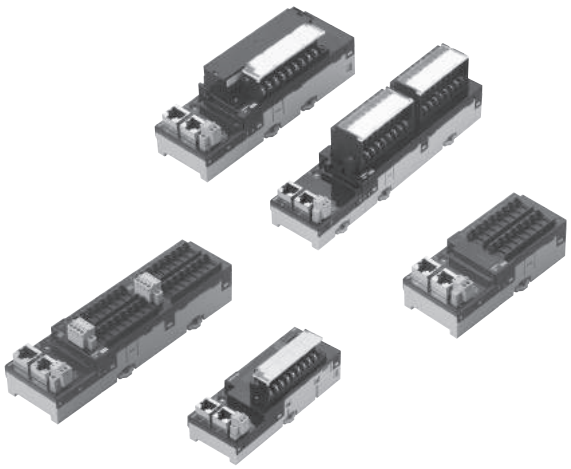
EtherCAT Remote I/O Terminals
GX-Series

CSM_GX_DS_E_8_4

Realizes high-speed communication to match a variety of applications



• Digital I/O Terminals
Inputs/Outputs the digital ON/OFF signals.

• Analog I/O Terminals
Inputs/Outputs the analog signal of 0-5V or 4-20mA, etc., and executes A/D or D/A conversion.

• Encoder Input Terminal
Performs conversion for pulse input signals from an encoder.

• Expansion Units
Attached to the Digital I/O Unit to expands the I/O points.
Can be attached to a two-tier terminal block type with 16 inputs, 16 outputs, and 16 relay outputs.

General Specifications

It is common specifications of EtherCAT Remote I/O Terminal GX-Series. Refer to the pages of specifications for individual I/O terminals for details.

Item	Specification
Unit power supply voltage	20.4 to 26.4 VDC (24 VDC –15% to +10%)
I/O power supply voltage	20.4 to 26.4 VDC (24 VDC –15% to +10%)
Noise resistance	Conforms to IEC 61000-4-4, 2 kV (power line)
Vibration resistance	Malfunction 10 to 60 Hz with amplitude of 0.7 mm, 60 to 150Hz and 50 m/s^2 in X, Y, and Z directions for 80 minutes <Relay Output Unit GX-OC1601 only> 10 to 55 Hz with double-amplitude of 0.7 mm
Impact resistance	150 m/s^2 with amplitude of 0.7 mm <Relay Output Unit GX-OC1601 only> 100 m/s^2 (3 times each in 6 directions on 3 axes)
Dielectric strength	600 VAC (between isolated circuits)
Isolation resistance	20 MΩ or more (between isolated circuits)
Ambient operating temperature	–10 to 55 °C
Operating humidity	25% to 85% (with no condensation)
Operating atmosphere	No corrosive gases
Storage temperature	–25 to 65 °C
Storage humidity	25% to 85% (with no condensation)
Terminal block screws tightening torque ✻	M3 wiring screws: 0.5 N•m M3 terminal block mounting screws: 0.5 N•m
Mounting method	35-mm DIN track mounting

✻ Applicable only to 2-tier terminal block and 3-tier terminal block type slaves.

EtherCAT Communications Specifications

Communications Specifications of GX-Series EtherCAT Remote I/O Terminal

Item	Specification
Communication protocol	Dedicated protocol for EtherCAT
Modulation	Base band
Baud rate	100 Mbps
Physical layer	100BASE-TX (IEEE802.3)
Connectors	RJ45 shielded connector × 2 CN IN: EtherCAT input CN OUT: EtherCAT output
Communications media	Category 5 or higher (cable with double, aluminum tape and braided shielding is recommended.)
Communications distance	Distance between nodes (slaves): 100 m max.
Noise resistance	Conforms to IEC 61000-4-4, 1 kV or higher
Node address setting method	Set with decimal rotary switch or Sysmac Studio
Node address range	1 to 99: Set with rotary switch 1 to 65535: Set with Sysmac Studio
LED display	PWR × 1 L/A IN (Link/Activity IN) × 1 L/A OUT (Link/Activity OUT) × 1 RUN × 1 ERR × 1
Process data	Fixed PDO mapping
PDO size/node	2 bit to 256 byte
Mailbox	Emergency messages, SDO requests, SDO responses, and SDO information
SYNCHRONIZATION mode	Digital I/O Slave Unit and Analog I/O Slave Unit: Free Run mode (asynchronous) Encoder Input Slave Unit: DC mode 1

Version Information

Unit Versions

Units	Models	Unit Version	
		Unit version 1.0	Unit version 1.1
GX-Series EtherCAT Slave Units	GX-□□□□□□	Supported	Supported
Compatible Sysmac Studio version		Version1.00 or higher ✻	Version1.00 or higher

✻ The function that was enhanced by the upgrade for Unit version1.1 can not be used. For detail, refer to "Function Support by Unit Version".

