character strings whose language code was selected by the programming pendant.

Use the same language code as the YRC1000micro.
The characters corrupt when the client side does not correspond to the same language code as the YRC1000micro.

3 High-Speed Ethernet Server Function
3.3 Communication Method

3.3.3.5 Axis Configuration Information Reading Command

Request

Sub header part

<Details>

Command No.	0x74										
Instance	<p>Specify one out of followings</p> <ul style="list-style-type: none"> • 1 to 2 • 11 to 12 • 21 to 23 • 101 to 102 • 111 to 112 										
Attribute	<p>Specify the control group</p> <table> <tr><td>1 : R1 to 2 : R2</td><td>...Robot (pulse value)</td></tr> <tr><td>11 : B1 to 12 : B2</td><td>...Base (pulse value)</td></tr> <tr><td>21 : S1 to 23 : S3</td><td>...Station (pulse value)</td></tr> <tr><td>101 : R1 to 102 : R2</td><td>...Robot (cartesian value)</td></tr> <tr><td>111 : B1 to 112 : B2</td><td>...Base (cartesian value)</td></tr> </table> <p>Specify the data number of axis information. Each axis name is set from Byte 0. "0" is set to nonexistent axis.</p>	1 : R1 to 2 : R2	...Robot (pulse value)	11 : B1 to 12 : B2	...Base (pulse value)	21 : S1 to 23 : S3	...Station (pulse value)	101 : R1 to 102 : R2	...Robot (cartesian value)	111 : B1 to 112 : B2	...Base (cartesian value)
1 : R1 to 2 : R2	...Robot (pulse value)										
11 : B1 to 12 : B2	...Base (pulse value)										
21 : S1 to 23 : S3	...Station (pulse value)										
101 : R1 to 102 : R2	...Robot (cartesian value)										
111 : B1 to 112 : B2	...Base (cartesian value)										
Service	<p>Specify the accessing method to the data.</p> <p>0x0E: Read out data of the specified element number. 0x01: Read out data of all the element number. (In this case, specify 0 to the element number.)</p>										

Data part

No data part

Answer

Sub header part

<Details>

Status	Respond by one in the followings
	<ul style="list-style-type: none"> • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: not specified • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	First coordinate name				“S” (R*: pulse)/“X” (R*/B*: cartesian value)/ “1” (B*/S*: pulse)
2	Second coordinate name				“L” (R*: pulse)/“Y” (R*/B*: cartesian value)/ “2” (B*/S*: pulse)
3	Third coordinate name				“U” (R*: pulse)/“Z” (R*/B*: cartesian value) “3” (B*/S*: pulse)
4	Fourth coordinate name				“R” (R*: pulse)/“Rx” (R*: cartesian value)/ “4” (B*/S*: pulse)
5	Fifth coordinate name				“B” (R*: pulse)/“Ry” (R*: cartesian value)/ “5” (B*/S*: pulse)
6	Sixth coordinate name				“T” (R*: pulse)/“Rz” (R*: cartesian value)/ “6” (B*/S*: pulse)
7	Seventh coordinate name				“E” (R*: pulse)/“Rz” (R*: cartesian value)/ “7” (B*/S*: pulse)
8	Eighth coordinate name				

*: Each control group number.

R: Robot (R1 to R2)

S: Station (S1 to S3)

B: Base (B1 to B2)

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.6 Robot Position Data Reading Command

Only the base coordinate can be used as cartesian value. (robot, user and tool coordinates can not be used.)

Request

Sub header part

<Details>

Command No.	0x75								
Instance	<p>Specify one out of followings</p> <ul style="list-style-type: none"> • 1 to 2 • 11 to 12 • 21 to 23 • 101 to 102 								
Attribute	<p>Specify the control group</p> <table> <tr><td>1 : R1 to 2 : R2</td><td>... Robot (pulse value)</td></tr> <tr><td>11 : B1 to 12 : B2</td><td>... Base (pulse value)</td></tr> <tr><td>21 : S1 to 23 : S3</td><td>... Station (pulse value)</td></tr> <tr><td>101 : R1 to 102 : R2</td><td>... Robot (cartesian coordinate)</td></tr> </table> <p>Specify the position information data number.</p> <p>1 0: pulse value/16: base coordinate value 2 As for the form, refer to the “Details of data”. 3 Tool number 4 User coordinate number 5 As for the extended form, refer to the “Details of data”. 6 First axis data 7 Second axis data 8 Third axis data 9 Fourth axis data 10 Fifth axis data 11 Sixth axis data 12 Seventh axis data 13 Eighth axis data Each axis data is output by the same order as mentioned in <i>chapter 3.3.3.5 “Axis Configuration Information Reading Command”</i>, and “0” is set to nonexistent axis.</p>	1 : R1 to 2 : R2	... Robot (pulse value)	11 : B1 to 12 : B2	... Base (pulse value)	21 : S1 to 23 : S3	... Station (pulse value)	101 : R1 to 102 : R2	... Robot (cartesian coordinate)
1 : R1 to 2 : R2	... Robot (pulse value)								
11 : B1 to 12 : B2	... Base (pulse value)								
21 : S1 to 23 : S3	... Station (pulse value)								
101 : R1 to 102 : R2	... Robot (cartesian coordinate)								
Service	<ul style="list-style-type: none"> •Get_Attribute_Single: 0x0E •Get_Attribute_All: 0x01 <p>Specify the accessing method to the data.</p> <p>0x0E: Read out data of the specified element number 0x01: Read out data of all the element number (In this case, specify 0 to the element number.)</p>								

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Data part

No data part

Detail of data

Please refer to "Chap.3.9.4.12 Flip/ No flip" in "YRC1000micro OPERATOR'S MANUAL (RE-CSO-A058)" prepared for each application.

Type	bit0	0: Front	1: Back	Extended type	bit0	0: $\theta L < 180$,	1: $\theta L \geq 180$
bit1	0: Upper arm		1: Lower arm		bit1	0: $\theta U < 180$,	1: $\theta U \geq 180$
bit2	0: Flip		1: No flip		bit2	0: $\theta B < 180$,	1: $\theta B \geq 180$
bit3	0: $\theta R < 180$,		1: $\theta R \geq 180$		bit3	0: $\theta E < 180$,	1: $\theta E \geq 180$
bit4	0: $\theta T < 180$,		1: $\theta T \geq 180$		bit4	0: $\theta W < 180$,	1: $\theta W \geq 180$
bit5	0: $\theta S < 180$,		1: $\theta S \geq 180$		bit5	Reserve	
bit6	0: Redundant front		1: Redundant back		bit6	Reserve	
bit7	0: Previous step regarded reverse conversion specified 1: Type regarded reverse conversion specified				bit7	Reserve	

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Data type			
2	Type			
3	Tool number			
4	User coordinate number			
5	Extended type			
6	First axis data			
7	Second axis data			
8	Third axis data			
9	Fourth axis data			
10	Fifth axis data			
11	Sixth axis data			
12	Seventh axis data			
13	Eighth axis data			

<Details>

0: Pulse value/ 16: Base coordinate value

For the type, refer to "Details of data".

Tool number

User coordinate number

For the extended form, refer to "Details of data".

Details of data

Please refer to "Chap.3.9.4.12 Flip/ No flip" in "YRC1000micro OPERATOR'S MANUAL (RE-CSO-A058)" prepared for each application.

Form	bit0	0: Front	1: Back	Extended form	bit0	0: $\Theta_L < 180$, 1: $\Theta_L \geq 180$
	bit1	0: Upper arm	1: Lower arm		bit1	0: $\Theta_U < 180$, 1: $\Theta_U \geq 180$
	bit2	0: Flip	1: No flip		bit2	0: $\Theta_B < 180$, 1: $\Theta_B \geq 180$
	bit3	0: $\Theta_R < 180$,	1: $\Theta_R \geq 180$		bit3	0: $\Theta_E < 180$, 1: $\Theta_E \geq 180$
	bit4	0: $\Theta_T < 180$,	1: $\Theta_T \geq 180$		bit4	0: $\Theta_W < 180$, 1: $\Theta_W \geq 180$
	bit5	0: $\Theta_S < 180$,	1: $\Theta_S \geq 180$		bit5	Reserve
	bit6	0: Redundant front	1: Redundant back		bit6	Reserve
	bit7	0: Previous step regarded reverse conversion specified 1: Form regarded reverse conversion specified			bit7	Reserve

3.3.3.7 Position Error Reading Command

Request

Sub header part

<Details>

Command No.	0x76
Instance	Specify one out of followings • 1 to 2 • 11 to 12 • 21 to 23
Attribute	Specify one out of followings 1: First axis data 2: Second axis data 3: Third axis data 4: Fourth axis data 5: Fifth axis data 6: Sixth axis data 7: Seventh axis data 8: Eighth axis data
Service	• Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01

Specify the control group

1 : R1 to 2 : R2 ... Robot axis
 11 : B1 to 12 : B2 ... Base axis
 21 : S1 to 23 : S3 ... Station axis

Specify the axis number.

Each axis data is output by the same order as mentioned in *chapter 3.3.3.5 “Axis Configuration Information Reading Command”*, and “0” is set to nonexistent axis.

Specify the accessing method to the data.

0x0E: Read out data of the specified element number
 0x01: Read out data of all the element number
 (In this case, specify 0 to the element number.)

Data part

No data part

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	First axis data			
2	Second axis data			
3	Third axis data			
4	Fourth axis data			
5	Fifth axis data			
6	Sixth axis data			
7	Seventh axis data			
8	Eighth axis data			

<Details>

Position variable data of each axis can be read out.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.8 Torque Data Reading Data

Request

Sub header part

<Details>

Command No.	0x77
Instance	Specify one out of followings • 1 to 2 • 11 to 12 • 21 to 23
Attribute	Specify one out of followings 1: First axis data 2: Second axis data 3: Third axis data 4: Fourth axis data 5: Fifth axis data 6: Sixth axis data 7: Seventh axis data 8: Eighth axis data
Service	<ul style="list-style-type: none"> • Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01

Specify the control group
 1 : R1 to 2 : R2 ... Robot axis
 11 : B1 to 12 : B2 ... Base axis
 21 : S1 to 23 : S3 ... Station axis

Specify the axis number.
 Each axis data is output by the same order as mentioned in *chapter 3.3.3.5 “Axis Configuration Information Reading Command”*, and “0” is set to nonexistent axis.

Specify the accessing method to the data.
 0x0E: Read out data of the specified element number
 0x01: Read out data of all the element number
 (In this case, specify 0 to the element number.)

Data part

No data part

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	First axis data			
2	Second axis data			
3	Third axis data			
4	Fourth axis data			
5	Fifth axis data			
6	Sixth axis data			
7	Seventh axis data			
8	Eighth axis data			

<Details>

Torque data of each axis can be read out.

3.3.3.9 I/O Data Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x78	
Instance	Specify one out of followings • 1 to 512 • 1001 to 1512 • 2001 to 2128 • 2701 to 2956 • 3001 to 3128 • 3701 to 3956 • 4001 to 4256 • 5001 to 5512 • 6001 to 6064 • 7001 to 7999 • 8001 to 8512 • 8701 to 8720	Specify logical number /10 • 1 to 512 : Robot general input signal • 1001 to 1512: Robot general output signal • 2001 to 2128: External input signal • 2701 to 2956: Network input signal • 3001 to 3128: External output signal • 3701 to 3956: Network output signal • 4001 to 4256: Robot specific input signal • 5001 to 5512: Robot specific output signal • 6001 to 6064: Interface panel input signal • 7001 to 7999: Auxiliary relay signal • 8001 to 8512: Robot control status signal • 8701 to 8720: Pseudo input signal
Attribute	Fixed to "1".	Specify "1".
Service	• Get_Attribute_Single: 0x0E • Set_Attribute_Single: 0x10	Specify the accessing method to the data. 0x0E: Read out of all I/O data is enabler 0x01: Only network input signal is writable.

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	IO data				

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	IO data				I/O data exists only when requested by the client.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.10 Register Data Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x79
Instance	Specify one out of followings • 0 to 999
Attribute	Fixed to “1”.
Service	• Get_Attribute_Single: 0x0E • Set_Attribute_Single: 0x10

Specify the register number
0 to 999 (writable register: 0 to 559)
Specify “1”.
Specify the accessing method to the data.
0x0E: Read out the specified register data
0x01: Register 0 to 599 is writable

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Register data				

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Register data				Register data exists only when requested by the client.

3.3.3.11 Byte Variable (B) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x7A
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to “1”.
Service	<ul style="list-style-type: none"> • Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01 • Set_Attribute_Single: 0x10 • Set_Attribute_All: 0x02

Specify the variable number.

Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number.

Specify “1”.

Specify the accessing method to the data.
0x0E/0x01: Read out data of the specified element number

0x10/0x02: Write the data to the specified variable

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	B variable			

<Details>

Set the data when writing.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	B variable			

<Details>

The data exists only when requested by the client.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.12 Integer Type Variable (I) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x7B	
Instance	Specify one out of followings • 0 to 99 (for standard setting)	Specify the variable number. Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number.
Attribute	Fixed to “1”.	Specify “1”.
Service	• Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01 • Set_Attribute_Single: 0x10 • Set_Attribute_All: 0x02	Specify the accessing method to the data. 0xE/0x01: Read out data of the specified element number 0x10/0x02: Write the data to the specified variable

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	I variable				Set the data when writing.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	I variable				The data exists only when requested by the client.

3.3.3.13 Double Precision Integer Type Variable (D) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x7C
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to “1”.
Service	<ul style="list-style-type: none"> • Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01 • Set_Attribute_Single: 0x10 • Set_Attribute_All: 0x02

Specify the variable number.

Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number.

Specify “1”.

Specify the accessing method to the data.
0x0E/0x01: Read out data of the specified element number

0x10/0x02: Write the data to the specified variable

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	D variable			

<Details>

Set the data when writing.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	D variable			

<Details>

The data exists only when requested by the client.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.14 Real Type Variable (R) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x7D	
Instance	Specify one out of followings • 0 to 99 (for standard setting)	Specify the variable number. Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number.
Attribute	Fixed to “1”.	Specify “1”.
Service	• Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01 • Set_Attribute_Single: 0x10 • Set_Attribute_All: 0x02	Specify the accessing method to the data. 0x0E/0x01: Read out data of the specified element number 0x10/0x02: Write the data to the specified variable

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	R variable				Set the data when writing.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.	

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	R variable				The data exists only when requested by the client.

3.3.3.15 16 Byte Character Type Variable (S) Reading Writing Command

Request

Sub header part

<Details>

Command No.	0x7E
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to "1".
Service	<ul style="list-style-type: none"> • Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01 • Set_Attribute_Single: 0x10 • Set_Attribute_AI: 0x02

Specify the variable number.

Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number

Specify "1".

Specify the accessing method to the data.
0x0E/0x01: Read out data of the specified element number

0x10/0x02: Write the data to the specified variable

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	S variable			
2				
3				
4				

<Details>

Set the data when writing.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	S variable			
2				
3				
4				

<Details>

The data exists only when requested by the client.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.16 Robot Position Type Variable (P) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x7F	
Instance	Specify one out of followings • 0 to 127 (for standard setting)	Specify the variable number. Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number.
Attribute	Specify one out of followings 1: Data type 2: Figure 3: Tool number 4: User coordinate number 5: Extended figure 6: "Coordinated data" of the first axis 7: "Coordinated data" of the second axis 8: "Coordinated data" of the third axis 9: "Coordinated data" of the fourth axis 10: "Coordinated data" of the fifth axis 11: "Coordinated data" of the sixth axis 12: "Coordinated data" of the seventh axis 13: "Coordinated data" of the eighth axis	Specify the axis information data number. Followings are the data type. 0: Pulse value 16: Base coordinated value 17: Robot coordinated value 18: User coordinated value 19: Tool coordinated value
Service	• Get_Attribute_All: 0x01 • Set_Attribute_All: 0x02	Specify the accessing method to the data. 0x0E/0x01: Read out data of the specified element number 0x10/0x02: Write the data to the specified variable

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Data type				0: Pulse value 16: Base coordinated value 17: Robot coordinated value 18: User coordinated value 19: Tool coordinated value
2	Figure				For the figure, refer to "Details of data".
3	Tool number				Tool number
4	User coordinate number				User coordinate number
5	Extended figure				For the extended figure, refer to "Details of data".
6	First coordinate data				
7	Second coordinate data				
8	Third coordinated data				
9	Fourth coordinate data				
10	Fifth coordinate data				
11	Sixth coordinate data				
12	Seventh coordinate data				
13	Eighth coordinate data				

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Details of data

Please refer to “Chap.3.9.4.12 Flip/ No flip” in “YRC1000micro OPERATOR’S MANUAL (RE-CSO-A058)” prepared for each application.

Type	bit0	0: Front	1: Back	Extended type	bit0	0: $\theta L < 180$,	1: $\theta L \geq 180$
	bit1	0: Upper arm	1: Lower arm		bit1	0: $\theta U < 180$,	1: $\theta U \geq 180$
	bit2	0: Flip	1: No flip		bit2	0: $\theta B < 180$,	1: $\theta B \geq 180$
	bit3	0: $\theta R < 180$,	1: $\theta R \geq 180$		bit3	0: $\theta E < 180$,	1: $\theta E \geq 180$
	bit4	0: $\theta T < 180$,	1: $\theta T \geq 180$		bit4	0: $\theta W < 180$,	1: $\theta W \geq 180$
	bit5	0: $\theta S < 180$,	1: $\theta S \geq 180$		bit5	Reserve	
	bit6	0: Redundant front	1: Redundant back		bit6	Reserve	
	bit7	0: Previous step regarded reverse conversion specified 1: Type regarded reverse conversion specified			bit7	Reserve	

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Data type				0: Pulse value 16: Base coordinated value 17: Robot coordinated value 18: User coordinated value 19: Tool coordinated value
2	Type				For the type, refer to "Details of data".
3	Tool number				Tool number
4	User coordinate number				User coordinate number
5	Extended type				For the extended type, refer to "Details of data".
6	First coordinate data				
7	Second coordinate data				
8	Third coordinated data				
9	Fourth coordinate data				
10	Fifth coordinate data				
11	Sixth coordinate data				
12	Seventh coordinate data				
13	Eighth coordinate data				

Details of data

Please refer to "Chap.3.9.4.12 Flip/ No flip" in "YRC1000micro OPERATOR'S MANUAL (RE-CSO-A058)" prepared for each application.

Type	bit0	0: Front	1: Back	Extended type	bit0	0: $\theta_L < 180$,	1: $\theta_L \geq 180$
	bit1	0: Upper arm	1: Lower arm		bit1	0: $\theta_U < 180$,	1: $\theta_U \geq 180$
	bit2	0: Flip	1: No flip		bit2	0: $\theta_B < 180$,	1: $\theta_B \geq 180$
	bit3	0: $\theta_R < 180$,	1: $\theta_R \geq 180$		bit3	0: $\theta_E < 180$,	1: $\theta_E \geq 180$
	bit4	0: $\theta_T < 180$,	1: $\theta_T \geq 180$		bit4	0: $\theta_W < 180$,	1: $\theta_W \geq 180$
	bit5	0: $\theta_S < 180$,	1: $\theta_S \geq 180$		bit5	Reserve	
	bit6	0: Redundant front	1: Redundant back		bit6	Reserve	
	bit7	0: Previous step regarded reverse conversion specified 1: Type regarded reverse conversion specified			bit7	Reserve	

3.3.3.17 Base Position Type Variable (BP) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x80	
Instance	Specify one out of followings • 0 to 127 (for standard setting)	Specify the variable number. Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number.
Attribute	Specify one out of followings 1: Data type 2: "Coordinated data" of the first axis 3: "Coordinated data" of the second axis 4: "Coordinated data" of the third axis 5: "Coordinated data" of the fourth axis 6: "Coordinated data" of the fifth axis 7: "Coordinated data" of the sixth axis 8: "Coordinated data" of the seventh axis 9: "Coordinated data" of the eighth axis	Specify the axis information data number. Followings are the data type. 0: Pulse value 16: Base coordinated value
Service	<ul style="list-style-type: none"> • Get_Attribute_Single :0x0E • Get_Attribute_All :0x01 • Set_Attribute_Single :0x10 • Set_Attribute_All :0x02 	Specify the accessing method to the data. 0x0E: Read out the specified data 0x01: Read out the data 0x10: Write a specified data. If it is not an object element, keep the data previous to writing operation. 0x02: Write the data

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Data type				0: Pulse value 16: Base coordinated value
2	First coordinate data				
3	Second coordinate data				
4	Third coordinate data				
5	Fourth coordinate data				
6	Fifth coordinate data				
7	Sixth coordinate data				
8	Seventh coordinate data				
9	Eighth coordinate data				

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Data type				0: Pulse value 16: Base coordinated value
2	First coordinate data				
3	Second coordinate data				
4	Third coordinated data				
5	Fourth coordinate data				
6	Fifth coordinate data				
7	Sixth coordinate data				
8	Seventh coordinate data				
9	Eighth coordinate data				

3.3.3.18 External Axis Type Variable (EX) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x81	
Instance	Specify one out of followings • 0 to 127 (for standard setting)	Specify the variable number. Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number.
Attribute	Specify one out of followings 1: Data type 2: "Coordinated data" of the first axis 3: "Coordinated data" of the second axis 4: "Coordinated data" of the third axis 5: "Coordinated data" of the fourth axis 6: "Coordinated data" of the fifth axis 7: "Coordinated data" of the sixth axis 8: "Coordinated data" of the seventh axis 9: "Coordinated data" of the eighth axis	Specify the axis information data number. Followings are the data type. 0: Pulse value
Service	<ul style="list-style-type: none"> • Get_Attribute_Single :0x0E • Get_Attribute_All :0x01 • Set_Attribute_Single :0x10 • Set_Attribute_All :0x02 	Specify the accessing method to the data. 0x0E : Read out the specified data 0x01 : Read out the data 0x10 :Write a specified data. If it is not an object element, keep the data previous to writing operation. 0x02 : Write the data

Data part

(Data exists during the writing operation only)

<Details>

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Data type			
2	First coordinate data			
3	Second coordinate data			
4	Third coordinated data			
5	Fourth coordinate data			
6	Fifth coordinate data			
7	Sixth coordinate data			
8	Seventh coordinate data			
9	Eighth coordinate data			

0: Pulse value

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Data type				0: Pulse value
2	First coordinate data				
3	Second coordinate data				
4	Third coordinated data				
5	Fourth coordinate data				
6	Fifth coordinate data				
7	Sixth coordinate data				
8	Seventh coordinate data				
9	Eighth coordinate data				

3.3.3.19 Alarm Reset / Error Cancel Command

Request

Sub header part

<Details>

Command No.	0x82
Instance	Specify one out of followings 1: Resetting of alarm 2: Cancelling of error
Attribute	Fixed to "1".
Service	• Set_Attribute_Single: 0x10

Specify the type of reset/cancel
1: RESET (resetting of alarm)
2: CANCEL (cancelling of error)

Specify "1".

Specify the accessing method to the data.
0x10 : Execute the specified request

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Data 1				Fixed to "1".

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

No data part

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.20 Hold / Servo On/off Command

Request

Sub header part

<Details>

Command No.	0x83
Instance	Specify one out of followings 1: HOLD 2: Servo ON 3: HLOCK
Attribute	Fixed to "1".
Service	• Set_Attribute_Single: 0x10 Specify the accessing method to the data. 0x10 : Execute the specified request

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	1:ON 2:OFF				Specify ON/OFF

Details of data

■ HLOCK

This data interlocks the P.P and I/O operation system signals. Only the following operations are available while the interlock operation is ON.

- Emergency stop for the programming pendant
- Inputting signals excluding I/O mode switching, external start, external servo ON, cycle switch, inhibit I/O, inhibit PP/PANEL and calling up master JOB.

HLOCK is invalid while the programming pendant is in edit mode or it is file accessing using other functions.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

No data part

3.3.3.21 Step / Cycle / Auto Switching Command

Request

Sub header part

<Details>

Command No.	0x84
Instance	Specify the following • 2
Attribute	Fixed to “1”.
Service	• Set_Attribute_Single: 0x10

Specify the type of status switch command
2: CYCLE (switching of STEP/CYCLE/AUTO)
Specify “1”.
Specify the accessing method to the data.
0x10 : Execute the specified request

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Data 1			

<Details>

CYCLE = 1: STEP/2: 1 CYCLE/3:AUTO

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.22 Character String Display Command To The Programming Pendant

Request

Sub header part

<Details>

Command No.	0x85
Instance	Fixed to “1”.
Attribute	Fixed to “1”.
Service	• Set_Attribute_Single: 0x10

Specify “1”.

Specify “1”.

Specify the accessing method to the data.
0x10 : Execute the specified request

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Displaying message			
2				
3				
4				
5				
6				
7				
8				

<Details>

Set the character strings to be indicated on the programming pendant

Half-width character: 30 characters

Full-width character: 15 characters

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part



For the character strings displayed on the programming pendant, use the same language code as the YRC1000micro. If the language code is different from that of the YRC1000micro, the characters may corrupt when displayed on the programming pendant.

3.3.3.23 Start-up (Job Start) Command

Request

Sub header part

<Details>

Command No.	0x86
Instance	Fixed to “1”.
Attribute	Fixed to “1”.
Service	<ul style="list-style-type: none"> • Set_Attribute_Single: 0x10

Specify “1”.

Specify “1”.

Specify the accessing method to the data.
 0x10 : Execute the specified request

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Data 1				Fixed to “1”.

Answer

Sub header part

<Details>

Status	Respond by one in the followings <ul style="list-style-type: none"> • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	<ul style="list-style-type: none"> • 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.24 Job Select Command

Request

Sub header part

<Details>

Command No.	0x87	
Instance	Specify one out of followings 1: Set the executing job 10: Set the master job (task 0) 11: Set the master job (task 1) 12: Set the master job (task 2) 13: Set the master job (task 3) 14: Set the master job (task 4) 15: Set the master job (task 5)	Specify the type.
Attribute	Specify one out of followings 1: Job name 2: Line number (valid only when executing job setting.)	Specify the setting content.
Service	• Set_Attribute_All: 0x02	Specify the accessing method to the data. 0x02: Read out data of all the element number (In this case, specify 0 to the element number.)

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	
1	Job name (Character strings: 32 characters)				<Details> Job name Half-width character: 32 characters Full-width character: 16 characters
2					
3					
4					
5					
6					
7					
8					
9	Line number (0 to 9999)				Line number



For the job name, use the same language code as the YRC1000micro.
 If the language code is different from that of the YRC1000micro, the job name may not be recognized by the YRC1000micro, and an error may occur.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD “1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status size The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.25 Management Time Acquiring Command

Request

Sub header part

<Details>

Command No.	0x88
Instance	Specify one out of followings • 1 • 10 • 11 to 12 • 21 to 23 • 110 • 111 to 112 • 121 to 123 • 210 • 211 to 212 • 221 to 223 • 301 to 302
Attribute	Specify one out of followings 1: Operation start time 2: Elapse time
Service	• Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01

Specify the type of the management time
 1 :Control power ON time
 10 :Servo power ON time (TOTAL)
 11 to 12 :Servo power ON time (R1 to R2)
 21 to 23 :Servo power ON time (S1 to S3)
 110 :Play back time (TOTAL)
 111 to 112 :Play back time (R1 to R2)
 121 to 123 :Play back time (S1 to S3)
 210 :Moving time (TOTAL)
 211 to 212 :Moving time (R1 to R2)
 221 to 223 :Moving time (S1 to S3)
 301 to 302 :Operation time (application 1 to 2)

Specify the type of the management time

Specify the accessing method to the data.
 0x0E : Read out data of the specified element number
 0x01 : Read out data of all the element number
 (In this case, specify 0 to the element number.)

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Operation start time (Character strings: 16 characters) Ex. 2011/10/10 15:49			
2				
3				
4				
5	Elapse time (Character strings: 12 characters) Ex. 000000:00'00			
6				
7				

<Details>

Operation start time

Elapse time

3.3.3.26 System Information Acquiring Command

Request

Sub header part

<Details>

Command No.	0x89
Instance	Specify one out of followings • 11 to 12 • 21 to 23 • 101 to 102
Attribute	Specify one out of followings 1: System software version 2: Model name / application 3: Parameter version
Service	• Get_Attribute_Single: 0x0E • Get_Attribute_AI: 0x01

Specify the type of system type.

11 to 12: Type information (R1 to R2)

21 to 23: Type information (S1 to S3)

101 to 102: Application information (application 1 to 2)

Specify the type of system information

Specify the accessing method to the data.

0x0E: Read out data of the specified element number

0x01 : Read out data of all the element number

(In this case, specify 0 to the element number)

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	System software version (Character strings: 24 characters) Ex. YBS1.00.00A. (JP/EN) -00			
2				
3				
4				
5				
6				
7	Model name / application (Character strings: 16 characters) Ex. (For model) ES0165D-A0* (For application) GENERAL			
8				
9				
10				
11	Parameter version (Character strings: 8 characters) Ex. 12.34			
12				

<Details>

The same character strings are returned even if either 11 to 12, 21 to 23 or 101 to 102 is specified to the instance in the request sub-header part.

The model name is returned when it is R1 to R2, and NULL character is returned when it is S1 to S3. Also, application name is returned when it is application 1 to 2.

R1 to R2: Parameter version

When it is nonexistent control group, it is returned in NULL characters.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.27 Plural I/O Data Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x300	
Instance	Specify one out of followings • 1 to 512 • 1001 to 1512 • 2001 to 2128 • 2701 to 2956 • 3001 to 3128 • 3701 to 3956 • 4001 to 4256 • 5001 to 5512 • 6001 to 6064 • 7001 to 7999 • 8001 to 8512 • 8701 to 8720	Specify logical number /10 • 1 to 512 : Robot general input signal • 1001 to 1512: Robot general output signal • 2001 to 2128: External input signal • 2701 to 2956: Network input signal • 3001 to 3128: External output signal • 3701 to 3956: Network output signal • 4001 to 4256: Robot specific input signal • 5001 to 5512: Robot specific output signal • 6001 to 6064: Interface panel input signal • 7001 to 7999: Auxiliary relay signal • 8001 to 8512: Robot control status signal • 8701 to 8720: Pseudo input signal
Attribute	Fixed to "0".	Specify "0".
Service	0x33:Read plural data 0x34:Write plural data	Specify the accessing method to the data. 0x33: Read out the fixed size specified by the data part. 0x34: Write the fixed size specified by the data part. Only the network input signal can be writable.

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 474 *It can specify by a multiple of 2 only.
2	I/O data 1	I/O data 2	I/O data 3	I/O data 4	I/O data part is valid only when writing. Only the number of data is valid when reading.
:					
120	I/O data 473	I/O data 474			

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 474 *It can specify by a multiple of 2 only.
2	I/O data 1	I/O data 2	I/O data 3	I/O data 4	
	:				
120	I/O data 473	I/O data 474			

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.28 Plural Register Data Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x301
Instance	Specify one out of followings • 0 to 999
Attribute	Fixed to "0"
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
0 to 999 (writable register: 0 to 559)

Specify "0"

Specify the accessing method to the data.
0x33: Read out the fixed size specified by the data part.
0x34: Write the fixed size specified by the data part.

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	Register data 1	Register data 2		
:				
120	Register data 237			

<Details>

Maximum: 237

I/O data part is valid only when writing. Only the number of data is valid when reading.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	Register data 1	Register data 2		
:				
120	Register data 237			

<Details>

Maximum: 237

3.3.3.29 Plural Byte Type Variable (B) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x302
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to "0".
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
 Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.
 Specify "0".
 Specify the accessing method to the data.
 0x33: Read out the fixed size specified by the data part.
 0x34: Write the fixed size specified by the data part.

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	B variable 1	B variable 2	B variable 3	B variable 4
:				
120	B variable 473	B variable 474		

<Details>

Maximum: 474
 *It can specify by a multiple of 2 only.
 Variable data part is valid only when writing. Only the number of data is valid when reading.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

3 High-Speed Ethernet Server Function
3.3 Communication Method

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 474 *It can specify by a multiple of 2 only. (invalid if specified by other than a multiple of 2)
2	B variable 1	B variable 2	B variable 3	B variable 4	
:					
120	B variable 473	B variable 474			

3.3.3.30 Plural Integer Type Variable (I) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x303
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to "0"
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
 Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.
 Specify "0"
 Only batch access of all elements is valid
 Specify the accessing method to the data.
 0x33: Read plural data.
 0x34: Write plural data

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	I variable 1	I variable 2		
:				
120	I variable 237			

<Details>

Maximum: 237

Variable data part is valid only when writing. Only the number of data is valid when reading.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	I variable 1	I variable 2		
:				
120	I variable 237			

<Details>

Maximum: 237

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.31 Plural Double Precision Integer Type Variable (D) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x304
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to "0"
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
 Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.
 Specify "0"
 Only batch access of all elements is valid
 Specify the accessing method to the data.
 0x33: Read plural data
 0x34: Write plural data

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	D variable 1			
:				
119	D variable 118			

<Details>

Maximum: 118

Variable data part is valid only when writing. Only the number of data is valid when reading.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	D variable 1			
:				
119	D variable 118			

<Details>

Maximum: 118

3.3.3.32 Plural Real Type Variable (R) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x305
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to "0"
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
 Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.
 Specify "0"
 Only batch access of all elements is valid
 Specify the accessing method to the data.
 0x33: Read plural data
 0x34: Write plural data

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	R variable 1			
:				
119	R variable 118			

<Details>

Maximum: 118

Variable data part is valid only when writing. Only the number of data is valid when reading.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	R variable 1			
:				
119	R variable 118			

<Details>

Maximum: 118

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.33 Plural 16 Byte Character Type Variable (S) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x306	
Instance	Specify one out of followings • 0 to 99 (for standard setting)	Specify the variable number (the first number with which reading/writing is executed) Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.
Attribute	Fixed to "0"	Specify "0" Only batch access of all elements is valid
Service	0x33 : Read plural data 0x34 : Write plural data	Specify the accessing method to the data. 0x33: Read plural data 0x34: Write plural data

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 29
2	S variable 1				Variable data part is valid only when writing.
3					Only the number of data is valid when reading.
4					
5					
...					
114	S variable 29				
115					
116					
117					

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 29
2	S variable 1				
3					
4					
5					
:					
114	S variable 29				
115					
116					
117					

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.34 Plural Robot Position Type Variable (P) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x307
Instance	Specify one out of followings • 0 to 127 (for standard setting)
Attribute	Fixed to "0"
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
 Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.
 Specify "0"
 Only batch access of all elements is valid
 Specify the accessing method to the data.
 0x33: Read plural data
 0x34: Write plural data

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2 to 14	Data type			
	Type			
	Tool number			
	User coordinate number			
	Extended type			
	First coordinate data			
	Second coordinate data			
	Third coordinated data			
	Fourth coordinate data			
	Fifth coordinate data			
	Sixth coordinate data			
	Seventh coordinate data			
	Eighth coordinate data			
:				

<Details>

Maximum: 9
 0: Pulse value
 16: Base coordinated value
 17: Robot coordinated value
 18: User coordinated value
 19: Tool coordinated value

Type
 Tool number
 User coordinate number

Variable data part is valid only when writing.
 Only the number of data is valid when reading.

106 to 118	Data type
	Type
	Tool number
	User coordinate number
	Extended type
	First coordinate data
	Second coordinate data
	Third coordinated data
	Fourth coordinate data
	Fifth coordinate data
	Sixth coordinate data
	Seventh coordinate data
	Eighth coordinate data

0: Pulse value
 16: Base coordinated value
 17: Robot coordinated value
 18: User coordinated value
 19: Tool coordinated value

Type
 Tool number
 User coordinate number

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD “1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status size The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 9
2 to 14	Data type				0: Pulse value 16: Base coordinated value 17: Robot coordinated value 18: User coordinated value 19: Tool coordinated value
	Type				Type
	Tool number				Tool number
	User coordinate number				User coordinate number
	Extended type				
	First coordinate data				
	Second coordinate data				
	Third coordinated data				
	Fourth coordinate data				
	Fifth coordinate data				
	Sixth coordinate data				
	Seventh coordinate data				
	Eighth coordinate data				
	:				
106 to 118	Data type				0: Pulse value 16: Base coordinated value 17: Robot coordinated value 18: User coordinated value 19: Tool coordinated value
	Type				Type
	Tool number				Tool number
	User coordinate number				User coordinate number
	Extended type				
	First coordinate data				
	Second coordinate data				
	Third coordinated data				
	Fourth coordinate data				
	Fifth coordinate data				
	Sixth coordinate data				
	Seventh coordinate data				
	Eighth coordinate data				

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.35 Plural Base Position Type Variable (BP) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x308
Instance	Specify one out of followings • 0 to 127 (for standard setting)
Attribute	Fixed to "0".
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
 Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.
 Specify "0".
 Specify the accessing method to the data.
 0x33: Read plural data
 0x34: Write plural data

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2 (Replying data is determined by the value specified by the element number.)	Data type			
	First coordinate data			
	Second coordinate data			
	Third coordinated data			
	Fourth coordinate data			
	Fifth coordinate data			
	Sixth coordinate data			
	Seventh coordinate data			
	Eighth coordinate data			
:				
119	Data type			
	First coordinate data			
	Second coordinate data			
	Third coordinated data			
	Fourth coordinate data			
	Fifth coordinate data			
	Sixth coordinate data			
	Seventh coordinate data			
	Eighth coordinate data			

<Details>

Maximum: 13
 0x00 : Pulse value
 0x10 : Base coordinate value

Variable data part is valid only when writing.
 Only the number of data is valid when reading.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD “1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 13 0x00 : Pulse value 0x10 : Base coordinate
2 to 10 (Replying data is determined by the value specified by the element number.)	Data type				
	First coordinate data				
	Second coordinate data				
	Third coordinated data				
	Fourth coordinate data				
	Fifth coordinate data				
	Sixth coordinate data				
	Seventh coordinate data				
	Eighth coordinate data				
:					
119	Data type				0x00 : Pulse value 0x10 : Base coordinate
	First coordinate data				
	Second coordinate data				
	Third coordinated data				
	Fourth coordinate data				
	Fifth coordinate data				
	Sixth coordinate data				
	Seventh coordinate data				
	Eighth coordinate data				

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.36 Plural Station Type Variable (EX) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x309
Instance	Specify one out of followings • 0 to 127 (for standard setting)
Attribute	Fixed to "0"
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.

