KEYENCE

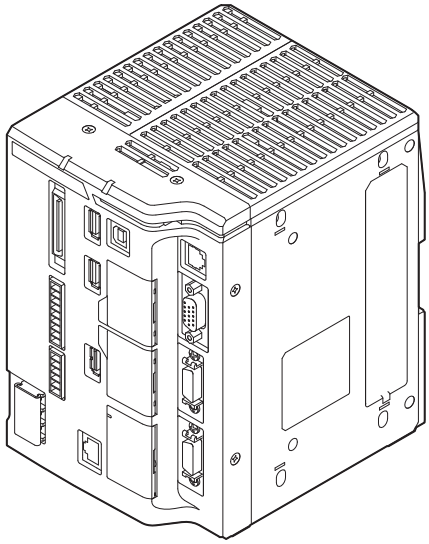
96M13839

Multi Camera High Performance Machine Vision System

XG-X2000 Series

Controller Instruction Manual

Read this manual thoroughly before using the XG-X2000 Series. Always keep this manual in a safe place for future reference.



Introduction

This manual describes the hardware information. Read this manual thoroughly to understand how the XG-X2000 Series works in order to maximize the performance of the system.

- This manual is for the XG-X2000 Series. All references however, unless otherwise noted, pertain to the XG-X2700/2702. For more details about the differences between the models, see "Main Specifications" (page 12) and the "XG-X2000 Series User's Manual".
- Always keep this manual in a safe location for future reference.
- Please ensure that the manual is passed to the end user of the controller.

Symbols

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

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

Trademarks

- “SD Memory Card” is a registered trademark of the SD association.
- Other company names and product names are registered trademarks or trademarks of their respective companies.The TM mark and ® mark are omitted in this manual.

Software information

This product incorporates the software files developed independently by or for Keyence Corporation, software files owned and licensed by a third party, and software files subject to certain open source license agreements.

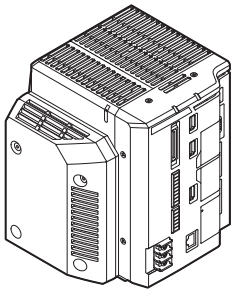
- The open source software files are subject to the notices and additional terms and conditions. For information about such open source software files, please refer to the “License Information” in the “System Information” menu option under “Global”.
- Such open source software files are provided on an “AS IS” basis to the maximum extent permitted by applicable law.
- If there is any discrepancy between the terms and conditions of the applicable open source license agreement and the “License”, the terms and conditions of the applicable open source license agreement prevail with respect to the applicable open source software.
- You may obtain a copy of the source code corresponding to the binaries for GPL/LGPL-licensed file by sending a request to Keyence customer service at “soft-license@keyence.co.jp”. There will be a charge to cover the costs of providing the source code.

Package Contents

The equipment and accessories listed below are included in the package when shipped. After opening the carton, check that you have received all of the equipment and accessories listed below.

Standard Package

- Controller Unit × 1
  (XG-X2000/2002/2200/2202/2500/2502/2700/2702/2800/2802/2800LJ)
- SD Card
  (OP-87133(512MB):
  XG-X2000/2002/2200/2202/2500/2502
  CA-SD1G(1GB):
  XG-X2700/2702/2800/2802/2800LJ) × 1
  (pre-installed in SD1 slot)
- Terminal block sticker package ×1
- Controller instruction manual × 1



Safety Precautions

General Cautions

WARNING	• Do not use this product for the purpose of protecting the human body or any part thereof. • Because this product was not designed for use in an explosion-proof area, it must never be used in an explosion-proof area.
CAUTION	• Before starting or operating the system, check to make sure all system functions are working properly. • If any Keyence product fails, take all safety precautions to prevent damage before using the system again.
NOTICE	• If the system is operated beyond its published specifications or if the system is modified, its functions and performance cannot be guaranteed. • Please note that when the system is used in combination with other instruments, its functions and performance may be degraded. • Do not subject the controller or connected devices to a sudden change in temperature. There is the risk of condensation occurring.

General cautions for the controller

CAUTION	• Do not use with any power voltage other than 24 VDC. Doing so may cause fire, electric shock, or product malfunction. • Do not disassemble or modify the unit. Doing so may cause fire or electric shock.

Operating environment and conditions

CAUTION	To use the system properly and safely, avoid installing this unit in the following locations. Doing so may cause fire, electric shock, or product malfunction. • Locations that contain moisture or dust, or that are poorly ventilated. • Locations where the system is exposed to direct sunlight or temperature increases. • Locations where there are flammable or corrosive gases. • Locations where the unit may be directly subjected to vibration or impact. • Locations where water, oil or chemicals may splash onto the unit. • Locations where static electricity is present or electric discharge may occur.
NOTICE	Keep this unit and cables away from high-tension cables and power lines. • Otherwise, noise may cause malfunction or accidents. • Bundle cables with spiral tubing material. Direct bundling will concentrate the cable load on the bindings, which can result in cable damage or short circuit. • The controller and optional devices are precision components. To maintain performance do not subject them to vibration or shock.

Measures to be taken when an abnormality occurs

CAUTION	In the following cases, turn the power OFF immediately. Using the unit in an abnormal condition may cause fire, electric shock, or product malfunction. Contact your local Keyence office for repair. • If water or debris enters the system • If the system is dropped or the case is damaged • If smoke or a burning smell emits from the controller

Usage

NOTICE	• Before making any connections/disconnections, be sure to turn off the power of this unit and connected devices. Failure to do so may result in a malfunction of the controller or connected devices. • Do not turn the power off while you are programming. Otherwise, all or part of the program settings may be lost. • Do not block the ventilation holes. Otherwise, the inside temperature may rise and a malfunction may occur. • Do not allow an excessive amount of sunlight or bright indoor light to enter the camera for a long period of time. Doing so may cause damage to the image capture surface inside the camera.

Maintenance

NOTICE	• Do not clean with benzene, thinner, or alcohol. Doing so may cause discoloration or deformation of the unit. • If the unit has any dirt on it, wipe it off with a cloth moistened with a mild detergent, then wipe with a dry cloth.

Precautions on Regulations and Standards

CE Marking

Keyence Corporation has confirmed that this product complies with the essential requirements of the applicable EU Directive(s), based on the following specifications. Be sure to consider the following specifications when using this product in the Member States of European Union.

EMC Directive

- Applicable standard EN61326-1, Class A
- This product is intended to be used in an industrial electromagnetic environment.
- Use cables shorter than 30 m to connect this product and its external devices.
- Be sure to connect the ground terminal to a grounding.
- When connecting a CC-Link unit CA-NCL20E, attach a ferrite core (OP-84364, optional) within 300 mm on the CA-NCL20E side of the CC-Link dedicated cable.
- When connecting a LJ-V input unit CA-E100LJ/CA-E110LJ, for the head cables and head extension cables, wind the following ferrite core (furnished accessory CA-E100LJ/CA-E110LJ) with them to within 200 mm of the controller's head connecter.
  Model: ZCAT2035-0930A-BK (manufactured by TDK)

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

KC mark (Republic of Korea)

Class A device

This product is a industrial electromagnetic wave generating device (Class A) and is intended for use in all establishments other than domestic.

A 급 기기 (업무용 방송통신기자재)
이 기기는 업무용(A 급) 전자파적합기기로서 판매자또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Safety precautions on laser product

The LJ-V7000 series head laser classes which are to be connected to the CA-E100LJ/110LJ are classified as per the following.

Models		LJ-V7020K	LJ-V7020	LJ-V7060K	LJ-V7060	LJ-V7080	LJ-V7200	LJ-V7300
Wavelength		405nm						
IEC60825-1,	Output	10mW	10mW	4.8mW	10mW	4.8mW	4.8mW	4.8mW
FDA(CDRH) Part 1040.10 *	Laser class	Class 2M	Class 2M	Class 2	Class 2M	Class 2	Class 2	Class 2

* The laser classification for FDA(CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No. 50.

WARNING

- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
  Follow the instructions mentioned in this manual. Otherwise, injury to the human body (eyes and skin) may result.

  Precautions on Class 2M Laser Product
  - Do not stare into the direct or specularly reflected beam.
  - Do not direct the beam at other people or into areas where other people might be present.
  - Be careful of the path of the laser beam. If there is a possibility that the operator may be exposed to the specular or diffuse reflections, block the beam by installing a protective enclosure.
  - Install this product so that the path of the laser beam is not as the same height as that of human eye.
  - Do not view the beam directly with optical instruments (for example, eye loupes, magnifiers, microscopes, telescopes and binoculars). Viewing the laser output with the optical instruments may pose an eye hazard.

  Precautions on Class 2 Laser Product
  - Do not stare into the direct or specularly reflected beam.
  - Do not direct the beam at people or into areas where people might be present.
  - Be careful of the path of the laser beam. If there is a possibility that the operator may be exposed to the specular or diffuse reflections, block the beam by installing a protective enclosure.
  - Install this product so that the path of the laser beam is not as the same height as that of human eye.
- Do not disassemble this product. Laser emission from this product is not automatically stopped when it is disassembled.

Warning labels

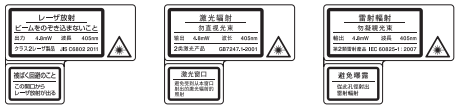
The contents of warning indications and locations for attaching warning labels are described below.
The IEC (English) warning labels are attached to the unit when shipped from the factory. Use the suitable warning label included in the package of this product according to the countries and/or regions where this product is used. In this case, it can be affixed on the IEC (English) warning label, which has already been affixed to this product.