Function Support by Unit Version

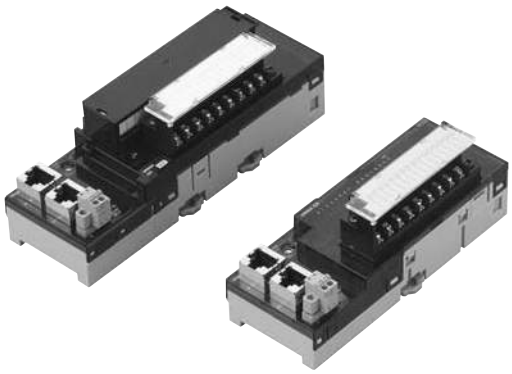
The following tables show the relationship between unit versions and CX-Programmer versions.

Unit Versions and Programming Devices

Unit	GX-Series EtherCAT Slave Units	
Model	GX-□□□□□□	
Item \ Unit version	Unit version 1.0	Unit version 1.1
Sysmac error status	No Supported	Supported
Save the node address setting	No Supported	Supported
Serial Number Display	No Supported	Supported
ESI standard (1.0)	Supported	Supported
SII data check	No Supported	Supported

GX-□D16□1/OC1601

High-speed digital I/O terminal with the screw type terminal block for EtherCAT communications



- Detachable screw terminal block facilitates the maintenance.
- The expansion unit can be connected.
  (One expansion unit per one I/O terminal unit.)
  Input/output point can be flexibly increased depending on the system.
- Input response time can be switched for high-speed processing.
- Selectable node address setting methods: setting with rotary switch and with tool software.
  When setting the nodes with rotary switch, setting is easy and node identification becomes possible for maintenance.

Expansion Units

One Expansion Unit can be combined with one Digital I/O Terminal (GX-ID16□1/OD16□1/OC1601). The following Expansion Units are available. They can be combined in various ways for flexible I/O capacity expansion.

Model	I/O points	Input capacity	Output capacity
XWT-ID08	8 DC inputs (NPN)	8	0
XWT-ID08-1	8 DC inputs (PNP)	8	0
XWT-OD08	8 transistor outputs (NPN)	0	8
XWT-OD08-1	8 transistor outputs (PNP)	0	8
XWT-ID16	16 DC inputs (NPN)	16	0
XWT-ID16-1	16 DC inputs (PNP)	16	0
XWT-OD16	16 transistor outputs (NPN)	0	16
XWT-OD16-1	16 transistor outputs (PNP)	0	16

General Specifications

For Common Specifications of I/O terminals, refer to page 1.

Input Section Specifications

16-point Input Terminals

Item	Specification	
	GX-ID1611	GX-ID1621
Input capacity	16 points	
Internal I/O common	NPN	PNP
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	6.0 mA max./input (at 24-VDC) 3.0 mA min./input (at 17-VDC)	
ON delay	0.1 ms max.	
OFF delay	0.2 ms max.	
Input filter value	Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms)	
Number of circuits per common	16 inputs/common	
Input indicators	LED display (yellow)	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Unit power supply current consumption	90 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Weight	180 g max.	
Expansion functions	Enabled	
Short-circuit protection function	No	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Output Section Specifications

16-point Output Terminals

Item	Specification	
	GX-OD1611	GX-OD1621
Output capacity	16 points	
Rated current (ON current)	0.5 A/output, 4.0 A/common	
Internal I/O common	NPN	PNP
Residual voltage	1.2 V max. (0.5 ADC, between each output terminal and the G terminal)	1.2 V max. (0.5 ADC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	16 points/common	
Output indicators	LED display (yellow)	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Unit power supply current consumption	90 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Weight	180 g max.	
Expansion functions	Enabled	
Output handling for communications errors	Select either hold or clear	
Short-circuit protection function	No	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Relay 16-point Output Terminals

Item	Specification
	GX-OC1601
Output capacity	16 points
Mounted relays	NY-5W-K-IE (Fujitsu Component) ✻
Rated load	Resistance load 250 VAC 2 A/output, common 8 A 30 VDC 2 A/output, common 8 A
Rated ON current	3 A/output
Maximum contact voltage	250 VAC, 125 VDC
Maximum contact current	3 A/output
Maximum switching capacity	750 VAAC, 90 WDC
Minimum applicable load (reference value)	5 VDC 1mA
Mechanical service life	20,000,000 operations min.
Electrical service life	100,000 operations min.
Number of circuits per common	8 points/common
Output indicators	LED display (yellow)
Isolation method	Relay isolation
I/O power supply method	The relay drive power is supplied from the unit power supply.
Unit power supply current consumption	210 mA max. (for 20.4 to 26.4-VDC power supply voltage)
Weight	290 g max.
Expansion functions	Enabled
Output handling for communications errors	Select either hold or clear
Short-circuit protection function	No

✻ For the specification of individual relay, refer to the data sheet of published by manufacturers.

Precautions for Correct Use

- With a current of between 2 and 3 A (8 to 10 A per common), either ensure that the number of points per common that simultaneously turn ON does not exceed 4 or ensure that the ambient temperature does not exceed 45 °C. Also, there are no restrictions if the current does not exceed 2 A (8 A per common).
- The rated current is the value for assuring normal operation, and not for assuring durability of the relays. The relay service life depends greatly on factors such as the operating temperature, the type of load, and switching conditions. The actual equipment must be checked under actual operating conditions.