Specify "0".

Specify the accessing method to the data.
0x33: Read plural data
0x34: Write plural data

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2 to 10	Data type			
	First coordinate data			
	Second coordinate data			
	Third coordinated data			
	Fourth coordinate data			
	Fifth coordinate data			
	Sixth coordinate data			
	Seventh coordinate data			
	Eighth coordinate data			
:				
110 to 118	Data type			0 : Pulse value
	First coordinate data			
	Second coordinate data			
	Third coordinated data			
	Fourth coordinate data			
	Fifth coordinate data			
	Sixth coordinate data			
	Seventh coordinate data			
	Eighth coordinate data			

<Details>

Maximum: 13

0 : Pulse value

Variable data part is valid only when writing.

Only the number of data is valid when reading.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD “1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 13 0: Pulse value
2 to 10	Data type				
	First coordinate data				
	Second coordinate data				
	Third coordinated data				
	Fourth coordinate data				
	Fifth coordinate data				
	Sixth coordinate data				
	Seventh coordinate data				
	Eighth coordinate data				
:					
110 to 118	Data type				0: Pulse value
	First coordinate data				
	Second coordinate data				
	Third coordinated data				
	Fourth coordinate data				
	Fifth coordinate data				
	Sixth coordinate data				
	Seventh coordinate data				
	Eighth coordinate data				

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.37 Alarm Data Reading Command (for Applying the Sub Code Character String)

Request

Sub header part

<Details>

Command No.	0x30A
Instance	Specify one out of followings 1: The latest alarm 2: The second alarm from the latest 3: The third alarm from the latest 4: The fourth alarm from the latest
Attribute	Specify one out of followings 1: Alarm code 2: Alarm data 3: Alarm type 4: Alarm occurring time 5: Alarm character string name 6: Sub code data additional information character strings 7: Sub code data character strings 8: Sub code data character strings reverse display information
Service	• Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01

Alarm code means the alarm No.

Alarm data means the sub code which supports the alarm contents. Some alarms may not appear as the sub code.

Sub code additional info character strings means the number for alarms from the Servo circuit board [SV#*] or the function safety board[FSU#*(CPU#*)]. (*denotes number)

Sub code data character string reverse display information sets [1], when the characters are reverse.

Specify the accessing method to the data.

0x0E: Read out data of the specified element number

0x01: Read out data of all the element number

(In this case, specify 0 to the element number.)

Data part

No data part

Answer

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: not specified • 1: 1 WORD • 2: 2 WORD
Added status	Error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

3 High-Speed Ethernet Server Function
3.3 Communication Method

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	
1	Alarm code				<Details> Range is from 0x0001 to 0x270F(decimal value: 9999)
2	Alarm data				Setting values vary in accordance with the contents of the alarm type. Also, some alarms are not displayed with the sub code. In this case, the value is zero (0x0).
3	Alarm type				<ul style="list-style-type: none"> 0 : No alarm 1 : Decimal UNSIGNED SHORT type (display example: [1]) 2 : UNSIGNED CHAR bit pattern (display example: [0000_0001]) 3 : User axis type (display example: [SLURBT]) 4 : Spacial coordinate type (display example: [XYZ]) 5 : Robot coordinate type (display example: [XYZRxRyRz]) 6 : Conveyor characteristic file (display example: [123]) 8 : Control group type (display example: [R1R2S1S2]) robot & station 9 : Decimal SHORT type (display example: [-1]) 10 : UNSIGNED SHORT bit pattern (display example: [0000_0000_0000_0001]) 11 : Control group type (display example: [R1]) for robot only 12 : Control group type (display example:[R1S1B1]) for robot, station and base 20 : Control group LOW/HIGH logical axis (display example: [R1:LOW SLURBT, HIGH SLURBT]) 21 : Control group MIN/MAX logical axis (display example: [R1: MIN SLURBT, MAX SLURBT]) 22 : Control group MIN/MAX spacial coordinate (display example: [R1: MIN XYZ, MAX XYZ]) 23 : Logical axis of both control group 1 and control group 2 (display example: [R1: SLURBT, R2: SLURBT]) 24 : Logical axis 1 and 2 of the control group (display example: [R1: SLURBT, SLURBT]) 25 : Logical axis of the control group and UNSIGNED CHAR type (display example: [R1: SLURBT, 1]) 27 : Control group and UNSIGNED CHAR type (display example: [R1: 1])
4 to 7	Alarm occurring time (Character strings of 16 letters) Ex.2011/10/10 15:49				
8 to 15	Alarm character strings name (character strings: 32 letters)				It is transmitted in the form of the character strings whose language code was selected by the programming pendant and half- and full-width characters are mixed.
16 to 19	Sub code data additional information character strings (Character strings of 16 letters)				[SV#1] indicates the servo board number 1. [FSU#1(CPU#1)] indicates that an alarm is found in the function safety board number 1 CPU#1.
20 to 43	Sub code data character strings (Character strings of 96 letters)				
44 to 67	Sub code data character strings reverse display information (Character strings of 96 letters)				Regular characters show [0] and reverse characters show [1]. (display example: [R1R2S1S2])

3 High-Speed Ethernet Server Function
3.3 Communication Method



For the alarm character strings name, it is transmitted in the form of the character strings whose language code was selected by the programming pendant.

Use the same language code as the YRC1000micro.
The characters corrupt when the client side does not correspond to the same language code as the YRC1000micro.

3.3.3.38 Alarm History Reading Command (for Applying the Sub Code Character String)

Request

Sub header part

<Details>

Command No.	0x30B
Instance	Specify one out of followings • 1 to 100 • 1001 to 1100 • 2001 to 2100 • 3001 to 3100 • 4001 to 4100
Attribute	Specify one out of followings 1:Alarm code 2:Alarm data 3:Alarm type 4:Alarm occurring time 5:Alarm character strings name 6:Sub code data additional information character strings 7:Sub code data character strings 8:Sub code data character strings reverse display information
Service	• Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01

Specify the alarm number
 1 to 100 : Major failure
 1001 to 1100: Minor alarm
 2001 to 2100: User alarm (system)
 3001 to 3100: User alarm (user)
 4001 to 4100: OFF line alarm

Alarm code means the alarm No.
 Alarm data means the sub code which supports the alarm content. Some alarms may not appear as the sub code.
 Sub code additional info character strings mean the number for alarms from the Servo circuit board [SV#*] or the function safety board [FSU#*(CPU#*)].
 Sub code data character strings reverse display information means setting [1], when the characters are reverse.

Specify the accessing method to the data.
 0x0E: Read out data of the specified element number
 0x01: Read out data of all the element number
 (In this case, specify 0 to the element number.)

Data part

No data part

Answer

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: not specified • 1: 1 WORD • 2: 2 WORD
Added status	Error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

3 High-Speed Ethernet Server Function
3.3 Communication Method

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Alarm code				Range is from 0x0001 to 0x270F(decimal value: 9999)
2	Alarm data				Setting values vary in accordance with the contents of the alarm type. Also, some alarms are not displayed with the sub code. In this case, the value is zero (0x0).
3	Alarm type				<ul style="list-style-type: none"> 0 : No alarm 1 : Decimal UNSIGNED SHORT type (display example: [1]) 2 : UNSIGNED CHAR bit pattern (display example: [0000_0001]) 3 : User axis type (display example: [SLURBT]) 4 : Spacial coordinate type (display example: [XYZ]) 5 : Robot coordinate type (display example: [XYZRxRyRz]) 6 : Conveyor characteristic file (display example: [123]) 8 : Control group type (display example: [R1R2S1S2]) robot & station 9 : Decimal SHORT type (display example: [-1]) 10 : UNSIGNED SHORT bit pattern (display example: [0000_0000_0000_0001]) 11 : Control group type (display example: [R1]) for robot only 12 : Control group type (display example:[R1S1B1]) for robot, station and base 20 : Control group LOW/HIGH logical axis (display example: [R1:LOW SLURBT, HIGH SLURBT]) 21 : Control group MIN/MAX logical axis (display example: [R1: MIN SLURBT, MAX SLURBT]) 22 : Control group MIN/MAX spacial coordinate (display example: [R1: MIN XYZ, MAX XYZ]) 23 : Logical axis of both control group 1 and control group 2 (display example: [R1: SLURBT, R2: SLURBT]) 24 : Logical axis 1 and 2 of the control group (display example: [R1: SLURBT, SLURBT]) 25 : Logical axis of the control group and UNSIGNED CHAR type (display example: [R1: SLURBT, 1]) 27 : Control group and UNSIGNED CHAR type (display example: [R1: 1])
4 to 7	Alarm occurring time (Character strings of 16 letters) Ex.2011/10/10 15:49				
8 to 15	Alarm character strings name (character strings: 32 letters)				It is transmitted in the form of the character strings whose language code was selected by the programming pendant and half- and full-width characters are mixed.
16 to 19	Sub code data additional information character strings (Character strings of 16 letters)				[SV#1] indicates the servo board number 1. [FSU#1(CPU#1)] indicates that an alarm is found in the function safety board number 1 CPU#1.
20 to 43	Sub code data character strings (Character strings of 96 letters)				
44 to 67	Sub code data character strings reverse display information (Character strings of 96 letters)				Regular characters show [0] and reverse characters show [1]. (display example: [R1R2S1S2])

 NOTE

For the alarm character strings name, it is transmitted in the form of the character strings whose language code was selected by the programming pendant.

Use the same language code as the YRC1000micro.
The characters corrupt when the client side does not correspond to the same language code as the YRC1000micro.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.39 Move instruction command (Type Cartesian Coordinate)

Request

Sub header part

<Details>

Command No.	0x8A
Instance	Specify one out of followings 1:Link absolute position operation 2:Straight absolute position operation 3:Straight increment value operation
Attribute	Fixed to "1"
Service	<ul style="list-style-type: none"> • Set_Attribute_All: 0x02 Specify the accessing method to the data. 0x02: Write the data to the specified coordinate.

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	
1	Specifying control group (Robot)				<Details> 1 to 2 (Robot No.)
2	Specifying control group (Station)				1 to 3 (Station No.)
3	Specifying the classification in speed				Specify the classification of operations 0: % (Link operation) 1: V (Cartesian operation) 2: VR (Cartesian operation)
4	Specifying a speed				Specify the rate Link operation : 0.01% Cartesian operation V speed : 0.1 mm/s Cartesian operation VR speed : 0.1 degree/s
5	Specifying the operation coordinate				Specify the operation coordinate 16: Base coordinate 17: Robot coordinate 18: User coordinate 19: Tool coordinate
6	X coordinate value (unit: μm)				
7	Y coordinate value (unit: μm)				
8	Z coordinate value (unit: μm)				
9	Tx coordinate value (unit: 0.0001 degree)				
10	Ty coordinate value (unit: 0.0001 degree)				
11	Tz coordinate value (unit: 0.0001 degree)				
12	Reservation				
13	Reservation				
14	Type				For Type and Expanded type, refer to "Details of Data" in the following page.
15	Expanded type				
16	Tool No. (0 to 63)				
17	User coordinate No. (1 to 63)				
18	Base 1st axis position (unit: μm)				The base axis can be used up to three axes.
19	Base 2nd axis position (unit: μm)				
20	Base 3rd axis position (unit: μm)				
21	Station 1st axis position (pulse value)				
22	Station 2nd axis position (pulse value)				
23	Station 3rd axis position (pulse value)				
24	Station 4th axis position (pulse value)				
25	Station 5th axis position (pulse value)				
26	Station 6th axis position (pulse value)				

3 High-Speed Ethernet Server Function

3.3 Communication Method

Details of data

Please refer to “Chap.3.9.4.12 Flip/ No flip” in “YRC1000micro OPERATOR’S MANUAL (RE-CSO-A058)” prepared for each application.

Type	bit0	0: Front bit1 bit2 bit3 bit4 bit5 bit6 bit7	1: Back 0: Upper arm 0: Flip 0: $\Theta R < 180$, 0: $\Theta T < 180$, 0: $\Theta S < 180$, Reserve Reserve	Extended type	bit0	0: $\Theta L < 180$, bit1 bit2 bit3 bit4 bit5 bit6 bit7	1: $\Theta L \geq 180$ 1: $\Theta U \geq 180$ 1: $\Theta B \geq 180$ 1: $\Theta E \geq 180$ 1: $\Theta W \geq 180$ Reserve Reserve Reserve
------	------	--	---	---------------	------	---	---

To move the base axis, specify the robot No. at the specifying control group and input the total amount value, which the following coordinate value and the current value are added.



- X coordinate value (unit: μm)
- Y coordinate value (unit: μm)
- Z coordinate value (unit: μm)
- Tx coordinate value (unit: 0.0001 degree)
- Ty coordinate value (unit: 0.0001 degree)
- Tz coordinate value (unit: 0.0001 degree)

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: not specified • 1: 1 WORD • 2: 2 WORD	“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	Error code specified by the added status size	The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part



It is not able to operate the robot and the station at the same time. Setting the both operation at the same time receives the control group setting error (0xB008) from the YRC1000micro.

3.3.3.40 Move Instruction Command (Type Pulse)

Request

Sub header part

<Details>

Command No.	0x8B
Instance	Specify one out of followings 1:Link absolute position operation 2:Straight absolute position operation
Attribute	Fixed to "1"
Service	• Set_Attribute_All: 0x02

Specify the operation number from one to three.

1:Link absolute position operation
2:Straight absolute position operation

Specify "1".

Specify the accessing method to the data.

0x02: Write the data to the specified coordinate.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Specifying control group (Robot)				1 to 2 (Robot No.)
2	Specifying control group (Station)				1 to 3 (Station No.)
3	Specifying the classification in speed				Specify the classification of operations 0: % (Link operation) 1: V (Cartesian operation) 2: VR (Cartesian operation)
4	Specifying a speed				Specify the rate Link Operation : 0.01% Cartesian operation V speed : 0.1 mm/s Cartesian operation VR speed : 0.1 degree/s
5	Robot 1st axis pulse value				
6	Robot 2nd axis pulse value				
7	Robot 3rd axis pulse value				
8	Robot 4th axis pulse value				
9	Robot 5th axis pulse value				
10	Robot 6th axis pulse value				
11	Robot 7th axis pulse value				
12	Robot 8th axis pulse value				
13	Tool No. (0 to 63)				
14	Base 1st axis position (Pulse value)				The base axis can be used up to three axes.
15	Base 2nd axis position (Pulse value)				
16	Base 3rd axis position (Pulse value)				
17	Station 1st axis position (pulse value)				
18	Station 2nd axis position (pulse value)				
19	Station 3rd axis position (pulse value)				
20	Station 4th axis position (pulse value)				
21	Station 5th axis position (pulse value)				
22	Station 6th axis position (pulse value)				

To move the base axis, specify the robot No. at the specifying control group, and input the each axis value.

- Robot 1st axis pulse value
- Robot 2ndt axis pulse value
- Robot 3rd axis pulse value
- Robot 4th axis pulse value
- Robot 5th axis pulse value
- Robot 6th axis pulse value
- Robot 7th axis pulse value
- Robot 8th axis pulse value



Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: not specified • 1: 1 WORD • 2: 2 WORD
Added status	Error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

Data part

No data part



It is not able to operate the robot and the station at the same time. Setting the both operation at the same time receives the control group setting error (0xB008) from the YRC1000micro.

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.3.41 32 Byte Character Type Variable (S) Reading Writing Command

Request

Sub header part

<Details>

Command No.	0x8C
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to “1”.
Service	<ul style="list-style-type: none"> • Get_Attribute_Single: 0x0E • Get_Attribute_All: 0x01 • Set_Attribute_Single: 0x10 • Set_Attribute_Al: 0x02

Specify the variable number.
Since the extended variable is an optional function, follow the numbers of the variables specified by the parameter when specifying the number

Specify “1”.

Specify the accessing method to the data.
0x0E/0x01: Read out data of the specified element number
0x10/0x02: Write the data to the specified variable

Data part

(Data exists during the writing operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	S variable				Set the data when writing.
2					
3					
4					
5					
6					
7					
8					

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally	
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD	“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status size	The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	S variable				The data exists only when requested by the client.
2					
3					
4					
5					
6					
7					
8					

3.3.3.42 Plural 32 Byte Character Type Variable (S) Reading / Writing Command

Request

Sub header part

<Details>

Command No.	0x30C
Instance	Specify one out of followings • 0 to 99 (for standard setting)
Attribute	Fixed to "0"
Service	0x33 : Read plural data 0x34 : Write plural data

Specify the variable number (the first number with which reading/writing is executed)
 Follow the numbers of the variable specified by the parameter since the extended variable is an optional function.
 Specify "0"
 Only batch access of all elements is valid
 Specify the accessing method to the data.
 0x33: Read plural data
 0x34: Write plural data

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
1	Number			
2	S variable 1			
3				
4				
5				
6				
7				
8				
9				
:				
114	S variable 14			
115				
116				
117				

<Details>

Maximum: 14
 Variable data part is valid only when writing.
 Only the number of data is valid when reading.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

"1" indicates 1 WORD of added status data, and "2" indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is "1" and that of 2 WORD exists if the code is "2".

3 High-Speed Ethernet Server Function
3.3 Communication Method

Data part

(Data exists during the reading operation only)

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
1	Number				Maximum: 14
2	S variable 1				
3					
4					
5					
6					
7					
8					
9					
:					
106	S variable 14				
107					
108					
109					
110					
111					
112					
113					

3.3.4 File Control Command

Followings are respective commands used in the high-speed Ethernet communication.

Table 3-3: List of File Control Command

No.	Command No.	Instance	Attribute	Service	Command name	Reference
1	0x0	0x0	0x0	0x09	File delete	Refer to <i>chapter 3.3.4.1</i> .
2				0x15	Fileloading command (the PC to the YRC1000micro)	Refer to <i>chapter 3.3.4.2</i> .
3				0x16	File saving command (the YRC1000micro to the PC)	Refer to <i>chapter 3.3.4.3</i> .
4				0x32	File list acquiring command	Refer to <i>chapter 3.3.4.4</i> .
5				0x16	File saving command (A batch data backup) (the YRC1000micro to the PC)	Refer to <i>chapter 3.3.4.5</i> .

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.4.1 File Deleting Command

Request

Sub header part

<Details>

Command No.	0x0
Instance	0x0
Attribute	0x0
Service	0x09

File deleting process

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
	T	E	S	T
	J	O	B	.
	J	B	I	

<Details>

Specify the job name to be deleted

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD “1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status size The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part

3.3.4.2 File Loading Command

Request

Sub header part

<Details>

Command No.	0x0
Instance	0x0
Attribute	0x0
Service	0x15

File loading process

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
T J J	T	E	S	T
	J	O	B	.
	J	B	I	

<Details>

Specify the job name to be loaded

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part

 3 High-Speed Ethernet Server Function
 3.3 Communication Method

3.3.4.3 File Saving Command

Request

Sub header part

<Details>

Command No.	0x0
Instance	0x0
Attribute	0x0
Service	0x16

File saving process

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3
	T	E	S	T
	J	O	B	.
	J	B	I	

<Details>

Specify the job names to be saved.

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD “1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.
Added status	The error code specified by the added status size The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part

3.3.4.4 File List Acquiring Command

Request

Sub header part

<Details>

Command No.	0x0
Instance	0x0
Attribute	0x0
Service	0x32

File list accruing process

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
	*	.	J	B	Refer to "Details of data" for the file type.

Details of data

No specification JBI list

. JBI list

*.JBI JBI list

*.DAT DAT file list

*.CND CND file list

*.PRM PRM file list

*.SYS SYS file list

*.LST LST file list

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

3 High-Speed Ethernet Server Function
3.3 Communication Method

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
	1	.	J	B	
	I	<CR>	<LF>	2	File name + <CR><LF> to input consecutively
	2	.	J	B	
	I	<CR>	<LF>	3	
	3	3	.	J	
	B	I	<CR>	<LF>	
	T	E	S	T	
	0	1	.	J	
	B	I	<CR>	<LF>	

3.3.4.5 File Saving Command (Batch Data Backup)

Request

Sub header part

<Details>

Command No.	0x0
Instance	0x0
Attribute	0x0
Service	0x16

File saving process

Data part

32bit integer	Byte 0	Byte 1	Byte 2	Byte3	<Details>
/ R M K N	/	S	P	D	Specify /SPDRV/CMOSBK.BIN
	R	V	/	C	
	M	O	S	B	
	K	.	B	I	
	N				

Answer

Sub header part

<Details>

Status	Respond by one in the followings • 0x00 : respond normally • Other than 0x00 : respond abnormally
Added status size	• 0: no added status • 1: 1 WORD • 2: 2 WORD
Added status	The error code specified by the added status size

“1” indicates 1 WORD of added status data, and “2” indicates 2 WORD of added status data.

The error code of 1 WORD exists if the added status code is “1” and that of 2 WORD exists if the code is “2”.

Data part

No data part

To set the batch data backup function, set the device as “RAMDISK” as in advance.



It takes about ten minutes to finish backing-up the data by using the batch data backup function.

Refer to *chapter 3.2.2 “Batch Data Back-up Function Setting”* for more detail.

3	High-Speed Ethernet Server Function
3.4	Response Code

3.4 Response Code

For the results of the execution for the high-speed Ethernet server command, confirm the status code and the added status code.

3.4.1 Status Code

The list of the status code is shown below.

Table 3-4: Status Code List

Status code	Details
0x00	The transmission processing was executed successfully. However, whether processing as the YRC1000micro was completed successfully, confirm that an added status does not exist. In the following case, the added status shows that there was a problem in the processing as the YRC1000micro. <ul style="list-style-type: none"> ▪ Requested a job file list that does not exist ▪ Tried to read a job that does not exist
0x08	Requested command is not defined.
0x09	The element number of the invalid data is detected.
0x1f	An error inherent in vendor occurred. (This error corresponds to the vendor specification error in the CIP communication protocol.) For details, refer to <i>chapter 3.4.2 “Added Status Code”</i> .
0x28	An instance of the requested data does not exist in the specified command.

3.4.2 Added Status Code

The list of the added status code is shown below.

Added status code	Details
0834	File cannot be accessed in the read-only status
1010	Command error
1011	Error in number of command operands
1012	Command operand value range over
1013	Command operand length error
1020	Disk full of files
2010	Manipulator operating
2020	Hold by programming pendant
2030	Hold by playback panel
2040	External hold
2050	Command hold
2060	Error/alarm occurring
2070	Servo OFF
2080	Incorrect mode
2090	File accessing by other function
2100	Command remote not set
2110	This data cannot be accessed
2120	This data cannot be loaded
2130	Editing
2150	Running the coordinate conversion function *Refer to the NOTE in the last page of this list.
3010	Turn ON the servo power
3040	Perform home positioning
3050	Confirm positions
3070	Current value not made
3220	Panel lock; mode/cycle prohibit signal is ON
3230	Panel lock; start prohibit signal is ON
3350	User coordinate is not taught
3360	User coordinate is destroyed
3370	Incorrect control group
3380	Incorrect base axis data
3390	Relative job conversion prohibited (at CVTRJ)
3400	Master job call prohibited (parameter)
3410	Master job call prohibited (lamp ON during operation)
3420	Master job call prohibited (teach lock)
3430	Robot calibration data not defined
3450	Servo power cannot be turned ON
3460	Coordinate system cannot be set
4010	Insufficient memory capacity (job registered memory)
4012	Insufficient memory capacity (position data registered memory)
4020	Job editing prohibited
4030	Same job name exists

 3 High-Speed Ethernet Server Function
 3.4 Response Code

Added status code	Details
4040	No specified job
4060	Set an execution job
4120	Position data is destroyed
4130	Position data not exist
4140	Incorrect position variable type
4150	END instruction for job which is not master job
4170	Instruction data is destroyed
4190	Invalid character in job name
4200	Invalid character in the label name
4230	Invalid instruction in this system
4420	No step in job to be converted
4430	Already converted
4480	Teach user coordinate
4490	Relative job/ independent control function not permitted
5110	Syntax error (syntax of instruction)
5120	Position data error
5130	No NOP or END
5170	Format error (incorrect format)
5180	Incorrect number of data
5200	Data range over
5310	Syntax error (except instruction)
5340	Error in pseudo instruction specification
5370	Error in condition file data record
5390	Error in JOB data record
5430	System data not same
5480	Incorrect welding function type
6010	The robot/station is under the operation
6020	Not enough memory of the specified device
6030	Cannot be accessed to the specified device
6040	Unexpected auto backup request
6050	CMOS size is over the RAM area
6060	No memory allocation at the power supply on
6070	Accessing error to backup file information
6080	Failed in sorting backup file (Remove)
6090	Failed in sorting backup file (Rename)
6100	Drive name exceeds the specified values
6110	Incorrect device
6120	System error
6130	Auto backup is not available
6140	Cannot be backed up under the auto backup
A000	Undefined command
A001	Instance error
A002	Attribute error
A100	Replying data part size error (hardware limit)
A101	Replying data part size error (software limit)

 3 High-Speed Ethernet Server Function
 3.4 Response Code

Added status code	Details
B001	Undefined position variable
B002	Data use prohibited
B003	Requiring data size error
B004	Out of range the data
B005	Data undefined
B006	Specified application unregistered
B007	Specified type unregistered
B008	Control group setting error
B009	Speed setting error
B00A	Operating speed is not setting
B00B	Operation coordinate system setting error
B00C	Type setting error
B00D	Tool No. setting error
B00E	User No. setting error
C001	System error (data area setting processing error)
C002	System error (over the replying data area)
C003	System error (size of the data element not same)
C800	System error (customize API processing error) (Example) When a writing command during play in S2C541=1 is performed, etc.
CFFF	Other error
D8FA	Transmission exclusive error (BUSY or Semaphore error)
D8F1	Processing the another command (BUSY condition)
E24F	Wrong parameter setting for the system backup
E250	System backup file creating error (confirm if the mode is the remote mode)
E289	System error
E28A	System error
E28B	Disconnect the communication due to receive timeout
E28C	Cannot over write the target file
E29C	The requested file does not exist or the file size is "0".
E29D	System error
E29E	System error
E29F	System error
E2A0	The wrong required pass
E2A7	The relevant file is not in the requested file list.
E2AA	System error
E2AF	Receive the deletion request of the file that cannot to delete
E2B0	System error
E2B1	The directory cannot to be deleted
E2B2	Receive the request of the sending/receiving file at the remote OFF state.
E2B3	File not found
E2B4	The requested pass is too long
E444	Processing the another command (BUSY condition)

3 High-Speed Ethernet Server Function

3.4 Response Code

Added status code	Details
E49D	Format error (data size 0)
E49E	Format error (frame size over)
E49F	Format error (frame size 0)
E4A1	Format error (block number error)
E4A2	Format error (ACK error)
E4A3	Format error (processing category error)
E4A4	Format error (access level error)
E4A5	Format error (header size error)
E4A6	Format error (identifier error)
E4A7	Format error (the size of the requested command and received frame are different)
E4A8	System error
E4A9	System error
FFF0	System error
FFF2	System error
FFF3	System error
FFF4	System error
FFF5	System error
FFF6	Too many request and unable to process (BUSY condition)
FFF7	System error
FFF8	System error
FFFE	The remote mode is detected, and disconnect the communication

- Added status code 2150: Running the coordinate conversion function

This error occurs when executes the axis configuration information reading command at displaying the following window.

- Parallel shift job conversion window
- Mirror shift conversion window
- PAM window
- Relative job conversion window
- PMT conversion window
- Position modification window
- Arm bend compensate window
- User coordinate shift window
- Gun teaching position modification window
- 4 point teaching window

NOTE

Also, the same error occurs not only when each of the above mentioned window is indicated, it occurs when the PMT command is being executed.

When the YRC1000micro returning the system error, perform the following procedures.



- 1: Reset the alarm.
- 2: By using the mode key of the programming pendant, perform the remote OFF/ON operation.
- 3: Save the CMOS.BIN, and report the occurrence of the alarm to YASKAWA service representative.

 3 High-Speed Ethernet Server Function
 3.5 Troubleshooting

3.5 Troubleshooting

3.5.1 Network Communication Confirmation

Refer to *chapter 2.4 "Network Communication Confirmation"*, and confirm that TCP/IP basic communication can be performed.

3.5.2 Communication Setting Confirmation for Firewall and Security Software

The high-speed Ethernet server function uses UDP port 10040 and 10041.

Confirm that these ports are not blocked by the firewall or security software.

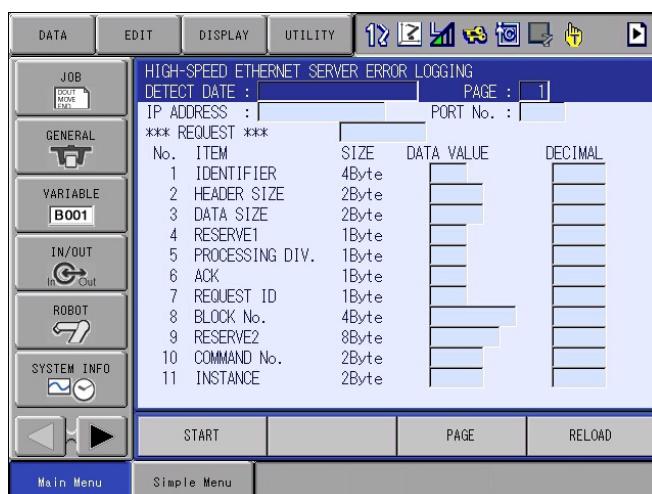
3.5.3 Error Log Confirmation of High-speed Ethernet Server Communication

The YRC1000micro performs the error logging for the high-speed Ethernet server. Confirm that there are no errors in the communication data using this logging information.

1. Start in online mode, select {SYSTEM INFO} - {HI-SPEED ETHER.ERR LOG.} under the Main Menu.



2. Select {START} in the HIGH-SPEED ETHERNET SERVER LOGGING window to start acquiring logging information, and then select {STOP} to stop acquiring logging information.



4 FTP Server Function

4.1 Outline

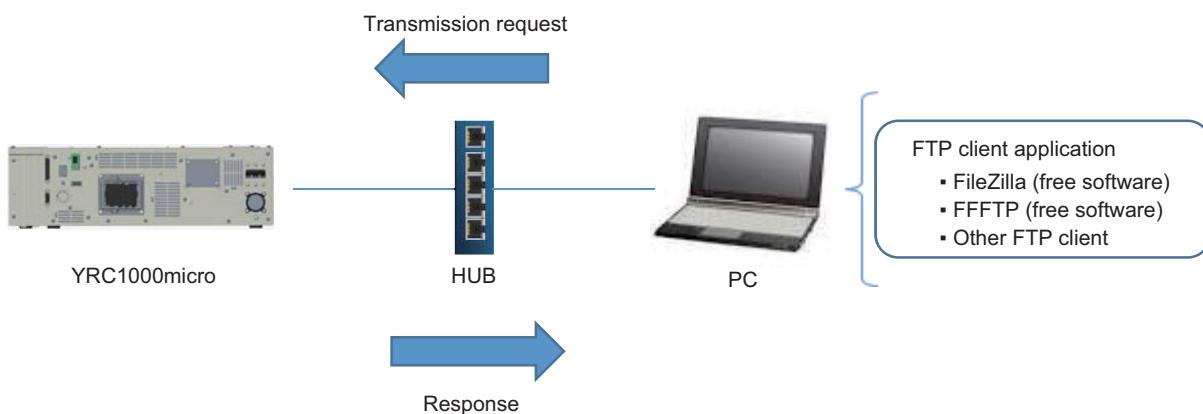
With the FTP (File Transfer Protocol), the FTP server function can send / receive the YRC1000micro internal data from the operation by PC, etc. Encrypted communication is also possible by using the FTPS (File Transfer Protocol over SSL/TLS).

The batch file (CMOSBK.BIN) of the YRC1000micro internal data can also be saved.

4.1.1 System Configuration

The FTP server function can be used with the following configuration.

Fig. 4-1: System Configuration When Using the FTP Server Function



4.1.2 Communication Target

The following can be used as a communication target with the FTP server function.

Table 4-1: FTP Server Function Communication Target

Device	Software	Details
Windows PC	FTP client software included in Windows	FTP client software that operates using the Windows command prompt (cmd.exe) * Only when set to the FTP server function's "STANDARD" mode
	FTP client software other than those listed above	FTP client software such as FileZilla or FFFTP
Device with which Ethernet communication is available	FTP client software	FTP client software

 4 FTP Server Function
 4.1 Outline

4.1.3 Function Mode

For the FTP server function, either the “STANDARD” or “EXPAND” mode can be used. The differences of both modes in regards to the DX200/FS100 are shown below.

Division	Details	DX200/FS100	YRC1000micro	
			Standard	Expand
Unencrypted communication	Plain text communication	○	○	×
Encrypted communication	SSL/TLS encrypted communication	×	×	○
Login name	‘rcmaster’	○	○	○
	‘ftp’	○	○	×
	‘anonymous’	○	○	×
Command support	‘ls’ (list display)	Job list output * Other than the job, an extension must be specified.	File/folder list output * If an extension is not specified, a list of all files and folders are output.	
	‘cd’ (change directory)	×	○	
	‘b’ (binary transmission)	○	○	
	‘a’ (ASCII transmission) * Responds OK to the ASCII transmission command, but it is not applied.	×	×	
	‘get’ (Receiving a file)	○	○	
	‘put’ (Sending a file)	○	○	
	‘del’ (Deleting a job) *The file except for the job cannot be deleted.	○	○	
Data configuration	Data saved to the login directory * Changes can be made by the parameter.	Internal data	Data folder <ul style="list-style-type: none">▪ JBI▪ DAT▪ CNDOthers	

4.1.4 CMOS Saving Function via FTP

When the FTP server function is enabled, the CMOS data, which is the batch data of the YRC1000micro, can be saved to the PC via FTP. The CMOS data to be saved is the saved data to the internal memory by the automatic backup function.

4.1.5 Restriction

① Restriction of the function by the remote mode

The FTP server function can be used only when the command remote is enabled.

For the command remote, refer to *chapter 1.2 “Command Remote Setting for YRC1000micro”*.

② Prohibition of sending of the files whose size is “0”

Do not send a file whose size is “0” to the YRC1000micro. When a file whose size is “0” is sent to the YRC1000micro, a transmission system error occurs and the FTP connection is disconnected. In this case, after resetting the alarm, reconnect the FTP, and then perform transmission processing.

③ Prohibition of interruption of the data transmission

Do not interrupt the transmission using, such as “Ctrl” + “c”. If the transmission is interrupted, the FTP connection status error may occur. In this case, disconnect the FTP connection, and then perform the FTP connection again.

④ File information

If the file list is acquired from the YRC1000micro, the information of each file (file size, date, attributes) is given to match the format of the general FTP client software, and the actual status is not reflected. For file information of the actual status, receive each file to confirm the status.

⑤ Restriction of access with other communication processing by the exclusion

The communication function of the YRC1000micro (such as the high-speed Ethernet server function, the FTP server function, or the internal data browsing function by using the Web browser) cannot be performed simultaneously. Normally, the pseudo multiplex communication by dividing the time can be performed, but because FTP communication occupies a lot of communication bandwidth during FTP communication, other communication processes may be made to wait a long time or the communication time out may occur. For this reason, design the system so that it can avoid any influences by waiting to be processed caused by the FTP server function.

⑥ SSL certificate for encrypted communication

The SSL certificate when performing encrypted communication is a self-certificate. This certificate is not issued by a third-party.

⑦ No support for parallel forwarding

Since the parallel forwarding is not supported, the number of files that can be simultaneously forwarded is one even if a FTP client that supports parallel forwarding, such as FileZilla is used.

4 FTP Server Function
4.2 Setting

4.2 Setting

4.2.1 Enabling Setting for the FTP Function

Enable the FTP function in accordance with following procedures.

1. Turn ON the power supply while pressing {Main Menu}.
Maintenance mode starts.



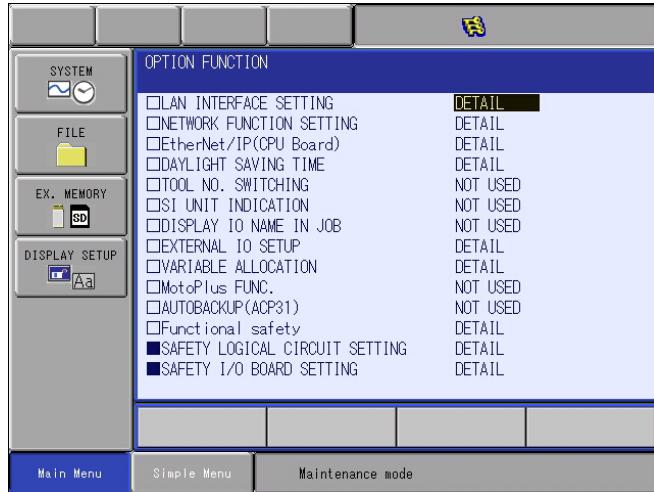
2. Set the security mode to the "MANAGEMENT MODE".