- **Warning label display content**

LJ-V7060K/LJ-V7080/LJ-V7200/LJ-V7300

IEC (English) DIN (German) CEI (French) CEI (Italian)

JIS (Japanese) GB (Simplified Chinese) IEC (Traditional Chinese)



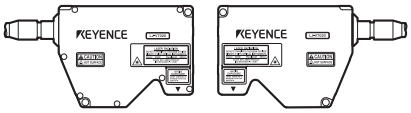
LJ-V7020/LJ-V7020K/LJ-V7060

IEC (English) DIN (German) CEI (French) CEI (Italian)

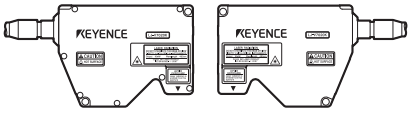
JIS (Japanese) GB (Simplified Chinese) IEC (Traditional Chinese)

- **Warning label attachment positions**

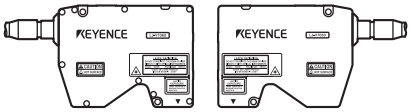
LJ-V7020



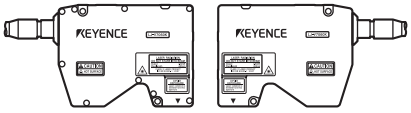
LJ-V7020K



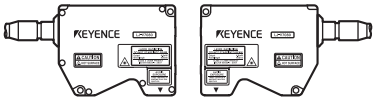
LJ-V7060



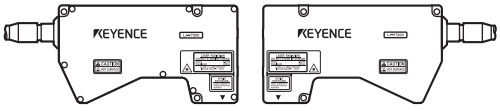
LJ-V7060K



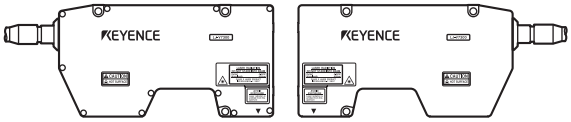
LJ-V7080



LJ-V7200

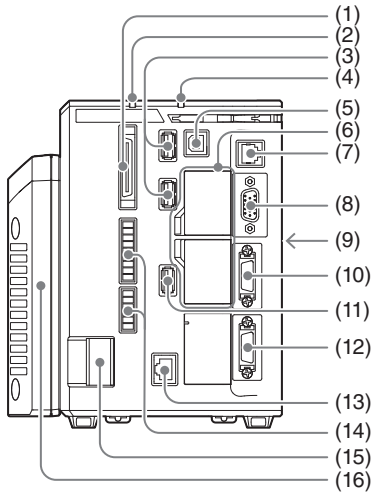


LJ-V7300

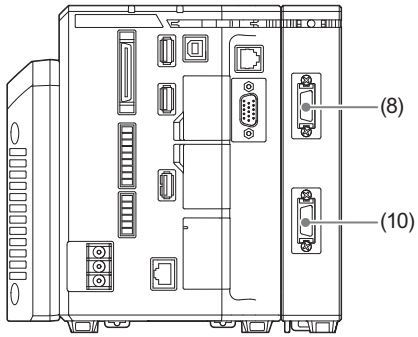


Identifying Controls and Connectors

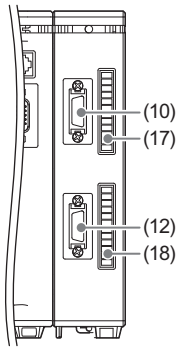
XG-X2000/2002/2200/2202/2500/2502/2700/2702



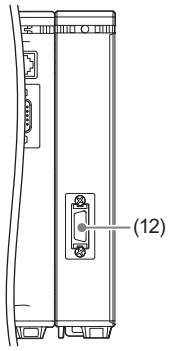
XG-X2800/2802+CA-E100



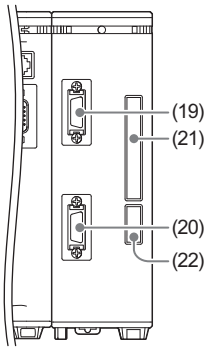
XG-X2800/2802+ CA-E100L



XG-X2800/2802+ CA-E100T



XG-X2800/2802/2800LJ+ CA-E100LJ/110LJ



(1) I/O (Parallel I/O) connector

Use to connect the parallel input/output signals.

(2) Power supply LED

Lights up when the power supply is being fed to the unit.

(3) CONSOLE/MOUSE (USB) connector

Connects the USB console (OP-87983, sold separately), or the proprietary mouse (OP-87506, sold separately).

NOTICE	The CONSOLE/MOUSE (USB) connector is used exclusively for the USB console (OP-87983) and the dedicated mouse (OP-87506). Connecting other equipment including a commercial USB mouse can cause a malfunction or damage to the controller or connected devices.

(4) Error LED

Lights up in conjunction with the error output (%Error0) ON which is being used.

(5) USB connector

Use to connect a USB cable.

(6) SD2 slot (upper), SD1 slot (lower)

Insert an SD card.

The accessory SD card (CA-SD1G: 1 GB, or OP-87133: 512 MB) is inserted as SD card 1 in the lower slot (SD1).

Point	SD Card 1 must be inserted while the device is operating.

(7) RS-232C port

Use to connect an optional RS-232C communication cable (OP-26487: 2.5 m) or an optional RS-232C modular cable for touch panels (OP-87264: 3 m/ OP-87265: 10 m).

Reference	By default, RS-232C port 1 is used for data output and command control. For details about how to change the setting, see the XG-X2000 Series User's Manual.

(8) MONITOR (RGB output) terminal

Use to connect to an external monitor.

NOTICE	The unit's power GND (0V) is shared in common with the connector seals and signal GND. If there is a potential difference with the connection for the external monitor, this may result in breakdowns or malfunctions of the unit and the connected external monitor. (Recommended monitors: CA-MP120/CA-MP120T)

Point	The unit's monitor output is XGA (1024 × 768 pixels). If commercial analog RGB monitors other than XGA monitors are used, the display quality may worsen depending on the monitor's specifications, and images may not properly be displayed.

(9) Expansion unit connector (right side)

Use when connecting all kinds of expansion units (camera input units, illumination expansion units, and CC-Link units).

(10) CAMERA 2 connector

Use to connect camera 2.

(11) USB HDD connector

Connect USB 3.0 or USB 2.0 compatible hard discs.

NOTICE	The unit's power GND (0V) is shared in common with the connector seals and signal GND. If there is a potential difference with the connection for the USB HDD, this may result in breakdowns or malfunctions of the unit and the USB HDD.

Reference	If there are concerns about the potential difference with the connections, then use a USB HDD which supports bus powered drives. The unit's bus power feed capacity is 900 mA (USB 3.0 compatible). Check with the USB HDD manufacturer concerning compatibility with the bus powered USB HDD that you are using. In addition, do not use USB hubs since they may cause the feed capacities and the data transmission speeds to decrease.

(12) CAMERA 1 connector

Use to connect to the camera 1.

(13) ETHERNET connector

Use to connect an Ethernet cable.

(14) OUT/IN connector (Terminal block)

Use for signal input and output (OUT/IN).

(15) Power and ground terminals

Use to connect power (24 V DC) and the ground wire.

(16) Fan unit (only XG-X2700, 2702, 2800, 2802, and 2800LJ)

Equipped with controller cooling fan unit (CA-F100).

NOTICE	Since the equipped fan units can be detached and replaced for maintenance, the units cannot be operated with them detached.

(17) ENCODER 2/4 (Encoder signal 2/4 connection)

Connects (supplies 5 V out) the encoder signal 2/4 (RS-422 or open collector).

(18) ENCODER 1/3 (Encoder signal 1/3 connection) connector

Connects (supplies 5 V out) the encoder signal 1/3 (RS-422 or open collector).

Reference	The ENCODER No. allocations (1 - 4) are determined by the installation positions to the CA-E100L controller. ENCODER 1/ENCODER 2 are allocated to the units which are directly connected to the controller, and other cameras that include CA-100L. ENCODER 3/ENCODER 4 are allocated to the units which they are connected to that sandwich the input units.

(19) LJ-V HEAD B (LJ-V series head B connection) connector

Use to connect to the LJ-V series head B.

(20) LJ-V HEAD A (LJ-V series head A connection) connector

Use to connect to the LJ-V series head A

NOTICE	Don't connect any device except LJ-V series head. Otherwise it may cause a malfunction.

(21) ENCODER 1/3 (Encoder signal connection) connector

Connects the encoder signal (RS-422 or open collector).

(22) I/O connector (terminal block)

Used in encoder 5 V out, and laser remote interlock inputs (short-circuited is factory default).

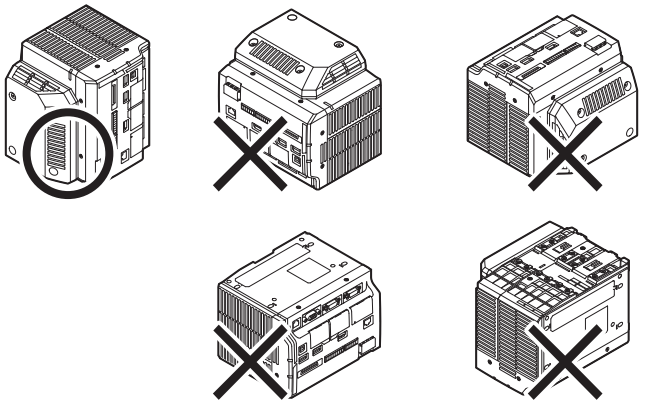
Installing the Controller Unit

Install the controller unit to DIN rail, or use the holes on the bottom of the controller to secure it with screws.

NOTICE	• Do not install the controller in a location with lots of dust or water vapor. The controller does not have a mechanism to protect it from dust or water. Dust or water entering the controller can cause damage to the controller. • Turn off the power to the controller when connecting or removing an expansion unit, a cable, or a terminal block. Connecting or removing the camera expansion unit, the cable, or the terminal block while the power is being supplied may damage the controller or peripheral devices. • When an expansion unit is not connected, place the connector protection cover back on the controller. Using the controller with the connector exposed may cause damage to the controller.

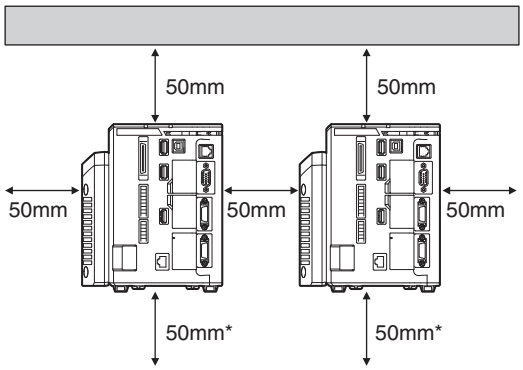
Caution on Direction of Controller Mounting

- Install the controller in the direction indicated by the circle shown below. Do not install the controller in any other direction.



Be careful in regard to cooling the unit in the installation site

- For ventilation, keep the space free of objects for 50 mm or more above the controller and 50 mm or more for both sides. Keep the space free of objects for 90 mm or more in the front of the connector panel in order to connect the cables safely.
- If the controller units are to be installed in rows, make sure that there are spaces of 50 mm or more between the controllers, and spaces of 50 mm or more above them.
  If spaces of 50 mm or more are ensured of even on the underside orientations of DIN rail mounts, etc., then the units can be used at higher than rated temperatures.



NOTICE	• Do not block the ventilation openings on the top and bottom of the controller. If the vents are blocked, heat will accumulate inside the controller and can cause a system failure. • If the temperature inside the control panel (temperature at the bottom of the controller) exceeds the rating, use forced air-cooling or increase the free space around the system to improve ventilation until the operating ambient temperature decreases below the rating. • When the temperature gets high inside the controller unit, the unit may display abnormal heat generation alerts such as the following. (1) Warning: you are being notified that it is likely that operations may be terminated due to high temperatures, (2) Operations terminated: since it is likely that thermal runaway and damage to the unit are being generated, and as the unit is in an error state, operations are terminated. If these alerts are displayed, quickly implement countermeasures whereas the usage ambient temperatures are lowered below the rated temperatures.

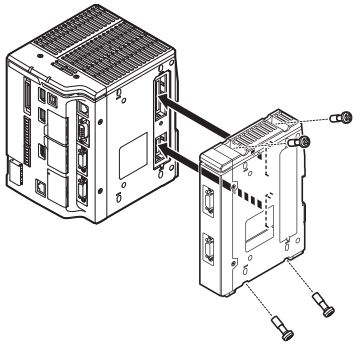
- Some of the model in the XG-X2000 series are factory equipped with fan units (CAF100) on their left sides. Since the fan units can be detached and replaced for maintenance, the units cannot be operated with them detached.