Input and Output Section Specifications

8-point Input and 8-point output Terminals

General Specifications

Item	Specification	
	GX-MD1611	GX-MD1621
Internal I/O common	NPN	PNP
I/O indicators	LED display (yellow)	
Unit power supply current consumption	80 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Weight	190 g max.	
Expansion functions	No	
Short-circuit protection function	No	

Input Section

Item	Specification	
	GX-MD1611	GX-MD1621
Input capacity	8 points	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	6.0 mA max./input (at 24-VDC) 3.0 mA min./input (at 17-VDC)	
ON delay	0.1 ms max.	
OFF delay	0.2 ms max.	
Input filter value	Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms)	
Number of circuits per common	8 points/common	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	

Output Section

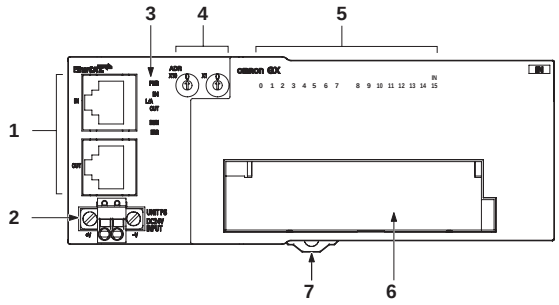
Item	Specification	
	GX-MD1611	GX-MD1621
Output capacity	8 points	
Rated output current	0.5 A/output, 2.0 A/common	
Residual voltage	1.2 V max. (0.5 ADC, between each output terminal and the G terminal)	1.2 V max. (0.5 ADC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 points/common	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Output handling for communications errors	Select either hold or clear	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Components and Functions

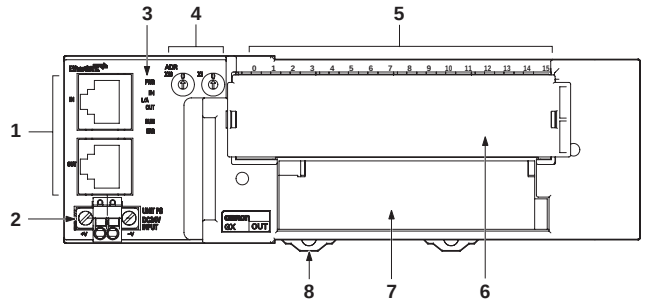
16 Inputs Terminal GX-ID1611/ID1621

16 Outputs Terminal GX-OD1611/OD1621



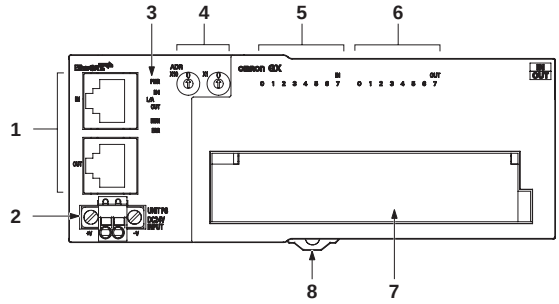
No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input terminal: Input indicator (0 to 15) Output terminal: Output indicator (0 to 15)	Indicates the state of input/output contact (ON/OFF). Input terminal: Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) Output terminal: Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
6	Terminal Block	Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 15: Input terminals
7	DIN track mounting hook	Fixes a slave to a DIN track.

Relay 16-point Output Terminals GX-OC1601



No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Output indicator (0 to 15)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
6	Output Relay	Turn ON/OFF the contacts.
7	Terminal Block	Connects external devices and the I/O power supply. COM0, COM1: Common terminals 0 to 15: Output terminals
8	DIN track mounting hook	Fixes a slave to a DIN track.

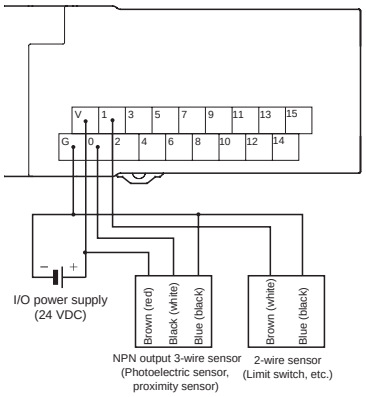
8 Inputs Terminal / 8 Outputs Terminal GX-MD1611/MD1621



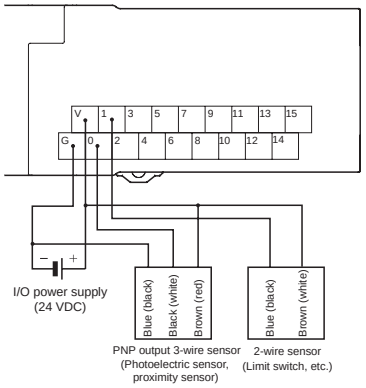
No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input indicator (0 to 7)	Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
6	Output indicator (0 to 7)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
7	Terminal Block	Connects external devices and the I/O power supply. <Left side> V1, G1: Input I/O terminals 0 to 7: Input terminals <Right side> V2, G2: Output I/O terminals 0 to 7: Output terminals
8	DIN track mounting hook	Fixes a slave to a DIN track.