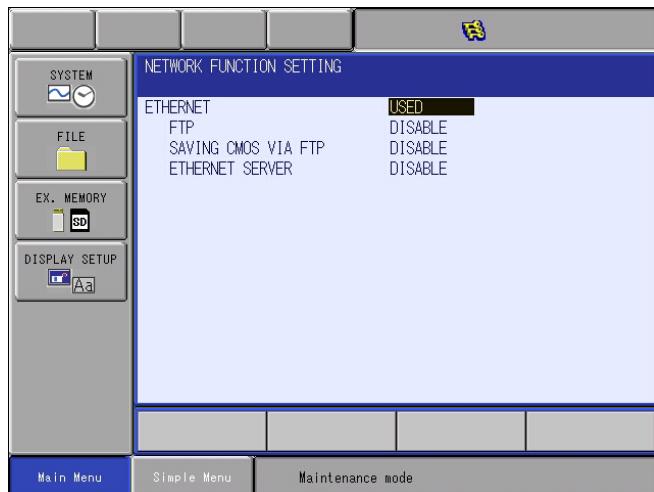
4 FTP Server Function

4.2 Setting

3. In the Main Menu, select {SYSTEM} - {SETUP} - "OPTION FUNCTION".
The OPTION FUNCTION window appears.



4. After necessary settings are done, select "DETAIL" of the "NETWORK FUNCTION SETTING".
NETWORK FUNCTION SETTING appears.

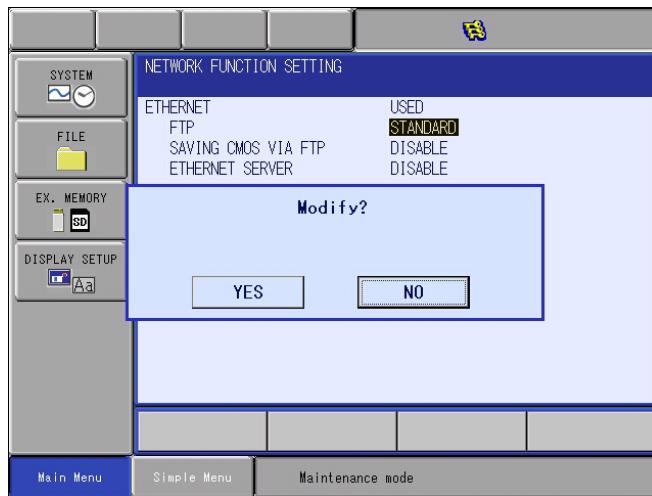


5. Set "FTP" to either "STANDARD" or "EXPAND".
For details about the difference between STANDARD and EXPAND, refer to chapter 4.1.3 "Function Mode".

4 FTP Server Function

4.2 Setting

6. Press [Enter].
The confirmation dialog box appears.



7. Select {YES}.
Select {YES} to return to the OPTION FUNCTION window.

4.2.2 Enabling the CMOS Saving Function via FTP

The CMOS saving function via FTP is a function which backs up the data saved in the YRC1000micro such as system settings or operation conditions via the FTP server function by using the YRC1000micro automatic backup function.

When using this function, perform the following settings.

1) Function enabling settings

Enable this function in accordance with following procedures.

1. Turn ON the power supply while pressing {Main Menu}.
Maintenance mode starts.



4 FTP Server Function

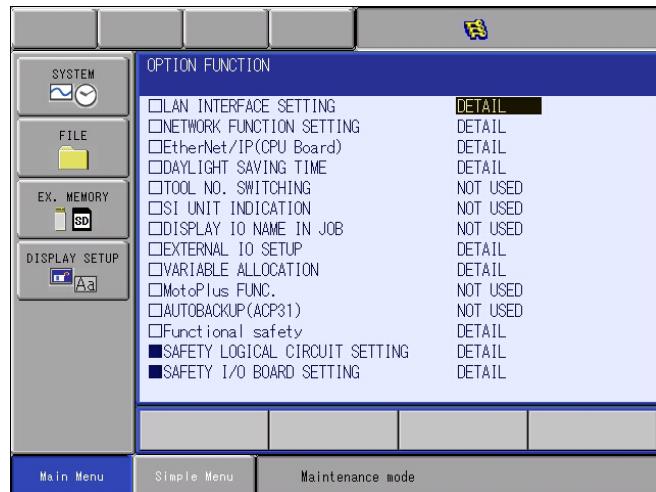
4.2 Setting

2. Set the security mode to the “MANAGEMENT MODE”.



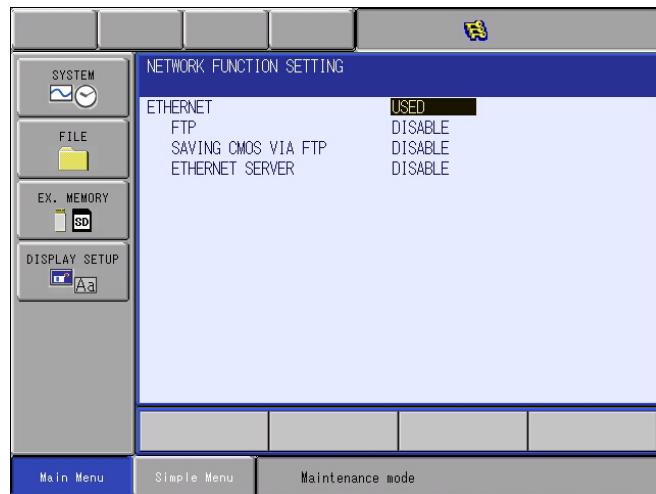
3. In the Main Menu, select {SYSTEM} - {SETUP} - “OPTION FUNCTION”.

The OPTION FUNCTION window appears.



4. Select “DETAIL” of the “NETWORK FUNCTION SETTING”.

The NETWORK FUNCTION SETTING window appears.



 4 FTP Server Function
 4.2 Setting

5. Set “SAVING CMOS VIA FTP” to “NORMAL MODE” or “SIMPLE MODE”.

SIMPLE MODE: There is no notification about the generation of CMOS data for forwarding.

NORMAL MODE: There is notification about the generation of CMOS data for forwarding.

When the “FTP” is set to “DISABLE”, set the “FTP” to “STANDARD” or “EXPAND”.

6. Press [Enter].

The confirmation dialog box appears.



7. Select {YES}.

Select {YES} to return to the OPTION FUNCTION window.

8. Turn ON the power supply again to start the normal operation mode.

2) Data generation notification setting in the NORMAL MODE

If the CMOS saving function via FTP is set to “NORMAL MODE”, also perform the following settings for the CMOS data generation notification.

1. Start normal operation mode.

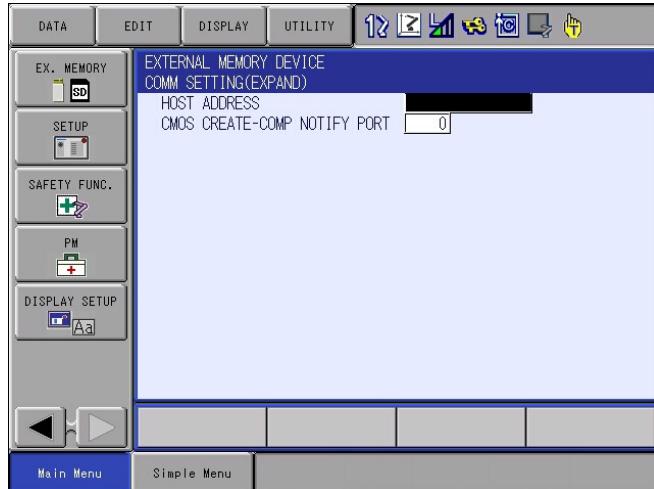
Starts in online mode.

4 FTP Server Function

4.2 Setting

2. Under the Main Menu, select {EX. MEMORY} - {COMM SETTING(EXPAND)}.

The COMM SETTING(EXPAND) window appears.



3. Set the HOST ADDRESS and the NOTIFY PORT number.
Set the HOST ADDRESS for the communication target to notify the CMOS data generation notification and port number.

■ HOST ADDRESS

For the IP address of the communication target, use half-width numbers and periods (.), and set "xx.xx.xx.xx" using the following format (xx is a decimal number from 0 to 255). Note that if the DNS client function is enabled, the FQDN (Fully Qualified Domain Name):

"Hostname@domainname" name format) can also be set. Characters that can be used for the FQDN are half-width alphanumeric characters, hyphens (-), underscores (_) and the at-sign (@) which acts as the character boundary between the host name and the domain name. Set it within 128 characters or less.

■ CMOS CREATION NOTIFICATION REPORT

Set the port number of the communication target by using half-width numeric characters and decimal digits from 1 to 65535. For this port number, perform CMOS creation notification with TCP. The notification message is the ASCII character string "Ready to CMOS Save".



If the CMOS creation notification cannot be performed, the system judges that an error occurred in the automatic backup. And then a signal output to "UNIV.OUT ON ERROR" and "DISPLAY AT EMERGENCY" are performed.



The host address set in this window is commonly used with DCI function and the standalone function. These addresses cannot be set separately.

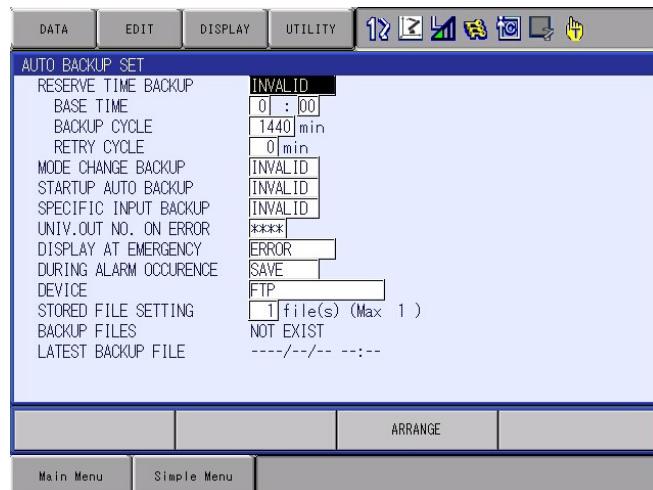
4 FTP Server Function

4.2 Setting

3) Automatic backup function settings

The YRC1000micro automatic backup function is used to backup the batch data. Perform the following settings for the function.

1. Set the security mode to the “MANAGEMENT MODE”.
2. Select {Controller Setting} - {AUTO BACKUP SET}.
The AUTO BACKUP SET window appears.
3. Set “DEVICE” to “FTP”.



- For details of the automatic backup function, refer to “Chap. 9.3 Automatic Backup Function” in “YRC1000micro INSTRUCTIONS (RE-CTO-A222)”.

- For operations which the backed-up batch data that uses the CMOS saving function via FTP is written to the YRC1000micro, refer to “Chap. 9.4 Loading the Backup Data from the SD Card” in “YRC1000micro INSTRUCTIONS (RE-CTO-A222)”.
- While an alarm is occurring, the device cannot be changed on the AUTO BACKUP SET window. In this case, first cancel the alarm, and then change the device.
- If the parameter is not RS004=20, “FTP” will not appear on the DEVICE in the “AUTO BACKUP SET” window. In this case, confirm the setting of the parameter RS004.



When performing these settings, the automatic backup to the SD Card is not performed. Also, these settings cannot be used together with the high-speed Ethernet server function, which is previously described.

When using these settings, the maximum number of saves is one. (The saved file name must be “CMOSBK.BIN”.)



4.2.3 Command Remote Setting

When using the FTP server function, set the command remote to “VALID”.

For procedures to enable the command remote, refer to
chapter 1.2.3 “Command Remote Setting Method”.

4.3 Specification

4.3.1 Account

For the FTP server function, the following account can be used.

Files which can be sent and received differ depending on the account.

Table 4-2: FTP Server Function Account

User name	Password	Processes that can be executed
'rcmaster'	Management mode password	<ul style="list-style-type: none"> ▪ Saving / Loading a job ▪ Saving / Loading a condition file or general data ▪ Saving the system data ▪ Saving the parameters ▪ Backing up batch data
'ftp' * Only in the standard mode	Any password	<ul style="list-style-type: none"> ▪ Saving / Loading a job ▪ Saving / Loading a condition file or general data ▪ Saving the system data ▪ Backing up batch data
'anonymous' * Only in the standard mode	Any password	<ul style="list-style-type: none"> ▪ Saving / Loading a job ▪ Saving a condition file or general data



If the password protection function (extra charged option) is enabled, only the user name and password defined in the password protection function can be used. In this case, the above user name and login name cannot be used.

4.4 Communication Method

Shows an example of the communication procedure for the FTP server function.

4.4.1 Example of Communication Procedure in Normal Operation Mode (When Using the Windows 7 Command Prompt)

Shows the example of the procedure for performing FTP communications in the normal operation mode.

In the following example, the Windows 7 command prompt is used to save (get) a job. The underlined sections are the items to enter. After inputting each section, enter [Enter].

```
C:/>ftp 192.168.255.1 . . .1)
Connected to 192.168.255.1
220 YRC FTP server ( 1.00) ready.
User (192.168.255.1:(none)): ftp . . .2)
331 Password required for ftp.
Password:_____. . .3)
230 User ftp logged in.
ftp> ls . . .4)
200 PORT command successful.
150 Opening ASCII mode data connection. (192,168,255,100,63365)
JOB
DAT
CND
SYS
PRM
LST
CSV
LOG
TXT
226 Transfer complete.
ftp: 45 bytes received in 0.02Seconds 2.81Kbytes/sec.
ftp> cd JOB . . .5)
250 CWD command successful.
ftp> ls . . .6)
200 PORT command successful.
150 Opening ASCII mode data connection. (192,168,255,100,63366)
A.JBI
B.JBI
C.JBI
226 Transfer complete.
ftp: 21 bytes received in 0.00Seconds 21000.00Kbytes/sec.
ftp> get A.JBI . . .7)
200 PORT command successful.
150 Opening ASCII mode data connection. (192,168,255,100,63369)
226 Transfer complete.
ftp: 118 bytes received in 0.00Seconds 118000.00Kbytes/sec.
ftp> bye . . .8)
221 Goodbye.
```

C:/>

4 FTP Server Function

4.4 Communication Method

1. The processing is for starting the FTP connection to the YRC1000micro (FTP server).
2. Enter the user name for logging in to the YRC1000micro.
3. Enter the password that corresponds to the user name.
4. The processing is for acquiring the folder list of the YRC1000micro.
5. The processing is for changing the target directory to "JOB".
6. The processing is for acquiring the job list in the "JOB" folder.
7. The processing is for acquiring a job from the YRC1000micro.
8. The processing is for ending the FTP connection.

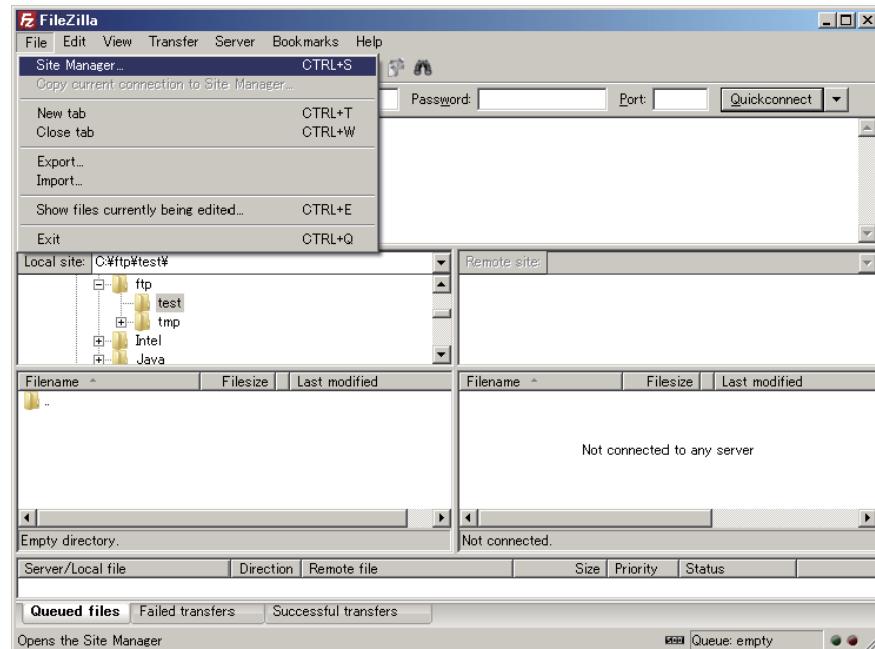
4.4.2 Example of Communication Procedure in Expand Mode (When Using FileZilla)

Shows the example of the procedure for performing FTP encrypted communications in the expand mode.

In the following example, FileZilla version 3.9.0.6 is used to save (get) a job.

1. FTP Server Setting Procedure

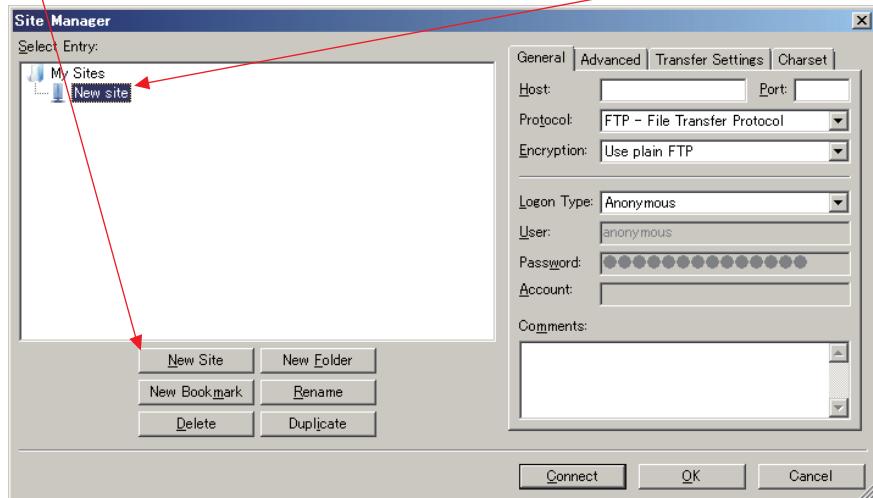
- Select {File} - {Site Manager}.



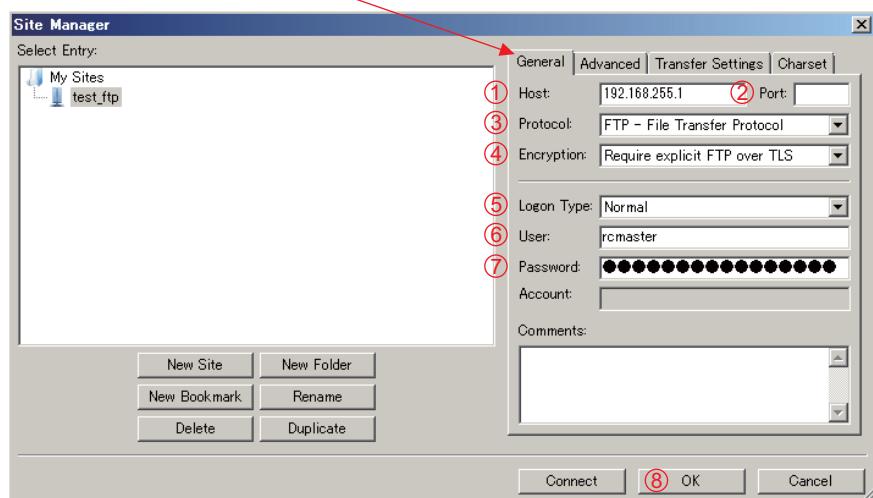
4 FTP Server Function

4.4 Communication Method

Click [New Site], and then add any name to the New site that was output.



Set each item in the General tab.

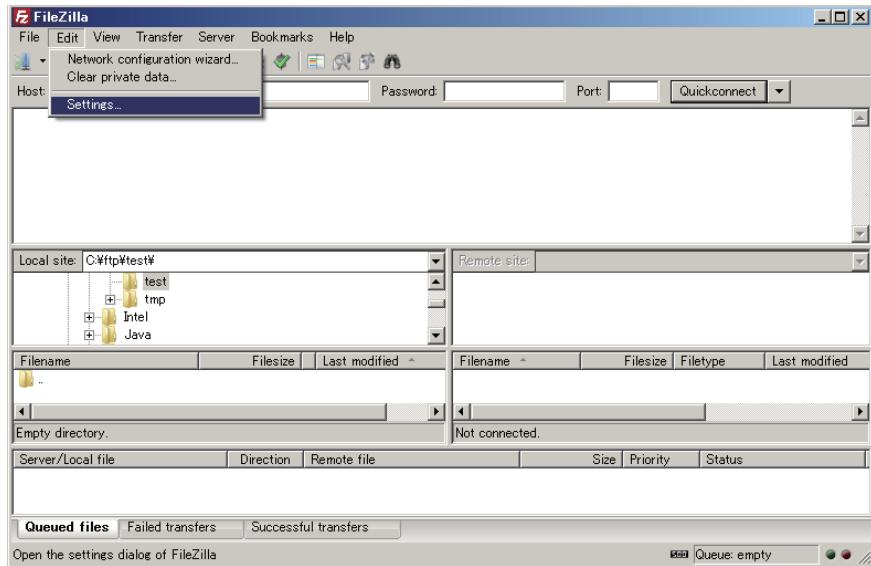


- ① Host: Enter the IP address of the FTP server.
- ② Port: Leave it blank.
- ③ Protocol: Select “FTP - File Transfer Protocol”.
- ④ Encryption: Select “Require explicit FTP over TLS”.
- ⑤ Logon Type: Select “Normal”.
- ⑥ User: Enter the FTP account name of the FTP server.
- ⑦ Password: Enter the password that corresponds to the FTP account.
- ⑧ Click {OK}.

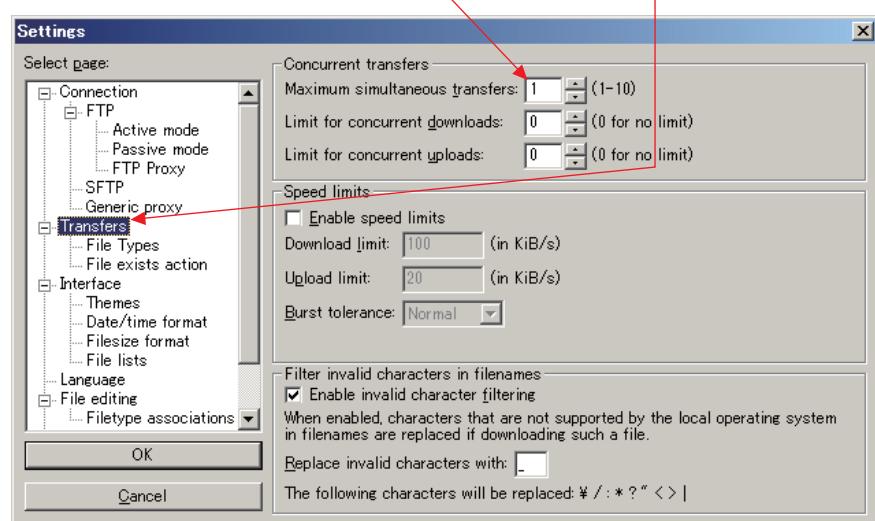
4 FTP Server Function

4.4 Communication Method

● Select {Edit} - {Settings}.



Set "Maximum simultaneous transfers" to "1" in "Transfers".



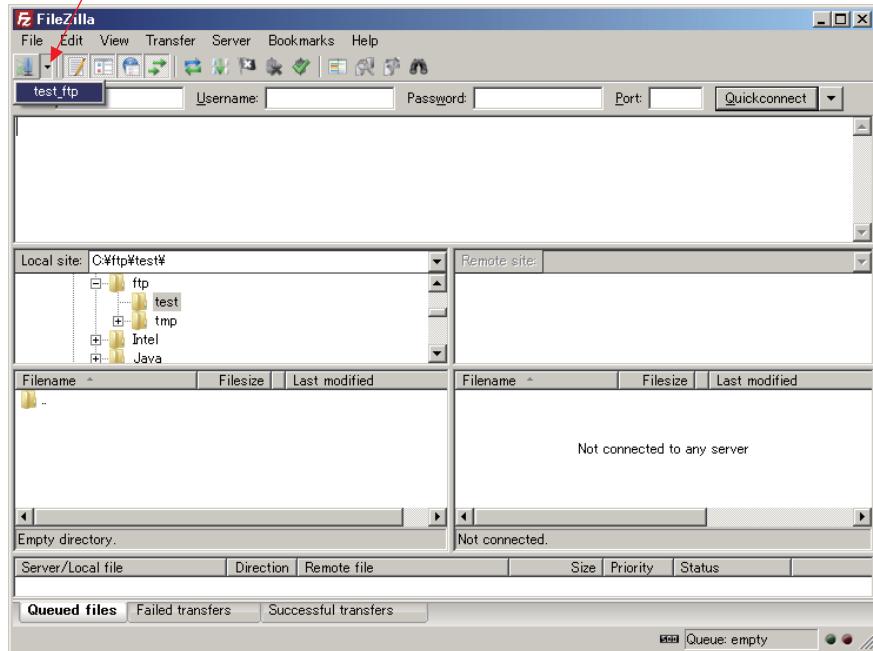
2. FTP Communication Procedure

2.1. Connection

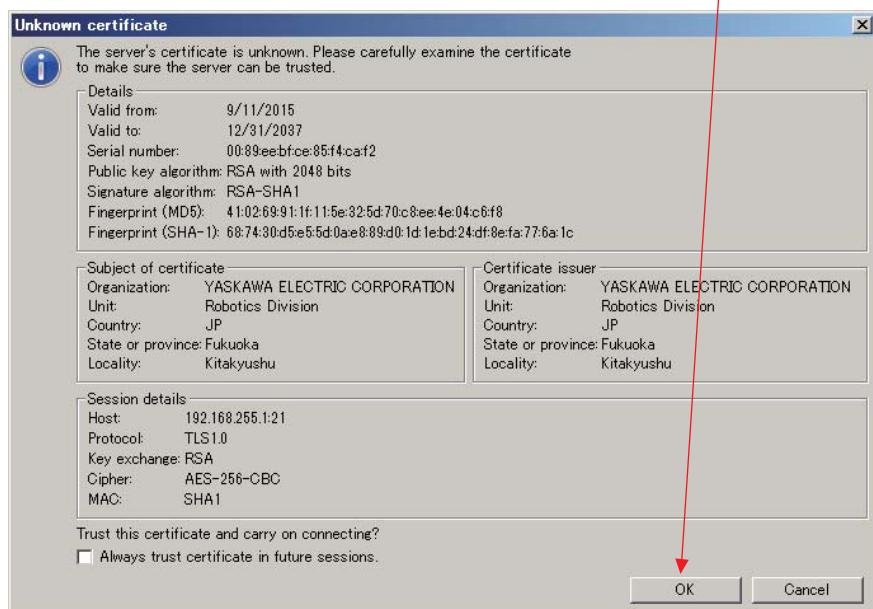
4 FTP Server Function

4.4 Communication Method

Click {▼} under "File", and select the appropriate account.



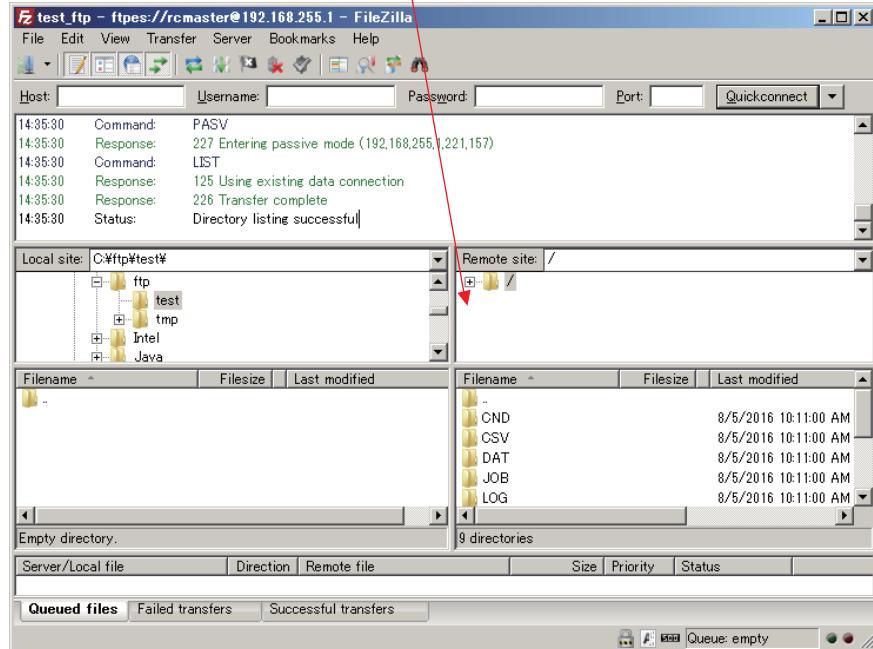
When the certificate appears, confirm the contents, and select {OK}.



4 FTP Server Function

4.4 Communication Method

If the folder appears in the remote site, the connection is complete successfully.

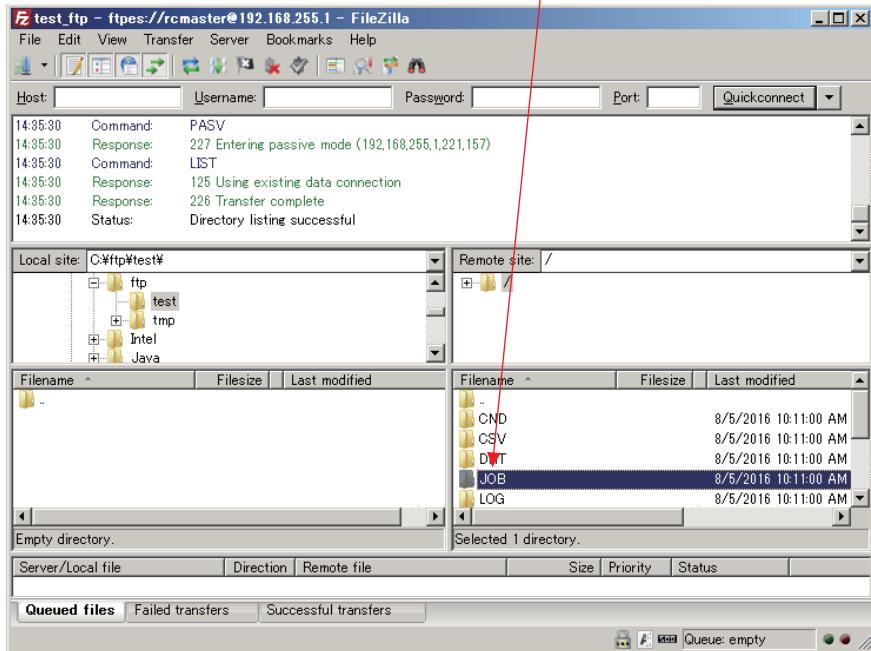


4 FTP Server Function

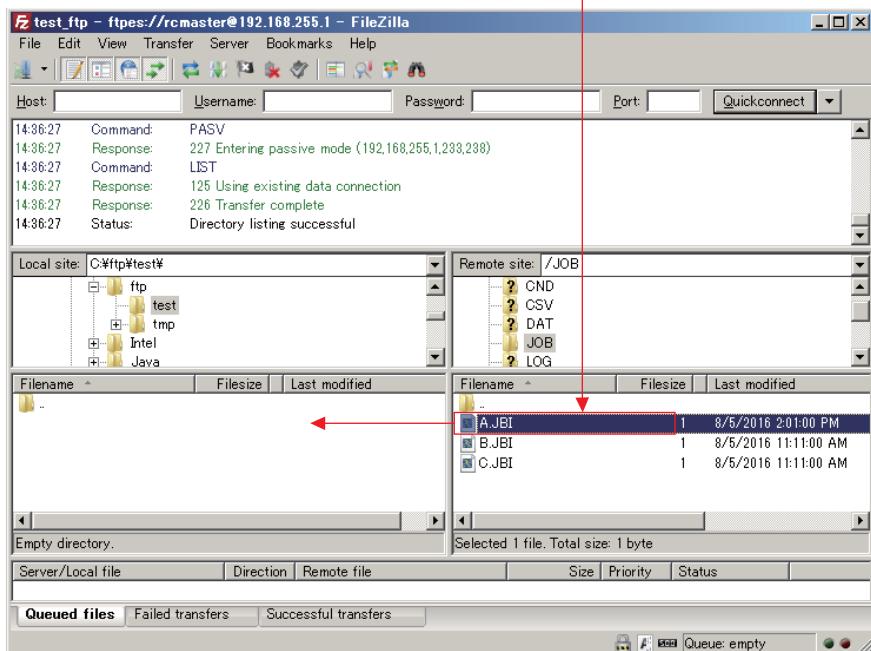
4.4 Communication Method

2.2 Downloading and Uploading a File

To download a file, double-click the target folder in the remote site, and then open the folder containing the file to download.



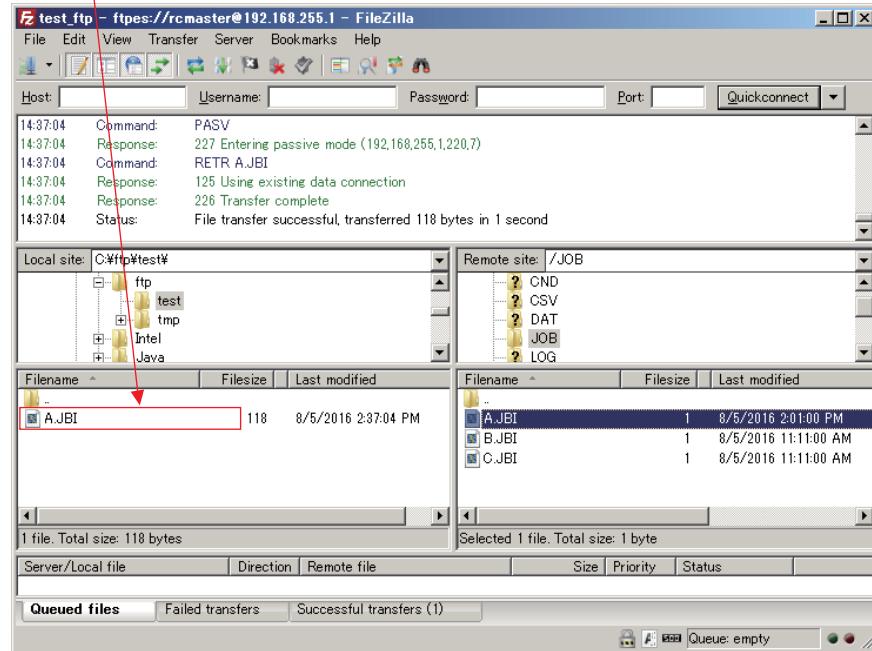
Select the target file in the remote site, and then drag the file to the file display field of the local site.



4 FTP Server Function

4.4 Communication Method

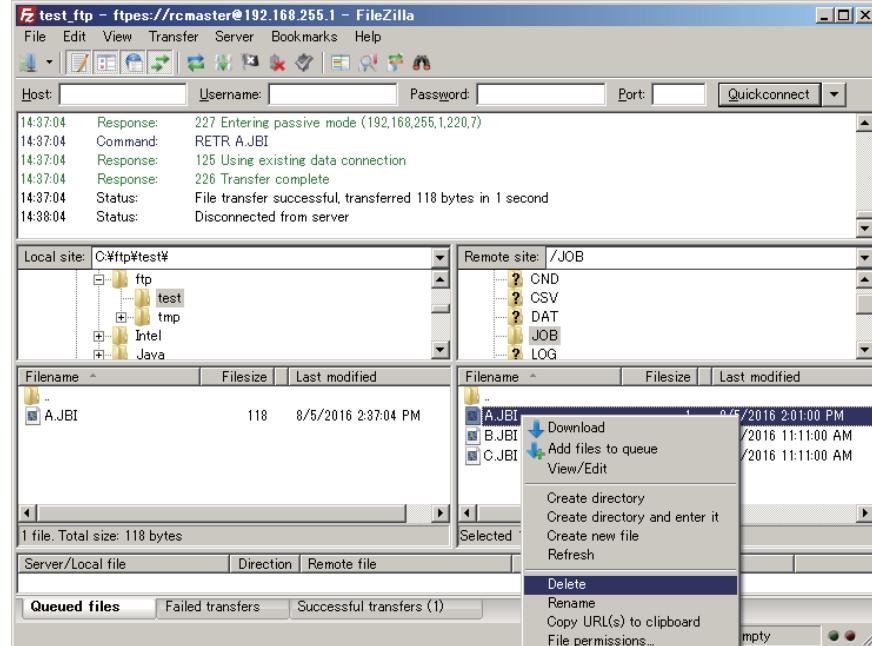
Transfer Result



To upload a file, as the same procedure above, select the target file in the local site, and then drag the file to the file display field of the remote site.

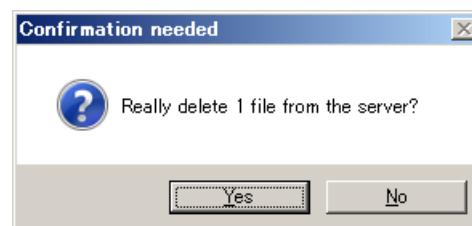
2.3. Deleting a File

To delete a file, right click the target file in the remote site, and select "Delete".