Installing the Expansion Unit

NOTICE	• Turn off the controller when connecting or disconnecting an expansion unit. Connecting or disconnecting a expansion unit while connected to a power source may damage the controller or peripheral devices. • When an expansion unit is not connected, keep the connector protection cover. Using the controller with the connector exposed may cause damage to the controller.

Installing the Camera Input Unit

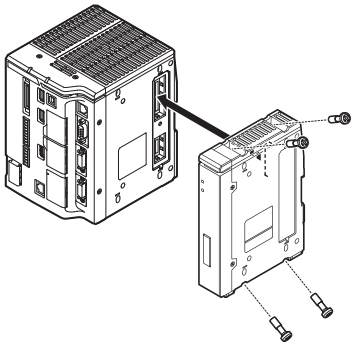
Use a camera input unit in order to increase the number of cameras to connect. In addition, since the XG-X2800 and XG-X2800LJ do not have camera connectors, camera input units which are compatible with the cameras that are to be used must surely be installed. Remove the protective cover of the expansion unit connector from the right side of the controller, and then install the camera input unit as shown on the right.



Point	Illumination expansion units and CC-Link units cannot be installed between camera input units and controllers.

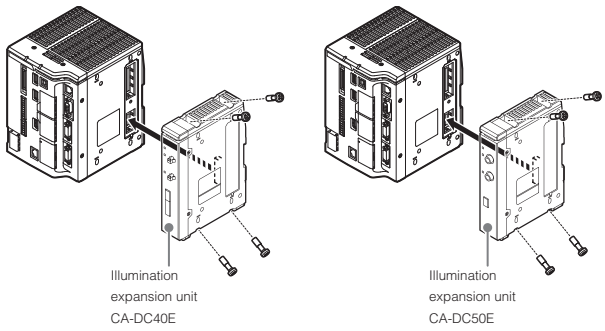
Installing the Communication Expansion Unit

The optional CC-Link unit CA-NCL20E is used when communicating via CC-Link. Remove the protective cover from connector 2 on the right side of the controller and install the CC-Link unit as shown below.



Installing the Illumination Expansion Unit

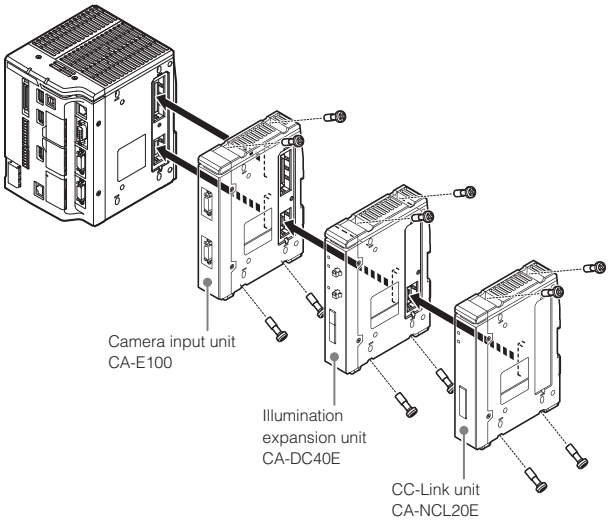
If the illumination is to be controlled from the controller, up to a maximum of eight (a maximum of two of the eight units can be CA-DC50E) separately sold CA-DC40E/DC50E illumination expansion units can be added. Remove the protective cover from connector 2 on the right side of the controller and install the illumination expansion unit as shown below.



NOTICE	Turn off the controller when connecting or removing an illumination expansion unit. Connecting or removing the illumination expansion unit while connected to a power source may damage the controller or peripheral devices.

When Using the Camera Input Unit, Illumination Expansion Unit and CC-Link Unit Together

Mount the camera input unit directly to the controller, then mount the illumination expansion unit and CC-Link unit to the right side of the camera input unit.



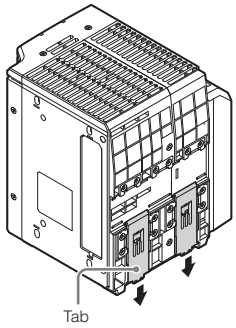
Point	Illumination expansion units and CC-Link units cannot be installed between camera input units and controllers.

Installing the Controller

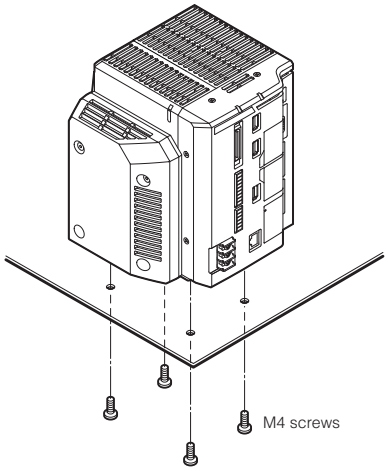
NOTICE	Mount the controller in a stable location that is free from vibration.

Installing the Controller on a DIN Rail

The controller and the expansion unit are designed to be mounted on a DIN rail.
Pull the tab on the bottom in the direction of the arrow to mount or dismount the controller.

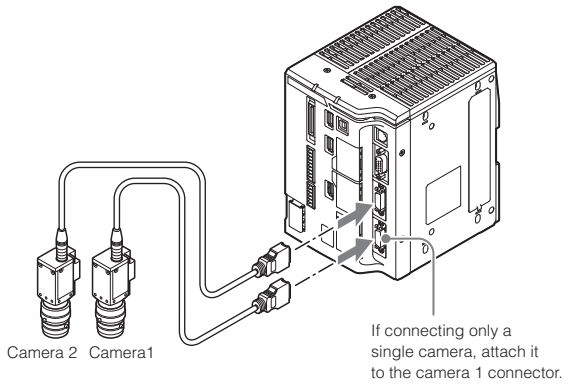


Mounting to the Bottom of the Controller



Connecting the Camera Cables

Connect the camera to the camera connector of the controller unit using one of the optional camera cables.
If connecting only a single camera, attach it to the CAM1 connector.

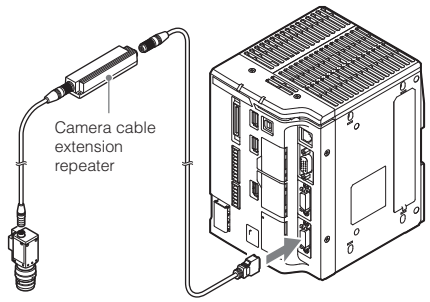


NOTICE	• Make sure that there is no power to the controller before connecting cables. Connecting cables while the power is turned on may cause damage to the camera or peripherals. • Bundle cables with spiral tubing material. Direct bundling will concentrate the cable load on the bindings, which can result in cable damage or a short circuit. • In the absence of other specifications, the minimum cable flexibility (R) should be 3 times the external diameter (5 times is recommended). Additionally, repeated curvature and screw stress should be avoided. The minimum bend radius is the same, even when using high-flex cable. Unless otherwise stated, use R100 or greater. • Do not connect cameras, LV-J series heads, or cables, etc. which the controller does not support. This may cause failures, or breakdowns of the unit and connected devices. • For more details about the cameras and cable combinations which the controller supports, see the Main Specifications, or the XG-X2000 Series Setup Manual.

Using the repeater for camera cable extension

The camera cable can be extended by using the extension repeater for the camera cable.

For more information on connection, read the instructions provided with the camera extension repeater.



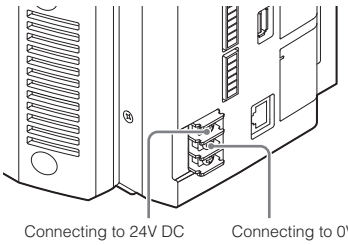
Connecting the 24 VDC Power Source

NOTICE

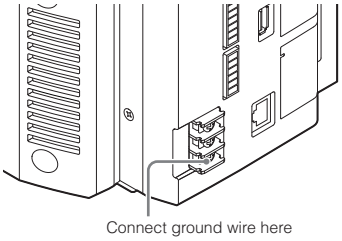
- Use electrical wiring AWG14 to AWG22.
- Make sure to connect the frame ground terminal for the 24 VDC power source to a type D ground.
- The sizes of solderless connectors are shown below. Use connectors that fit M3 screws.

- Tighten the screws with a torque of 0.5 to 0.75 Nm.

1 Connect 24 VDC and 0 V to the power supply terminals.

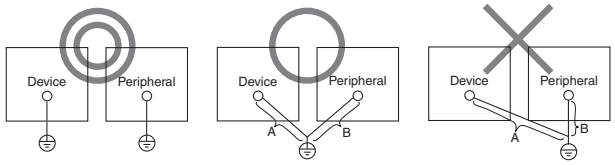


2 Connect the ground wire to the ground terminal.



NOTICE

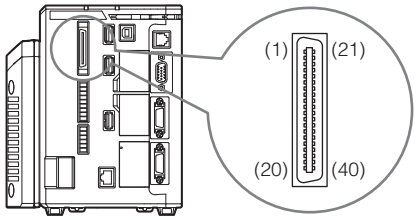
- Ground each device separately.
- Use a D type ground.
- Keep ground resistance to 100 W. or less.
- Keep the ground wire as short as possible.
- If it is not possible to ground each device separately, ground them together. However, make sure that the electrical cables are the same as shown below.



Parallel I/O Interface

Connector Specifications

The specifications of the parallel I/O connector for the controller are as follows.



Connector

FX2B-40SA-1.27R
(Hirose Electric)

Color flat cable

UL20028-FRX-CF-40 (Fujikura, equivalent wire gauge AWG28)

Reference

In normal situations, use the specialized parallel connection cable (3 m) OP-51657 (option).

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

Reference

*1 It is the default assigned value on the terminal where the signal assignment can be changed. These assignments may vary if the Global settings have been changed.

*2 For more details about the signal description, see the "XG-X2000 Series Communications Control Manual".