Wiring

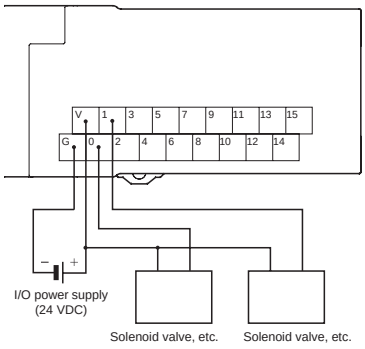
GX-ID1611 (NPN)



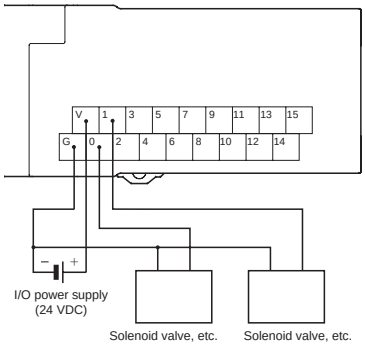
GX-ID1621 (PNP)



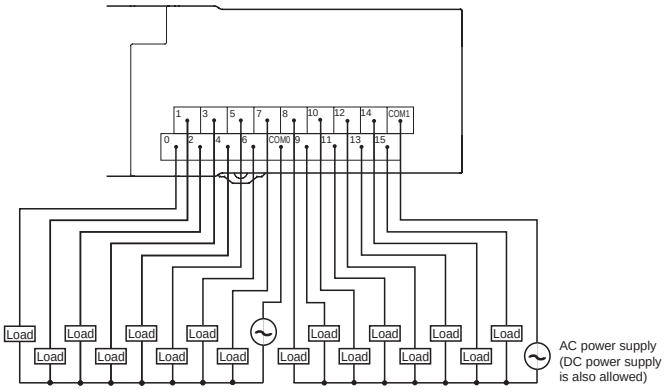
GX-OD1611 (NPN)



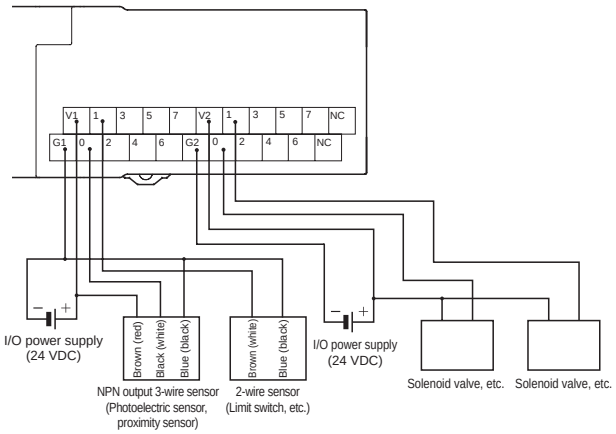
GX-OD1621 (PNP)



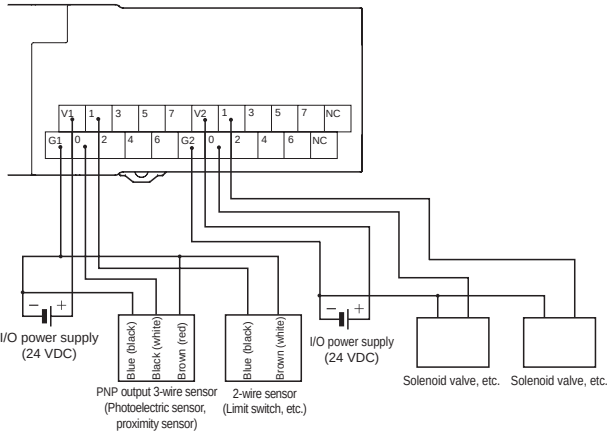
GX-OC1601



GX-MD1611 (NPN)



GX-MD1621 (PNP)