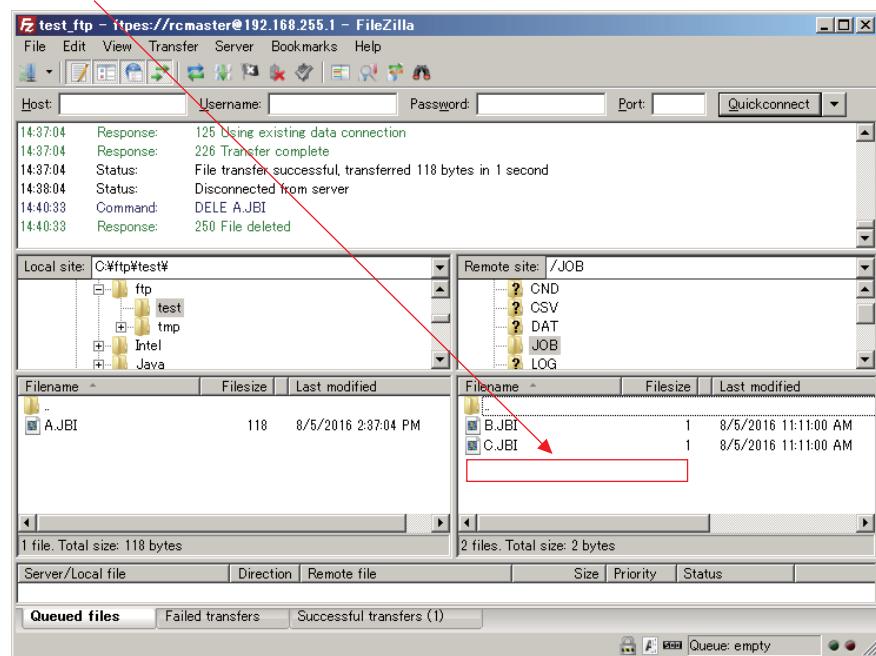


 4 FTP Server Function
 4.4 Communication Method

Click {YES}.



Result of Deleting a File



4.4.3 Saving CMOS Data by Using CMOS Saving Function via FTP

The procedure for accessing the CMOS data is the same as the one for accessing the general files, such as the job files, however, the existing folder is different from these files. If the CMOS data is created, the data exists as the following file.

'/SPDRV/CMOSBK.BIN'

4	FTP Server Function
4.5	Troubleshooting

4.5 Troubleshooting

4.5.1 Network Communication Confirmation

Refer to *chapter 2.4 “Network Communication Confirmation”*, and confirm that TCP/IP basic communication can be performed.

4.5.2 Confirming the Communication Setting for Firewall and Security Software

Confirm that FTP communications are not blocked by the firewall or security software.

4.5.3 Confirming the Function Mode

In the standard mode, confirm whether the encrypted communication is not being performed.

In the expand mode, confirm whether the unencrypted communication is not being performed.

5 DCI Function

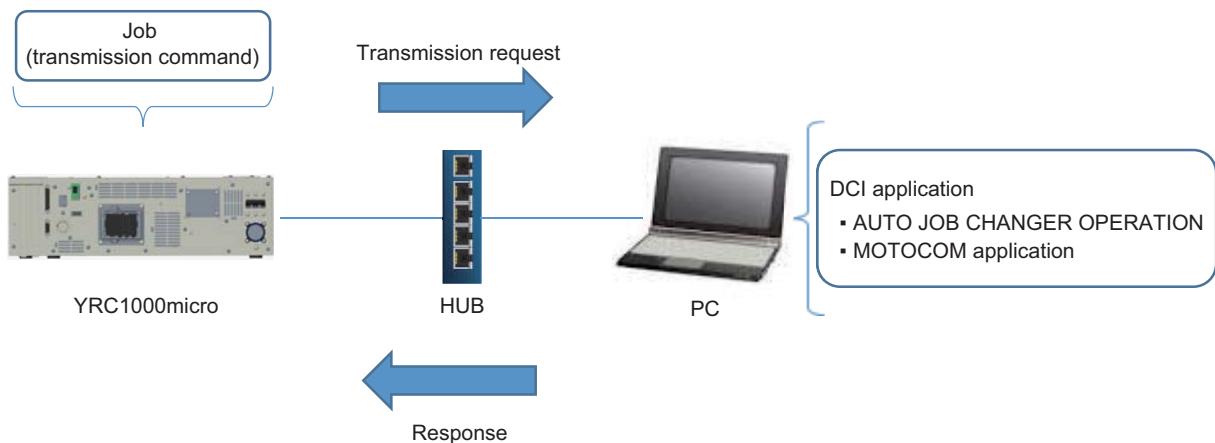
5.1 Outline

The DCI (Data Communication by Instruction) function can send / receive jobs or variables with the YRC1000micro and PC by executing the transmission commands written in the job.

5.1.1 System Configuration

The DCI function can be used with the following configuration.

Fig. 5-1: System Configuration When Using the DCI Function



5.1.2 Communication Target

The following can be used as a communication target of the DCI function.

Table 5-1: DCI Function Communication Target

Device	Software	Details
Windows PC	AUTO JOB CHANGER OPERATION	Application software included with the MOTOCOM32 which is an optional function.
	MOTOCOM application	Customer-created communication application software by using the communication DLL included with the MOTOCOM32 which is an optional function.

 5 DCI Function
 5.2 Setting

5.2 Setting

5.2.1 Communication Target Setting

Perform the settings for the communication target of DCI in accordance with following procedures.

1. Start normal operation mode.
Start in the online mode.
 2. Under the Main Menu, select {EX. MEMORY} - {COMM SETTING(EXPAND)}.
- The COMM SETTING(EXPAND) window appears.



3. Set a HOST ADDRESS.
Set the HOST ADDRESS for the communication target.

■ HOST ADDRESS

For the communication target IP address, use half-width numbers and periods (.), and set “xx.xx.xx.xx” using the following format (xx is a decimal number from 0 to 255). Note that if the DNS client function is enabled, the FQDN (Fully Qualified Domain Name: ‘Hostname@domainname’ name format) can also be set. Characters that can be used for the FQDN are half-width alphanumeric characters, hyphens (-), underscores (_) and the at-sign (@) which acts as the character boundary between the host name and the domain name. Set it within 128 characters or less.



The host address that is set on this window is used for CMOS save functions and standalone functions via FTP. These addresses cannot be set separately.

5.2.2 Command Remote OFF Setting

Set the command remote to DISABLE.

To disable the command remote, set the key switch of the programming pendant to “PLAY” or “TEACH”, or set the “CMD REMOTE SEL” of the PSEUDO INPUT SIGNAL to DISABLE. For procedures about changing the pseudo input signal, refer to *chapter 1.2.3 “Command Remote Setting Method”*.

5.3 Preparation at the YRC1000micro Side

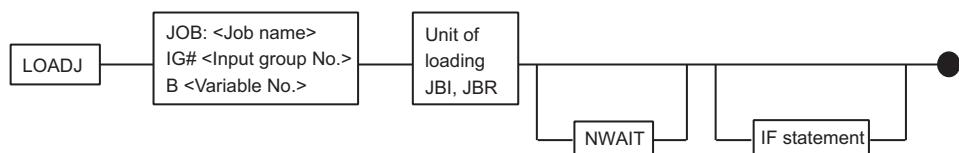
5.3.1 Command for Job Transmission

5.3.1.1 LOADJ

■ Function

Loads specified jobs as single or related jobs, from the PC to the memory of the YRC1000micro.

■ Configuration



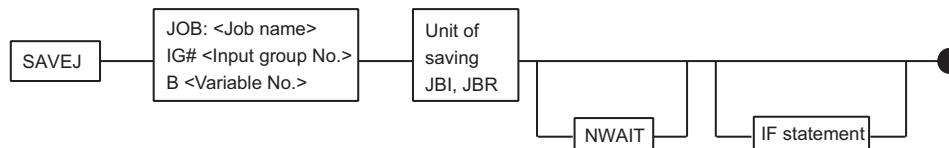
- If the YRC1000micro memory already contains a job having the same name as the job to be loaded, the existing job is deleted and the new job is loaded.
However, if the job to be loaded is as follows, an alarm occurs.
 - Execution starting job
 - Job under execution/halting
 - Job registered in job call stack
- Specify input group numbers (BCD/BIN, parity specification), and variable numbers in the same way as for the CALL command.
If the pattern input value is 0, the operation is not executed.
A variable number 0 is valid.
For characters which are used for entering the job names of the pattern input value and the variable number, only the half-width numeric characters are used.
- Unit of loading : Select either a single job (JBI) or related jobs (JBR).
- When the NWAIT is specified, the next command is executed without waiting completion of job loading.
- While a job is being loaded by the LOADJ command for which NWAIT is specified, if an access is attempted to a job called by the CALL command or JUMP command, an alarm occurs.
If a LOADJ or SAVEJ command has already been executed, a job is loaded after completion of the execution.

 5 DCI Function
 5.3 Preparation at the YRC1000micro Side

5.3.1.2 SAVEJ

■ Function

Saves a specified job as single or related jobs, from the memory of the YRC1000micro to the PC.

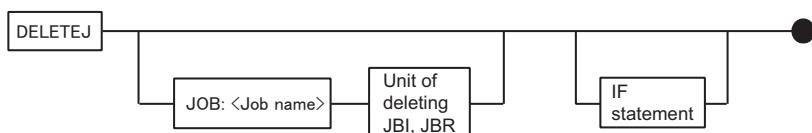
■ Configuration

- Specify input group numbers (BCD/BIN, parity specification), and variable numbers in the same way as for the CALL command. If the pattern input value is 0, the operation is not executed. A variable number 0 is valid.
- For characters which are used for entering the job names of the pattern input value and the variable number, only the half-width numeric characters are used.
- Unit of saving : Select either a single job (JBI) or related jobs (JBR).
- When the NWAIT is specified, the next command is executed without waiting completion of job saving.
When a LOADJ or SAVEJ command has already been executed, a job is saved after completion of the execution.

5.3.1.3 DELETEJ

■ Function

Deletes all jobs except its own job or specified jobs as single or related jobs, from the memory of the YRC1000micro.

■ Configuration

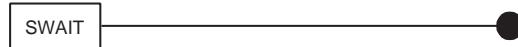
- Unit of deleting : Select either a single job (JBI) or related jobs (JBR).
- The following jobs cannot be deleted.
 - Execution starting job
 - Job under execution/halting
 - Job registered in job call stack

5.3.1.4 SWAIT

■ Function

Waits for completion of loading or saving jobs or variables.

Use this command to recognize a completion of LOADJ, SAVEJ, LOADV, and SAVEV commands when a NWAIT is specified for these commands.

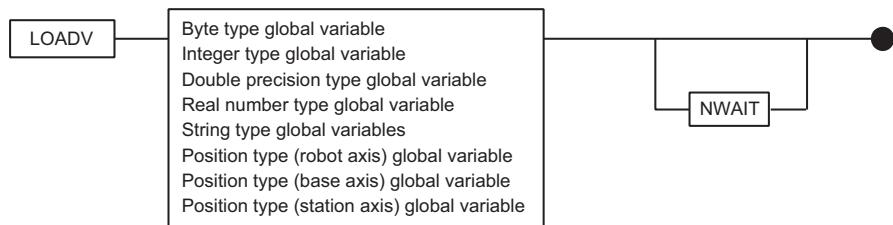
■ Configuration

5.3.2 Command for Variable Transmission

5.3.2.1 LOADV

■ Function

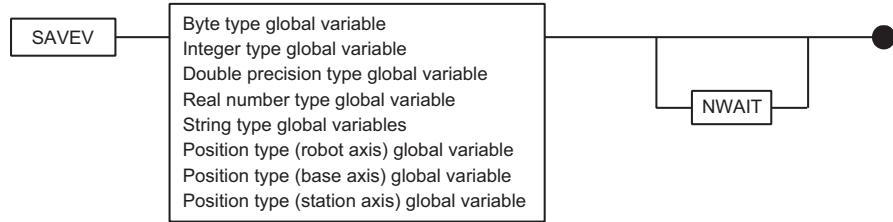
Loads the specified global variables from a PC to the YRC1000micro memory.

■ Configuration

5.3.2.2 SAVEV

■ Function

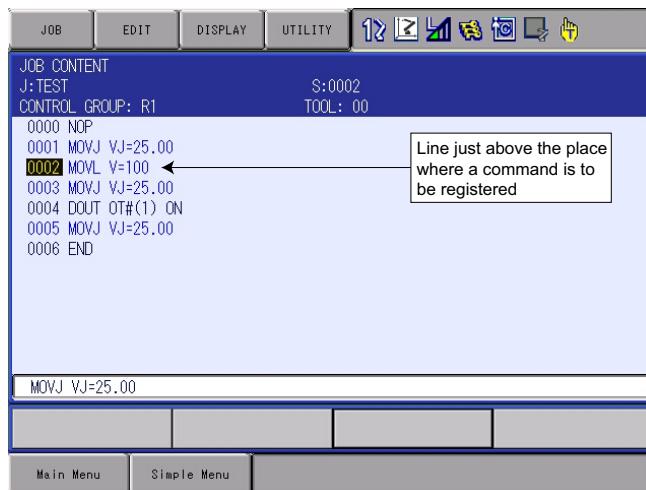
Saves the specified global variables from the YRC1000micro memory to a PC.

■ Configuration

5 DCI Function
5.3 Preparation at the YRC1000micro Side

5.3.3 Registering DCI Command

1. Move the cursor to the address area.
2. Move the cursor to the line where a command is to be registered in the job content window.
 - In the job content window in the teach mode, move the cursor to the line just above the place where a command is to be registered.



3. Press [INFORM LIST].
4. Select a command to be registered.
 - The command list dialog is displayed.



5 DCI Function

5.3 Preparation at the YRC1000micro Side

- The cursor moves to the command list dialog, and the cursor in the address area changed to an underline.
- The command where the cursor is positioned is displayed with the previously registered additional items in the input buffer line.



5. Change the additional items and variable data.

- <To register items as displayed in the input buffer>

(1) Perform operation described in the step 6 below.

- <To edit any additional items>

(1) With the cursor on the command to be registered, press [SELECT].

- The cursor moves to the input buffer line.



• Changing a numerical value data of additional items

I) Move the cursor to the additional item whose numerical value is to be changed. Pressing simultaneously [SHIFT] and the cursor key increments or decrements the value.



II) To enter a value by pressing the number key, press [SELECT] to display the input line.

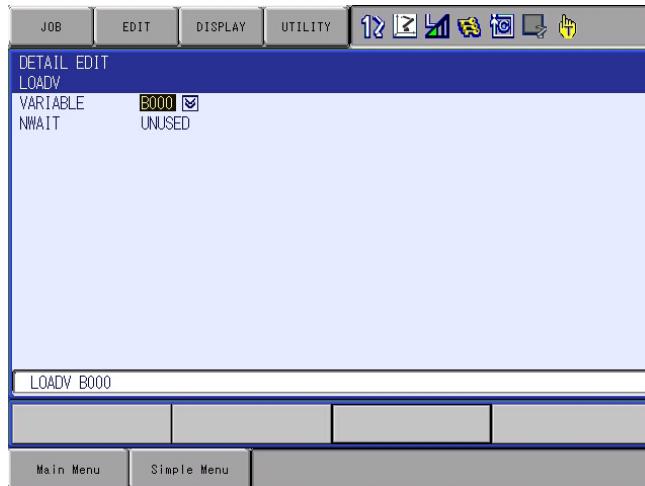


Enter a value, then press [ENTER]. The value displayed in the input buffer line is changed.

5 DCI Function

5.3 Preparation at the YRC1000micro Side

- Adding, changing, or deleting the additional items
- To add, change or delete the additional items, select a command in the input buffer line to display the detail edit display.



- Adding the additional item
 - I) Select “UNUSED” of an additional item selection status, then display the selection dialog.
 - II) Select an additional item to be added.
- To delete an additional item, move the cursor to an additional item to be deleted, then select “UNUSED” to delete.



- Changing the data type
 - (1) To change the data type of additional item, move the cursor to the of the additional item and press [SELECT] to select a data type.



- (2) After having added, changed or deleted the additional items, press [ENTER].
 - The detail edit window is exited and the job content window appears.

 5 DCI Function
 5.3 Preparation at the YRC1000micro Side

6. Press [INSERT] and [ENTER].

- The command displayed in the input buffer line is registered.
- To register a command just before an END command, it is not necessary to press [INSERT].

**5.3.4 Concurrent Task from Multiple Job**

As an option, commands related to DCI function can be executed from more than one job concurrently. The operations are explained below.

- The DCI related commands can be executed in any job regardless of distinction among the ordinary job, concurrent job (optional), or job activated in series (optional).
- Multiplexing of DCI transmission function is not supported. Therefore, it is impossible to manipulate files on two or more PCs connected to the YRC1000micro.
- If two or more commands related to DCI function are issued concurrently, the execution starts after completion of processing of the currently executing command. Therefore, if a module issues a command request while another module is executing DCI function, the request has to wait until the ongoing processing completes.

5.3.5 DCI Parallel Execution

By using the function described below, the DCI command can be executed in parallel with general commands such as a move command and operating command.

When this function is used, the robot can be moved or the calculation is executed during data transmission; this function is effective for reduction of tact time, etc.

5.3.5.1 Parallel Execution Using NWAIT

```

NOP
MOVJ VJ=50.00
MOVJ VJ=50.00
LOADJ JOB:ABC JBI NWAIT . . . ①
MOVJ VJ=50.00 . . . . . ②
MOVJ VJ=50.00 . . . . . ③
SWAIT . . . . . ④
CALL JOB:ABC . . . . . ⑤
. .
END
  
```

In the above job, when the command ① is executed, loading of the job is executed with PC.

Normally, when NWAIT is not specified, the commands of ② and later are not executed until the job loading is completed. However, when NWAIT is specified, the commands ② and ③ are executed sequentially during the job loading; at execution of SWAIT command ④, the execution of command ⑤ is waited for the job "ABC" loading is completed.

At the time of completion of job "ABC" loading, the command ⑤ is executed to execute the job "ABC".

At this time, if SWAIT command is not specified before the command ⑤, the command ⑤ is executed during the loading of job "ABC", and an alarm occurs.

Therefore, be sure to verify that loading is completed before executing a job to be loaded, by using SWAIT command.

To load/save variables, be sure to input a SWAIT command before using variables to be loaded/saved as shown below.

(Correct)	(Wrong)
NOP	NOP
.
LOADV B000 NWAIT	LOADV B000 NWAIT
.
SWAIT	SET B001 B000
SET B001 B000	

5.3.5.2 Parallel Execution Using PSTART (Optional)

By using an independent control command (optional), DCI commands can be executed in parallel with general commands.

For example, to execute the job “R1” for robot 1 is to be executed in parallel with the job “S1” for station 1 during job loading, the following procedure is taken :

Job “R1” : Job for robot 1
 Job “S1” : Job for station 1

[JOB:R1]	[JOB:S1]
NOP	NOP
MOVJ VJ=50.00	MOVJ VJ=50.00
MOVJ VJ=50.00	MOVJ VJ=50.00
PSTART JOB:S1 SUB1 · · · ① END	
LOADJ JOB:ABC · · · · · ②	
PWAIT · · · · · · · · · · ③	
CALL JOB:ABC · · · · · · · · ④	
END	

When PSTART command ① is executed, the job “S1” starts execution in parallel with the job “R1”.

The job “ABC” is loaded by the command ② during execution of the job “S1”; when loading is completed, the YRC1000micro waits for the job “S1” to be completed by the command ③.

When the execution of job “S1” is completed, the job “ABC” is executed by the command ④.

5.3.6 Axis Data Transmission Format

The YRC1000micro data transmission function has the following restrictions on transmission of the YRC1000micro internal data.

The robot axes are fixed to a 6-axis set.

A base axis and a station axis are recognized as an external axis.

Up to three base axes are available. With station axis data added after base axis data, up to six axes can be handled.

For example, SAVEV BP005 is read as SAVEV BP005 + EX005.

If the one of the variables does not exist in the system, only the other existing variable is used.

However, if the existing variable has not been registered, an error occurs.

The definition of the robot, base, and station axes is used as it is, free of the predetermined axis data R1, B1, and S1.

5 DCI Function
5.3 Preparation at the YRC1000micro Side

<Example>

Transmission data of SAVEV in different system configurations are shown below.

- In a system having two base axes (X and Z) and no station axis
If BP005 is pulse type and 1st axis is 100 and 2nd axis is 200, then
SAVEV BP005 → 03, 007 100, 200, 0, 0, 0, 0
If BP005 is XYZ type and X-axis is 123.456 and Z-axis is 234.567, then
SAVEV BP005 → 03, 008 123.456, 234.567, 0, 0, 0
- In a system having no base axis and three station axes
If EX005 is pulse type and 1st axis is 500, 2nd axis is 600, and 3rd axis is 700, then
SAVES EX005 → 03, 007 500, 600, 700, 0, 0, 0
- In a system having two base axes (X and Z) and three station axes
If BP005 is pulse type, 1st axis is 100 and 2nd axis is 200, and EX005 is pulse type, 1st axis is 500, 2nd axis is 600, and 3rd axis is 700, then
SAVEV BP005 → 03, 007 100, 200, 500, 600, 700, 0
(Same as for SAVEV EX005)
If BP005 is XYZ type, X axis is 123.456, and Z axis is 234.567, and EX005 is pulse type, 1st axis is 500, 2nd axis is 600, and 3rd axis is 700, then
SAVEV BP005 → 03, 008 123.456, 234.567, 500, 600, 700, 0
(same as for SAVEV EX005)

5.4 Preparation at the PC Side

When using the DCI function, the “AUTO JOB CHANGER OPERATION” or a customer-created communication application is required on the PC side. For details about this software, refer to “5 AUTO JOB CHANGER OPERATION” or “6 TRANSMISSION APPLICATION PREPARATION PROCEDURES” in the “MOTOCOM32 OPERATION MANUAL(HW9482689)” included with the MOTOCOM32, which is YASKAWA other optional functions.

5.5 Executing the DCI Function

After starting the application from *chapter 5.4 “Preparation at the PC Side”*, execute the job created in *chapter 5.3 “Preparation at the YRC1000micro Side”*.

5.6 Alarm Code

If the transmission command cannot execute normally, an alarm will occur on the YRC1000micro. The alarm list and data are shown below.

Table 5-2: Alarm Codes and Data

Code	Message	Data
4104	WRONG EXECUTION OF LOAD INST	Refer to the table below.
4105	WRONG EXECUTION OF SAVE INST	
4106	WRONG EXECUTION OF DELETE INST	

Data	Contents
001	Insufficient memory capacity
002	Job editing prohibited
003	Attempted to load or delete a job being executed.
004	No specified job
012	Position data destroyed
013	Position variable not registered
017	Command destroyed
019	Invalid character in job name
020	Invalid character in label
023	Invalid character in this system
024	Syntax error
090	Control command sending/receiving error (Ethernet)
104	Error response from PC
111	Syntax error
112	Error in position data
113	No NOP or END command
117	Format error
118	Invalid number of data
120	Data range exceeded
122	Destroyed file exists
125	No standard port setting. Confirm the setting of the parameter RS000.
126	This standard port already used by other function.
127	This protocol already used by other function.
128	File accessing in other function
211	System block error (Receiving EOT while waiting ACK)
212	System block error (Receiving EOT at starting receiving)
213	System block error (Receiving EOT before receiving the last block)
214	System block error (Receiving codes other than EOT before receiving the last block)
221	Sending error (Retry for NAK exceeded)
222	Sending error (Timeup for timer A after multiple retries)
223	Sending error (ACK0/ACK1 order error after multiple retries)
231	Receiving error (Timeup for timer A while waiting ACK after ENQ, timeup for timer A while waiting ENQ response)

5 DCI Function
5.6 Alarm Code

Data	Contents
232	Receiving error (Timeup for timer B while receiving text)
233	Receiving error (Heading length is shorter than 6 characters)
234	Receiving error (Heading length is longer than 6 characters)
235	Receiving error (Header number error)
236	Receiving error (Text length exceeds 256 bytes)
237	Receiving error (Receiving other than ENQ while waiting ENQ, receiving other than control code while waiting control code, receiving other than STX, SOH, ENQ, EOT while waiting text)
240	Software error
241	Hardware error (Overrun error)
242	Hardware error (Parity error)
243	Hardware error (Framing error)
244	Hardware error (Sending timeup (timer A))
245	Hardware error (Sending timeup (timer B))

5.7 Troubleshooting

5.7.1 Network Communication Confirmation

Refer to chapter 2.4 “Network Communication Confirmation”, and confirm that TCP/IP basic communication can be performed.

5.7.2 Communication Setting Confirmation for Firewall and Security Software

The DCI function uses UDP ports 10000 and 10006.

Confirm that these ports are not blocked by the firewall or security software.

5.7.3 Confirming the Operation of the PC-side Application

Confirm that the PC-side applications are operating normally.

5.7.4 Confirming That the Remote Setting is OFF

Confirm that the settings of the command remote and the read-only option are disabled.

6 FTP Client Function

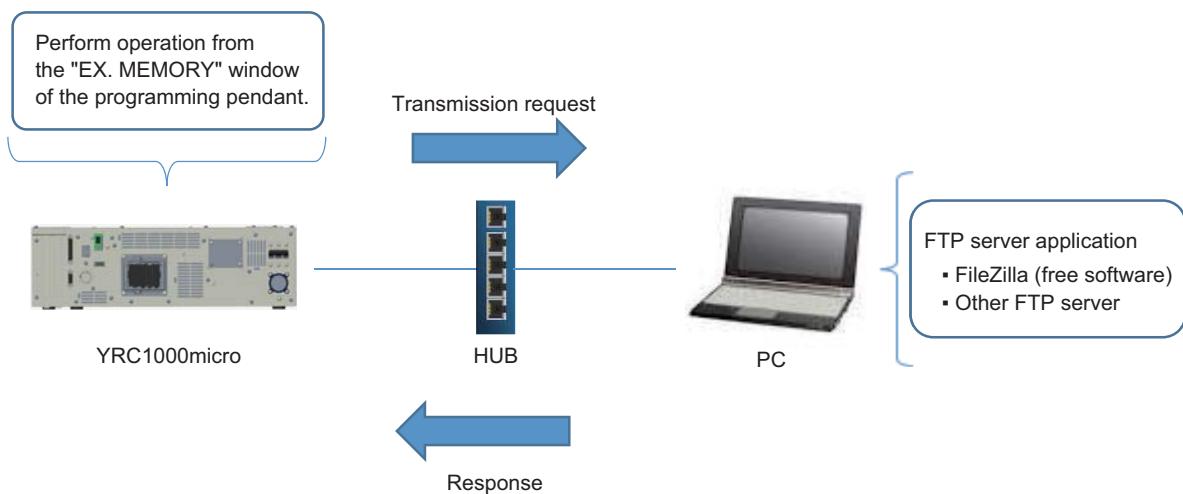
6.1 Outline

The FTP client function can send / receive the internal data of the YRC1000micro by operating external memory of the YRC1000micro via the FTP (File Transfer Protocol), general file transfer protocol. When using this function, refer to "Chap. 7 External Memory Devices" in "YRC1000micro OPERATOR'S MANUAL (RE-CSO-A058)".

6.1.1 System Configuration

The FTP client function can be used with the following configuration.

Fig. 6-1: System Configuration When Using the FTP Client Function



Files that can be sent or received via the FTP client function are described below.

Table 6-1: Files That Can be Sent or Received via the FTP Client Function

Data type
JOB
Condition file / General data
Parameter
I/O data
System data

NOTE For the FTP client function, the system backup (the batch data backup) cannot be performed.

Some of the files above can be saved (loading is not available).

6.1.2 Communication Target

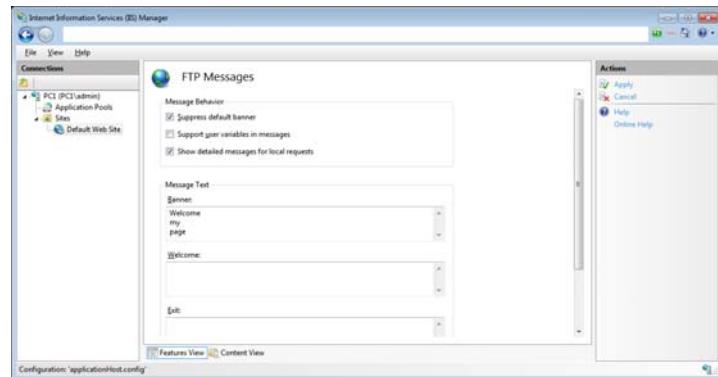
The following can be used as a communication target of the FTP client function.

Table 6-2: FTP Client Function Communication Target

Device	Software	Details
Windows PC	FTP server software	Free or paid FTP server software such as FileZilla
Ethernet communication-enabled devices	FTP server software	FTP server software

6.1.3 Restriction

- ① Encrypted communications cannot be performed.
- ② Folder operations (folder creation/deletion, relocation of folders) cannot be performed.
- ③ Cannot communicate with the FTP server, which sends welcome message by dividing into plural packets. Make sure that the welcome message is sent in the single packet. For the IIS (Internet Information Service manufactured by Microsoft®) version 7.5.7600.16385, uncheck the checkbox of the “Suppress default banner”.



6	FTP Client Function
6.2	Preparation at the PC Side

6.2 Preparation at the PC Side

Prepare a PC on which the FTP server software, as the target of the communication, is operated or a network device equivalent to the PC.

6.3 YRC1000micro-side Setting and Operation

In order to use the FTP client function, perform the following settings and operations.

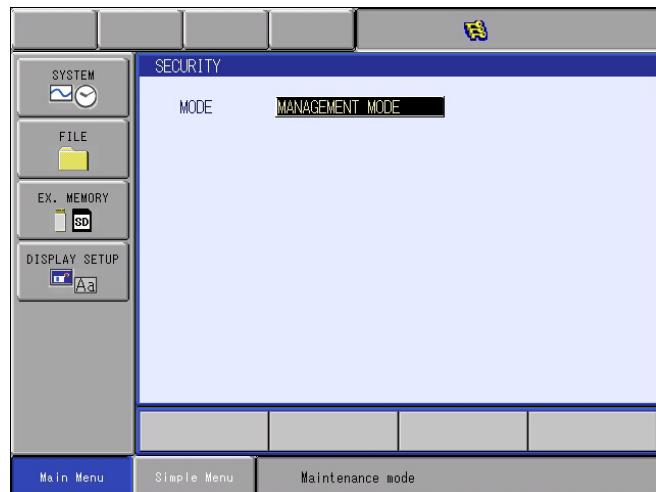
6.3.1 Enabling Setting for the FTP Function

Enable the FTP function in accordance with following procedures.

1. Turn ON the power supply while pressing {Main Menu}.
Maintenance mode starts.



2. Set the security mode to the "MANAGEMENT MODE".

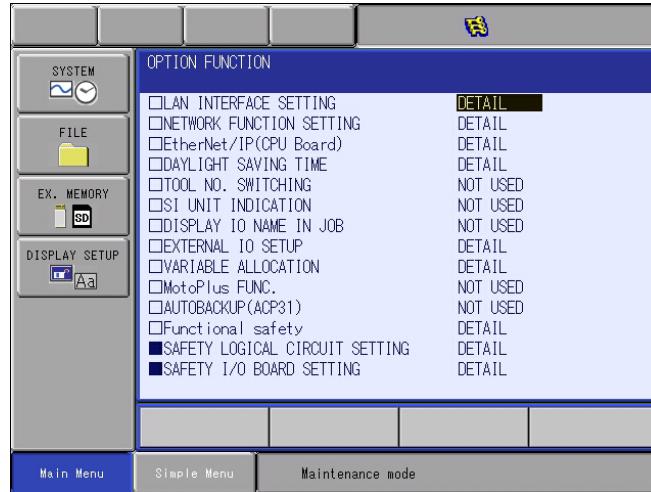


6 FTP Client Function

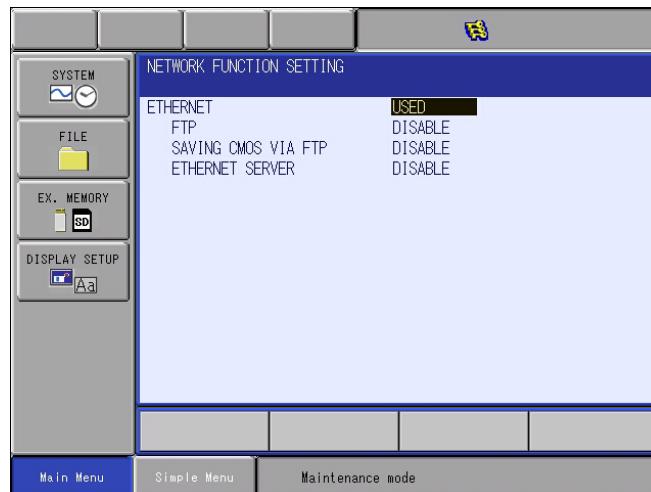
6.3 YRC1000micro-side Setting and Operation

3. Under the Main Menu, select {SYSTEM} - {SETUP} - "OPTION FUNCTION".

The OPTION FUNCTION window appears.



4. After necessary settings are done, select DETAIL of the "NETWORK FUNCTION SETTING".
NETWORK FUNCTION SETTING appears.

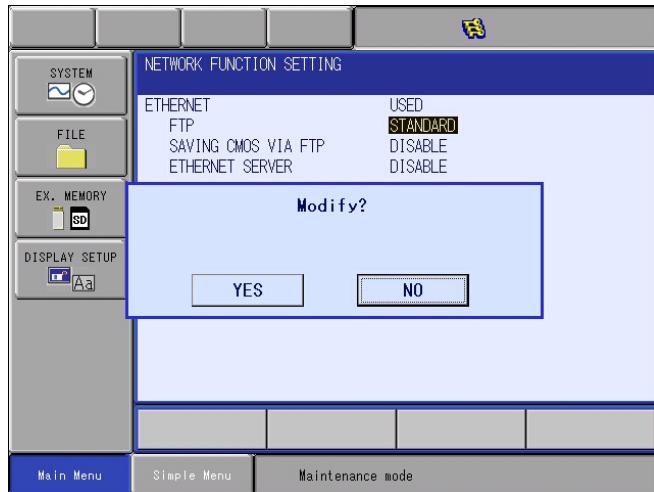


5. Set "FTP" to either "STANDARD" or "EXPAND".
There is no functional differences between the FTP client settings set by "STANDARD" and "EXPAND". This setting affects the FTP server function. For details about the difference between them, refer to chapter 4.1.3 "Function Mode".

6 FTP Client Function

6.3 YRC1000micro-side Setting and Operation

6. Press [ENTER].
The confirmation dialog box appears.

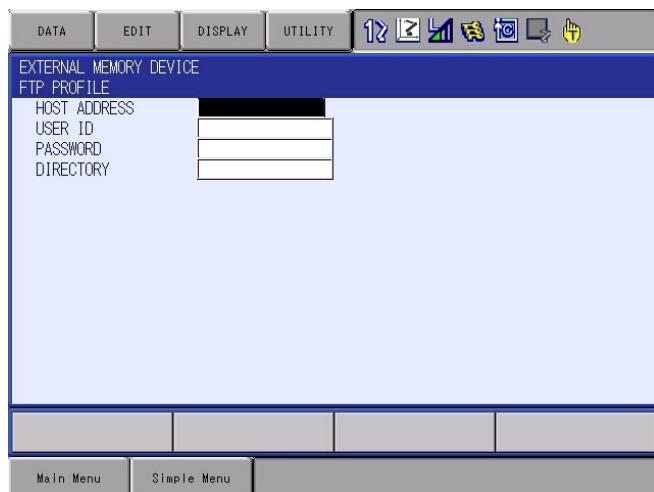


7. Select {YES}.
Select {YES} to return to the OPTION FUNCTION window.
8. Turn ON the power supply again.
Turn ON the power supply again to start the normal operation mode.

6.3.2 Setting for the FTP Connection Condition

Set the FTP connection condition in accordance with the following procedures.

1. In the Main Menu, select {EX. MEMORY} - {FTP PROFILE}.
FTP PROFILE window appears.



2. Set the connection condition.
Set the connection conditions as needed.

■ HOST ADDRESS

For the communication target IP address, use half-width numbers and periods (.), and set “xx.xx.xx.xx” using the following format (xx is a decimal number from 0 to 255). Note that if the DNS client function is enabled, a host name can be set instead of an IP address. Characters that can be used for the host name are half-width alphanumeric characters, hyphens (-), underscores (_), and periods (.). Set it within 50 characters or less.

 6 FTP Client Function
 6.3 YRC1000micro-side Setting and Operation

■ USER ID

Set the user ID for logging into the FTP server. Characters that can be used for the user ID are half-width alphanumeric characters, hyphens (-) and underscores (_). Set it within 16 characters or less.

■ PASSWORD

Set the password for logging into the FTP server. Characters that can be used for the password are half-width alphanumeric characters, hyphens (-) and underscores (_). Set it within 32 characters or less.