No.	Terminal name	Terminal explanation	Assigned default state*1		Circuit diagram	color
			Variable function*2	Bit		
1	COMIN2	Connector input common	-	-	B	Brown
2	IN0	General purpose input 0	Custom instruction parameter input	0	B	Red
3	IN1	General purpose input 1		1	B	Orange
4	IN2	General purpose input 2		2	B	Yellow
5	IN3	General purpose input 3		3	B	Green
6	IN4	General purpose input 4		4	B	Blue
7	IN5	General purpose input 5		5	B	Purple
8	IN6	General purpose input 6		6	B	Gray
9	IN7	General purpose input 7		7	B	White
10	IN8	General purpose input 8	Custom instruction No. input	0	B	Black
11	IN9	General purpose input 9		1	B	Brown
12	IN10	General purpose input 10		2	B	Red
13	IN11	General purpose input 11		3	B	Orange
14	IN12	General purpose input 12	Custom instruction assignment input (terminal)	0	B	Yellow
15	IN13	General purpose input 13	Reset input	0	B	Green
16	IN14	General purpose input 14	Output data input switch	0	B	Blue
17	COMOUT2	Connector output common	-	-	-	Purple
18	OUT0	General purpose output 0	Pin command success confirmation output	0	C	Gray
19	OUT1	General purpose output 1	Pin command failure confirmation output	0	C	White
20	OUT2	General purpose output 2	Busy output	0	C	Black
21	OUT3	General purpose output 3	Permission output for command input	0	C	Brown
22	OUT4	General purpose output 4	Permission output for trigger 1 input	0	C	Red
23	OUT5	General purpose output 5	Permission output for trigger 2 input	0	C	Orange
24	OUT6	General purpose output 6	Data output of system variable %OutDataA	0	C	Yellow
25	OUT7	General purpose output 7		1	C	Green
26	OUT8	General purpose output 8		2	C	Blue
27	OUT9	General purpose output 9		3	C	Purple
28	OUT10	General purpose output 10		4	C	Gray
29	OUT11	General purpose output 11		5	C	White
30	OUT12	General purpose output 12		6	C	Black
31	OUT13	General purpose output 13		7	C	Brown
32	OUT14	General purpose output 14		8	C	Red
33	OUT15	General purpose output 15		9	C	Orange
34	OUT16	General purpose output 16		10	C	Yellow
35	OUT17	General purpose output 17		11	C	Green
36	OUT18	General purpose output 18		12	C	Blue
37	OUT19	General purpose output 19		13	C	Purple
38	OUT20	General purpose output 20		14	C	Gray
39	OUT21	General purpose output 21		15	C	White
40	COMOUT2	Connector output common	-	-	-	Black

Point

- COMOUT2 for Pin 17 and Pin 40 are common.
- Power source 0V, COMIN1, COMIN2, COMOUT1, COMOUT2, COMOUT_F are all isolated.
- COMIN2 is the common terminal for output for Parallel I/O connectors 2 to 16.
- COMOUT2 is the common terminals for Parallel I/O connectors 18 to 39.

Terminal Block Interface

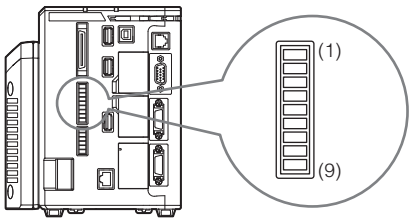
Standard Specifications

Terminal block specifications for the controller are as follows.

NOTICE	Tightening with a force above the standard torque may cause damage to the terminal block.

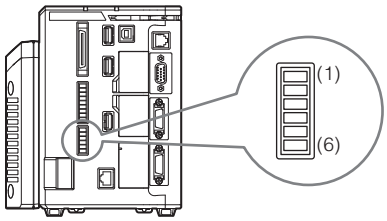
OUT connector

- Suitable wiring
  AWG 16 - 28
- Terminal block screw torque
  0.25 Nm or less



IN connector

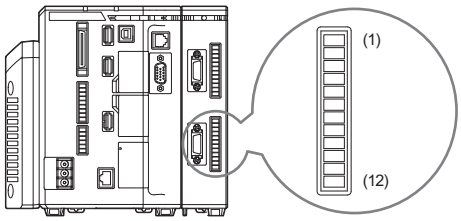
- Suitable wiring
  AWG 16 - 28
- Terminal block screw torque
  0.25 Nm or less



ENCODER1/3 connector

When connecting line scan camera input unit CA-E100L (sold separately)

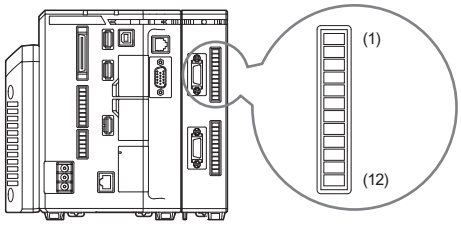
- Suitable wiring
  AWG 16 - 28
- Terminal block screw torque
  0.25 Nm or less



ENCODER2/4 connector

When connecting line scan camera input unit CA-E100L (sold separately)

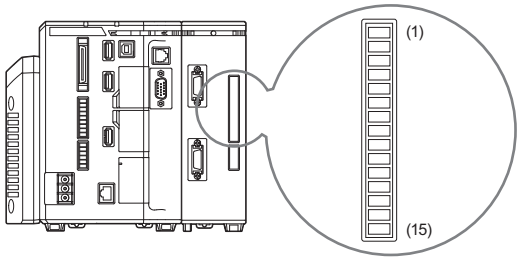
- Suitable wiring
  AWG 16 - 28
- Terminal block screw torque
  0.25 Nm or less



ENCODER connector

When connecting LJ-V input unit CA-E100LJ/110LJ (sold separately)

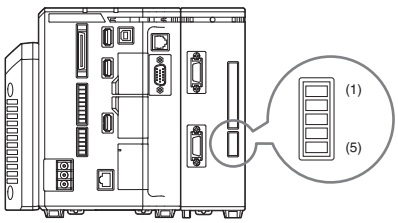
- Suitable wiring
  AWG 16 - 28
- Terminal block screw torque
  0.25 Nm or less



IO connector

When connecting LJ-V input unit CA-E100LJ/110LJ (sold separately)

- Suitable wiring
  AWG 16 - 28
- Terminal block screw torque
  0.25 Nm or less



Pin layout

Reference

*1 It is the default assigned value on the terminal where the signal assignment can be changed. These assignments may vary if the Global settings have been changed.

*2 For more details about the signal description, see the "XG-X2000 Series Communications Control Manual".

OUT connector

No.	Terminal name	Terminal explanation	Assigned default state*1		Circuit diagram
			Variable function*2	Bit	
1	OUT22(STO)	General purpose output 22	Strobe output for reading parallel terminal output unit data	0	D
2	OUT23(OR)	General purpose output 23	Hold output general status	0	D
3	F_OUT2(ERR)	High-speed general purpose output 2	Error 0 output	0	C
4	F_OUT3(RUN)	High-speed general purpose output 3	Run mode output	0	C
5	COMOUT (COMOUT)	Common for terminal block outputs	-	-	-
6	F_OUT0(FLS1)	High-speed general purpose output 0	Strobe light output 1	0	C
7	F_OUT1(FLS2)	High-speed general purpose output 1	Strobe light output 2	0	C
8	N.C	-	-	-	-
9	COMOUT_F (COMF)	common for high-speed general purpose output terminals	-	-	-

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

IN connector

No.	Terminal name	Terminal explanation	Assigned default state*1		Circuit diagram
			Variable function*2	Bit	
1	COMIN1(COMIN1)	Common for terminal block inputs	-	-	-
2	IN15(PLC)	General purpose input 15	Custom instruction execution input (PLC)	0	B
3	F_IN0(TRG1)	High-speed general purpose output 0	Trigger 1 input	0	A
4	F_IN1(TRG2)	High-speed general purpose output 1	Trigger 2 input	0	A
5	F_IN2(TEST)	High-speed general purpose output 2	Trial run input	0	A
6	F_IN3(EXT)	High-speed general purpose output 3	Disable trigger input	0	A

Point

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

ENCODER1/3 connector, ENCODER2/4 connector

When connecting line scan camera input unit CA-E100L (sold separately)

No.	Terminal name	Terminal explanation	Circuit diagram
1	422 A+	RS-422 Encoder input A+	D
2	422 A-	RS-422 Encoder input A-	D
3	422 B+	RS-422 Encoder input B+	D
4	422 B-	RS-422 Encoder input B-	D
5	422 Z+	RS-422 Encoder input Z+	D
6	422 Z-	RS-422 Encoder input Z-	D
7	5V OUT	Encoder service power supply (150mA MAX)	-
8	0V OUT		-
9	OC A	Open collector Encoder input A (24V)	E
10	OC B	Open collector Encoder input B (24V)	E
11	OC Z	Open collector Encoder input Z (24V)	E
12	OC COM	Open collector Encoder input common	E

Reference

- Use a shield cable that supports an RS-422 signal for the connection, and always connect the Cable shield to the FG.
- The rated output for the 5 V OUT is 150 mA. When using encoders which are going to exceed that, prepare an external 5 V power supply.
- Open collector encoder inputs are only compatible with 24 V type encoders.
- The OV OUT, and OC COM are respectively insulated with the controller and the other expansion unit commons.

ENCODER connector

When connecting LJ-V input unit CA-E100LJ/110LJ (sold separately)

No.	Terminal name	Terminal explanation	Circuit diagram
1	OC A 24(24V)	Open collector Encoder input A (24V)	F
2	OC A 12(12V)	Open collector Encoder input A (12V)	F
3	OC A 5(5V)	Open collector Encoder input A (5V)	F
4	422 A+(+)	RS-422 Encoder input A+	F
5	ENC A COM (COM(-))	Encoder input A common (-)	F
6	OC B 24(24V)	Open collector Encoder input B (24V)	F
7	OC B 12(12V)	Open collector Encoder input B (12V)	F
8	OC B 5(5V)	Open collector Encoder input B (5V)	F
9	422 B+(+)	RS-422 Encoder input B+	F
10	ENC B COM (COM(-))	Encoder input B common (-)	F
11	OC Z 24(24V)	Open collector Encoder input Z (24V)	F
12	OC Z 12(12V)	Open collector Encoder input Z (12V)	F
13	OC Z 5(5V)	Open collector Encoder input Z (5V)	F
14	422 Z+(+)	RS-422 Encoder input Z+	F
15	ENC Z COM (COM(-))	Encoder input Z common (-)	F

Reference

- Use a shield cable that supports an RS-422 signal for the connection, and always connect the Cable shield to the FG.
- There is continuity between each input circuit. Pay attention so that potential differences are not generated between the signals.
- The ENC A COM, ENC B COM, ENC C COM, 0V OUT and REMOTE COM are respectively insulated with the controller and the other expansion unit commons.

I/O connector

When connecting LJ-V input unit CA-E100LJ/110LJ (sold separately)

No.	Terminal name	Terminal explanation	Circuit diagram
1	5V OUT(5V OUT)	Encoder service power supply (150mA MAX)	-
2	0V OUT(0V OUT)		-
3	N.C	-	-
4	RMT COM(COM)	Laser remote interlock input common	G
5	REMOTE(RMT)	Laser remote interlock input	G

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

Reference

- The rated output for the 5 V OUT is 150 mA. When using encoders which are going to exceed that, prepare an external 5 V power supply.
- The laser remote interlock inputs are non-voltage inputs. The laser emits from the LJ-V sensor head which is connected to CA-E100LJ/E110LJ via a short-circuit with the input commons, if it is open the emissions terminate (factory default is that it is short-circuited via a shorting pin).
- The ENC A COM, ENC B COM, ENC C COM, 0V OUT and REMOTE COM are respectively insulated with the controller and the other expansion unit commons.