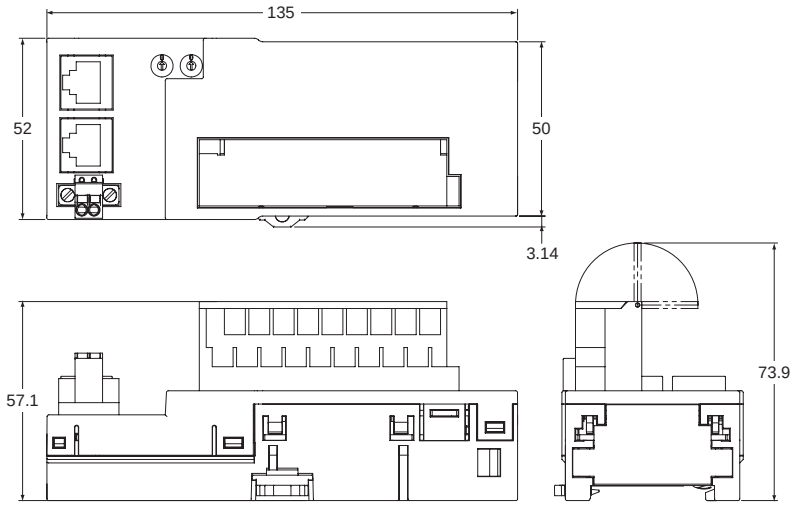


Note: Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

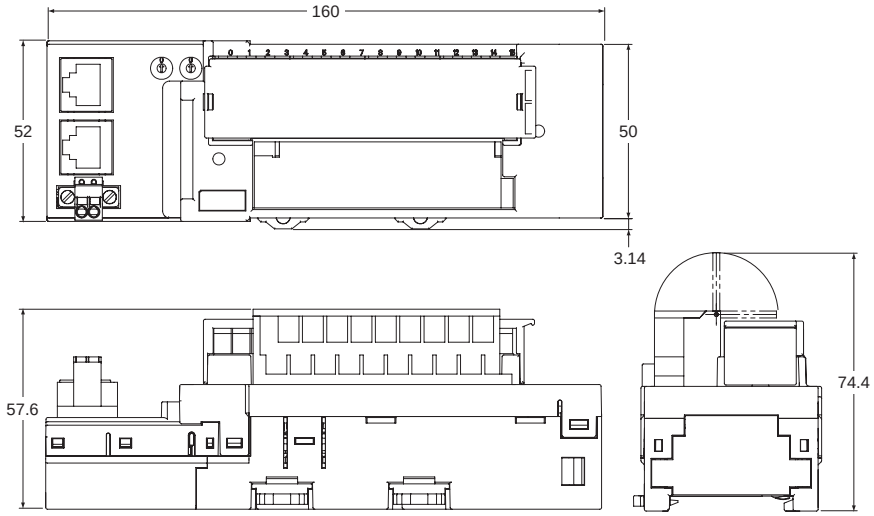
Dimensions

(Unit: mm)

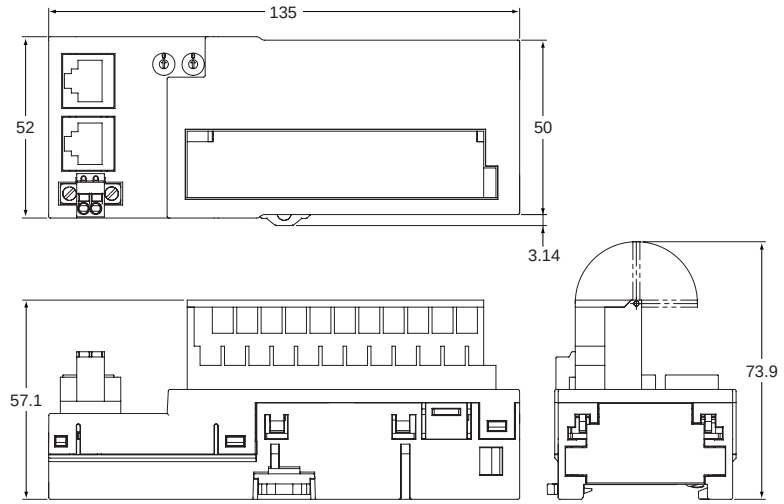
GX-ID1611/ID1621
GX-OD1611/OD1621



GX-OC1601

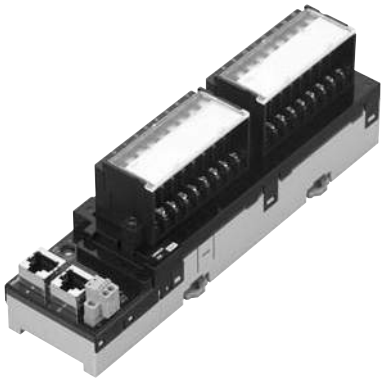


GX-MD1611/MD1621



GX-ID16□2/OD16□2/MD16□2

A common terminal is provided for each contact.
It eliminate the needs for relay terminal blocks



- It is unnecessary to share the common terminal among multiple contacts.
  Easy-to-find wiring locations.
- Detachable screw terminal block facilitates the maintenance.
- Input response time can be switched for high-speed processing.
- Selectable node address setting methods: setting with rotary switch and with tool software.
  When setting the nodes with rotary switch, setting is easy and node identification becomes possible for maintenance.

General Specifications

For Common Specifications of I/O terminals, refer to page 1.