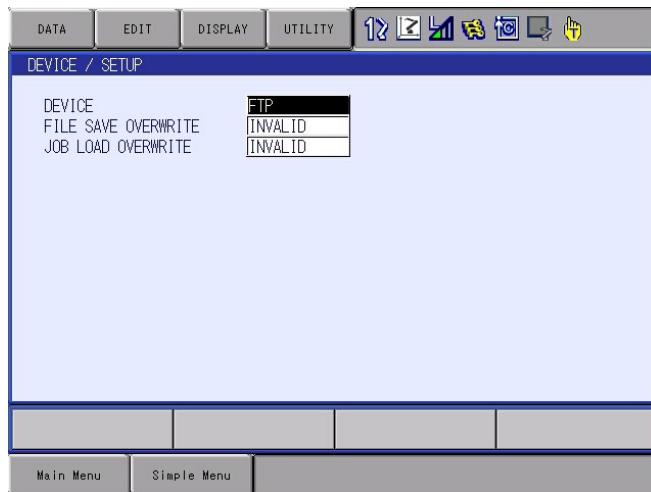
■ DIRECTORY

Set the default directory for logging into the FTP server. Characters that can be used for the default directory are half-width alphanumeric characters, hyphens (-), underscores (_), and slashes (/). Set it within 63 characters or less. Do not use a slash (/) at the beginning of the directory.

6.3.3 Selecting the FTP Function

Specify a FTP client as the external memory device to be used.

1. Select {EX. MEMORY} - {DEVICE / SETUP} under the Main Menu.
– DEVICE / SETUP window appears.
2. Select “FTP”.
– FTP is selected as the external memory device.



6.3.4 Save

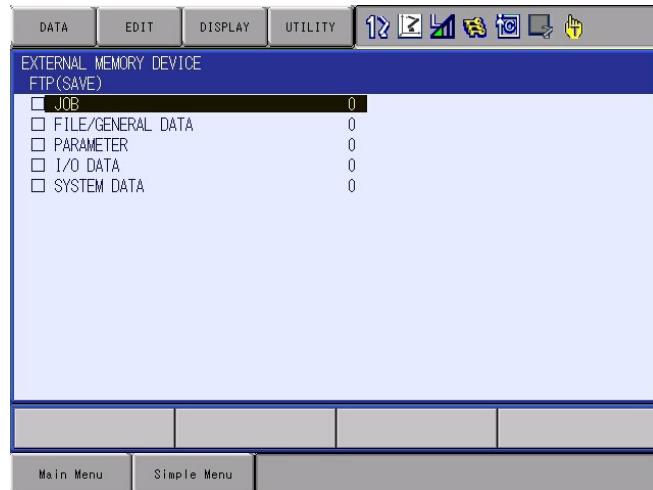
Save means the operation to PUT (write) data from the YRC1000micro to the FTP server.



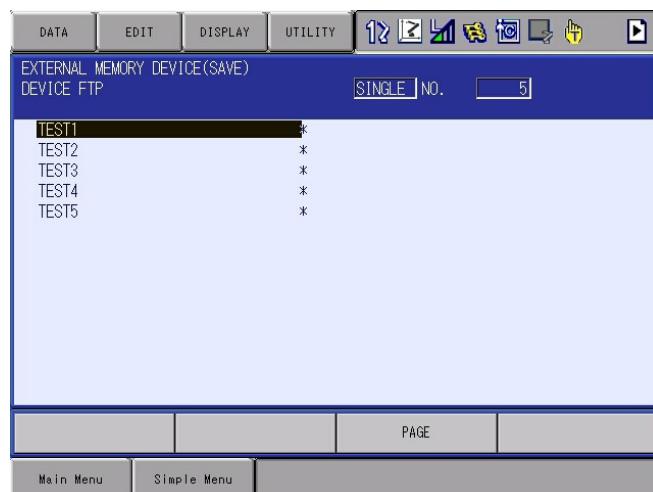
If the data is changed, save the target data individually.

6.3.4.1 Saving a Job

1. Select {EX. MEMORY} under the Main Menu.
2. Select {SAVE}.
 - The SAVE window appears.



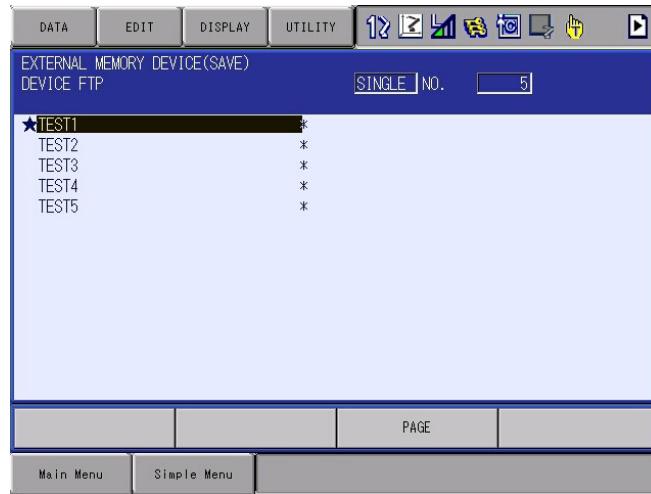
3. Select "JOB".
 - The job list appears.



 6 FTP Client Function
 6.3 YRC1000micro-side Setting and Operation

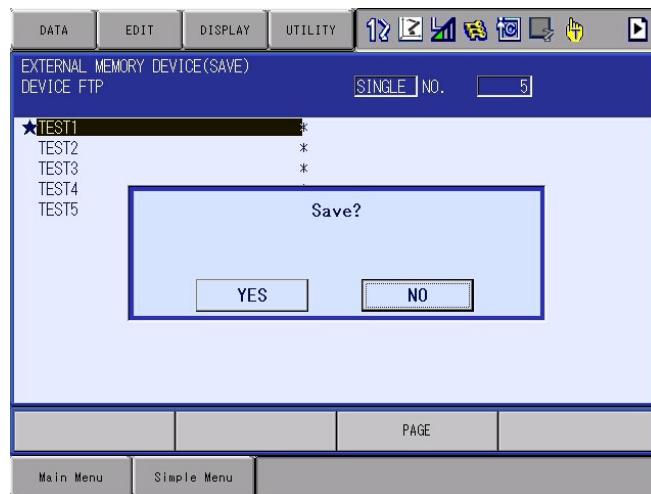
4. Select the job to save.

- “★” will appear for the selected job.



5. Press [Enter].

- The confirmation dialog box appears.



6. Select {YES}.

- The selected job will be saved.

6.3.4.2 Saving Files Except for Job

Save required files using the same procedure as *chapter 6.3.4.1 “Saving a Job”*.

With the FTP client function, saving of the system backup file (CMOS.BIN) is not available.

6.3.5 Load

The operation is to GET (read) data from the FTP server to the YRC1000micro.

The operating procedure is the same as saving.

6.3.5.1 Loading a Job

1. Select {EX. MEMORY} under the Main Menu.
2. Select {LOAD}.
 - The LOAD window appears.
3. Select {JOB}.
 - The job list appears.
4. Select the job to load.
 - “★” will appear for the selected job.
5. Press [Enter].
 - The confirmation dialog box appears.
6. Select {YES}.
 - The selected job will be loaded.

6.3.5.2 Loading File Except for Job

Load the required files using the same procedure as
chapter 6.3.5.1 “Loading a Job”.

The FTP client function cannot load the parameters and the system backup file (CMOS.BIN).

6.3.6 Verification

This operation is to verify the YRC1000micro data and the FTP server data.

If there is any difference, a notification message will appear.

The operating procedure is the same as saving.

6.3.6.1 Verifying a Job

1. Select {EX. MEMORY} under the Main Menu.
2. Select {VERIFY}.
 - The VERIFY window appears.
3. Select {JOB}.
 - The job list appears.
4. Select job to verify.
 - “★” will appear for the selected job.
5. Press [Enter].
 - The confirmation dialog box appears.
6. Select {YES}.
 - The selected job will be verified.

6.3.6.2 Verifying File Except for Job

Verify any required files using the same procedure as chapter 6.3.6.1 “Verifying a Job”.

The FTP client function cannot verify the system backup (CMOS.BIN).

6.3.7 Selecting Job and Data File

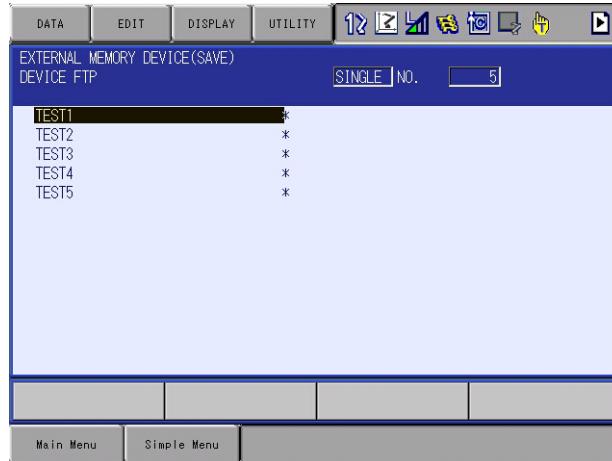
The method of selecting a job and various data files when loading, saving, verifying, and deleting are described in the following:

- Individual Selection
Jobs and data files are selected individually one at a time.
- Batch Selection
Jobs and data files are selected all at one time.
- Marker (*) Selection
Loading: selects the files in the external memory device.
Saving: selects the files in the memory of the YRC1000micro.
Verifying: selects both the files in the external memory device and in the memory of the YRC1000micro.
- Batch Selection (individual file)
Jobs and data files (FILE/GENERAL DATA, PARAMETER, I/O DATA, SYSTEM DATA) are selected all at one time.
This operation can be performed on the window where the data type of the external memory device is selected. Only in the case of saving and verifying, operation of the external memory device can be performed.

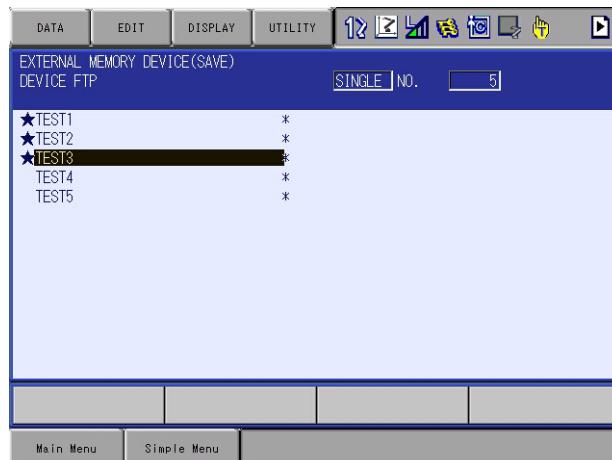
6 FTP Client Function
 6.3 YRC1000micro-side Setting and Operation

■ Using Individual Selection

1. In either the external memory JOB LIST window or the file selection window, move the cursor to a job or a file to be selected.

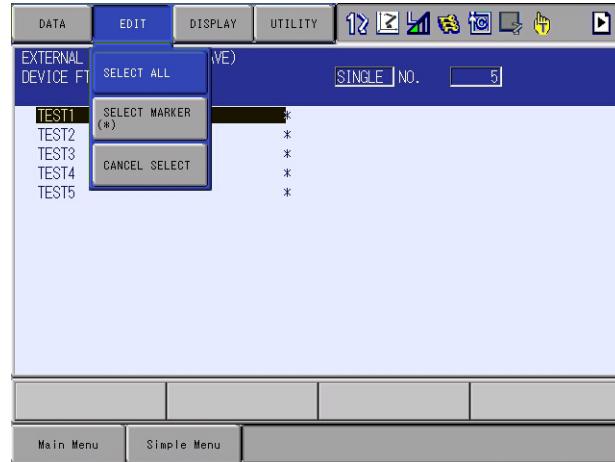


2. Press [SELECT].
 Move the cursor to a file needed and press [SELECT] again.
 *To cancel the selected items, select {EDIT} and then {CANCEL SELECT}.
 – The selected jobs are marked with “★”.

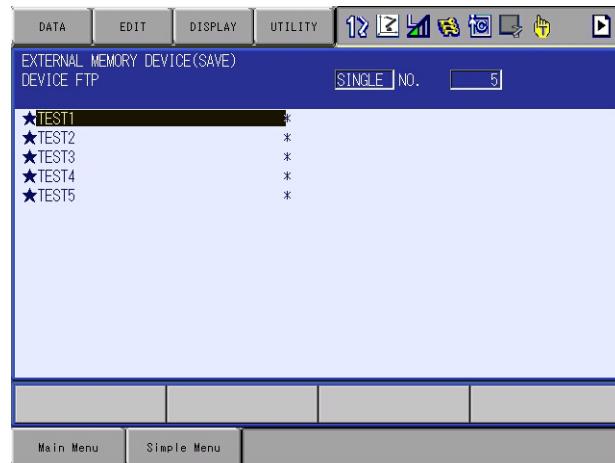


■ Using Batch Selection

1. In either the external memory JOB LIST window or the file selection window, select {EDIT} under the menu.
 - The pull-down menu appears.



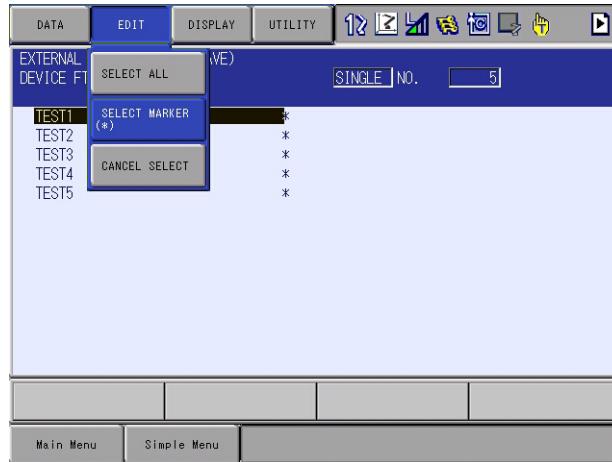
2. Select {SELECT ALL}.
 - All files are selected.
*To cancel the selected items, select {EDIT} and then {CANCEL SELECT}.



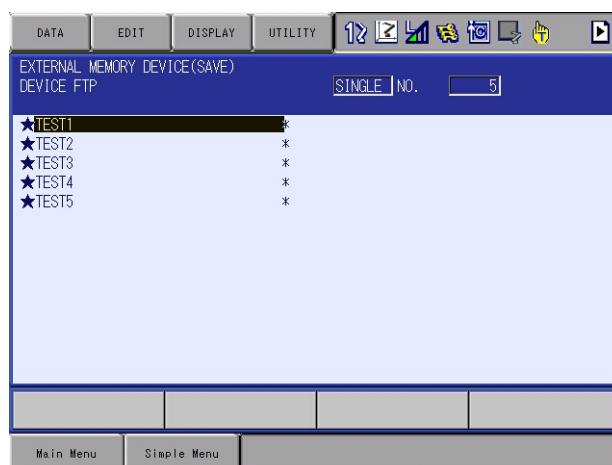
6 FTP Client Function
 6.3 YRC1000micro-side Setting and Operation

■ Using Marker (*) Selection

1. In either the external memory JOB LIST window or the file selection window, select {EDIT} under the menu.
 – The pull-down menu appears.



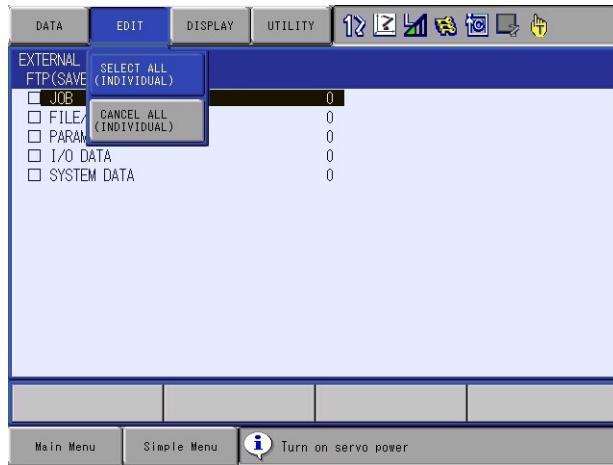
2. Select {SELECT MARKER (*)}.
- *To cancel the selected items, select {EDIT} and then {CANCEL SELECT}.



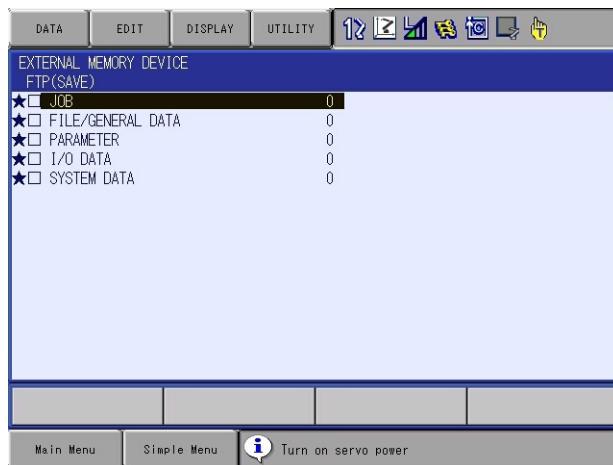
■ **Using Batch Selection (individual file)**

For two or more types of data (JOB, FILE/GENERAL DATA, PARAMETER, I/O DATA, SYSTEM DATA), the data can be selected all at one time. This operation can be performed when saving or verifying the data in the external memory device.

1. On the window where the types of data in the external memory device are selected, select {SELECT ALL (INDIVIDUAL)} from the pull-down menu {EDIT}.



2. On the left of JOB, FILE/GENERAL DATA, PARAMETER, I/O DATA, and SYSTEM DATA, the signs “★” appear and indicate the items are selected.

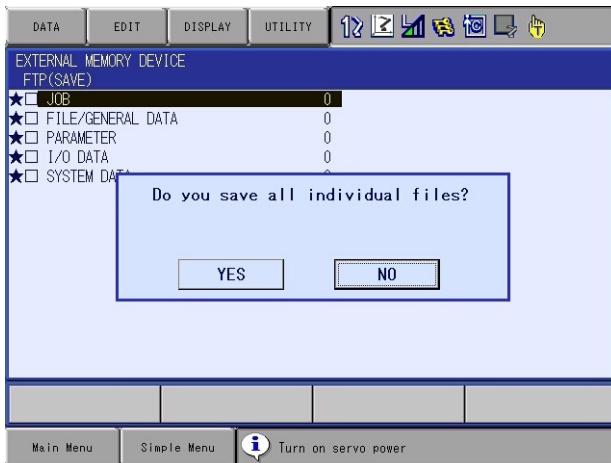


3. Press [ENTER].

6 FTP Client Function
 6.3 YRC1000micro-side Setting and Operation

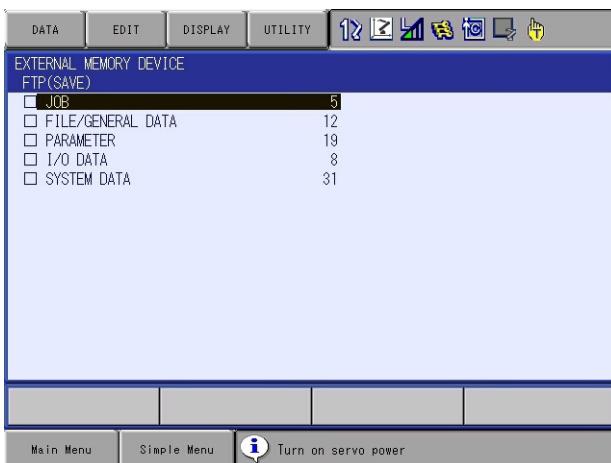
4. The confirmation dialog box appears.

When saving the data, “Do you save all individual files?” appears.
 When verifying the data, “Do you verify all individual files?” appears.



5. Select “YES”.

– The data of the data type selected all at one time is saved or verified in the external memory device.



- Move the cursor to the data type (JOB, FILE/GENERAL DATA, PARAMETER, I/O DATA, SYSTEM DATA) and press [SHIFT] + [SELECT] to individually select/cancel the data type.
- To perform operation (save/verify) of the external memory device all at one time for one specific data type, press [SHIFT] + [SELECT], and while the specific data type is selected, perform the steps 3 to 5 above.



To cancel all the selection on the window where the data type is selected, select {CANCEL ALL (INDIVIDUAL)} from the pull-down menu {EDIT}. The selection of the data types is canceled all at one time, and the signs “★” on the left of JOB, FILE/GENERAL DATA, PARAMETER, I/O DATA, and SYSTEM DATA are hidden.

6.4 Troubleshooting

6.4.1 Network Communication Confirmation

Refer to *chapter 2.4 “Network Communication Confirmation”*, and confirm that the basic communication of TCP/IP is performed.

6.4.2 Communication Setting Confirmation for Firewall and Security Software

Confirm that FTP communications are not blocked by the firewall or security software.

6.4.3 Confirming the FTP Server Operation

Confirm that the PC-side FTP server is operating normally.

6.4.4 Confirming That the Remote Setting is OFF

Confirm that the settings of the command remote and the read-only option are disabled.

7 Internal Data Browsing Function by Using a Web Browser

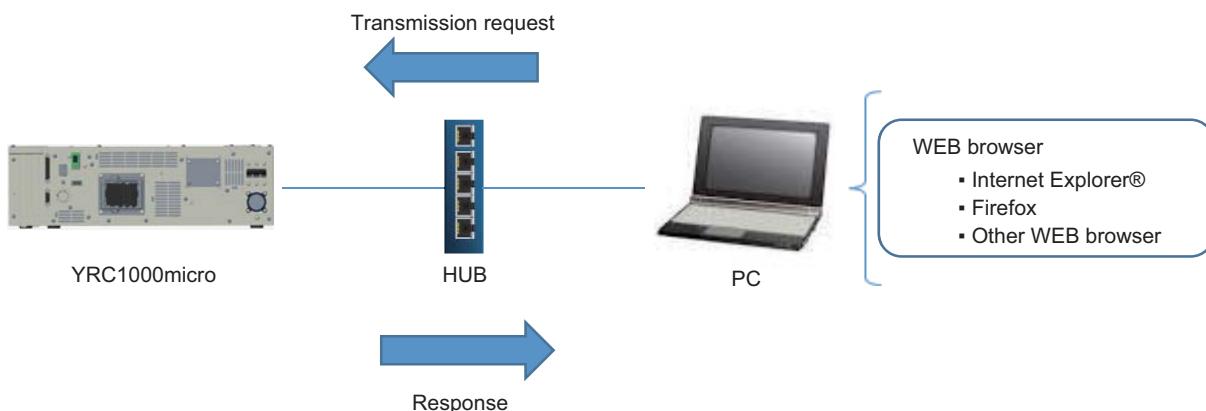
7.1 Outline

The internal data browsing function by using a Web browser is that by using the web browser such as Internet Explorer® by Microsoft®, the data in the YRC1000micro can be browsed.

7.1.1 System Configuration

The internal data browsing function by using a Web browser can be used with the following configuration.

Fig. 7-1: System Configuration When Using the Internal Data Browsing Function by Using a Web Browser



7.1.2 Communication Target

The following can be used as a communication target of the internal data browsing function by using a Web browser.

Table 7-1: Communication Target of the Internal Data Browsing Function by Using a Web Browser

Device	Software	Details
Windows PC	WEB browser	WEB browser Internet Explorer®, Firefox, etc.
Ethernet communication-enabled devices	WEB browser	WEB browser

7.1.3 Restriction

1) Restriction of the function by the remote mode

The internal data browsing function by using a Web browser can be executed only when the command remote is enabled.

For command remote, refer to chapter 1.2 “Command Remote Setting for YRC1000micro”.

2) Simultaneous use with other transmission functions

No error may occur when other communication function is performed simultaneously with this communication function, however this communication function is made to wait until the process of other communication function is completed.

7.2 Setting Method

7.2.1 Function Setting

Enable the internal data browsing function by using the Web browser in accordance with the following procedures.

1. Turn ON the power supply while pressing {Main Menu}.
Maintenance mode starts.



2. Set the security mode to the "MANAGEMENT MODE".



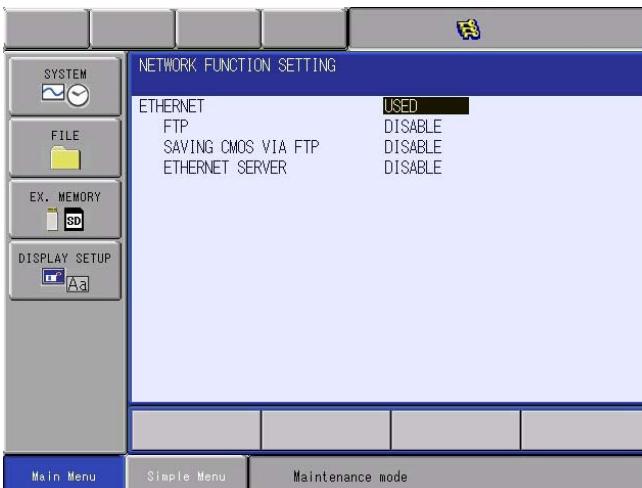
7 Internal Data Browsing Function by Using a Web Browser
 7.2 Setting Method

3. Under the Main Menu, select {SYSTEM} - {SETUP} - "OPTION FUNCTION".

The OPTION FUNCTION window appears.



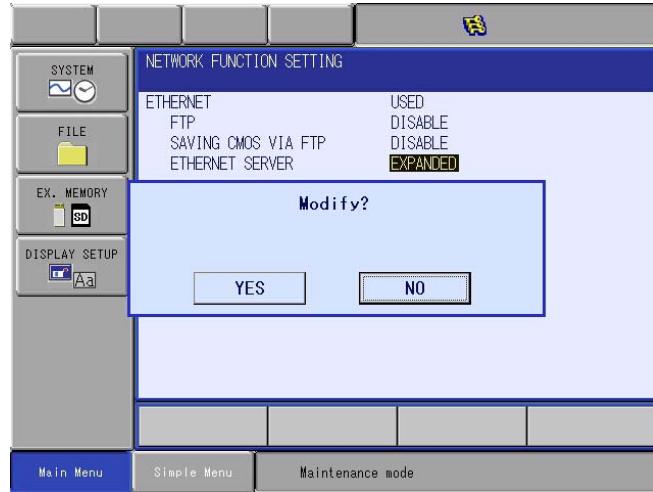
4. After necessary settings are done, select DETAIL of the "NETWORK FUNCTION SETTING".
 NETWORK FUNCTION SETTING appears.



5. Set "ETHERNET SERVER" to "EXPAND".

7 Internal Data Browsing Function by Using a Web Browser
7.2 Setting Method

6. Press [Enter].
The confirmation dialog box appears.



7. Select {YES}.
If the network function settings are correct, select {YES}.
Return to the OPTION FUNCTION window.

7.2.2 Command Remote Setting

Set the command remote to “VALID”.

For procedures to enable the command remote, refer to
chapter 1.2.3 “Command Remote Setting Method”.

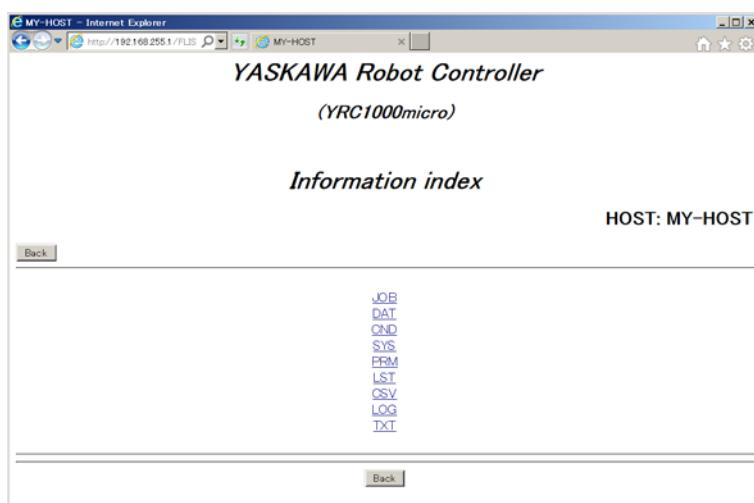
7 Internal Data Browsing Function by Using a Web Browser
7.3 Transmission Procedure Example

7.3 Transmission Procedure Example

1. Enter 'http://YRC1000micro's IP address/' into the address bar of Internet Explorer®.
 - The following window appears.



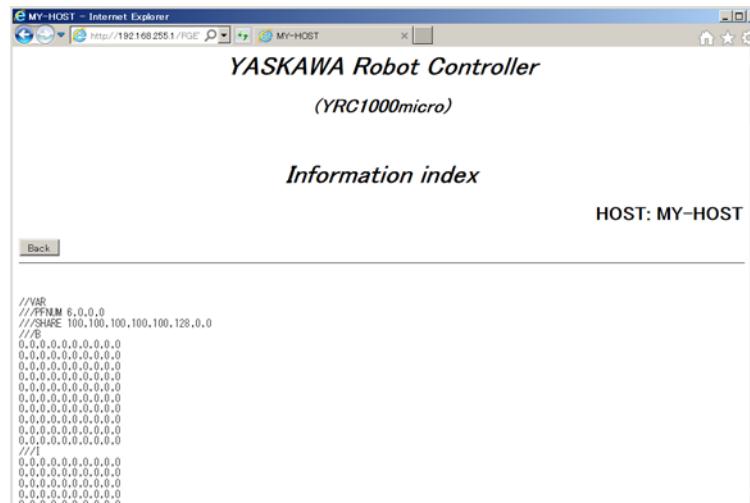
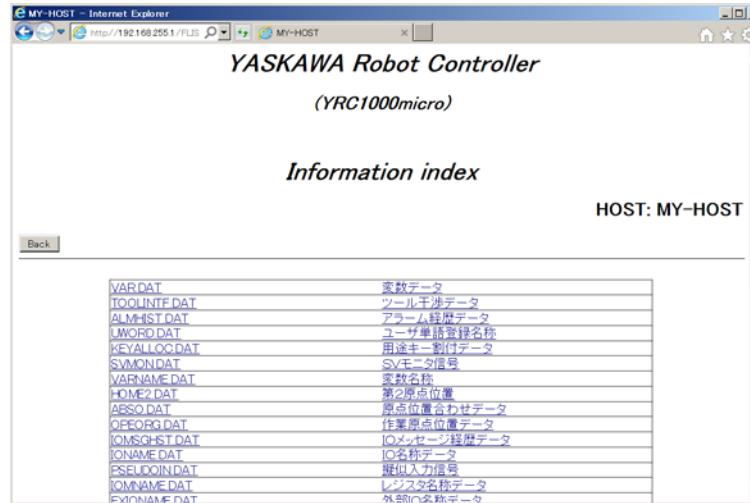
2. Select "File Index" from the window.
 - The following window appears.



7 Internal Data Browsing Function by Using a Web Browser

7.3 Transmission Procedure Example

3. For the following, click a folder or a file to be accessed in the same way.



7	Internal Data Browsing Function by Using a Web Browser
7.4	Troubleshooting

7.4 Troubleshooting

7.4.1 Network Communication Confirmation

Refer to *chapter 2.4 “Network Communication Confirmation”*, and confirm that TCP/IP basic communication can be performed.

7.4.2 Communication Setting Confirmation for Firewall and Security Software

Confirm that HTTP communications are not blocked by the firewall or security software.

8 Ethernet Server Function

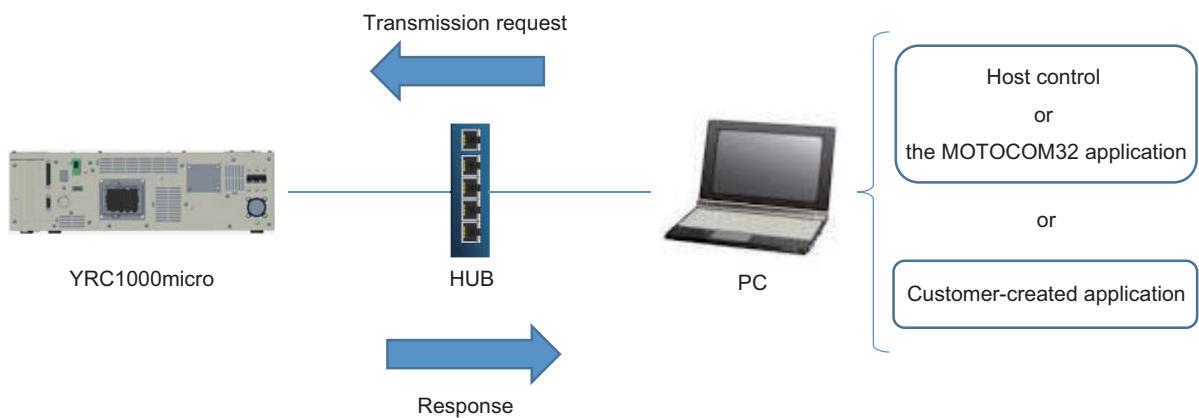
8.1 Outline

The Ethernet server function is that the host control function of the YRC1000micro Ethernet function can be communicated by using easier protocol.

8.1.1 System Configuration

The Ethernet server function can be used with the following configuration.

Fig. 8-1: System Configuration When Using the Ethernet Server Function



8.1.2 Communication Target

The following can be used as a communication target of the Ethernet server function.

Table 8-1: Communication Target of the Ethernet Server Function

Device	Software	Details
Windows PC	Host control	Application software included with the MOTOCOM32 which is an optional function.
	MOTOCOM32 application	Customer-created communication application software by using the communication DLL included with the MOTOCOM32 which is an optional function.
	Customer-created application	By referring the communication procedure described later, a customer-created communication application software
Ethernet communication-enabled devices	Customer-created application	By referring the communication procedure described later, a customer-created communication application software

8.1.3 General Information for When Using the Ethernet Server Function

When using the Ethernet server function, refer to *chapter 11.1 “General Information About the Host Control System Function”*.

8.1.4 Restriction

1) Restriction of the function by the remote mode

The Ethernet server function can be executed only when the command remote is enabled.

For command remote, refer to *chapter 1.2 “Command Remote Setting for YRC1000micro”*.

2) Simultaneous use with other transmission functions

No error may occur when other communication function is performed simultaneously with the Ethernet server function, however this communication function is made to wait until the process of other communication function is completed.

3) Automatic Close of Socket

In the Ethernet server function, the socket is automatically closed in the following cases to prevent the socket connection from remaining unreasonably.

- When the command execution is completed at a single command execution
- When the command execution for the specified number of times is completed at multiple commands execution
- When the command is not input for a given amount of time (approx. 30 seconds) at multiple commands execution
- When the processing ends abnormally (Including the case that the interpreter message is sent back.)

When the socket is closed, connect the socket again.

4) JWAIT command and sending/receiving file commands

The Ethernet server function cannot be used with JWAIT command of the host control function or sending/receiving file commands.

8 Ethernet Server Function

8.1 Outline

5) Restrictions on the Number of Sockets

The Ethernet server function, being different from the host control function of the YRC1000micro Ethernet function, adopts TCP, and arbitrary number can be used for the port on the PC side. Furthermore, the Ethernet server function can perform faster data transmission compared to the host control function.

For this reason, if a socket is repeatedly created/closed in a small amount of time in the setting that allows the use of arbitrary unoccupied port for the port on the PC side, many sockets remain waiting for time-out.

Since the number of available sockets is limited, if sockets are used up to this limit, a new socket cannot be created until the remained sockets time out.

To avoid this, perform the following procedures if necessary.

- Perform multiple commands execution, not single command execution.
- Use a fixed number for the port number on the PC side.
- (If sockets are insufficient on the PC side) Execute “reset - close” of the socket.

6) Restrictions on Transmission Text Length

The text length of the Ethernet server function is limited up to 256 bytes. When sending command data to the YRC1000micro from the PC side, messages exceeding 256 bytes cannot be sent.

If an answer is sent back to the PC from the YRC1000micro, the message exceeding 256 bytes are split into several packets and sent back.

7) Restrictions on Access from Multiple PCs

Communication resources of the YRC1000micro are occupied by the PC during the period from when the PC sends a communication start request (CONNECT Robot_access<CR><LF>) until when the YRC1000micro sends back an answer.

In this situation, communication start requests from other PCs (or other application in the same PC) cannot be accepted. The request from the Ethernet function and the FTP function cannot be accepted as well.

For this reason, the start requests from other PCs are forced to wait until an earlier request is completed. Especially if a start request is specified to infinite execution (CONNECT Robot_access Keep-Alive:-1<CR><LF>), START requests from other PCs cannot be received.

If accesses from multiple PCs are required, build a system so that a particular application does not occupy the communication resources.

8 Ethernet Server Function
8.2 Setting

8.2 Setting

8.2.1 Function Setting

Enable the Ethernet server function in accordance with following procedures.

1. Turn ON the power supply while pressing {Main Menu}.
Maintenance mode starts.



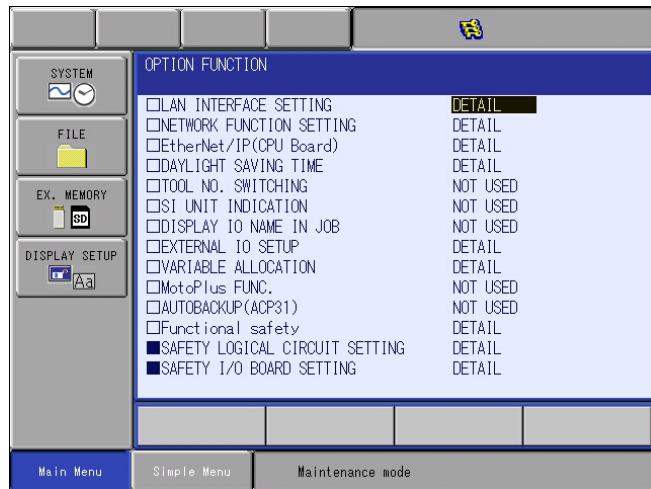
2. Set the security mode to the "MANAGEMENT MODE".