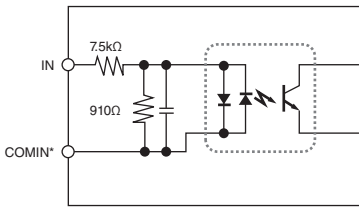
Input/Output Circuit

Input Circuit

Input circuit diagram

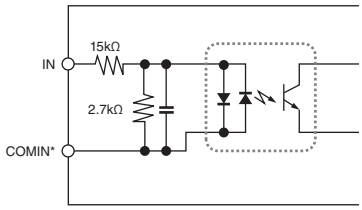
Circuit A (F_IN0 to 3 only, EV compatible)

- Max. imposed voltage: 26.4 V
- ON voltage: 19 V or greater
- ON current: 3 mA or greater
- OFF voltage: 5 V or less
- OFF current: 1 mA or less

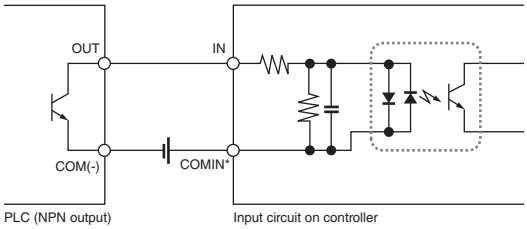


Circuit B (other inputs)

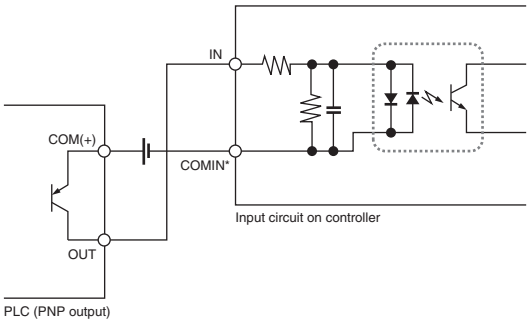
- Max. imposed voltage: 26.4 V
- ON voltage: 19 V or greater
- ON current: 3 mA or greater
- OFF voltage: 5 V or less
- OFF current: 1 mA or less



Example of connections :
When connecting a NPN PLC output to the system input



Example of connections :
When connecting a PNP output to the controller input



Point

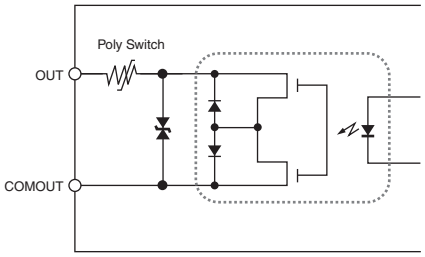
* The commons which are connected differ according to the IN terminals. The common terminal for IN connectors 2 - 6 is COMIN1, and the common terminals for parallel I/O connectors 2 - 16 is COMIN1.

Output Circuit

Output circuit diagram

Circuit C (share in common all output terminals)

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



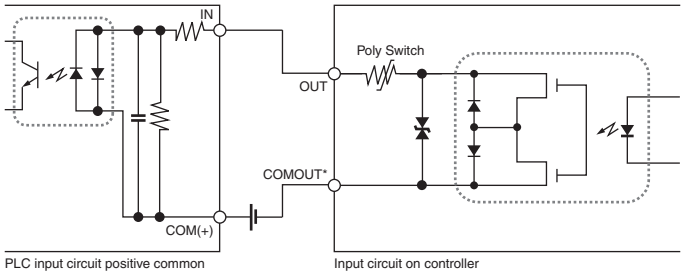
Point

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

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

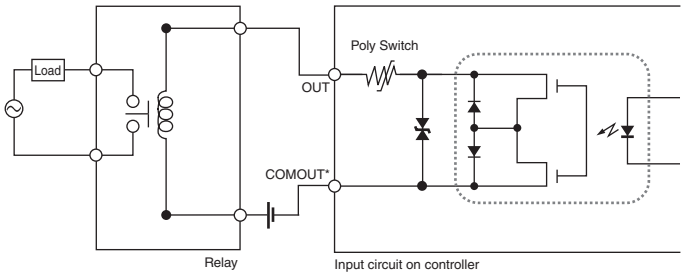
Point If the input instrument is compatible with the NPN open collector outputs, then refer to this connection example.

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



PLC input circuit positive common　　Input circuit on controller

- When connecting a output from the controller to a relay



Relay　　Input circuit on controller

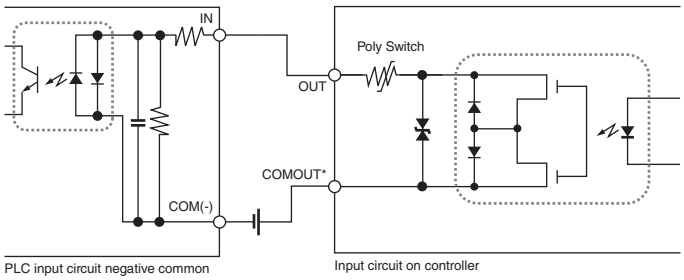
Point

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

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

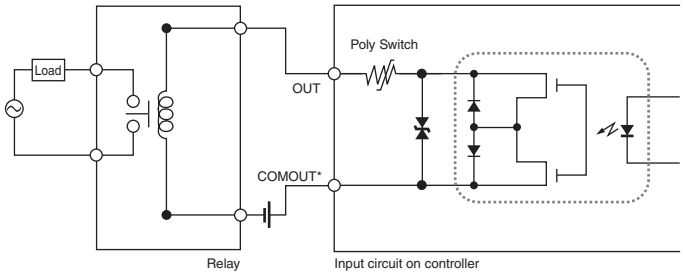
Point If the input instrument is compatible with the NPN open collector outputs, then refer to this connection example.

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



PLC input circuit negative common　　Input circuit on controller

- When connecting a output from the controller to a relay



Relay　　Input circuit on controller

Point

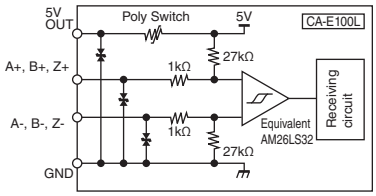
* The commons which are connected differ according to the OUT terminals. The common terminal for OUT connectors 1 - 2 is COMOUT1, and the common terminal for OUT connectors 3 - 4/6 – 7 is COMOUT_F, and the common terminal for parallel I/O connectors 18 - 39 is COMOUT2.

Encoder Input/Output Circuit

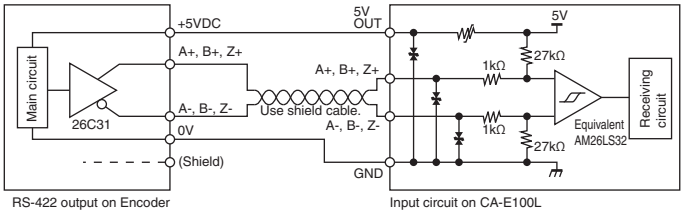
CA-E100L 422A/B/Z

Input circuit diagram

Circuit D



Connection example:
when connecting the RS-422 output encoder



RS-422 output on Encoder　　Input circuit on CA-E100L

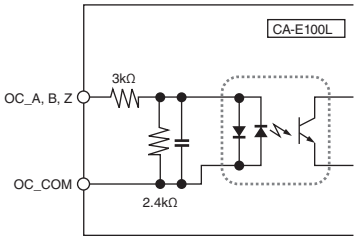
Reference This instrument supports multi-drop connecting. If several controllers are multi-drop connected for one encoder, install a terminating resistor (supplied CA-E100L) with 110Ω 1/2W to the fastest controller from the transmitting terminal.

CA-E100L OC A/B/Z

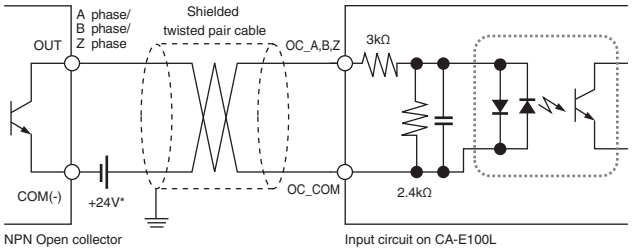
Output circuit diagram

Circuit E

- Max. imposed voltage: 26.4 V
- ON voltage: 19 V or greater
- ON current: 3 mA or greater
- OFF voltage: 5 V or less
- OFF current: 1 mA or less



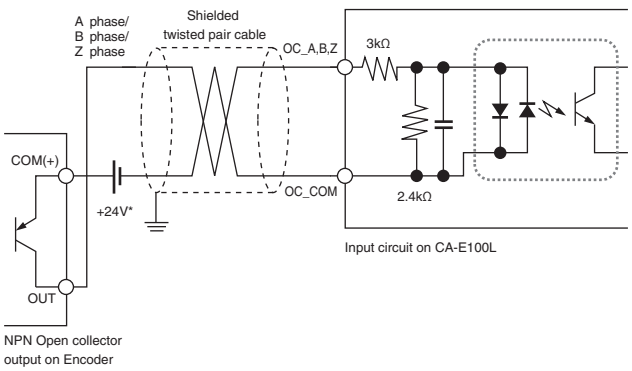
Connection example:
when connecting the NPN open collector output encoder



NPN Open collector output on Encoder　　Input circuit on CA-E100L

* This instrument's (CA-E100L) open collector encoder inputs are only compatible with 24 V type encoders.

Connection example:
when connecting the PNP open collector output encoder



Input circuit on CA-E100L

NPN Open collector output on Encoder

* This instrument's (CA-E100L) open collector encoder inputs are only compatible with 24 V type encoders.

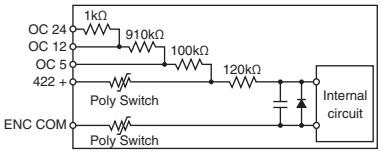
CA-E100LJ/110LJ ENCODER Connector

Input circuit diagram

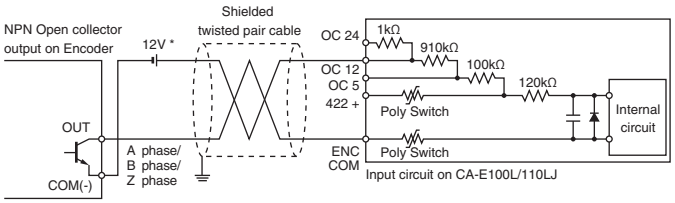
Circuit F

Input specifications for the open collector encoder inputs (DC24V/DC12V/DC5V)

- Max. imposed voltage: 26.4V/13.2V/5.5V
- ON voltage: 21.6 V or greater/ 10.8 V or greater/ 3.5V or greater/
- ON current: 5 mA or greater
- OFF voltage: 4.8 V or less/2.4 V or less/1.0 V or less/

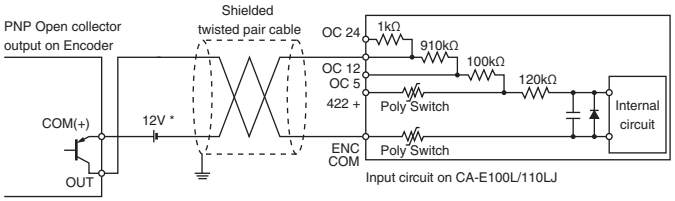


Connection example: when connecting the NPN open collector output encoder



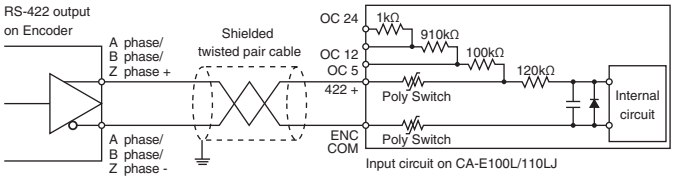
* 12 V was used for this example. Match 5V/12V/24V in accordance with the power supply.