Input Section Specifications

16-point Input Terminals

Item	Specification	
	GX-ID1612	GX-ID1622
Input capacity	16 points	
Internal I/O common	NPN	PNP
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	6.0 mA max./input (at 24-VDC) 3.0 mA min./input (at 17-VDC)	
ON delay	0.1 ms max.	
OFF delay	0.2 ms max.	
Input filter value	Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms)	
Number of circuits per common	8 points/common	
Input indicators	LED display (yellow)	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Input device supply current	100 mA/point	
Unit power supply current consumption	90 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Weight	370 g max.	
Expansion functions	No	
Short-circuit protection function	No	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Output Section Specifications

16-point Output Terminals

Item	Specification	
	GX-OD1612	GX-OD1622
Output capacity	16 points	
Rated current (ON current)	0.5 A/output, 4.0 A/common	
Internal I/O common	NPN	PNP
Residual voltage	1.2 V max. (0.5 ADC, between each output terminal and the G terminal)	1.2 V max. (0.5 ADC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 points/common	
Output indicators	LED display (yellow)	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Output device supply current	100 mA/point	
Unit power supply current consumption	90 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Weight	370 g max.	
Expansion functions	No	
Output handling for communications errors	Select either hold or clear	
Short-circuit protection function	No	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Input and Output Section Specifications

8-point Input and 8-point output Terminals

General Specifications

Item	Specification	
	GX-MD1612	GX-MD1622
Internal I/O common	NPN	PNP
I/O indicators	LED display (yellow)	
Unit power supply current consumption	90 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Weight	370 g max.	
Expansion functions	No	
Short-circuit protection function	No	

Input Section

Item	Specification	
	GX-MD1612	GX-MD1622
Input capacity	8 points	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max./input	
Input current	6.0 mA max./input (at 24-VDC) 3.0 mA min./input (at 17-VDC)	
ON delay	0.1 ms max.	
OFF delay	0.2 ms max.	
Input filter value	Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms)	
Number of circuits per common	8 points/common	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Input device supply current	100 mA/point	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	

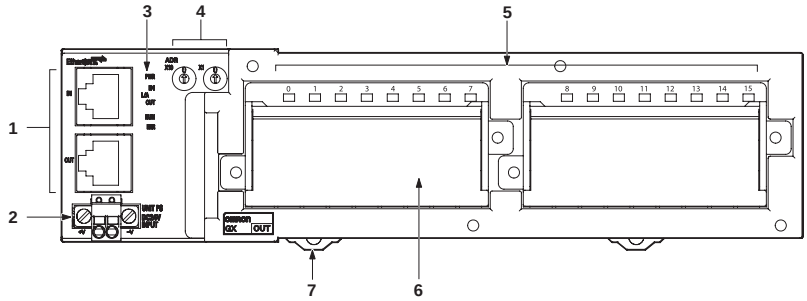
Output Section

Item	Specification	
	GX-MD1612	GX-MD1622
Output capacity	8 points	
Rated output current	0.5 A/output, 2.0 A/common	
Residual voltage	1.2 V max. (0.5 ADC, between each output terminal and the G terminal)	1.2 V max. (0.5 ADC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 points/common	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Output device supply current	100 mA/point	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Output handling for communications errors	Select either hold or clear	

Note: For the I/O power supply current value to V and G terminals, refer to GX-Series Operation Manual (Cat. No. W488).

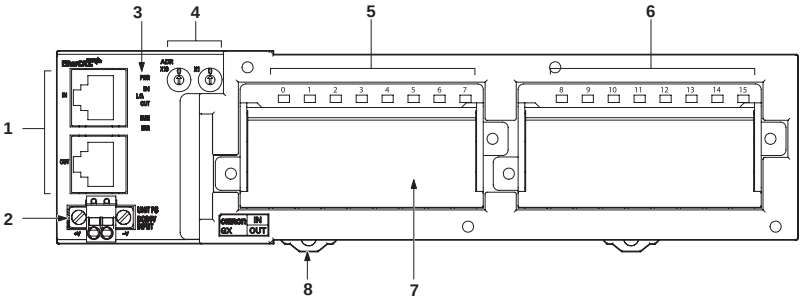
Components and Functions

16 Inputs Terminal GX-ID1612/ID1622
16 Outputs Terminal GX-OD1612/OD1622



No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input terminal: Input indicator (0 to 15) Output terminal: Output indicator (0 to 15)	Indicates the state of input/output contact (ON/OFF). Input terminal: Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state) Output terminal: Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
6	Terminal Block	Connects external devices and the I/O power supply. <Left side> V1, G1: I/O power supply terminals 0 to 7: Output terminals <Right side> V2, G2: I/O power supply terminals 8 to 15: Input terminals (Output terminals)
7	DIN track mounting hook	Fixes a slave to a DIN track.