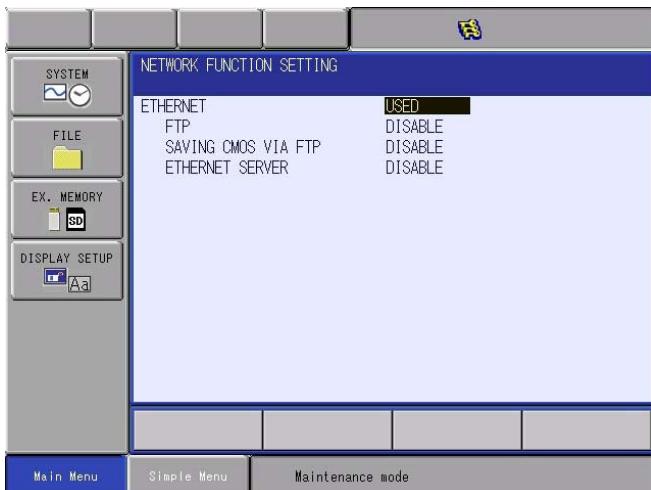
8 Ethernet Server Function

8.2 Setting

3. In the Main Menu, select {SYSTEM} - {SETUP} - "OPTION FUNCTION".
- The OPTION FUNCTION window appears.



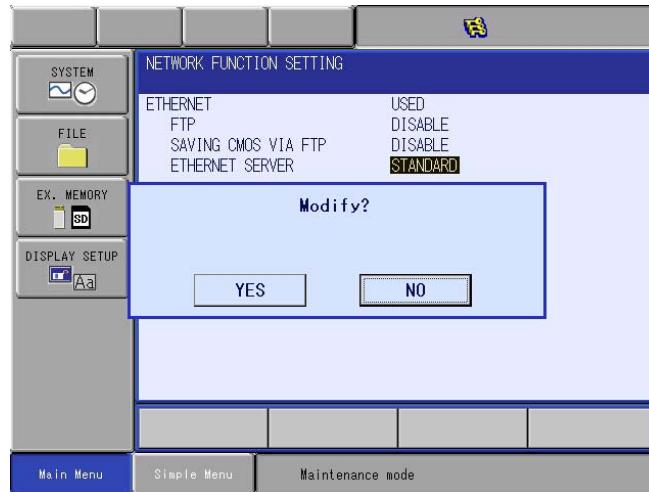
4. After necessary settings are done, select DETAIL of the "NETWORK FUNCTION SETTING".
- NETWORK FUNCTION SETTING appears.



5. Set "ETHERNET SERVER" to either "STANDARD" or "EXPAND". When "EXPAND" is set, the internal data browsing function by using the Web browser can be used. For details, refer to chapter 7 "Internal Data Browsing Function by Using a Web Browser".

8 Ethernet Server Function
8.2 Setting

6. Press [Enter].
The confirmation dialog box appears.



7. Select {YES}.
If the network function settings are correct, select {YES}.
Return to the OPTION FUNCTION window.

8.2.2 Command Remote Setting

Set the command remote to "VALID".

For procedures to enable the command remote, refer to
chapter 1.2.3 "Command Remote Setting Method".

8.3 Communication Method

Shows the transmission procedure for the Ethernet server in this chapter.



In the Ethernet server function, processings other than socket connection are performed by the transmission of ASCII character string. The processings are not correctly performed if the ASCII character string is not in accordance with the ASCII code. Use case-sensitive ASCII character string.

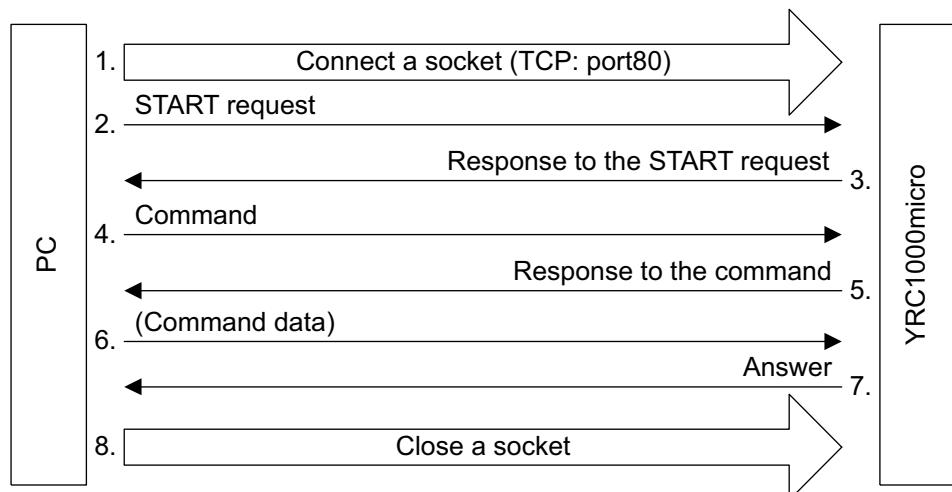
8.3.1 Transmission procedure

The command transmission with the YRC1000micro Ethernet server function proceeds as follows.

1. Connects a socket on the TCP port 80 of the YRC1000micro from the PC.
2. The PC sends a START request.
3. After the START request is accepted, the YRC1000micro sends the response to the START request.
4. The PC sends a command.
5. The YRC1000micro sends the response to the command sent from the PC.
6. The PC sends command data if required.
7. The YRC1000micro sends an answer.
8. Closes a TCP socket from the PC.

For more information on the procedures, refer to the descriptions in the next and later paragraphs.

Fig. 8-2: Outline of Command Transmission by Ethernet Server Function



8.3.1.1 Socket Connection

Connects a socket on the TCP port 80 of the YRC1000micro from the PC.

	8 Ethernet Server Function
	8.3 Communication Method

8.3.1.2 START Request

The PC sends a character string of a START request: “CONNECT Robot_access<CR><LF>”.

This character string allows for a single command processing.

If multiple commands need to be processed in a row, the PC sends a character string: “CONNECT Robot_access Keep-Alive:*n*<CR><LF>”. The following integer values can be specified in *n*.

- 2 to 32767 : Executes as many commands as the number specified in *n*.
- 1 : Executes infinite number of commands.

8.3.1.3 Response to START Request

After receiving a START request from the PC, the YRC1000micro sends back a character string for the response to the request.

If the YRC1000micro normally receives a START request, it sends a character string: “OK: YR Information Server(Ver).<CR><LF>” for a single command processing and “OK: YR Information Server(Ver) Keep-Alive:*n*.<CR><LF>” for processing of multiple commands. In each case the YRC1000micro waits for reception of *chapter 8.3.1.4 “Command”* after sending back a character string.

If the YRC1000micro cannot normally receive a START request, it sends back a character string: “NG: **HTTP Error Response**<CR><LF>”, and closes a socket.

8.3.1.4 Command

The PC sends a character string: “HOSTCTRL_REQUEST **Command Size**<CR><LF>”.

■ **Command**

Use the character strings listed in *chapter 8.3.2 “Command Detail”* for **Command**.

■ **Size**

For **Size**, use the ASCII character string which represents the byte number in decimal form, of character string that is sent in *chapter 8.3.1.6 “Command Data”*. This byte number is calculated including the linefeed code <CR> at the end of the character string. If no command data are sent, writes “0” in **Size**.

8.3.1.5 Response to Command

After receiving a command from the PC, the YRC1000micro sends back a character string for the response to the command.

The YRC1000micro normally sends back a character string: “OK: **Command**<CR><LF>”. Furthermore, if the **Size** specified in *chapter 8.3.1.4 “Command”* is “0”, the YRC1000micro responses according to *chapter 8.3.1.7 “Answer”*. If the **Size** is other than “0”, the YRC1000micro waits for *chapter 8.3.1.6 “Command Data”*.

At an error, the YRC1000micro sends back a character string: “NG: **Message**<CR><LF>” and closes a socket.

8.3.1.6 Command Data

If a command is accompanied by data, the PC sends a character string of the command data. The command data differ from **Command** to **Command**. (**Command** is not always accompanied by command data.) Make sure to add the linefeed code <CR> to the end of the command data character string.

The description method of command data differs with each **Command**. Refer to *chapter 8.3.2 “Command Detail”* for details on the description method.

8.3.1.7 Answer

The YRC1000micro sends back an answer in the following format according to a request from the PC.

Classification	Subclassification	Format
At normal answer	In case that the YRC1000micro sends back data	Data<CR> (Refer to <i>chapter 8.3.2 “Command Detail”</i>).
	In case that the YRC1000micro answers normally (In the absence of data)	0000<CR><LF>
At abnormal answer	In case that the YRC1000micro sends back an error answer	ERROR:[Command] is not successful (xxxx).<CR><LF> * xxxx indicates an interpreter message.
At socket error	In case that an error occurs at socket processing	ERROR: Message <CR><LF>

The linefeed code of when **data** are sent back as normal answer is different from the one of the case other than normal answer with **data** sent back.

The linefeed code of the normal answer with **data** sent back: <CR>

The linefeed code of the case other than above: <CR><LF>

The format when **data** are sent back as normal answer varies from each command. For details in the format, refer to *chapter 8.3.2 “Command Detail”*. For interpreter message, refer to *chapter 11.1.5 “Interpreter Message”*.

8.3.1.8 Closing of a Socket

A socket is closed.

8	Ethernet Server Function
8.3	Communication Method

8.3.2 Command Detail

The following show how to use each command.

The answer for each command is the one at normal answer.

For details on robot control function, commands for multi-control group and independent control functions, and interpreter message list, refer to *chapter 11.1 “General Information About the Host Control System Function”*.

8.3.2.1 Status Read Function

■ Read/Monitor Command

RALARM

Reads the error alarm code.

Command format: RALARM

Command data: None

Answer format: Data-1, Data-2, Data-3, Data-4, . . . , Data-10

Data-1 = Error code (0 to 9999)

Data-2 = Error data (0 to 256)

Data-3 = Alarm code (0 to 9999)

Data-4 = Alarm data (0 to 256)

Data-5 = Alarm code (0 to 9999)

Data-6 = Alarm data (0 to 256)

Data-7 = Alarm code (0 to 9999)

Data-8 = Alarm data (0 to 256)

Data-9 = Alarm code (0 to 9999)

Data-10 = Alarm data (0 to 256)

RPOSJ

Reads the current position in joint coordinate system.

Command format: RPOSJ

Command data: None

Answer format: Data-1, Data-2, Data-3, Data-4, · · · , Data-12 (For robots with 6 axes or less)

Data-1 = Number of S-axis pulses

Data-2 = Number of L-axis pulses

Data-3 = Number of U-axis pulses

Data-4 = Number of R-axis pulses

Data-5 = Number of B-axis pulses

Data-6 = Number of T-axis pulses

Data-7 = Number of 7th axis pulses

Data-8 = Number of 8th axis pulses

Data-9 = Number of 9th axis pulses

Data-10 = Number of 10th axis pulses

Data-11 = Number of 11th axis pulses

Data-12 = Number of 12th axis pulses

- For 7-axis robots, Data-7 (number of pulses of the 7th axis) is the number of pulses of the E-axis and Data-13 (number of pulses of the 13th axis) is added.

RPOS C

Reads the current position in a specified coordinate system. The specification with or without external axis can be made.

Command format: RPOS C

Command data: Data-1, Data-2

Data-1 = Specification of coordinate system

0: Base coordinate

1: Robot coordinate

2: User coordinate 1

.

.

65: User coordinate 64

Data-2 = With or Without external axis

0: Without external axis

1: With external axis

Answer format: Data-1, Data-2, Data-3, Data-4, · · · , Data-14 (For robots with 6 axes or less)

Data-1 = X coordinate value (unit: mm, significant 3 decimal points)

Data-2 = Y coordinate value (unit: mm, significant 3 decimal points)

Data-3 = Z coordinate value (unit: mm, significant 3 decimal points)

Data-4 = Wrist angle Rx coordinate value (unit: degree (°), significant 4 decimal point)

Data-5 = Wrist angle Ry coordinate value (unit: degree (°), significant 4 decimal point)

Data-6 = Wrist angle Rz coordinate value (unit: degree (°), significant 4 decimal point)

Data-7 = Type

Data-8 = Tool number (0 to 63)

Data-9 = Number of 7th axis pulses (for travel axis, mm)

Data-10 = Number of 8th axis pulses (for travel axis, mm)

Data-11 = Number of 9th axis pulses (for travel axis, mm)

Data-12 = Number of 10th axis pulses

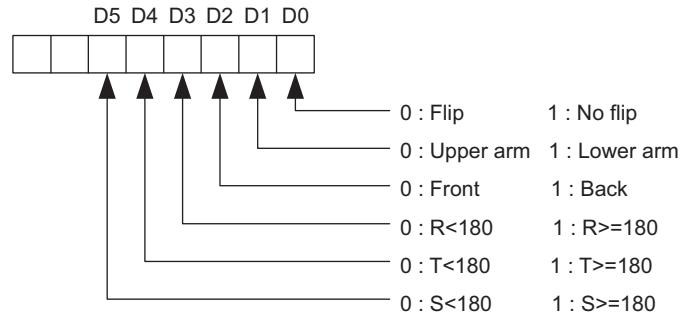
Data-13 = Number of 11th axis pulses

Data-14 = Number of 12th axis pulses

- Data-9 to Data-14 are added only when "With external axis" is specified.

 8 Ethernet Server Function
 8.3 Communication Method

- If the specified user coordinate system is undefined, an error answer is sent back.
- Data of the type are represented by the following bit data coded into a decimal number.



- For 7-axis robots, the elbow angle posture Re is inserted between Data-6 (Wrist angle Rz coordinate value) and Data-7 (Type). Therefore, the numbers of Data-7 and later are increased by 1 and the final data is Data-15.

RSTATS

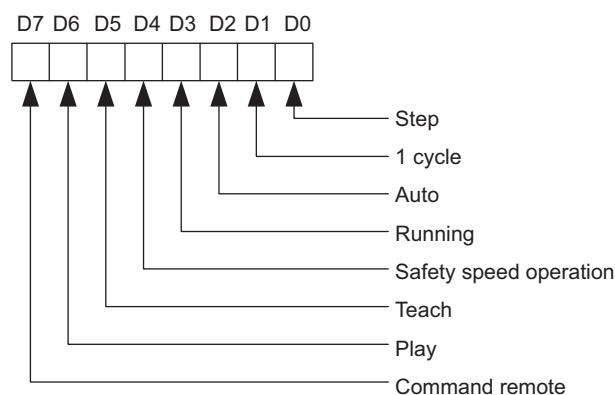
Reads the status of mode, cycle, operation, alarm error, and servo.

Command format: RSTATS

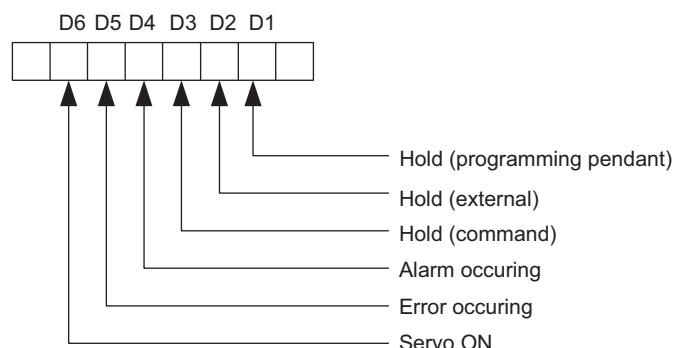
Command data: None

Answer format: Data-1, Data-2,

Data-1 = Represented by the following bit data coded into a decimal number



Data-2 = Represented by the following bit data coded into a decimal number



RJSEQ

Reads the current job name, line No. and step No.

Command format: RJSEQ

Command data: None

Answer format: Data-1, Data-2, Data-3

Data-1 = Read job name

Data-2 = Read line No. (0 to 9999)

Data-3 = Read step No. (1 to 9998)

JWAIT

The Ethernet server function does not support the JWAIT command.



Use the command: JWAIT in the Host Control function.

 8 Ethernet Server Function
 8.3 Communication Method

RGROUP

Reads the current control group set by the CGROUP command or CTASK command, and the task selection status.

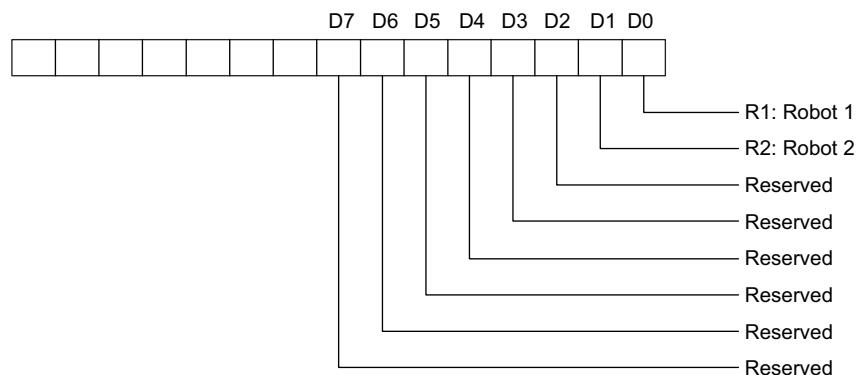
Command format: RGROUP

Command data: None

Answer format: Data-1, Data-2, Data-3

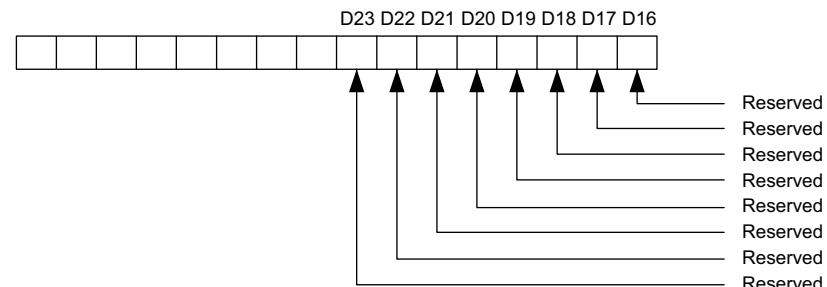
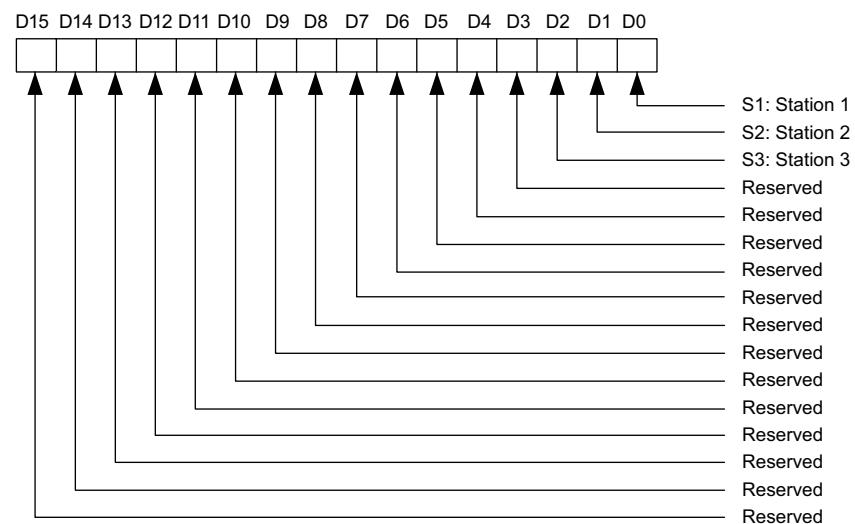
Data-1 = Robot control group information

- Represented by the following bit data coded into a decimal number



Data-2 = Station control group information

- Represented by the following bit data coded into a decimal number



8 Ethernet Server Function
8.3 Communication Method

Data-3 = Task information

In a system where independent control group is not allowed, “0” is returned.

0: Master task

1: Sub 1 task

2: Sub 2 task

.

.

5: Sub 5 task

■ **Read/Data Access System Command**

RJDIR

Reads all job names, or the names of jobs related to the parent job.

Command format: RJDIR

Command data: Job-Name

Job-Name = *

= Parent job name

If Job-Name is specified with “*”, RJDIR reads all the job names currently registered.

If Job-Name is specified with a parent job name, RJDIR reads the name of related jobs excluding the parent job. If there is not related child jobs, the command returns the null list. If the parent job has related child jobs but they are not registered in the system, an error occurs.

Answer format: Name-1, Name-2, . . . , Name-N

Name-1 = Job name-1

Name-2 = Job name-2

.

.

.

Name-N = Job name-N

- When the number of jobs exceeds 20, the output includes line feeds every 20 job names. A comma “,” is not used for line feed.

RUFRAME

Reads a specified user coordinate data.

Command format: RUFRAME

Command data: Data-1

Data-1 = User coordinate No.

2: User coordinate 1

.

.

65: User coordinate 64

Answer format: Data-1, Data-2, · · · , Data-28

Data-1 = ORG X coordinate value (unit: mm, significant 3 decimal points)

Data-2 = ORG Y coordinate value (unit: mm, significant 3 decimal points)

Data-3 = ORG Z coordinate value (unit: mm, significant 3 decimal points)

Data-4 = ORG wrist angle Rx coordinate value (unit: degree (°), significant 4 decimal points)

Data-5 = ORG wrist angle Ry coordinate value (unit: degree (°), significant 4 decimal points)

Data-6 = ORG wrist angle Rz coordinate value (unit: degree (°), significant 4 decimal points)

Data-7 = ORG type

Data-8 = XX X coordinate value (unit: mm, significant 3 decimal points)

Data-9 = XX Y coordinate value (unit: mm, significant 3 decimal points)

Data-10 = XX Z coordinate value (unit: mm, significant 3 decimal points)

Data-11 = XX wrist angle Rx coordinate value (unit: degree (°), significant 4 decimal points)

Data-12 = XX wrist angle Ry coordinate value (unit: degree (°), significant 4 decimal points)

Data-13 = XX wrist angle Rz coordinate value (unit: degree (°), significant 4 decimal points)

Data-14 = XX type

Data-15 = XY X coordinate value (unit: mm, significant 3 decimal points)

Data-16 = XY Y coordinate value (unit: mm, significant 3 decimal points)

Data-17 = XY Z coordinate value (unit: mm, significant 3 decimal points)

Data-18 = XY wrist angle Rx coordinate value (unit: degree (°), significant 4 decimal points)

Data-19 = XY wrist angle Ry coordinate value (unit: degree (°), significant 4 decimal points)

 8 Ethernet Server Function
 8.3 Communication Method

Data-20 = XY wrist angle Rz coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-21 = XY type

Data-22 = Tool No. (0 to 63)

Data-23 = Number of 7th axis pulses (for travel axis, unit: mm)

Data-24 = Number of 8th axis pulses (for travel axis, unit: mm)

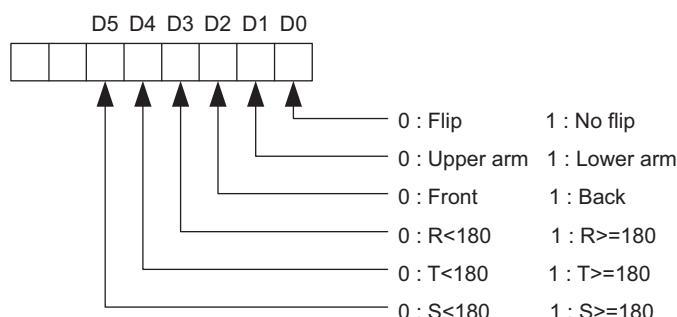
Data-25 = Number of 9th axis pulses (for travel axis, unit: mm)

Data-26 = Number of 10th axis pulses

Data-27 = Number of 11th axis pulses

Data-28 = Number of 12th axis pulses

- ORG, XX, XY coordinates are read in the base coordinate system.
- In a system having no external axis, Data-23 to Data-28 are “0”.
- If the specified user coordinate system is not registered, an error answer is sent back.
- If the group axis of the specified user coordinate system is not R1, an error answer is sent back.
- If ORG, XX, and XY have different base axis data, an error answer is sent back.
- Data of the type are represented by the following bit data coded into a decimal number.



- For 7-axis robots, this command cannot be used.

SAVEV

Reads variable data.

Command format: SAVEV

Command data: Data-1, Data-2

Data-1 = Type of variables

- 0: Byte type variables
- 1: Integer type variables
- 2: Double precision type variables
- 3: Real number type variables
- 4: Robot axis position type variables
- 5: Base axis position type variables
- 6: Station axis position type variables (only pulse type)
- 7: String variable

Data-2 = Variable No.

Answer format 1 (When the type of variables specified with the command data is 0, 1, 2, 3, or 7)

Answer: Data-1

Data-1 = Byte value / Integer value / Double precision integer value / Real number value / String

The value corresponding to the type of variables that is specified with the command data is read out.

Answer format 2 (When the type of variables specified with the command data is 4, 5, or 6)

Answer: Data-1, Data-2, . . . , Data-10 (When all the robots controlled by YRC1000micro have 6 axes or less)

Data-1 = Position data type (0: Pulse type, 1: Cartesian type)

(When the position data type is "0")

Data-2 = Number of robot S-axis pulses / Number of base 1st axis pulses / Number of station 1st axis pulses

Data-3 = Number of robot L-axis pulses / Number of base 2nd axis pulses / Number of station 2nd axis pulses

Data-4 = Number of robot U-axis pulses / Number of base 3rd axis pulses / Number of station 3rd axis pulses

Data-5 = Number of robot R-axis pulses / Number of base 4th axis pulses / Number of station 4th axis pulses

Data-6 = Number of robot B-axis pulses / Number of base 5th axis pulses / Number of station 5th axis pulses

8 Ethernet Server Function
8.3 Communication Method

Data-7 = Number of robot T-axis pulses / Number of base 6th axis pulses /
Number of station 6th axis pulses

Data-8 = Tool No. (0 to 63)

Data-9 = Not exist

Data-10 = Not exist

- When the robots controlled by YRC1000micro include a 7-axis robot, the number of pulses of robot's E-axis is inserted between Data-7 (Number of robot T-axis pulses) and Data-8 (Tool No). Therefore, the tool number is Data-9.

(When the position data type is “1”: Only robot axis position type variables and base axis position type variables exist.)

Data-2 = Coordinate data

0: Base coordinate

1: Robot coordinate

2: User coordinate 1

3: User coordinate 2

.

.

65: User coordinate 64

66: Tool coordinate

67: Master tool coordinate

Data-3 = X coordinate value / Base 1st Cartesian value (unit: mm,
significant 3 decimal points)

Data-4 = Y coordinate value / Base 2nd Cartesian value (unit: mm,
significant 3 decimal points)

Data-5 = Z coordinate value / Base 3rd Cartesian value (unit: mm,
significant 3 decimal points)

Data-6 = Wrist angle Rx coordinate value (unit: degree (°), significant 4
decimal points)

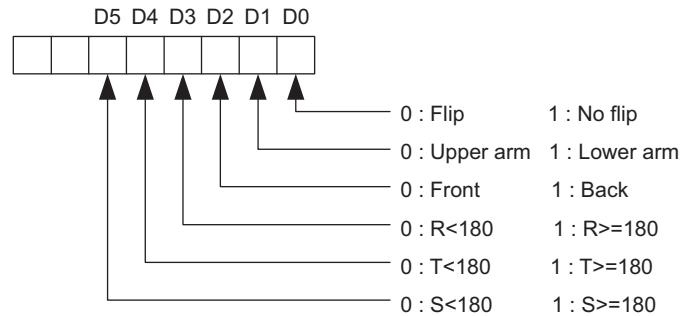
Data-7 = Wrist angle Ry coordinate value (unit: degree (°), significant 4
decimal points)

Data-8 = Wrist angle Rz coordinate value (unit: degree (°), significant 4
decimal points)

Data-9 = Type

- Data of the type are represented by the following bit data coded into
a decimal number.

8 Ethernet Server Function
8.3 Communication Method



Data-10 = Tool No. (0 to 63)

- When the robots controlled by YRC1000micro include a 7-axis robot, the elbow angle posture Re is inserted between Data-8 (Wrist angle Rz coordinate value) and Data-9 (Type). Therefore, the numbers of Data-9 and later are increased by 1 and the final data is Data-11.

8.3.2.2 System Control Function

■ Operation System Command

HOLD

Turns HOLD ON/OFF.

Command format: HOLD

Command data: Data

Data = Specification of HOLD ON/OFF status

0: OFF

1: ON

Answer format: 0000 at normal answer

RESET

Resets an alarm of manipulator.

The transmission alarms can be reset only by the programming pendant.

Command format: RESET

Command data: None

Answer format: 0000 at normal answer

CANCEL

Cancels an error.

Command format: CANCEL

Command data: None

Answer format: 0000 at normal answer

8 Ethernet Server Function
8.3 Communication Method

MODE

Selects a mode.

Command format: MODE

Command data: Mode-No

Mode-No = Mode specification No.

1: Teach mode

2: Play mode

Answer format: 0000 at normal answer



The MODE command can be used when the external mode switch is enabled on the OPERATING CONDITION window.

CYCLE

Selects cycle.

Command format: CYCLE

Command data: Cycle-No

Cycle-No = Cycle specification No.

1: Step

2: 1 cycle

3: Auto

Answer format: 0000 at normal answer

SVON

Turns servo power supply ON/OFF.

Command format: SVON

Command data: Data

Data = Specification of servo power supply ON/OFF status

0: OFF

1: ON

Answer format: 0000 at normal answer

HLOCK

Sets an interlock between the programming pendant and I/O operation signals. While the interlock is ON, all operations except the following are prohibited.

- Emergency stop from the programming pendant
- Input signals except I/O mode change, external start, external servo ON, cycle change, I/O prohibited, PP/PANEL prohibited, and master call

HLOCK is invalid while the programming pendant is in the edit mode or accessing to a file for other function.

Command format: HLOCK

Command data: Data

Data = Interlock status setting

0: OFF

1: ON

Answer format: 0000 at normal answer

MDSP

Receives message data and displays the message in the remote display of the programming pendant. If the currently shown display is not the remote display, it is forcibly changed to the remote display to display the MDSP command message.

Command format: MDSP

Command data: Data

Data = Message to be displayed (Characters up to 30 bytes)

Answer format: 0000 at normal answer

8 Ethernet Server Function 8.3 Communication Method

CGROUP

Changes an objective control group of various commands used in the host control function. The YRC1000micro can support multiple number of manipulators and stations. In this case, CGROUP is used when any control group for commands such as RPOSJ is to be changed.

When the power supply is started up, robot 1, base 1, and station 1 (when a base and a stations exist) are specified.

Command format: CGROUP

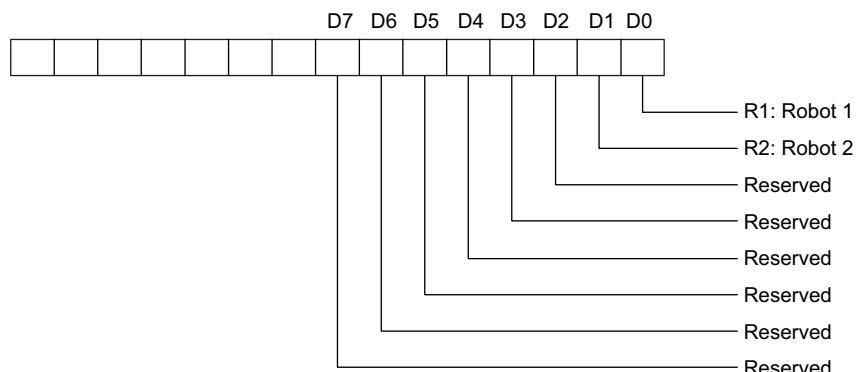
Command data: Data-1, Data-2

Data-1 = Robot control group specification

A control group can be specified according to the data shown below. However, the following settings cannot be made.

- Selection of control axis which does not exist
 - Specification of multiple number of robot

In a system with a base axis (such as travel axis), when the manipulator with this base axis is specified, this base axis is also automatically specified.

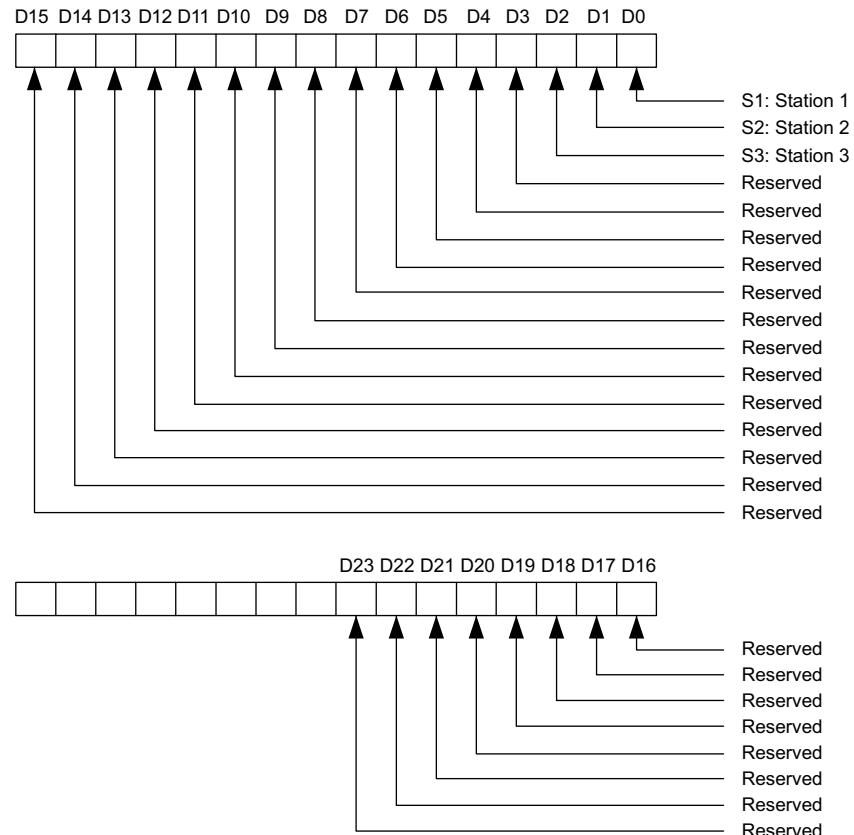


 8 Ethernet Server Function
 8.3 Communication Method

Data-2 = Station control group specification

A control group can be specified according to the following data.
 However, the following settings cannot be made.

- Selection of control axis which does not exist
- Specification of multiple number of station



Answer format: 0000 at normal answer

CTASK (OPTIONAL)

Changes the task for control in the host control function.

When the power supply is started up or in a system where an independent control is not allowed, CTASK is to be used as follows.

- When the power supply is started up, a master task is selected as a task to be controlled.
- CTASK cannot be used in a system where an independent control is not allowed.

Command format: CTASK

Command data: Data

Data = Specified task

0: Master task

1: Sub 1 task

2: Sub 2 task

.

.

5: Sub 5 task

Answer format: 0000 at normal answer

■ Start-Up System Command

START

Starts a job.

If a job name is specified for an operand, the execution is started from the beginning of the job. If no job name is specified, the execution is started from the current line number of the set execution job.

Command format: START

Command data: Job-Name (Can be omitted.)

Job-Name = Starting job name

Answer format: 0000 at normal answer

MOVJ

Moves a manipulator to a specified coordinate position in joint motion.

Command format: MOVJ

Command data: Data-1, Data-2, . . . , Data-16 (For robots with 6 axes or less)

Data-1 = Motion speed (0.01 to 100.0 %)

Data-2 = Coordinate specification

- 0: Base coordinate

- 1: Robot coordinate

- 2: User coordinate 1

- .

- .

- .

- 65: User coordinate 64

Data-3 = X coordinate value (unit: mm, significant 3 decimal points)

Data-4 = Y coordinate value (unit: mm, significant 3 decimal points)

Data-5 = Z coordinate value (unit: mm, significant 3 decimal points)

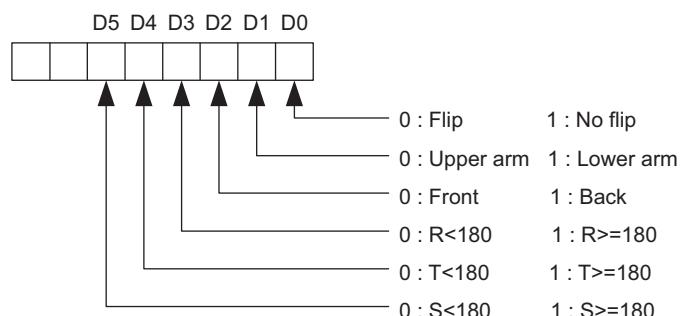
Data-6 = Wrist angle Rx coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-7 = Wrist angle Ry coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-8 = Wrist angle Rz coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-9 = Type

- Data of the type are represented by the following bit data coded into a decimal number.



Data-10 = Tool No. (0 to 63)

Data-11 = Number of 7th axis pulses (for travel axis, unit: mm)

Data-12 = Number of 8th axis pulses (for travel axis, unit: mm)

Data-13 = Number of 9th axis pulses (for travel axis, unit: mm)

8 Ethernet Server Function
8.3 Communication Method

Data-14 = Number of 10th axis pulses

Data-15 = Number of 11th axis pulses

Data-16 = Number of 12th axis pulses

- In a system without external axis, Data-11 to Data-16 should be set to "0".
- If a specified user coordinate is not defined, an error occurs.
- For 7-axis robots, the elbow angle posture Re is inserted between Data-8 (Wrist angle Rz coordinate value) and Data-9 (Type). Therefore, the numbers of Data-9 and later are increased by 1 and the final data is Data-17.