Connection example: when connecting the PNP open collector output encoder



* 12 V was used for this example. Match 5V/12V/24V in accordance with the power supply.

Connection example: when connecting the RS-422 output encoder



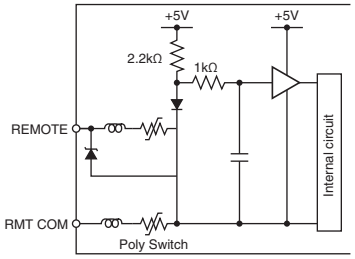
Laser Remote Interlock Input Circuit

CA-E100LJ/110LJ REMOTE

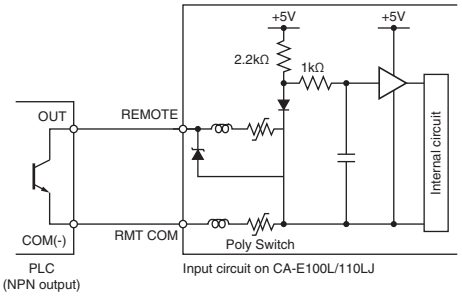
Input circuit diagram

Circuit G

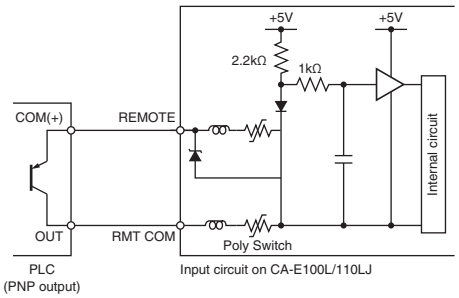
- Non-voltage input
- ON voltage: 1V or less
- ON current: 0.6 mA or less
- Short-circuit current (Typ.): 2 mA



Connection example: when connecting the NPN open collector output PLC



Connection example: when connecting the PNP open collector output PLC



Main Specifications

Model type		XG-X2700/2702	XG-X2500/2502	XG-X2200/2202	XG-X2000/2002
Camera input		2 color/monochrome cameras			
		A maximum of up to four are connectable by connecting one optional area camera input unit CA-E100			
	Trigger input	Simultaneous capture by up to 4 cameras/individual capture can be selected. (when CA-E100 is not connected, up to 2 cameras can be connected simultaneously)			
Supported cameras / Number of pixels		• With XG-035C/S035C/H035C/035M/S035M/H035M connected 310 k pixel mode: 640(H) x 480(V), approx. 310,000 pixels 240 k pixel mode: 512(H) x 480(V), approx. 240,000 pixels			
		• With CA-HX048C/HX048M connected 470 k pixel mode: 784(H) x 596(V), approx. 470,000 pixels 310 k pixel mode: 640(H) x 480(V), approx. 310,000 pixels 240 k pixel mode: 512(H) x 480(V), approx. 240,000 pixels			
		• With XG-200C/S200C/H200C/200M/S200M/H200M connected 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels 1 mega-pixel mode: 1024(H) x 960(V), approx. 980,000 pixels			
		• With CA-HX200C/HX200M connected 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels			
		• With XG-H500C/H500M connected 5 mega-pixel mode: 2432(H) x 2050(V), approx. 4.99 mega-pixels			
		• With CA-HX500C/HX500M connected 5 mega-pixel mode: 2432(H) x 2050(V), approx. 4.96 mega-pixels 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels			
		• With CA-H2100C/H2100M connected 21 mega-pixel mode: 5104(H)x4092(V), approx. 20.89 mega-pixels 5 mega-pixel mode: 2432(H)x2050(V), approx. 4.99 mega-pixel			
Main image processor		DSP (High-speed)	DSP		
Registered number of inspection settings		SD cards 1 and 2 can each hold 999 programs (depending on the size of the SD card and the size of the programs), external switching possible			
Number of registered screens		Maximum 1000 screens for each program (depending on SD card size), Image compression.			
SD card		• SD card slot x 2 • Compatible with OP-87133 (512MB), CA-SD1G (1GB: installed standard to SD1), and CA-SD4G (4GB: SDHC)		• SD card slot x 2 • Compatible with OP-87133 (512MB: installed standard to SD1), CA-SD1G (1GB), and CA-SD4G (4GB: SDHC)	
Interface	Controlled input (compatible with arbitrary assignment)	• 20 input (including four high speed inputs designed for trigger input) • Input rating 26.4 V or lower, 2 mA or greater (3 mA or greater for high speed input terminal)			
	Controlled output (compatible with arbitrary assignment)	• 28 output (including four high speed outputs designed for FLASH outputting linked to external device) • Photo MOSFET *1 Maximum 50 mA (30 V or less)			
	Monitor output	Analog RGB Output, XGA (1024 x 768, 24 bit color)			
	Operation indicators	LED display for Power ON and ERROR			
	RS-232C	• Can perform numerical value output, control input/output, and switching the functions of CA series touch panel interface (Cannot be used with PLC-Links using the RS-232C port) • Supports a max. baud rate of up to 230400 bps			
	PLC link	• Can output numerical values and perform control input/output using the Ethernet or RS-232C port (Cannot be used in conjunction with CC-Link, EtherNet/IP and PROFINET.) • The following PLCs are supported via link unit:*2 KEYENCE: KV-700 Series, KV-1000 Series, KV-3000 Series, KV-5000 Series, KV-5500 Series, KV-7000 Series, KV Nano Series Mitsubishi Electric: MELSEC A Series (RS-232C only), Q Series, L Series, FX Series (RS-232C only) OMRON: SYSMAC C Series (RS-232C only), CJ/CS1/CP1 Series YASKAWA Electric Corporation: MP900 Series (RS-232C only)/MP2000 Series			
	Ethernet	• Numerical value output, and control input/output enabled. • By the connection of KEYENCE PC application software, in addition to the function described above, uploading and downloading the inspection settings, simulations, data, including image data can be sent or received. • For the FTP client function, the VNC server function (for clients other than for PC it will be only for the screen display), and BOOTP function. • 1000BASE-T/100BASE-TX/10BASE-T			
	USB	• By the connection of KEYENCE PC application software, in addition to numerical value output and control input/output , uploading and downloading the inspection settings, simulations, data, including image data can be sent or received. • USB2.0			
	CC-Link	• By connecting the optional CC-Link expansion unit CA-NCL20E, numerical value input/output and control input/output are enabled. (Do not use to connect to PLC Link, EtherNet/IP and PROFINET.) • Compatible to the Ver.1.10 remote device station, Ver.2.00 remote device station			
	EtherNet/IP™	• Numerical value input/output, and control input/output by using the Ethernet port enabled. (Do not use to connect to PLC Link, CC-Link and PROFINET.) • Compatible to the cyclic communication (max.1436 byte), and message communication • Maximum number of connections 32 • Compatible with the conformance test Version.CT12			
	PROFINET	• Numerical value input, and control input/output by using the Ethernet port enabled. (Do not use to connect to PLC Link, CC-Link and EtherNet/IP.) • Compatible to the cyclic communication (max. 1408 byte) • Compatible to the aperiodic (recorded data) communication • Compatible with the Conformance Class A			
	USB Console	• By the optional USB Console (OP-87983), various menu can be used • Compatible to the operation assignment settings to the console button			
	Mouse	Possible to control various menus via an optional dedicated mouse (OP-87506)			
	Touch Panel	• Setting operation from the CA Series touch panel used by the RS-232 port is possible (When RS-232C is used, the nonprocedural communication and PLC-Links that use the RS-232C port cannot be used.) • For the dedicated touch menu or the operation button			
	USB HDD	By connecting a HDD (maximum 2 TB) to a proprietary USB port (USB 3.0 and bus powered compatible: rated output 900 mA), various kinds of data including image data can be output			
Display language		Japanese/English/Simplified Chinese/Traditional Chinese/German selectable (Choose the default language to be used when turning power ON)			
Illumination control		By connecting the optional illumination expansion unit CA-DC40E/DC50E, the lighting and light intensity of the LED illumination can be controlled.*3			
Cooling fan		Cooling fan unit CA-F100 is standard equipment	-		
Rating	Power source voltage	DC24V±10%			
	Consumption current	4.3 A	4.1 A	4.0 A	
Environmental resistance	Ambient temperature	0 to +45°C (DIN rail mounted)/0 to +45°C (Bottom mounted)			
	Ambient operating humidity	35 to 85% RH (no condensation)			
Weight		Approx. 2000 g	Approx. 1750 g		

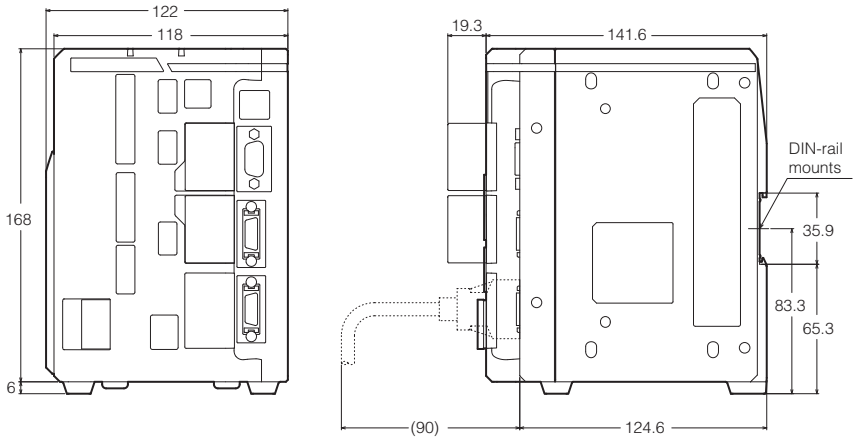
*1 Either positive common connecting which is compatible with NPN input instruments, or negative common connecting which is compatible with PNP input instruments is feasible.
*2 Models equipped with the Ethernet port in the CPU unit support Ethernet port direct connection.
*3 Connect up to 8 illumination expansion units (a maximum of two of the eight units can be CA-DC50E).