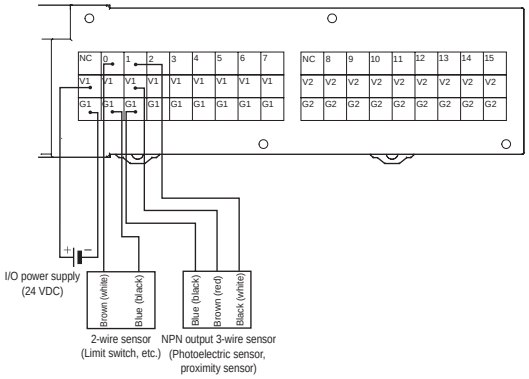
8 Inputs Terminal / 8 Outputs Terminal GX-MD1612/MD1622



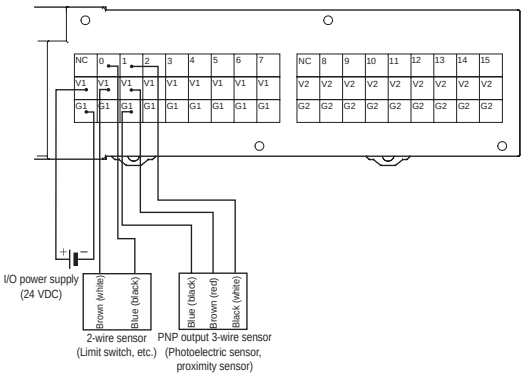
No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input indicator (0 to 7)	Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
6	Output indicator (0 to 7)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
7	Terminal Block	Connects external devices and the I/O power supply. <Left side> V1, G1: Input I/O puwer supply terminals 0 to 7: Input terminals <Right side> V2, G2: Output I/O power supply terminals 0 to 7: Output terminals
8	DIN track mounting hook	Fixes a slave to a DIN track.

Wiring

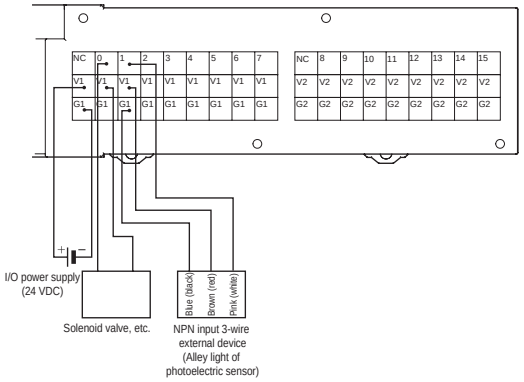
GX-ID1612 (NPN)



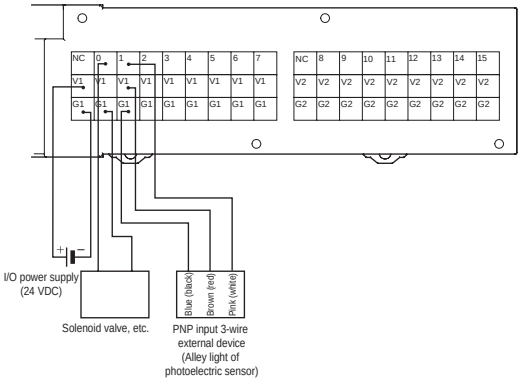
GX-ID1622 (PNP)



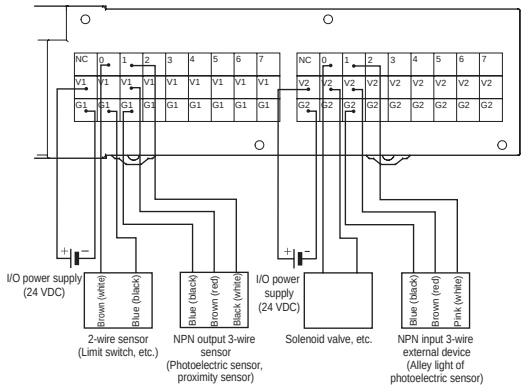
GX-OD1612 (NPN)



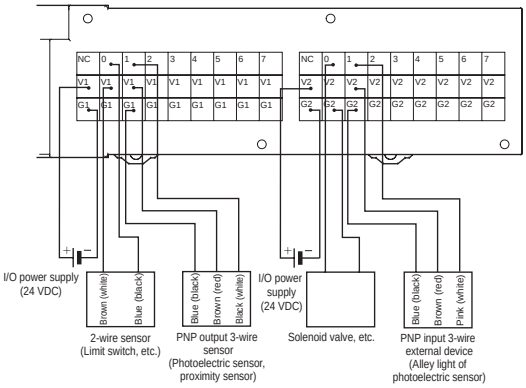
GX-OD1622 (PNP)



GX-MD1612 (NPN)



GX-MD1622 (PNP)