Answer format: 0000 at normal answer

MOVL

Moves a manipulator to a specified coordinate position in linear motion.

Command format: MOVL

Command data: Data-1, Data-2, . . . , Data-17 (For robots with 6 axes or less)

Data-1 = Motion speed selection

0: V (speed)

1: VR (posture speed)

Data-2 = Motion speed (0.1 to □□□. □□ mm/s, 0.1 to □□□. □° /s)

Data-3 = Coordinate specification

0: Base coordinate

1: Robot coordinate

2: User coordinate 1

.

.

.

65: User coordinate 64

Data-4 = X coordinate value (unit: mm, significant 3 decimal points)

Data-5 = Y coordinate value (unit: mm, significant 3 decimal points)

Data-6 = Z coordinate value (unit: mm, significant 3 decimal points)

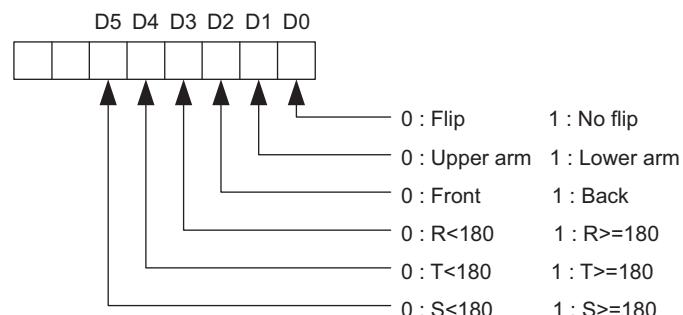
Data-7 = Wrist angle Rx coordinate value (unit: degree (°), significant 4 decimal points)

Data-8 = Wrist angle Ry coordinate value (unit: degree (°), significant 4 decimal points)

Data-9 = Wrist angle Rz coordinate value (unit: degree (°), significant 4 decimal points)

Data-10 = Type

- Data of the type are represented by the following bit data coded into a decimal number.



 8 Ethernet Server Function
 8.3 Communication Method

Data-11 = Tool No. (0 to 63)

Data-12 = Number of 7th axis pulses (for travel axis, unit: mm)

Data-13 = Number of 8th axis pulses (for travel axis, unit: mm)

Data-14 = Number of 9th axis pulses (for travel axis, unit: mm)

Data-15 = Number of 10th axis pulses

Data-16 = Number of 11th axis pulses

Data-17 = Number of 12th axis pulses

- In a system without external axis, Data-12 to Data-17 should be set to "0".
- If a specified user coordinate is not defined, an error occurs.
- For 7-axis robots, the elbow angle posture Re is inserted between Data-9 (Wrist angle Rz coordinate value) and Data-10 (Type). Therefore, the numbers of Data-10 and later are increased by 1 and the final data is Data-18.

Answer format: 0000 at normal answer

IMOV

Moves a manipulator from the current position for a specified coordinate incremental value in linear motion.

Command format: IMOV

Command data: Data-1, Data-2, · · · , Data-17 (For robots with 6 axes or less)

Data-1 = Motion speed selection

0: V (speed)

1: VR (posture speed)

Data-2 = Motion speed (0.1 to □□□. □□ mm/s, 0.1 to □□□. □° /s)

Data-3 = Coordinate specification

0: Base coordinate

1: Robot coordinate

2: User coordinate 1

.

.

65: User coordinate 64

66: Tool coordinate

Data-4 = X coordinate incremental value (unit: mm, significant 3 decimal points)

8 Ethernet Server Function
8.3 Communication Method

Data-5 = Y coordinate incremental value (unit: mm, significant 3 decimal points)

Data-6 = Z coordinate incremental value (unit: mm, significant 3 decimal points)

Data-7 = Wrist angle Rx coordinate incremental value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-8 = Wrist angle Ry coordinate incremental value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-9 = Wrist angle Rz coordinate incremental value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-10 = Reserved

Data-11 = Tool No. (0 to 63)

Data-12 = Number of 7th axis pulses (for travel axis, unit: mm)

Data-13 = Number of 8th axis pulses (for travel axis, unit: mm)

Data-14 = Number of 9th axis pulses (for travel axis, unit: mm)

Data-15 = Number of 10th axis pulses

Data-16 = Number of 11th axis pulses

Data-17 = Number of 12th axis pulses

- In a system without external axis, Data-12 to Data-17 should be set to "0".
- If a specified user coordinate is not defined, an error occurs.
- For 7-axis robots, the elbow angle posture Re is inserted between Data-9 (Wrist angle Rz coordinate incremental value) and Data-10 (Reserved). Therefore, the numbers of Data-10 and later are increased by 1 and the final data is Data-18.

Answer format: 0000 at normal answer

PMOVJ

Moves a manipulator to a specified pulse position in joint motion.

Command format: PMOVJ

Command data: Data-1, Data-2, · · · , Data-14 (For robots with 6 axes or less)

Data-1 = Motion speed (0.01 to 100.0 %)

Data-2 = Number of S-axis pulses

Data-3 = Number of L-axis pulses

Data-4 = Number of U-axis pulses

Data-5 = Number of R-axis pulses

Data-6 = Number of B-axis pulses

Data-7 = Number of T-axis pulses

Data-8 = Tool No. (0 to 63)

Data-9 = Number of 7th axis pulses

Data-10 = Number of 8th axis pulses

Data-11 = Number of 9th axis pulses

Data-12 = Number of 10th axis pulses

Data-13 = Number of 11th axis pulses

Data-14 = Number of 12th axis pulses

- In a system without external axis, Data-9 to Data-14 should be set to "0".
- For 7-axis robots, the number of pulses of the E-axis is inserted between Data-7 (Number of T-axis pulses) and Data-8 (Tool No.). Therefore, the numbers of Data-8 and later are increased by 1 and the final data is Data-15.

Answer format: 0000 at normal answer

PMOV

Moves a manipulator to a specified pulse position in linear motion.

Command format: PMOVL

Command data: Data-1, Data-2, . . . , Data-15 (For robots with 6 axes or less)

Data-1 = Motion speed selection

0: V (speed)

1: VR (posture speed)

Data-2 = Motion speed (0.1 to □□□. □□ mm/s, 0.1 to □□□. □° /s)

Data-3 = Number of S-axis pulses

Data-4 = Number of L-axis pulses

Data-5 = Number of U-axis pulses

Data-6 = Number of R-axis pulses

Data-7 = Number of B-axis pulses

Data-8 = Number of T-axis pulses

Data-9 = Tool No. (0 to 63)

Data-10 = Number of 7th axis pulses

Data-11 = Number of 8th axis pulses

Data-12 = Number of 9th axis pulses

Data-13 = Number of 10th axis pulses

Data-14 = Number of 11th axis pulses

Data-15 = Number of 12th axis pulses

- In a system without external axis, Data-10 to Data-15 should be set to "0".
- For 7-axis robots, the number of pulses of the E-axis is inserted between Data-8 (Number of T-axis pulses) and Data-9 (Tool No.). Therefore, the numbers of Data-9 and later are increased by 1 and the final data is Data-16.

Answer format: 0000 at normal answer

8 Ethernet Server Function
8.3 Communication Method

■ **Editing System Commands**

DELETE

Deletes a specified job.

Command format: DELETE

Command data: Job-Name

Job-Name = *

= Job name to be deleted

If Job-Name is specified with “*”, the command DELETE deletes all jobs which are currently registered.

If Job-Name is specified with the job name to be deleted, the command DELETE deletes only the specified job.

Answer format: 0000 at normal answer

CVTRJ (Optional)

Converts a specified job to a relative job of a specified coordinate.

Command format: CVTRJ

Command data: Data-1, Data-2

Data-1 = Name of job to be converted

Data-2 = Conversion coordinate system specification

0: Base coordinate

1: Robot coordinate

2: User coordinate 1

.

.

.

65: User coordinate 64

If the specified user coordinate is not defined, an error answer is sent back.

Answer format: 0000 at normal answer



The CVTRJ command can be used when the relative job function is enabled.

CVTSJ (Optional)

Converts a specified job to a standard job (pulse job) in a specified converting method.

Command format: CVTSJ

Command data: Data-1, Data-2, Data-3

Data-1 = Name of job to be converted

Data-2 = Converting method specification

 0: Previous step regarded (B-axis sign same)

 1: Type regarded

 2: Previous step regarded (R-axis travel amount minimum)

Data-3 = Reference position variable. Position variable No. indicating the first step conversion reference position when the previous step is regarded

Answer format: 0000 at normal answer



The CVTSJ command can be used when the relative job function is enabled.

WUFRAME

Writes a user coordinate data to a specified user coordinate system.

Command format: WUFRAME

Command data: Data-1, Data-2, · · · , Data-29

Data-1 = User coordinate No.

 2: User coordinate 1

 ·

 ·

 ·

 65: User coordinate 64

Data-2 = ORG X coordinate value (unit: mm, significant 3 decimal points)

Data-3 = ORG Y coordinate value (unit: mm, significant 3 decimal points)

Data-4 = ORG Z coordinate value (unit: mm, significant 3 decimal points)

Data-5 = ORG wrist angle Rx coordinate value (unit: degree (°), significant 4 decimal points)

 8 Ethernet Server Function
 8.3 Communication Method

Data-6 = ORG wrist angle Ry coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-7 = ORG wrist angle Rz coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-8 = ORG type

Data-9 = XX X coordinate value (unit: mm, significant 3 decimal points)

Data-10 = XX Y coordinate value (unit: mm, significant 3 decimal points)

Data-11 = XX Z coordinate value (unit: mm, significant 3 decimal points)

Data-12 = XX wrist angle Rx coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-13 = XX wrist angle Ry coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-14 = XX wrist angle Rz coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-15 = XX type

Data-16 = XY X coordinate value (unit: mm, significant 3 decimal points)

Data-17 = XY Y coordinate value (unit: mm, significant 3 decimal points)

Data-18 = XY Z coordinate value (unit: mm, significant 3 decimal points)

Data-19 = XY wrist angle Rx coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-20 = XY wrist angle Ry coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-21 = XY wrist angle Rz coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-22 = XY type

Data-23 = Tool Number (0 to 63)

Data-24 = Number of 7th axis pulses (for travel axis, unit: mm)

Data-25= Number of 8th axis pulses (for travel axis, unit: mm)

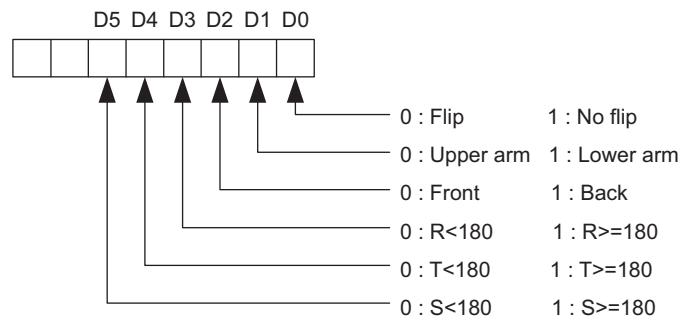
Data-26 = Number of 9th axis pulses (for travel axis, unit: mm)

Data-27 = Number of 10th axis pulses

Data-28 = Number of 11th axis pulses

Data-29 = Number of 12th axis pulses

- ORG, XX, and XY coordinates are written in the base coordinate system.
- In a system without external axis, Data-24 to Data-29 should be set to “0”.
- If the group axis of the specified user coordinate system is not R1, an error answer is sent back.
- For base-axis data of ORG, XX, and XY, the same data should be used.
- Data of the type are represented by the following bit data coded into a decimal number.



- For 7-axis robots, this command cannot be used.

Answer format: 0000 at normal answer

 8 Ethernet Server Function
 8.3 Communication Method

LOADV

Receives variable data from a PC and writes it in a specified variable.

Command format: LOADV

Command data format 1: (When the type of variables specified with the command data is 0, 1, 2, 3, or 7)

Command data: Data-1, Data-2, Data-3

Data-1 = Type of variables

0: Byte type variables

1: Integer type variables

2: Double precision type variables

3: Real number type variables

7: String variable

Data-2 = Variable No.

Data-3 = Byte value / Integer value / Double precision type integer value / Real number value / String

The value corresponding to the type of variables that is specified in Data-1 is written in.

Command data format 2: (When the type of variables specified with the command data is 4, 5, or 6)

Command data: Data-1, Data-2, · · · , Data-12 (When all the robots controlled by YRC1000micro have 6 axes or less)

Data-1 = Type of variables

4: Robot axis position type variables

5: Base axis position type variables

6: Station axis position type variables (only pulse type)

Data-2 = Variable No.

Data-3 = Position data type (0: Pulse type, 1: Cartesian type)

(When the position data type is 0)

Data-4 = Number of S-axis pulses / Number of base 1st axis pulses / Number of station 1st axis pulses

Data-5 = Number of L-axis pulses / Number of base 2nd axis pulses / Number of station 2nd axis pulses

Data-6 = Number of U-axis pulses / Number of base 3rd axis pulses / Number of station 3rd axis pulses

Data-7 = Number of R-axis pulses / Number of base 4th axis pulses / Number of station 4th axis pulses

Data-8 = Number of B-axis pulses / Number of base 5th axis pulses / Number of station 5th axis pulses

8 Ethernet Server Function**8.3 Communication Method**

Data-9 = Number of T-axis pulses / Number of base 6th axis pulses / Number of station 6th axis pulses

Data-10 = Tool No.(0 to 63)

Data-11 = Not exist

Data-12 = Not exist

- When the robots controlled by YRC1000micro include a 7-axis robot, the number of pulses of robot's E-axis is inserted between Data-9 (Number of T-axis pulses) and Data-10 (Tool No.). Therefore, the tool number is Data-11.

(When the position data type is 1: Only robot axis position type variables / base axis position type variables exist.)

Data-4 = Coordinate data

0: Base coordinate

1: Robot coordinate

2: User coordinate 1

3: User coordinate 2

.

.

.

65: User coordinate 64

66: Tool coordinate

67: Master tool coordinate

Data-5 = X coordinate value / Base 1st axis Cartesian value (unit: mm, significant 3 decimal points)

Data-6 = Y coordinate value / Base 2nd axis Cartesian value (unit: mm, significant 3 decimal points)

Data-7 = Z coordinate value / Base 3rd axis Cartesian value (unit: mm, significant 3 decimal points)

Data-8 = Wrist angle Rx coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

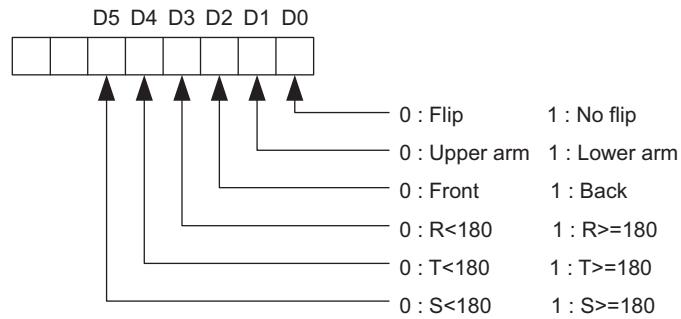
Data-9 = Wrist angle Ry coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-10 = Wrist angle Rz coordinate value (unit: degree ($^{\circ}$), significant 4 decimal points)

Data-11 = Type

- Data of the type are represented by the following bit data coded into a decimal number.

8 Ethernet Server Function
8.3 Communication Method



Data-12 = Tool No. (0 to 63)

- When the robots controlled by YRC1000micro include a 7-axis robot, the elbow angle posture Re is inserted between Data-10 (Wrist angle Rz coordinate value) and Data-11 (Type). Therefore, the numbers of Data-11 and later are increased by 1 and the final data is Data-13.

Answer format: 0000 at normal answer

■ **Job Selection System Command**

SETMJ

Sets a specified job as a master job.

At the same time, the specified job is set as an execution job.

Command format: SETMJ

Command data: Job-Name

Job-Name = Job name to be set

Answer format: 0000 at normal answer

JSEQ

Sets a job name and a line No.

Command format: JSEQ

Command data: Data-1, Data-2

Data-1 = Job name to be set

Data-2 = Line No. to be set (0 to 9999)

Answer format: 0000 at normal answer

8.3.2.3 I/O Read/Write Function

■ **Read-Out of I/O Signal Status**

Reads out I/O signals.

Command format: IOREAD

Command data: Data-1, Data-2

Data-1 = Contact point No. to start read-out

Data-2 = The number of contact points to be read out

- I/O data are output every eight contact points. Specify the number of contact points to be read out, in multiples of eight.

Answer format: Data-1, Data-2, · · · , Data-N

Data-1 = Read-out data for the first eight contact points

Data-2 = Read-out data for the next eight contact points

.

.

Data-N = Read-out data for the last eight contact points

N = (Command data Data-2)/8. The command data Data-2 should be multiples of eight.

■ **Write-in of I/O Signal Status**

Writes in I/O signals.

Command format: IOWRITE

Command data: Data-1, Data-2, · · · , Data-N

Data-1 = Contact point No. to start write-in

Data-2 = The number of contact points to be written in

Data-3 = Write-in data for the first eight contact points

Data-4 = Write-in data for the next eight contact points

.

.

Data-N = Write-in data for the last eight contact points

N = (Command data Data-2)/8+2. The command data Data-2 should be multiples of eight.

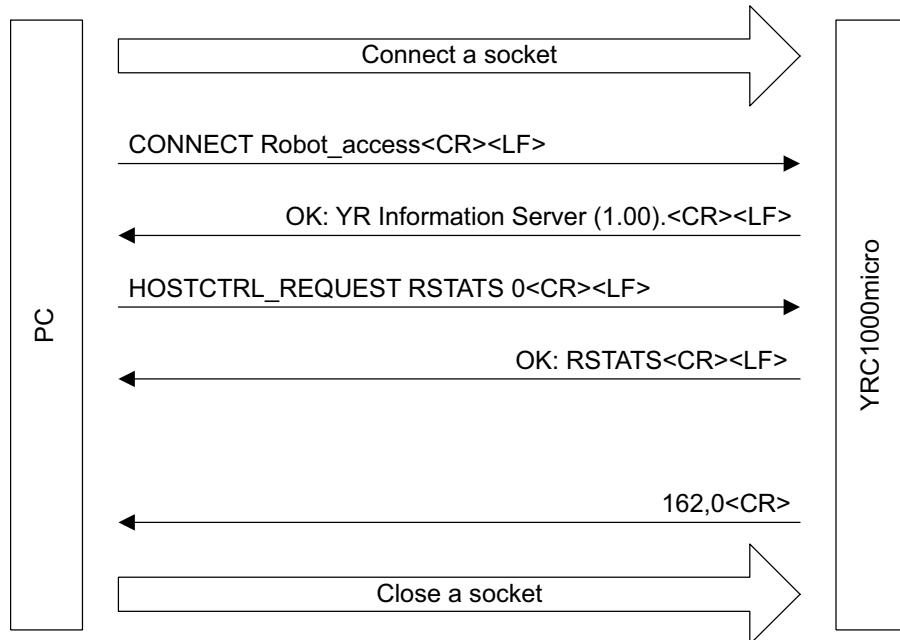
- I/O data are processed every eight contact points. Specify the number of contact points to be written-in, in multiples of eight.
- The IO signals can only be written to the network inputs (#27010 to #29567).

Answer format: 0000 at normal answer

8.3.3 Transmission Example

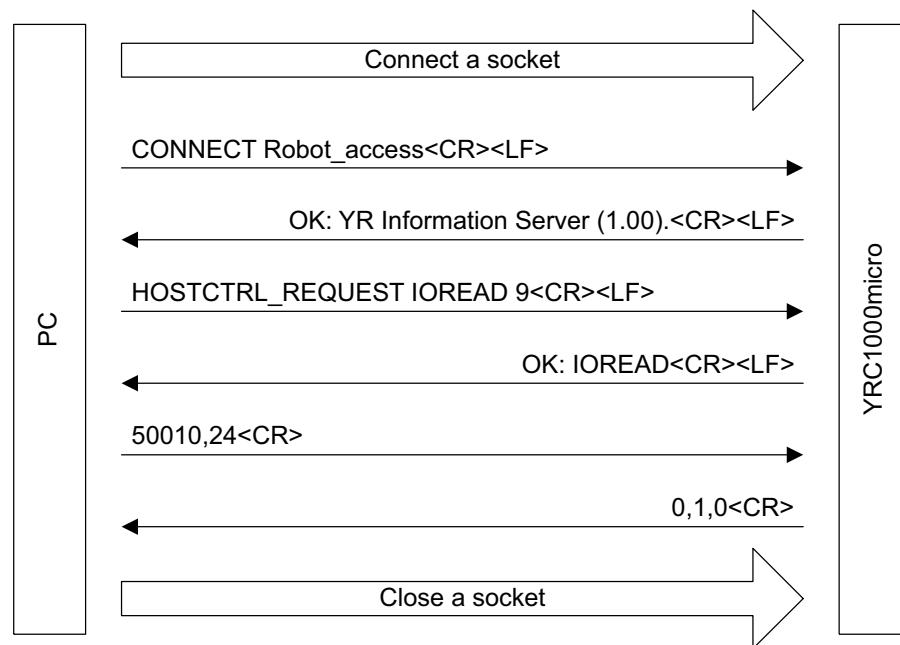
8.3.3.1 Read-Out of Status for Mode, Cycle, etc

See and follow the figure below to read out each status of mode, cycle, etc.



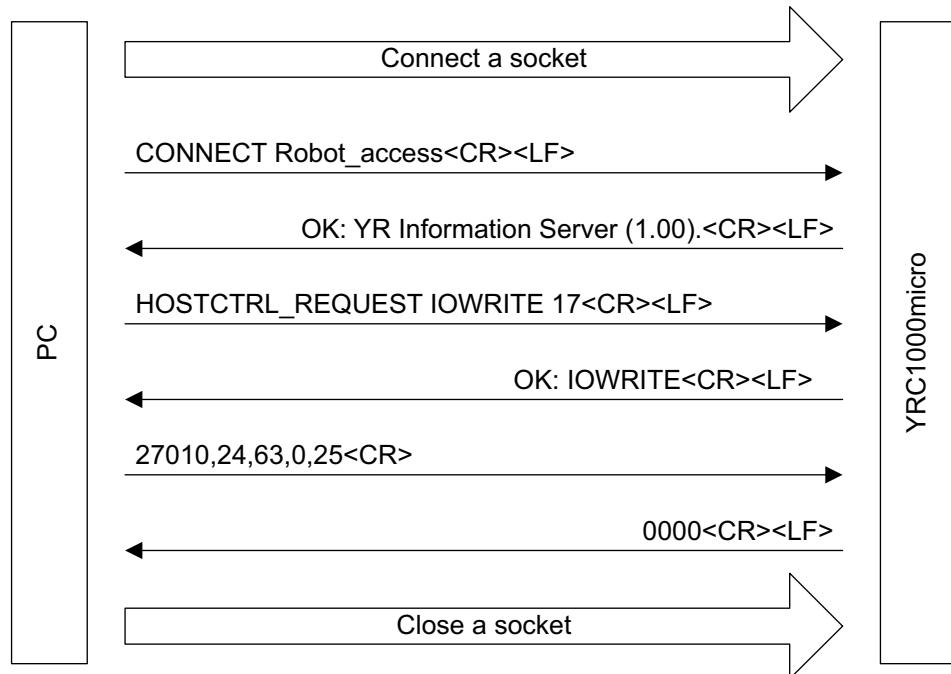
8.3.3.2 Read-Out of I/O Signals for the YRC1000micro

See and follow the figure below to read out three bytes (24 bits) from #50010.



8.3.3.3 Write-In of I/O Signals for the YRC1000micro

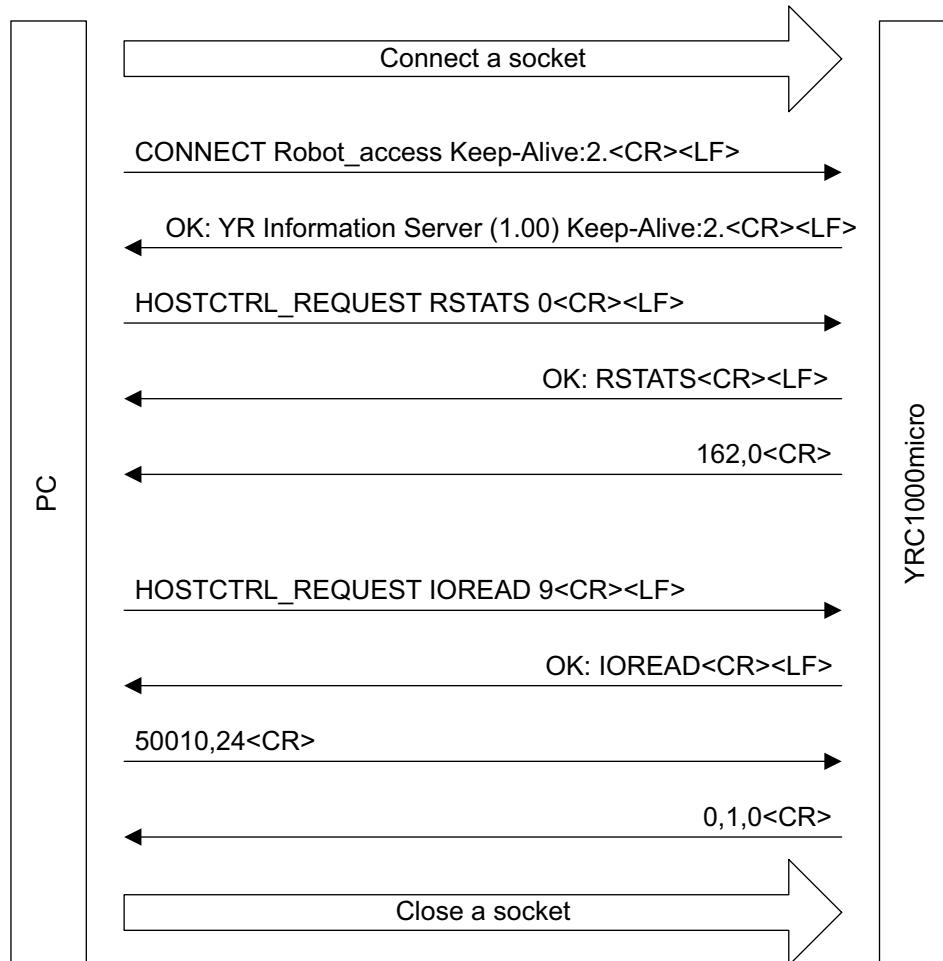
See and follow the figure below to write in three bytes (24 bits) from #27010.



 8 Ethernet Server Function
 8.3 Communication Method

8.3.3.4 Continuous Execution of Multiple Command

See and follow the figure below to read out three bytes (24 bits) from #50010, following the “Read-Out of Status for Mode, Cycle, etc”.



8.4 Troubleshooting

8.4.1 Network Communication Confirmation

Refer to chapter 2.4 “Network Communication Confirmation”, and confirm that TCP/IP basic communication can be performed.

8.4.2 Communication Setting Confirmation for Firewall and Security Software

The Ethernet server function uses TCP port 80.

Confirm that these ports are not blocked by the firewall or security software.

8.4.3 Confirming the connection of the Ethernet Server Function

Since the Ethernet server function uses the TCP port 80, it can be checked by the telnet command from the PC whether the Ethernet server function operates normally.

In the Windows 7, the command prompt can be started up to check the connection as follows:

1. Enter “telnet IP address 80”.

```
C:\>telnet 192.168.255.1 80
```

2. The display switches to the window for telnet.
-

3. Enter “CONNECT Robot_access” (At normal settings, an echo is not returned).
-

4. Enter “HOSTCTRL_REQUEST RSTATS 0”.
-

```
HOSTCTRL_REQUEST RSTATS 0
```

5. The check is completed when the response to command/answer is displayed.
-

```
HOSTCTRL_REQUEST RSTATS 0
OK: RSTATS
194,0
```

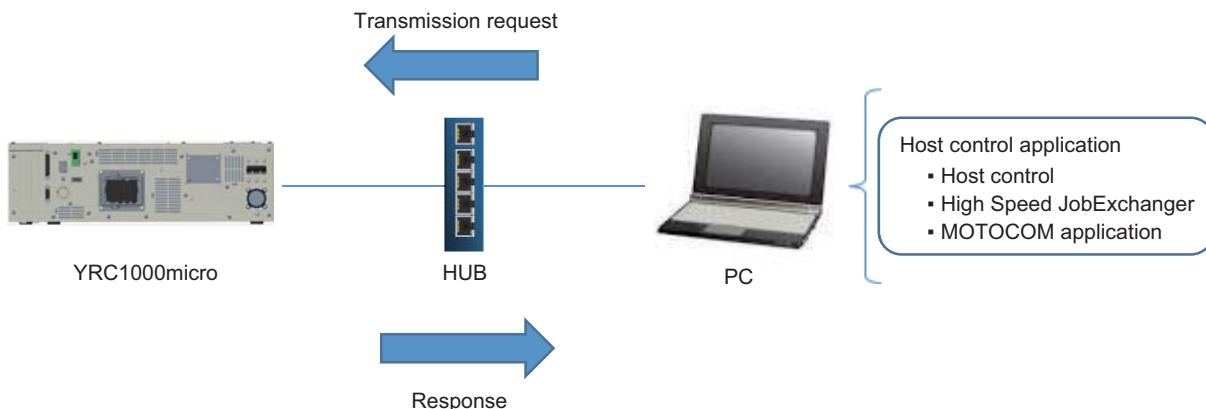
9 Host Control Function

9.1 Outline

The host control function is that by using the YASKAWA communication protocol, sending/receiving the data saved in the YRC1000micro, monitoring the manipulator status, controlling the manipulator can be performed by the operation from a PC, etc..

9.1.1 System Configuration

Fig. 9-1: System Configuration When Using the Host Control Function



9.1.2 Communication Target

The following can be used as a communication target of the host control function.

Table 9-1: Host Control Function Communication Target

Device	Software	Details
Windows PC	Host control (sending and receiving of the data in the YRC1000micro, monitoring the manipulator status, controlling the manipulator)	Application software included with the MOTOCOM32 which is an optional function.
	High Speed JobExchanger (sending and receiving of the data in the YRC1000micro)	Application software included with the MOTOCOM32 which is an optional function.
	MOTOCOM application	Customer-created communication application software which uses the communication DLL included with the MOTOCOM32 which is an optional function.

9.1.3 General Information When Using the Host Control Function

When using the host control function, refer to *chapter 11.1 “General Information About the Host Control System Function”*.

9.1.4 Restriction

1) Restrictions by the remote mode

The host control function can be used only when the command remote is enabled.

For command remote, refer to *chapter 1.2 “Command Remote Setting for YRC1000micro”*.

2) Restriction of the access by other communication processing and the exclusion

The communication function of the YRC1000micro (such as the high-speed Ethernet server function, the FTP server function, or the internal data browsing function by using the Web browser) cannot perform the concurrent processing simultaneously with Host Control Function. If these communications are used simultaneously, communication error may occur in the host control function. Do not use other communication processing while communicating using the host control function.

9	Host Control Function
9.2	Setting

9.2 Setting

9.2.1 Command Remote Setting

Set the command remote to “VALID”.

For procedures to enable the command remote, refer to
chapter 1.2.3 “Command Remote Setting Method”.

9.3 Transmission Procedure

9.3.1 File Data Transmission Function

By using PC software (either “Host Control”, “High Speed JobExchanger”, or “MOTOCOM Applications”), perform transmission processing.

9.3.2 Manipulator Control Function

By using PC software (either “Host Control” or “Motocom Applications”), perform transmission processing.

9	Host Control Function
9.4	Troubleshooting

9.4 Troubleshooting

9.4.1 Network Communication Confirmation

Refer to *chapter 2.4 “Network Communication Confirmation”*, and confirm the status that TCP/IP basic communication can be used.

9.4.2 Communication Setting Confirmation of Firewall and Security Software

The host control function uses UDP ports 10000 and 10006.

Confirm that these ports are not blocked by the firewall or security software.

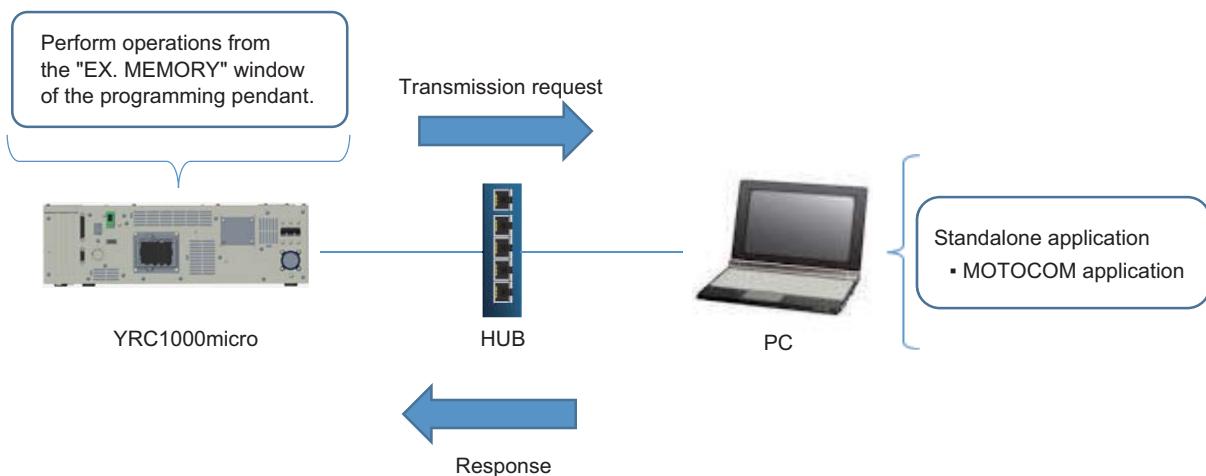
10 Standalone Function

10.1 Outline

The standalone function is that, by operating the external memory of the YRC1000micro, sending and receiving of the YRC1000micro internal data can be performed. When using this function, refer to "Chap. 7. External Memory Device" in the "YRC1000micro OPERATOR'S MANUAL (RE-CSO-A058)".

10.1.1 System Configuration

Fig. 10-1: System Configuration When Using the Standalone Function



The files that can be sent or received via the standalone function are described below.

Table 10-1: Files That can be Sent or Received by Using the Standalone Function

Data type

JOB

Condition file / General Data *Some data is read only

System information *read only



The standalone function cannot be used for system backup (batch data backup).

Some of the files above can only be saved (not loaded).

10.1.2 Communication Target

The following can be used as a communication target with the standalone function.

Table 10-2: Standalone Function's Communication Target

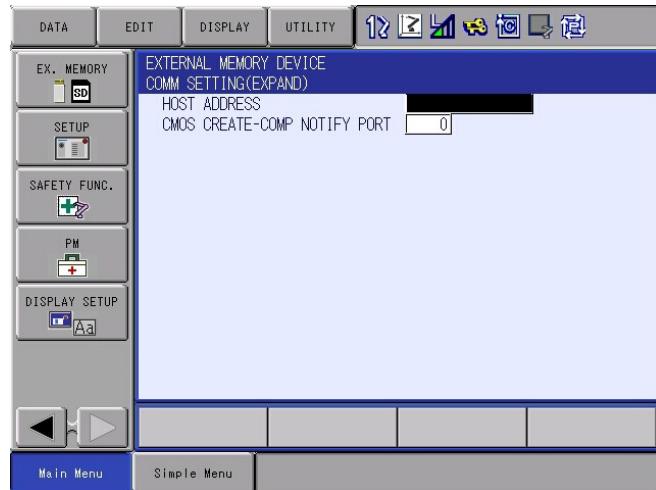
Device	Software	Details
Windows PC	MOTOCOM application	Customer-created communication application software by using the communication DLL included with the MOTOCOM32 which is an optional function.

10.2 Setting

10.2.1 Communication Target Setting

Perform the settings for the standalone communication target in accordance with following procedures.

1. Start normal operation mode.
Start in the online mode.
 2. In the Main Menu, select {EX. MEMORY} - {COMM SETTING(EXPAND)}.
- The COMM SETTING(EXPAND) window appears.



3. Set the HOST ADDRESS.
Set the HOST ADDRESS for the communication target.

■ HOST ADDRESS

For the communication target IP address, use half-width numbers and periods (.), and set "xx.xx.xx.xx" using the following format (xx is a decimal number from 0 to 255). Note that if the DNS client function is enabled, the FQDN (Fully Qualified Domain Name: 'Hostname@domainname' name format) can also be set. Characters that can be used for the FQDN are half-width alphanumeric characters, hyphens (-), underscores (_) and the at-sign (@) which acts as the character boundary between the host name and the domain name. Set it within 128 characters or less.



The host address that is set on this window is used for CMOS save functions via FTP and DCI functions. These addresses cannot be set separately.

10.2.2 Command Remote to OFF Setting

Set the command remote INVALID.

To disable the command remote, set the key switch of the programming pendant to “PLAY” or “TEACH”, or set the “CMD REMOTE SEL” of the PSUEDO INPUT SIGNAL window to DISABLE. For procedures about changing the pseudo input signal, refer to *chapter 1.2.3 “Command Remote Setting Method”*.

10.3 **Preparation at the PC Side**

On the PC, create the MOTOCOM application to be used as the communication target, and then execute it.