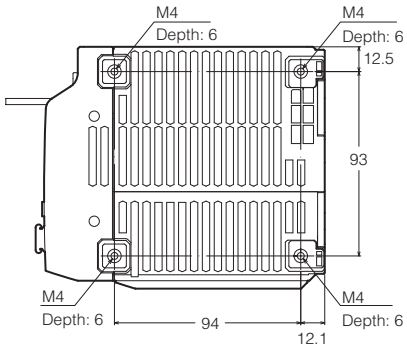
Model type		XG-X2800/2802	XG-X2800LJ
Camera input[*1]		• With area camera input unit CA-E100 connected 2 color/monochrome cameras per one CA-E100, up to 4 cameras via a maximum of 2 units can be connected	• With LJ-V input unit CA-E100LJ connected Up to 2 identical models of the LJ-V series heads per one CA-E100LJ can be connected
		• With line scan camera input unit CA-E100L connected 2 line scan cameras per one CA-E100L, or 2 color/monochrome camerass, up to 4 cameras via a maximum of 2 units can be connected	
		• With 3D camera input unit CA-E100T connected 1 3D camera per one CA-E100T, up to 2 cameras via a maximum of 2 units can be connected	
		• With LJ-V input unit CA-E100LJ/110LJ connected Up to 2 identical models of the LJ-V series heads per one CA-E100LJ/CA-E110LJ can be connected	
	Trigger input	Simultaneous capture by up to 4 cameras/individual capture can be selected. (when CA-E100 is not connected, up to 2 cameras can be connected simultaneously)	Up to 2 cameras can be connected simultaneously
Supported cameras / Number of pixels	Area camera	• With XG-035C/S035C/H035C/035M/S035M/H035M connected 310 k pixel mode: 640(H) x 480(V), approx. 310,000 pixels 240 k pixel mode: 512(H) x 480(V), approx. 240,000 pixels	
		• With CA-HX048C/HX048M connected 470 k pixel mode: 784(H) x 596(V), approx. 470,000 pixels 310 k pixel mode: 640(H) x 480(V), approx. 310,000 pixels 240 k pixel mode: 512(H) x 480(V), approx. 240,000 pixels	
		• With XG-200C/S200C/H200C/200M/S200M/H200M connected 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels 1 mega-pixel mode: 1024(H) x 960(V), approx. 980,000 pixels	
		• With CA-HX200C/HX200M connected 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels	
		• With XG-H500C/H500M connected 5 mega-pixel mode: 2432(H) x 2050(V), approx. 4.99 mega-pixels	
		• With CA-HX500C/HX500M connected 5 mega-pixel mode: 2432(H) x 2050(V), approx. 4.99 mega-pixels 2 mega-pixel mode: 1600(H) x 1200(V), approx. 1.92 mega-pixels	
		• With CA-H2100C/H2100M connected 21 mega-pixel mode: 5104(H)x4092(V), approx. 20.89 mega-pixels 5 mega-pixel mode: 2432(H)x2050(V), approx. 4.99 mega-pixel	
	Line scan camera	• With XG-HL08M connected 8192(H) x 8192(V), approx. 67.11 mega-pixels • With XG-HL04M connected 4096(H) x 16384(L), approx. 67.11 mega-pixels • With XG-HL02M connected 2048(H) x 16384(L), approx. 33.55 mega-pixels	
	3D Camera	• With XR-HT40M connected 2048(H) x 2048(H), approx. 4.19 mega-pixels • With XR-HT15M connected 1048(H) x 1048(H), approx. 1.98 mega-pixels	
	LJ-V Sensor Head	• With LJ-V7020/7020K/7060/7060K/7080/7200/7300 connected 512(H) x 16384(L), approx. 8.39 mega-pixels 1024(H) x 8192(L), approx. 8.39 mega-pixels 2048(H) x 4096(L), approx. 8.39 mega-pixels	
Main image processor		DSP (High-speed)	
Registered number of inspection settings		SD cards 1 and 2 can each hold 999 programs (depending on the size of the SD card and the size of the programs), external switching possible	
Number of registered screens		Maximum 1000 screens for each program (depending on SD card size), Image compression.	
SD card		• SD card slot x 2 • Compatible with OP-87133 (512MB), CA-SD1G (1GB: installed standard to SD1), and CA-SD4G (4GB: SDHC)	
Interface	Controlled input (compatible with arbitrary assignment)	• 20 input (including four high speed inputs designed for trigger input) • Input rating 26.4 V or lower, 2 mA or greater (3 mA or greater for high speed input terminal)	
	Controlled output (compatible with arbitrary assignment)	• 28 output (including four high speed outputs designed for FLASH outputting linked to external device) • Photo MOSFET [*2] Maximum 50 mA (30 V or less)	
	Encoder input	• When connecting CA-E100L, 2 systems per 1 unit, up to 4 systems via a maximum of 2 units • When connecting CA-E100LJ/110LJ, 1 system per 1 unit, up to 2 systems via a maximum of 2 units (up to 1 system via a maximum of 1 unit for XG-X2800LJ) • RS-422 line scan output (multi-drop compatible, 5 V output supplied maximum 150 mA), combined open collector output (CA-E100L is for 24 V compatible components)	
	Monitor output	Analog RGB Output, XGA (1024 x 768, 24 bit color)	
	Operation indicators	LED display for Power ON and ERROR	
	RS-232C	• Can perform numerical value output, control input/output, and switching the functions of CA series touch panel interface (Cannot be used with PLC-Links using the RS-232C port) • Supports a max. baud rate of up to 230400 bps	
	PLC link	• Can output numerical values and perform control input/output using the Ethernet or RS-232C port (Cannot be used in conjunction with CC-Link, EtherNet/IP and PROFINET.) • The following PLCs are supported via link unit:[*3] KEYENCE: KV-700 Series, KV-1000 Series, KV-3000 Series, KV-5000 Series, KV-5500 Series, KV-7000 Series, KV Nano Series Mitsubishi Electric: MELSEC A Series (RS-232C only), Q Series, L Series, FX Series (RS-232C only) OMRON: SYSMAC C Series (RS-232C only), CJ/CS1/CP1 Series YASKAWA Electric Corporation: MP900 Series (RS-232C only)/MP2000 Series	
	Ethernet	• Numerical value output, and control input/output enabled. • By the connection of KEYENCE PC application software, in addition to the function described above, uploading and downloading the inspection settings, simulations, data, including image data can be sent or received. • For the FTP client function, the VNC server function (for clients other than for PC it will be only for the screen display), and BOOTP function. • 1000BASE-T/100BASE-TX/10BASE-T	
	USB	• By the connection of KEYENCE PC application software, in addition to numerical value output and control input/output , uploading and downloading the inspection settings, simulations, data, including image data can be sent or received. • USB2.0	
	CC-Link	• By connecting the optional CC-Link expansion unit CA-NCL20E, numerical value input/output and control input/output are enabled. (Do not use to connect to PLC Link, EtherNet/IP and PROFINET.) • Compatible to the Ver.1.10 remote device station, Ver.2.00 remote device station	
	EtherNet/IP	• Numerical value input/output, and control input/output by using the Ethernet port enabled. (Do not use to connect to PLC Link, CC-Link and PROFINET.) • Compatible to the cyclic communication (max.1436 byte), and message communication • Maximum number of connections 32 • Compatible with the conformance test Version.CT12	
	PROFINET	• Numerical value input, and control input/output by using the Ethernet port enabled. (Do not use to connect to PLC Link, CC-Link and EtherNet/IP.) • Compatible to the cyclic communication (max. 1408 byte) • Compatible to the aperiodic (recorded data) communication • Compatible with the Conformance Class A	
	USB Console	• By the optional USB Console (OP-87983), various menu can be used • Compatible to the operation assignment settings to the console button	
	Mouse	Possible to control various menus via an optional dedicated mouse (OP-87506)	
	Touch Panel	• Setting operation from the CA Series touch panel used by the RS-232 port is possible (When RS-232C is used, the nonprocedural communication and PLC-Links that use the RS-232C port cannot be used.) • For the dedicated touch menu or the operation button	
	USB HDD	By connecting a HDD (maximum 2 TB) to a proprietary USB port (USB 3.0 and bus powered compatible: rated output 900 mA), various kinds of data including image data can be output	
Display language		Japanese/English/Simplified Chinese/Traditional Chinese/German selectable (Choose the default language to be used when turning power ON)	
Illumination control		By connecting the optional illumination expansion unit CA-DC40E/DC50E, the lighting and light intensity of the LED illumination can be controlled.[*4]	-
Cooling fan		Cooling fan unit CA-F100 is standard equipment	
Rating	Power source voltage	DC24V±10%	
	Consumption current	5.0 A	4.1 A
Environmental resistance	Ambient temperature	0 to +45°C (DIN rail mounted)/0 to +45°C (Bottom mounted)	
	Ambient operating humidity	35 to 85% RH (no condensation)	
Weight		Approx. 2000 g	

*1 Since the controller unit does not support camera inputs, at least 1 camera input unit (optional) or more is required.
*2 Either positive common connecting which is compatible with NPN input instruments, or negative common connecting which is compatible with PNP input instruments is feasible.
*3 Models equipped with the Ethernet port in the CPU unit support Ethernet port direct connection.
*4 Connect up to 8 illumination expansion units (a maximum of two of the eight units can be CA-DC50E).

Dimensions

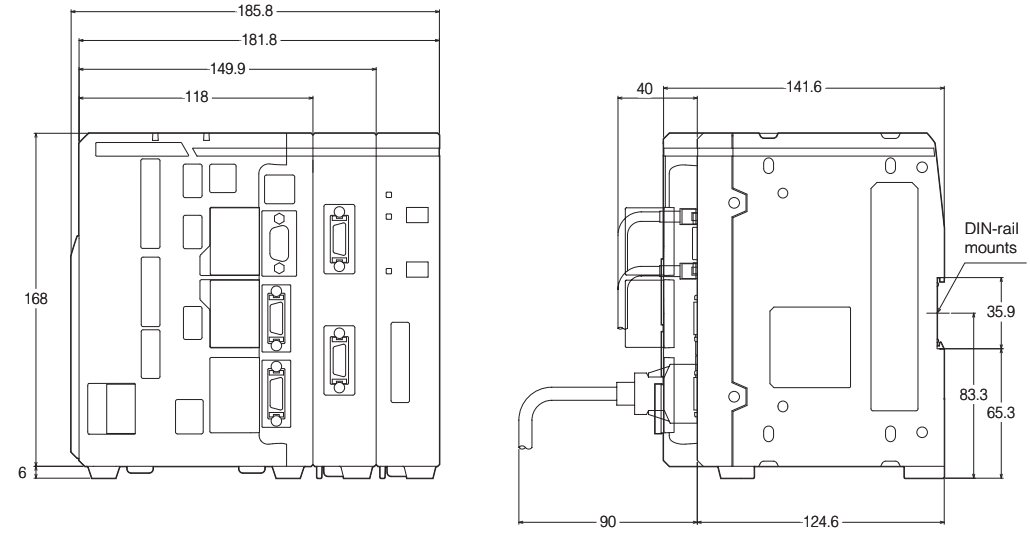
Controller Unit XG-X2000/2002/2200/2202/2500/2502