10.4 Executing the Standalone Function

10.4.1 Selecting the Standalone Function

1. Select {EX. MEMORY} - {DEVICE / SETUP} under the Main Menu.
– The DEVICE / SETUP window appears.
2. Select “PC”.
– The PC is selected as the external memory device.



10.4.2 Save

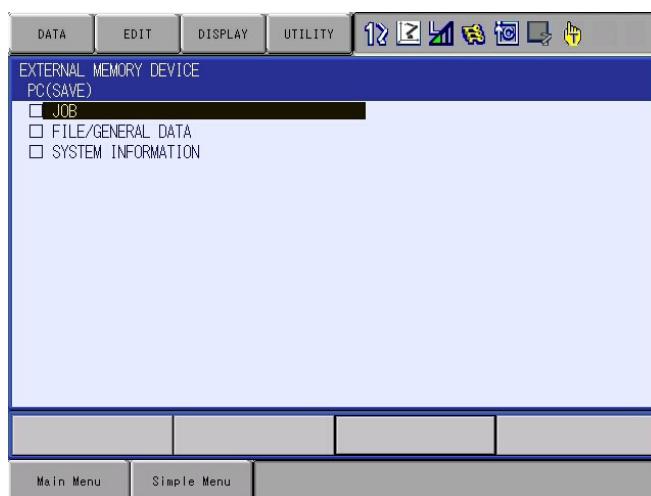
This operation transmits (writes) data from the YRC1000micro to the PC.



If the data is changed, save the target data separately.

10.4.2.1 Save Job

1. Select {EX. MEMORY} under the Main Menu.
2. Select {SAVE}.
– The SAVE window appears.

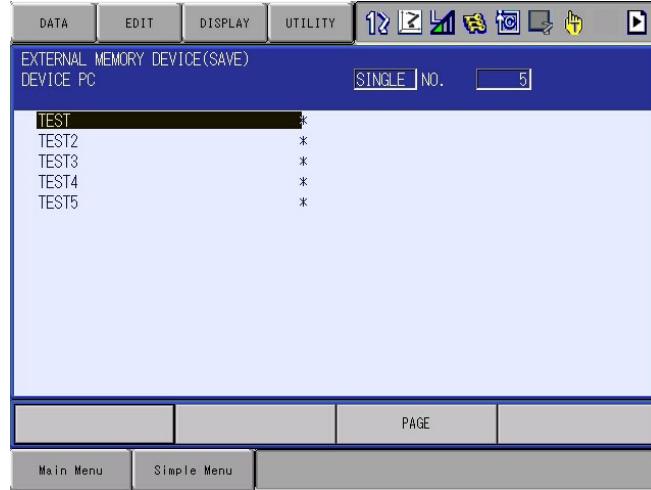


10 Standalone Function

10.4 Executing the Standalone Function

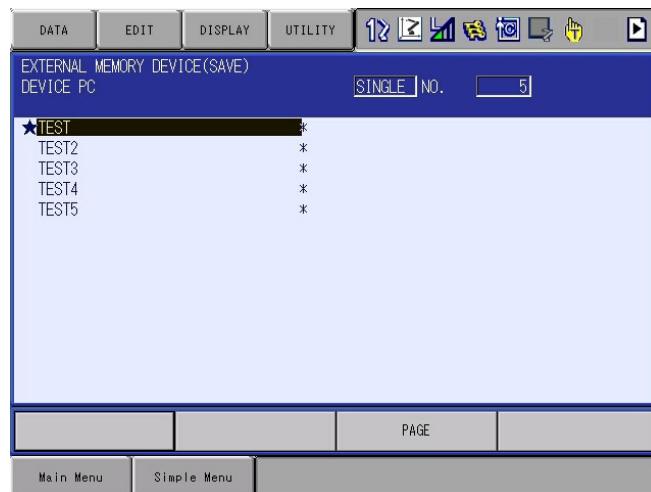
3. Select "JOB".

- The job list appears.



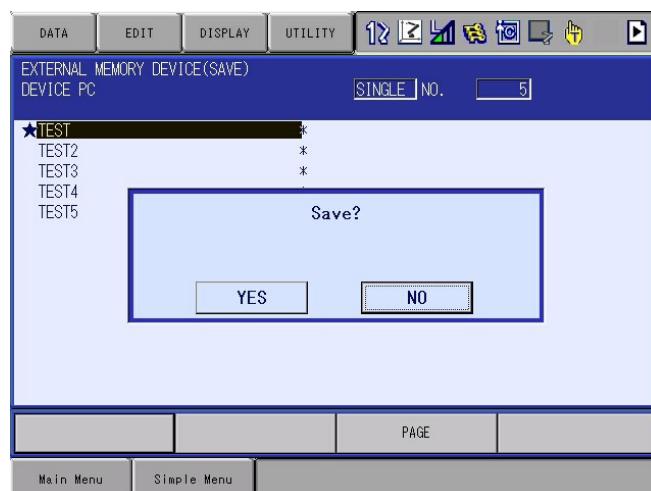
4. Select a job to save.

- “★” will appear for the selected job.



5. Press [Enter].

- The confirmation dialog box appears.



 10 Standalone Function
 10.4 Executing the Standalone Function

6. Select {YES}.
 - The selected job is saved.

10.4.2.2 Save a File Other Than Job

Save required files using the same procedure as *chapter 10.4.2.1 “Save Job”*.

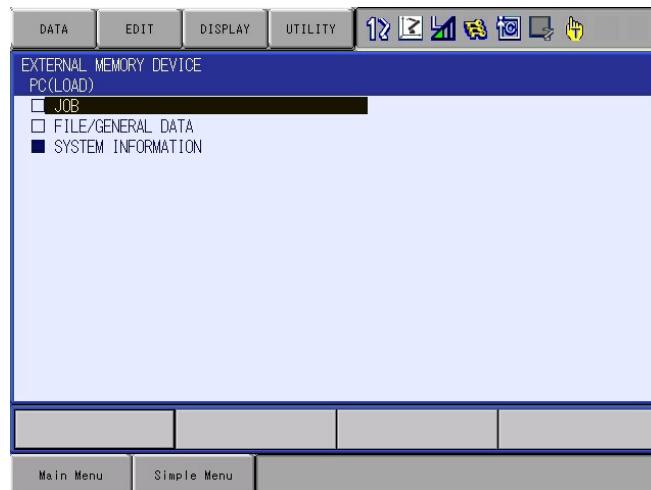
With the standalone function, the file other than JOB, FILE, and GENERAL DATA cannot be saved.

10.4.3 Load

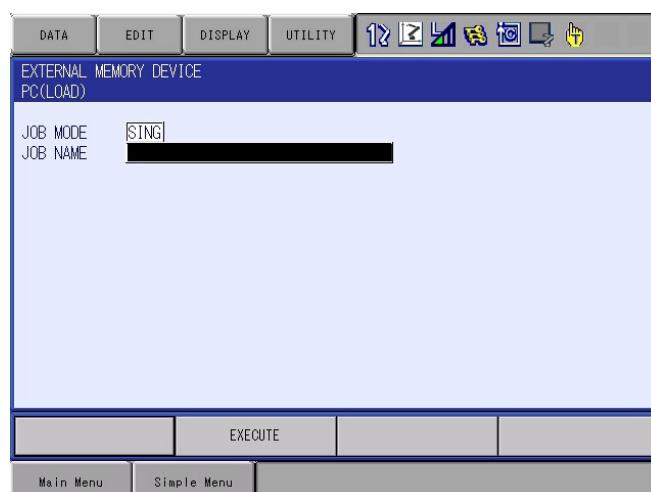
This operation transmits (reads) data from the PC to the YRC1000micro.

10.4.3.1 Load the Job

1. Select {EX. MEMORY} under the Main Menu.
2. Select {LOAD}.
 - The LOAD window appears.



3. Select “JOB”.
 - The input window for a job name to be loaded appears.



4. Enter a job name to load.

 10 Standalone Function
 10.4 Executing the Standalone Function

5. Select {EXECUTE}.
- The job whose name is entered is loaded.

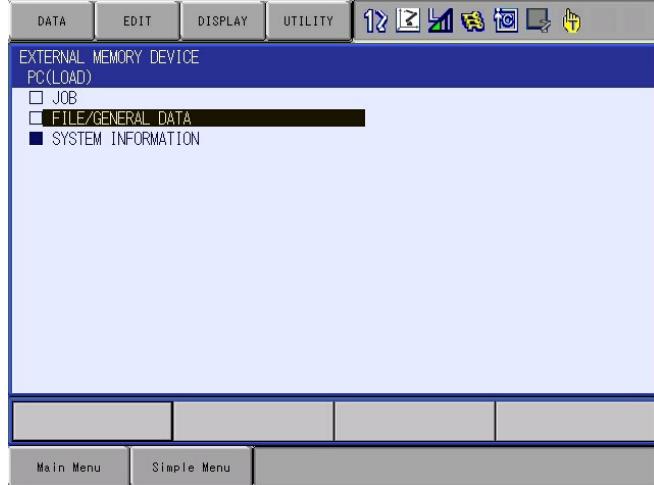
10.4.3.2 Load a File Other Than Job

Load required files using the same procedure as described in chapter 10.4.3.1 “Load the Job”.

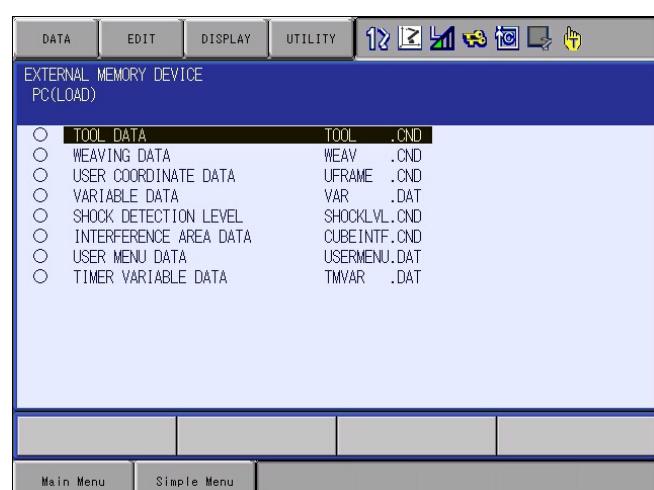
With the standalone function, the file other than JOB, FILE, and GENERAL DATA cannot be saved.

1. Select {EX. MEMORY} under the Main Menu.
2. Select {LOAD}.

- The LOAD window appears.



3. Select a file group to load.
- The file selection window appears.

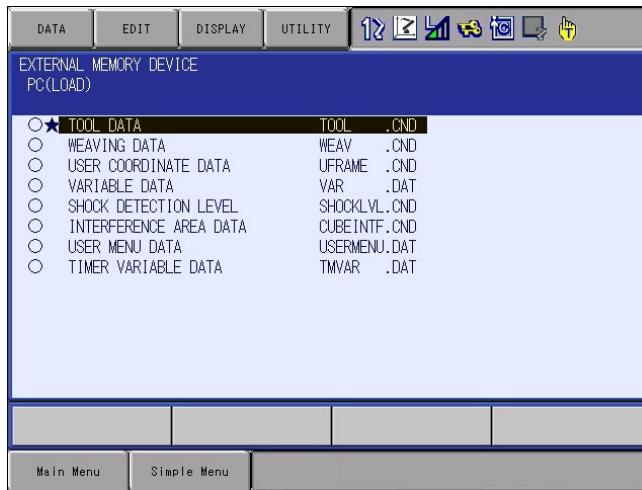


10 Standalone Function

10.4 Executing the Standalone Function

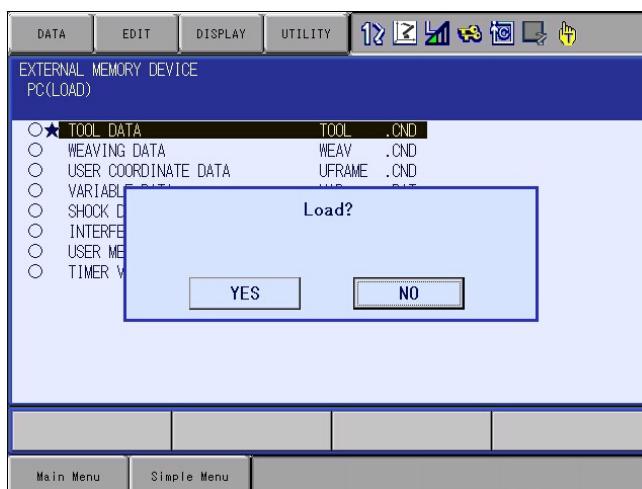
4. Select a file to load.

- “★” will appear for the selected file.



5. Press [Enter].

- The confirmation dialog box appears.



6. Select {YES}.

- The selected file will be loaded.

10.4.4 Verification

This operation is to verify the YRC1000micro data and the PC data.

The operating procedure is same as that of saving.

10.4.4.1 Verifying the Job

1. Select {EX. MEMORY} under the Main Menu.
2. Select {VERIFY}.
- The VERIFY window appears.
3. Select {JOB}.
- The job list appears.
4. Select a job to verify.
- “★” will appear for the selected job.

10 Standalone Function

10.4 Executing the Standalone Function

5. Press [Enter].
– The confirmation dialog box appears.
6. Select {YES}.
– The selected job will be verified.

10.4.4.2 Verifying the File Other Than the Job

Verify any required files using the same procedure described in *chapter 10.4.4.1 “Verifying the Job”*.

With the standalone function, the file other than JOB, FILE, and GENERAL DATA cannot be verified.

10.4.5 Selection Mode of the Job

Job can be loaded, saved, or verified by either one of the following modes.

10.4.5.1 Single Selection Mode

Only the selected job is loaded, saved, or verified.

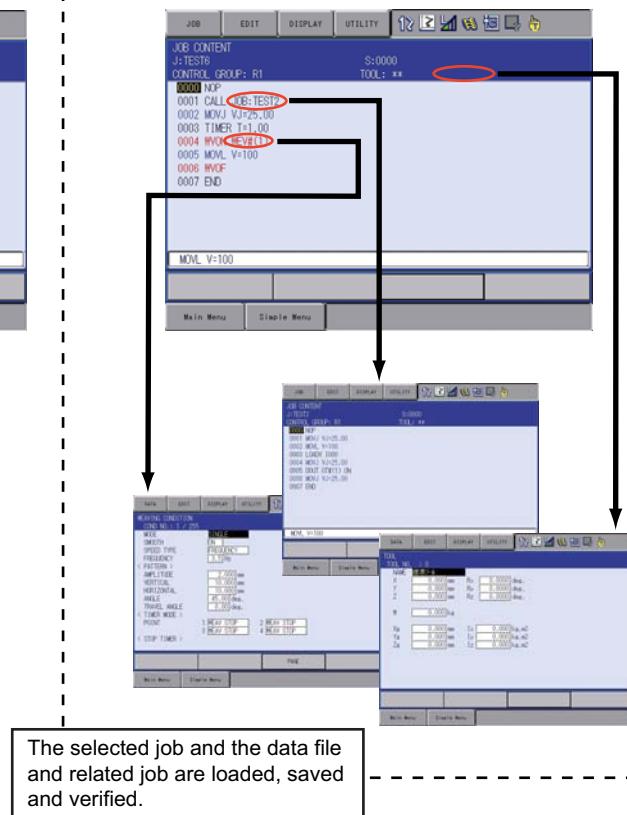
10.4.5.2 Related Selection Mode

The selected job as well as the related jobs and data files are loaded, saved, or verified.

For the single selection mode



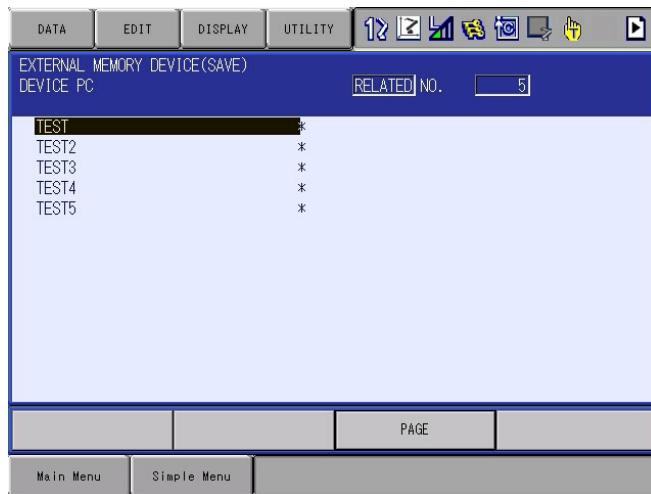
For the related selection mode



 10 Standalone Function
 10.4 Executing the Standalone Function

10.4.5.3 Switching the Selection Mode

1. Press [PAGE] on the external memory job list window.
 – Each time [PAGE] is pressed, the window switches alternatively from “single selection mode” to “related selection mode”.



10.4.6 Selecting a Job or Data File

There are two ways to select a job or various data files to be loaded, saved, or verified.

10.4.6.1 Individual Selection

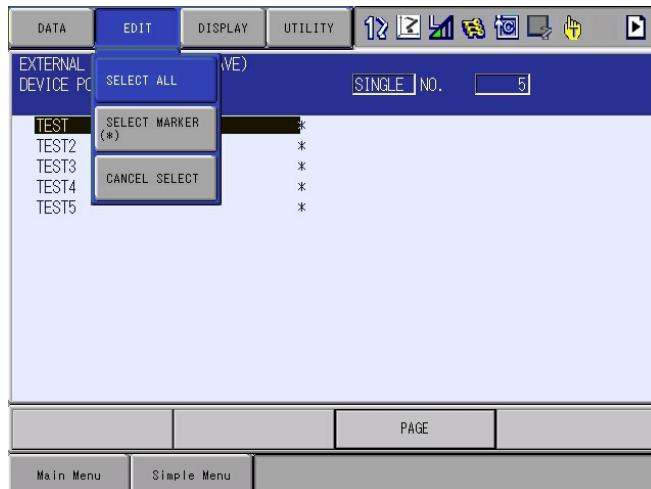
Selects job or data file one by one.

10.4.6.2 SELECT ALL

Selects all the jobs or data files at once.

When selecting all jobs, performs the following operation.

1. Select {EDIT} of the menu in the EXTERNAL MEMORY JOB LIST window or the file selection window.
 – The pull down menu appears.



2. Select {SELECT ALL}.

10.5 Troubleshooting

10.5.1 Network Communication Confirmation

Refer to chapter 2.4 “Network Communication Confirmation”, and confirm that TCP/IP basic communication can be performed.

10.5.2 Communication Setting Confirmation for Firewall and Security Software

The standalone function uses UDP ports 10000 and 10006.

Confirm that these ports are not blocked by the firewall or security software.

10.5.3 Confirming the Operation of the PC-side Application

Confirm that the PC-side applications are operating normally.

10.5.4 Confirming That the Remote Setting is OFF

Confirm that the settings of the command remote and the read-only option are disabled.

11 Related Information

11.1 General Information About the Host Control System Function

Shows the general information in *chapter 8 “Ethernet Server Function”* and *chapter 9 “Host Control Function”*.

11.1.1 List of Interlock for Command of Host Control Function

The executability of each command differs depending on the status of the YRC1000micro as shown in the following table.

Command Name		Read/Write Enabled					Only Read Enabled				
		Non-alarm/Non-error				Alarm/ Error	Non- alarm/ Non- error	Alarm/ Error			
		Teach Mode		Play Mode							
		Stop	Operat-ing	Stop	Operat-ing						
Read or Monitor	RALARM	○	○	○	○	○	○	○			
	RPOSC	○	○	○	○	○	○	○			
	RPOSJ	○	○	○	○	○	○	○			
	RSTATS	○	○	○	○	○	○	○			
	RJSEQ	○	○	○	○	○	○	○			
	JWAIT	○	○	○	○	A	○	A			
	RGROUP	○	○	○	○	○	○	○			
Read or Data Access	RJDIR	○	○	○	○	○	C	C			
	RUFRAME	○	○	○	○	○	C	C			
	UPLOAD	○	○	○	○	○	C	C			
	SAVEV	○	○	○	○	○	C	C			
	SAVEVP	○	○	○	○	○	C	C			
Operation	HOLD	○	○	○	○	○	C	C			
	RESET	○	○	○	○	○	C	C			
	CANCEL	○	○	○	○	○	C	C			
	MODE	○	○	○	○	O/A *3	C	C			
	CYCLE	○	○	○	○	O/A *3	C	C			
	SVON 0 (OFF)	○	○	○	○	○	C	C			
	SVON 1 (ON)	○	○	○	○	A	C	C			
	HLOCK	○	○	○	○	○	C	C			
	MDSP	○	○	○	○	○	C	C			
	CGROUP	○	○	○	○	○	C	C			
Activation	CTASK	○	○	○	○	○	C	C			
	START	M	M	O/H *1	MOVE/O*2	A	C	C			
	MOVJ	M	M	O/H *1	MOVE/O*2	A	C	C			
	MOVL	M	M	O/H *1	MOVE/O*2	A	C	C			
	IMOV	M	M	O/H *1	MOVE/O*2	A	C	C			
	PMOVJ	M	M	O/H *1	MOVE/O*2	A	C	C			
	PMOVL	M	M	O/H *1	MOVE/O*2	A	C	C			

Command Name		Read/Write Enabled						Only Read Enabled			
		Non-alarm/Non-error				Alarm/ Error	Non- alarm/ Non- error	Alarm/ Error			
		Teach Mode		Play Mode							
		Stop	Operat- ing	Stop	Operat- ing						
Editing	DELETE	O	MOVE	M	M	A	C	C			
	CVTRJ	O	MOVE	M	M	A	C	C			
	CVTSJ	O	MOVE	M	M	A	C	C			
	WUFRAME	O	MOVE	M	M	A	C	C			
	DOWNLOAD	O	O/MOVE*4	O	O/MOVE*4	A	C	C			
	LOADV	O	O	O	O	A	C	C			
	LOADVP	O	O	O	O	A	C	C			
Job selection	SETMJ	O	MOVE	O	MOVE	A	C	C			
	JSEQ	O	MOVE	O	MOVE	A	C	C			

<Interpreter message>

O : Possible to execute

A : Alarm/error occurring 2060

M : Incorrect mode 2080

H : Hold 2020 to 2050

MOVE : Manipulator moving 2010

C : No command remote setting 2100

*1 "O" if not being held ; "H" if being held

*2 "MOVE" if the manipulator is moving by operation other than command ; "O" if the manipulator is moving by command since a single command can be accepted.

*3 "O" during an alarm ; "A" during error

*4 Only a single job can be executed.

11.1.2 Command that Handle Axis Data

The data transmission function of the YRC1000micro has restrictions on handling control axis data.

① For the following commands, the order of response data varies whether the number of robot's axes is 6 or 7.

Object commands: RPOSJ, RPOSC, MOVJ, MOVL, IMOV, PMOVJ, PMOVL

② Since the manipulator axes are fixed to a six-axis set, any manipulator having more than seven axes cannot use the following commands.

Object commands: RUFRAME, WUFRAME

11 Related Information

11.1 General Information About the Host Control System Function

11.1.3 Response to MOV-type Command

The responses to MOV-type command are as follows.

- If the manipulator is moving by operations other than commands, the interpreter message 2010 (manipulator operating) is returned and the manipulator does not move.
- If the manipulator is in stop status, it turns ON the start lamp and moves according to the command, and returns a response immediately.
- If the manipulator is moving according to the previous commands, only a single command is accepted and the response is held up. After completing execution of the preceding commands, when starting execution of the suspended command, the manipulator returns a response.

This applied to the following commands.

MOVJ, MOVL, IMOV, PMOVJ, PMOVL

11.1.4 Command for Multi-control Group and Independent Control Function**11.1.4.1 Command for Multi-control Group**

The YRC1000micro can control more than one manipulator or station simultaneously.

The following commands are available for this multi-control function.

- CGROUP : Changing the control group
- RGROUP : Reading the control group and task selected status

The following table shows the combination which can be set by using the above commands.

R1 (robot 1)	R2 (robot 2)	S ¹⁾
×	×	●
● ²⁾	×	×
●	×	●
×	●	×
×	●	●

1 Either one station among S1 to S3 can be selected in a system having several stations.

2 Base axes is included in robot axes.

The following commands have influence when the above commands are used.

The operations of these commands are applicable to the set control group.

Read System Commands	Startup System Commands	Editing System Command
RPOSJ RPOSC RUFRAME	MOVJ MOVL IMOV PMOVJ PMOVL	WUFRAME

11 Related Information

11.1 General Information About the Host Control System Function

11.1.4.2 Command for Independent Control Function

The YRC1000micro supports the independent control function which can execute more than one job simultaneously.

For this independent function, the following commands are available.

- CTASK : Changing the tasks
- RGROUP : Reading the control group or task selected status

By using the above commands, a task to be controlled can be changed.

The following commands have influence when the independent control function is used.

① Job startup (START)

Starts up a job.

When a job name specification is provided for operand, execution of that job is started from the head of job as a task that is currently selected.

When a job name is not specified, all tasks that are currently set are executed from the current line No.

② Waiting for completion of startup (JWAIT)

As a response, returns the information whether the currently selected task operation has been completed.

③ Master job registration (SETMJ)

Sets a specified job as a master job, to the currently selected task.

④ Job selection (JSEQ)

Sets a job name, a line No. to the currently selected task.

⑤ Read of selected job (RJSEQ)

Reads the job name, line No., and step No. of the currently selected task.

⑥ Read of status (RSTATS)

Returns the system status disregarding the selected task status.

However, the “running” status differs from the conventional status ; the “running” is entered even if only one task was operating.

11 Related Information

11.1 General Information About the Host Control System Function

11.1.5 Interpreter Message

The interpreter messages are classified into the following categories.

- 1xxx : Command text general error
- 2xxx : Command execution mode error
- 3xxx : Command execution error
- 4xxx : Job registration error
- 5xxx : File contents error

Table 11-1: Interpreter Message List

Code	Content
1010	Command error
1011	Error in number of command operands
1012	Command operand value range over
1013	Command operand length error
1020	Disk full of files
2010	Manipulator operating
2020	Hold by programming pendant
2030	Hold by playback panel
2040	External hold
2050	Command hold
2060	Error/alarm occurring
2070	Servo OFF
2080	Incorrect mode
2090	File accessing by other function
2100	Command remote not set
2110	This data cannot be accessed.
2120	This data cannot be loaded.
2130	Editing
2150	Coordinates Conversion Function Execution *Refer to the NOTE in the last page of this table.
3010	Turn ON the servo power.
3040	Perform home positioning.
3050	Confirm positions.
3070	Current value not made
3220	Panel lock ; mode/cycle prohibit signal is ON.
3230	Panel lock ; start prohibit signal is ON.
3350	User coordinate not taught
3360	User file destroyed
3370	Incorrect control group
3380	Incorrect base axis data
3390	Relative job conversion prohibit (at CVTRJ)
3400	Master call prohibit (parameter)
3410	Master call prohibit (lamp On during operation)
3420	Master call prohibit (teach lock)
3430	Robot calibration data not defined
3450	Servo power cannot be turned ON.
3460	Coordinate system cannot be set.
4010	Insufficient memory capacity (job registered memory)
4012	Insufficient memory capacity (position data registered memory)
4020	Job editing prohibit
4030	Same job name exists
4040	No specified job

11 Related Information

11.1 General Information About the Host Control System Function

Table 11-1: Interpreter Message List

Code	Content
4060	Set a execution job.
4120	Position data destroyed
4130	Position data not exist
4140	Incorrect position variable type
4150	END instruction for job which is not master job
4170	Instruction data destroyed
4190	Invalid character in job name
4200	Invalid character in label name
4230	Invalid command in this system
4420	No step in job to be converted
4430	Already converted
4480	Teach user coordinate.
4490	Relative job/Independent control function not permitted
5110	Syntax error (syntax of command)
5120	Position data error
5130	No NOP or END instruction
5170	Format error (incorrect format)
5180	Incorrect number of data
5200	Data range over
5310	Syntax error (except command)
5340	Error in pseudo command specification
5370	Error in condition data record
5390	Error in job data record
5430	System not matched
5480	Incorrect welding function type

* Code 2150: Coordinates Conversion Function Execution

This error occurs when the “RPOSC”, “CVTRJ”, “CVTSJ”, “RUFRAME”, or “WUFRAME” command is executed while each of the following window is indicated.

- Parallel shift JOB conversion function window
- Mirror shift function window
- PAM function window
- Relative job conversion window (Optional)
- PMT data conversion window (Optional)
- Position correction function window (Optional)
- Arm bend compensate function window (Optional)
- User coordinates shift window (Optional)
- Gun teaching position correction function window (Optional)
- 4 point teaching function window (Optional)



Also, the same error occurs not only when each of the above mentioned window is indicated, it occurs when the PMT command is being executed.

11 Related Information

11.1 General Information About the Host Control System Function

11.1.6 Alarm Code

The alarms for the host control system function are shown as follows.

Code	Contents	Remarks
4112	Data sending error 1 : NAK retry over 2 : Timer A timeup retry over 3 : Alternating response error retry over	The EOT code is sent out and the data link is canceled.
4113	Data receiving error 1 : Receiving timeup (Timer A) 2 : Receiving timeup (Timer B) 3 : Short heading length 4 : Long heading length 5 : Illegal header No. 6 : Text longer than 256 characters 7 : Receiving other than expected control code	For 3 to 7, the EOT code is sent out and the data link is canceled.
4114	Transmission hardware error 1 : Overrun error 2 : Parity error 3 : Framing error 4 : Sending timeup (Timer A) 5 : Sending timeup (Timer B)	The EOT code is not sent.
4115	Transmission system block This alarm notifies that the transmission procedure is correct but the received contents makes inconsistency in the system. Usually this alarm is resulted from violation of rules on the other party or illegal notification. 1 : EOT was received while waiting for ACK 2 : EOT was received while waiting for ENQ 3 : EOT was received before receiving the last block 4 : Code other than EOT was received after receiving the last block	For 4, the EOT code is sent out and the data link is canceled.
4206	Transmission system error This alarm notifies an error on processing of transmission system. This alarm occurs in the following cases. 100 Error in transmission task • A job containing position type variable of which the value is not set, was to be saved. • A job which does not exist on the memory, was to be saved.	The EOT code is not sent.

11.2 Related Parameter

Parameter	Details	Default setting value
S2C230	<p>Specify the Valid of the programming pendant operation (in the remote)</p> <p>0: INVALID 1: VALID</p>	0
S2C541	<p>Specify the permission of variable and I/O input during the play mode</p> <p>0: Writing is allowed 1: Writing is prohibited</p>	0
S2C542	<p>Specify the permission of variable and I/O input during the edit-lock status</p> <p>0: Writing is allowed 1: Writing is prohibited</p>	0
S2C680	<p>Specify the permission of the batch data backup function</p> <p>0: INVALID 1: Create RAMDISK at the STARTUP</p>	1
RS000	<p>Specify the standard port protocol</p> <p>0: NON 1: System reserved 2: BSC LIKE 3: FC1</p>	2
RS004	<p>Specify the devices (automatic backup, system restore)</p> <p>0: SD (programming pendant) 1: USB (programming pendant) 20: FTP (CMOS saving function via FTP) 21: RAMDISK</p>	0
RS005	<p>Host control (read-only)</p> <p>0: INVALID 1: VALID</p>	0
RS022	<p>Specify the instance 0 permissions (high-speed Ethernet server, CIP message communications)</p> <p>0: Instance "0" is prohibited 1: Instance "0" is allowed</p>	1
RS023	<p>Specify the 1 byte I/O prohibitions (high-speed Ethernet server, CIP message communications)</p> <p>0: 1 byte I/O is allowed 1: 1 byte I/O is prohibited</p>	0
RS029	<p>Specify the permission of the jobs and the variables during playback</p> <p>0: INVALID 1: VALID</p>	1
RS034	<p>Timer A: Sequence monitoring timer</p> <p>Serves as protection against invalid response or no response</p> <p>Unit: 0.1 sec. (Setting range: 0 to 200)</p>	200
RS035	<p>Timer B: Text reception monitoring timer</p> <p>Serves as protection against no response of text end character</p> <p>Unit: 0.1 sec. (Setting range: 0 to 255)</p>	200

 11 Related Information
 11.2 Related Parameter

Parameter	Details	Default setting value
RS036	Number of resending of a control character for invalid response or no response (unit: times)	10
RS037	Number of resending of a text for a block check error (unit: times)	3
RS038	Block check method 0: Check sum	0
RS065	Specify the passive close for the Ethernet server function 0: Active close 1 to 254: Passive close (specified value x 100 ms wait) 255: Passive close (infinite wait)	0
RS066	Specify the Ethernet server function ringer (reset close condition specification) 0: Standard close (default) 0x01: Reset close during normal 0x02: Reset close during abnormal 0x08: Specify the FIN strict check 0x10: Reset close only during non-passive 0x20: Standard close during non-passive 0x40: Reset close during reinitializing detection 0x80: Standard close during passive confirmed error	0
RS068	Specify the Ethernet server function's TCP delay 0: TCP delay 3: No TCP delay	3
RS089	Virtual directory 0: INVALID 1: VALID	1
RS097	Specify the FTP server function's passive close 0: Active close 1 to 254: Passive close (specified value x 100 ms wait) 255: Passive close (infinite wait)	0
RS098	Specify the FTP server function's ringer (specify the reset close condition) 0: Standard close (default) 0x01: Reset close during normal 0x08: Specify the FIN strict check 0x10: Reset close only during non-passive 0x20: Standard close during non-passive 0x40: Reset close during reinitializing detection 0x80: Standard close during passive confirmed error	0
RS275	Specify the FTP server function's passive close 0: Active close 1 to 254: Passive close (specified value x 100 ms wait) 255: Passive close (infinite wait)	0
RS276	Specify the FTP client function's ringer (specify the reset close condition) 0: Standard close (default) 0x01: Reset close during normal 0x08: Specify the FIN strict check 0x10: Reset close only during non-passive 0x20: Standard close during non-passive 0x40: Reset close during reinitializing detection 0x80: Standard close during passive confirmed error	0

11.3 Communication Specification

The communication specifications of LAN is described below.

1) Electrical characteristics

IEEE 802.3 10Base-T/100Base-TX/1000Base-TX compliant



The YRC1000micro software does not support 1000Base-T.

2) LED specifications

	Left LED	Right LED
Link	-	Yellow lit
Action	-	Yellow blink
Speed	10Base-T Yellow lit 100Base-TX Green lit 1000Base-T Orange lit	-

11	Related Information
11.4	Recommended Cable and Switching Hub

11.4 Recommended Cable and Switching Hub

1) Ethernet Cable

Category 5 Ethernet cables with shielding are recommended.

2) Switching Hub

The following switching hub is recommended.

Model: EDS-205 (manufactured by MOXA)

YRC1000micro OPTIONS INSTRUCTIONS

FOR ETHERNET FUNCTION

HEAD OFFICE

2-1 Kurosakishiroishi, Yahatanishi-ku, Kitakyushu 806-0004, Japan
Phone +81-93-645-7703 Fax +81-93-645-7802

YASKAWA America Inc. (Motoman Robotics Division)
100 Automation Way, Miamisburg, OH 45342, U.S.A.
Phone +1-937-847-6200 Fax +1-937-847-6277

YASKAWA Europe GmbH (Robotics Division)
Yaskawastrasse 1, 85391 Allershausen, Germany
Phone +49-8166-90-100 Fax +49-8166-90-103

YASKAWA Nordic AB
Verkstadsgatan 2, Box 504 ,SE-385 25 Torsas, Sweden
Phone +46-480-417-800 Fax +46-486-414-10

YASKAWA Electric (China) Co., Ltd.
22F, One Corporate Avenue, No.222, Hubin Road, Huangpu District, Shanghai 200021, China
Phone +86-21-5385-2200 Fax +86-21-5385-3299

YASKAWA SHOUGANG ROBOT Co. Ltd.
No7 Yongchang North Road, Beijing E&T Development Area, China 100176
Phone +86-10-6788-2858 Fax +86-10-6788-2878

YASKAWA India Private Ltd. (Robotics Division)
#426, Udyog Vihar, Phase- IV, Gurgaon, Haryana, India
Phone +91-124-475-8500 Fax +91-124-475-8542

YASKAWA Electric Korea Corporation
35F, Three IFC, 10 Gukjegeumyung-ro, Yeongdeungpo-gu, Seoul, Korea 07326
Phone +82-2-784-7844 Fax +82-2-784-8495

YASKAWA Electric Taiwan Corporation
12F, No.207, Sec. 3, Beishin Rd., Shindian District, New Taipei City 23143, Taiwan
Phone +886-2-8913-1333 Fax +886-2-8913-1513

YASKAWA Electric (Singapore) PTE Ltd.
151 Lorong Chuan, #04-02A, New Tech Park, Singapore 556741
Phone +65-6282-3003 Fax +65-6289-3003

YASKAWA Electric (Thailand) Co., Ltd.
59, 1st-5th Floor, Flourish Building, Soi Ratchadapisek 18,Ratchadapisek Road,
Huaykwang, Bangkok 10310, THAILAND
Phone +66-2-017-0099 Fax +66-2-017-0199

PT. YASKAWA Electric Indonesia
Secure Building-Gedung B Lantai Dasar & Lantai 1 Jl. Raya Protokol Halim Perdanakusuma,
Jakarta 13610, Indonesia
Phone +62-21-2982-6470 Fax +62-21-2982-6741

Specifications are subject to change without notice
for ongoing product modifications and improvements.

YASKAWA

YASKAWA ELECTRIC CORPORATION

© Printed in Japan April 2018 17-07

MANUAL NO.

HW1484452 ◊

291/291