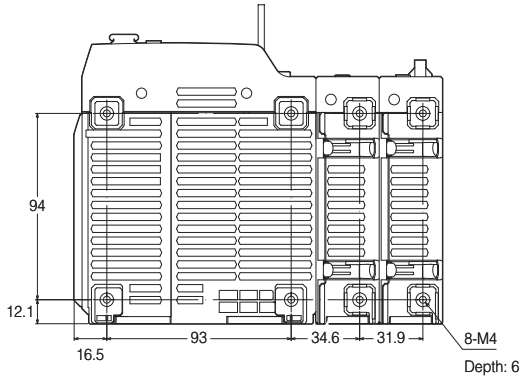




Unit: mm

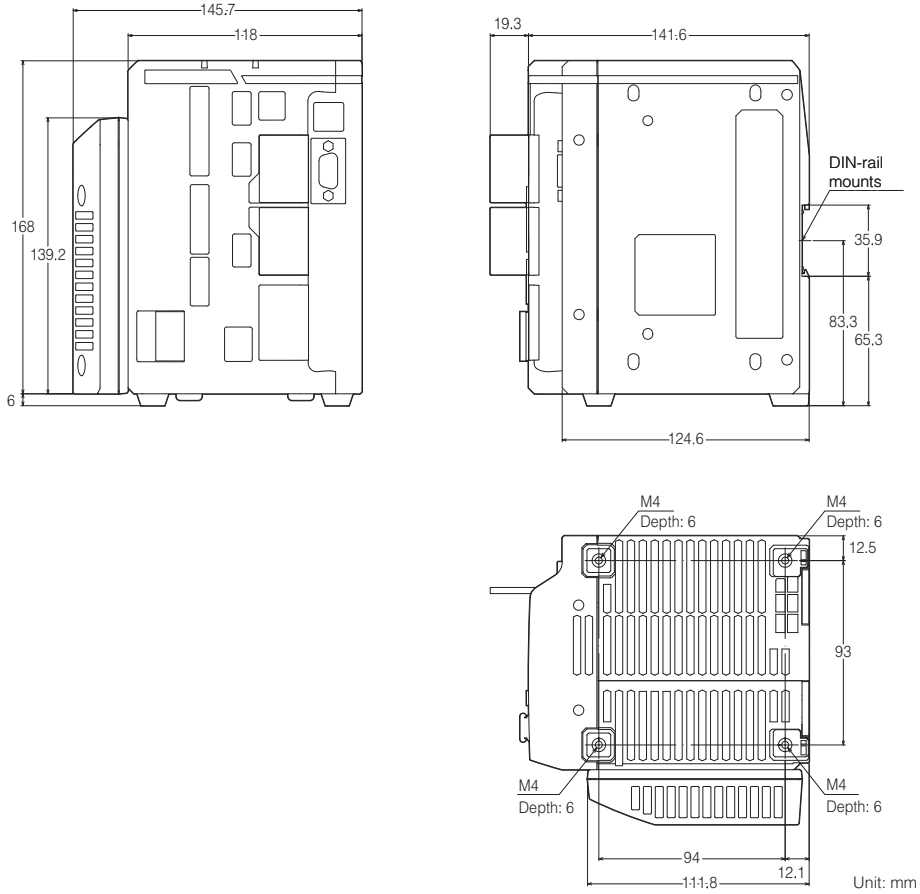
With Area Camera Input Unit CA-E100/Illumination expansion unit CA-DC40E installed





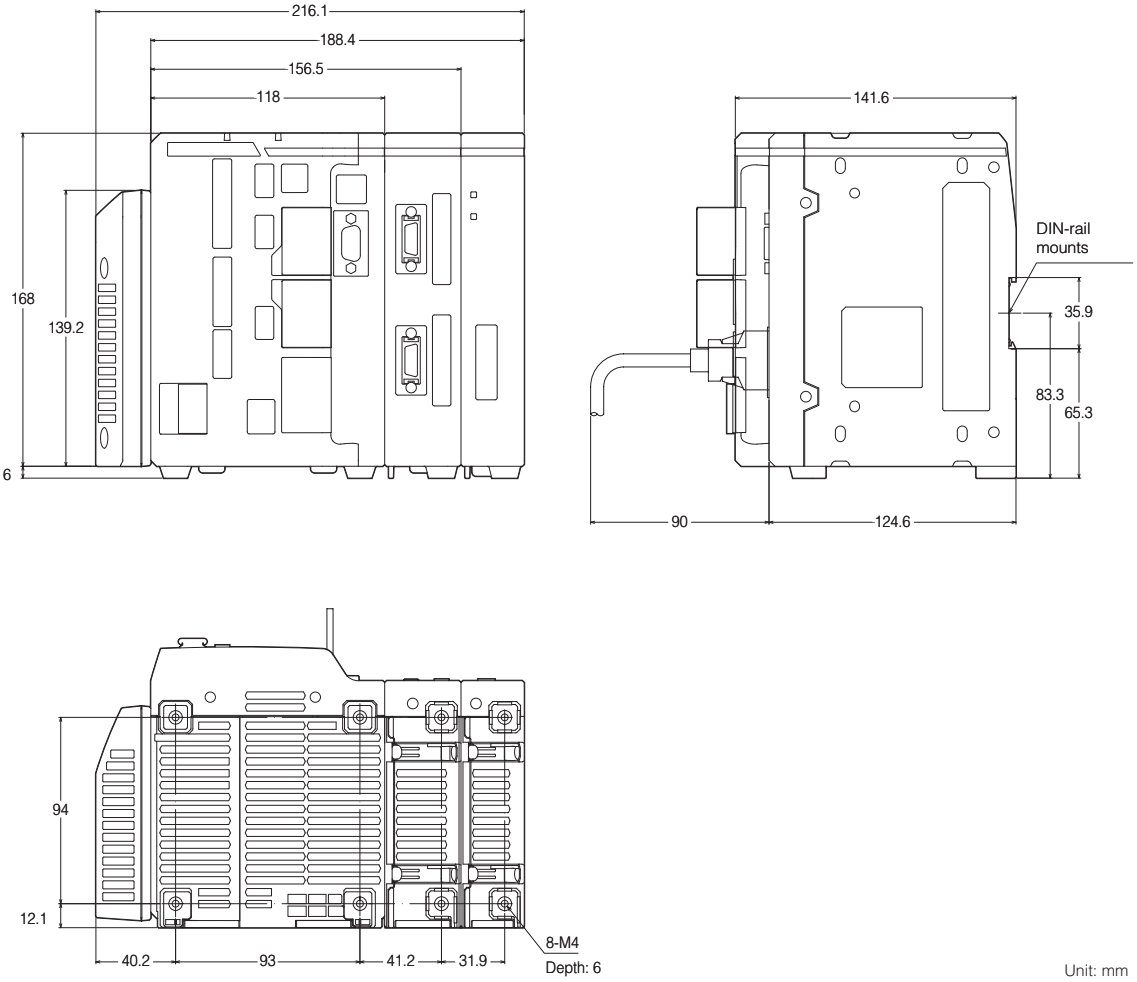
Unit: mm

Controller Unit XG-X2700*/2702*/2800/2802/2800LJ



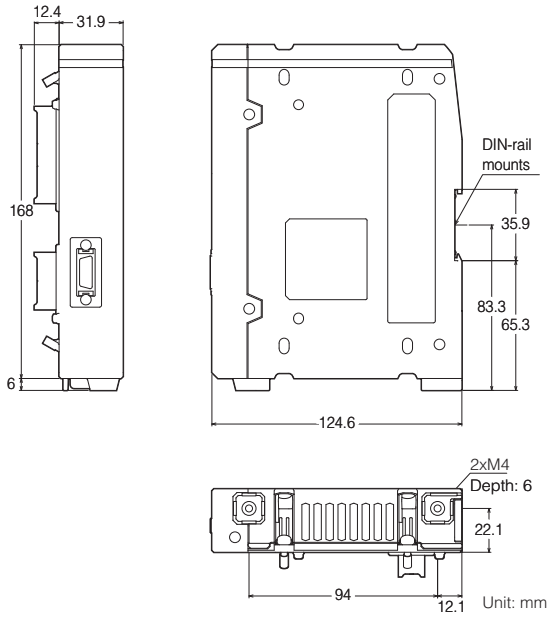
* Only the XG-X2700/2702 is equipped with camera connectors in the same place as the XG-X2000/2002.

With Line Scan Camera Input Unit CA-E100L*/CC-Link unit CA-NCL20E installed

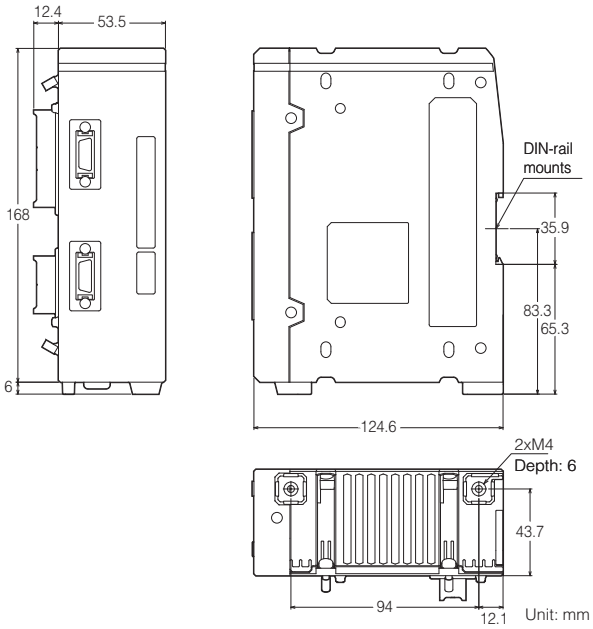


* CA-E100L can only be connected with XG-X2800/2802.

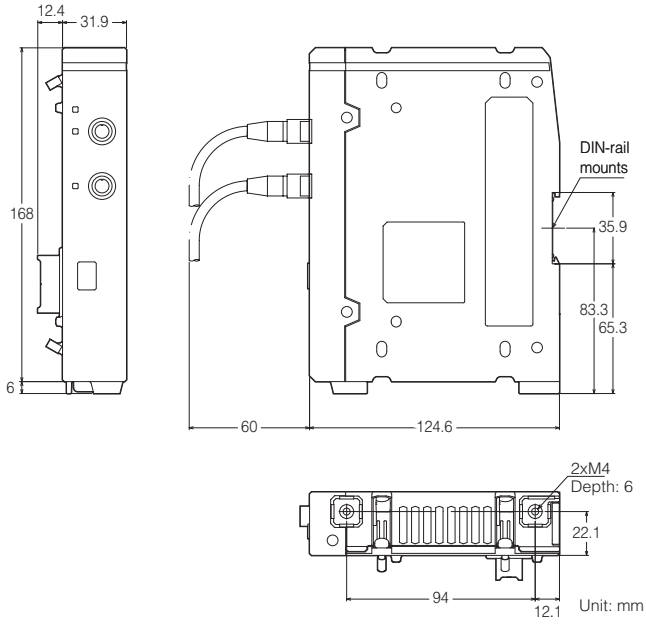
3D Camera Input Unit CA-E100T



LJ-V Input Unit CA-E100LJ/110LJ



Illumination expansion unit CA-DC50E



WARRANTIES AND DISCLAIMERS

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