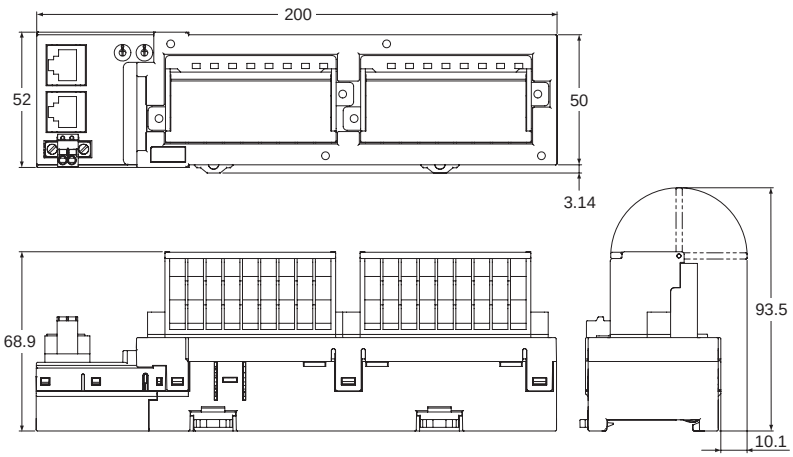


Note: Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

Dimensions

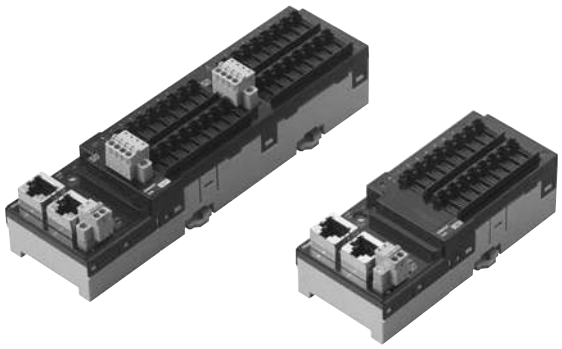
(Unit: mm)

GX-ID1612/ID1622
GX-OD1612/OD1622
GX-MD1612/MD1622



GX-□D16□8/□D32□8

Easy wiring using industry standard e-CON connectors. Special wiring tool is not necessary



- Digital I/O terminal with industry standard e-CON connectors.
- A common terminal is provided for each connector.
  The I/O terminal and the sensors can be connected directly.
- Input response time can be switched for high-speed processing.
- Selectable node address setting methods: setting with rotary switch and with tool software.
  When setting the nodes with rotary switch, setting is easy and node identification becomes possible for maintenance.

General Specifications

For Common Specifications of I/O terminals, refer to page 1.

Input Section Specifications

16-point Input Terminals

Item	Specification	
	GX-ID1618	GX-ID1628
Input capacity	16 points	
Internal I/O common	NPN	PNP
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	6.0 mA max./input (at 24-VDC) 3.0 mA min./input (at 17-VDC)	
ON delay	0.1 ms max.	
OFF delay	0.2 ms max.	
Input filter value	Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms)	
Number of circuits per common	16 points/common	
Input indicators	LED display (yellow)	
Isolation method	No isolation	
I/O power supply method	Supplied from unit power supply	
Input device supply current	50 mA/point	
Unit power supply current consumption	150 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
e-CON Connector insertion durability	50 times	
Weight	140 g max.	
Expansion functions	No	
Short-circuit protection function	Available (Operates at 50 mA/point min.)	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

32-point Input Terminals

Item	Specification	
	GX-ID3218	GX-ID3228
Input capacity	32 points	
Internal I/O common	NPN	PNP
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	6.0 mA max./input (at 24-VDC) 3.0 mA min./input (at 17-VDC)	
ON delay	0.1 ms max.	
OFF delay	0.2 ms max.	
Input filter value	Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms)	
Number of circuits per common	32 points/common	
Input indicators	LED display (yellow)	
Isolation method	No isolation	
I/O power supply method	Supplied from unit power supply	
Input device supply current	50 mA/point	
Unit power supply current consumption	230 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
e-CON Connector insertion durability	50 times	
Weight	220 g max.	
Expansion functions	No	
Short-circuit protection function	Available (Operates at 50 mA/point min.)	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Output Section Specifications

16-point Output Terminals

Item	Specification	
	GX-OD1618	GX-OD1628
Output capacity	16 points	
Rated current (ON current)	0.5 A/output, 4.0 A/common	
Internal I/O common	NPN	PNP
Residual voltage	1.2 V max. (0.5 ADC, between each output terminal and the G terminal)	1.2 V max. (0.5 ADC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	16 points/common	
Output indicators	LED display (yellow)	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Output device supply current	100 mA/point	
Unit power supply current consumption	80 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
e-CON Connector insertion durability	50 times	
Weight	130 g max.	
Expansion functions	No	
Output handling for communications errors	Select either hold or clear	
Short-circuit protection function	No	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

32-point Output Terminals

Item	Specification	
	GX-OD3218	GX-OD3228
Output capacity	32 points	
Rated current (ON current)	0.5 A/output, 4.0 A/common	
Internal I/O common	NPN	PNP
Residual voltage	1.2 V max. (0.5 ADC, between each output terminal and the G terminal)	1.2 V max. (0.5 ADC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	16 points/common	
Output indicators	LED display (yellow)	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Output device supply current	100 mA/point	
Unit power supply current consumption	100 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
e-CON Connector insertion durability	50 times	
Weight	210 g max.	
Expansion functions	No	
Output handling for communications errors	Select either hold or clear	
Short-circuit protection function	No	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

Input and Output Section Specifications

8-point Input and 8-point output Terminals

General Specifications

Item	Specification	
	GX-MD1618	GX-MD1628
Internal I/O common	NPN	PNP
I/O indicators	LED display (yellow)	
Unit power supply current consumption	120 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
e-CON Connector insertion durability	50 times	
Weight	140 g max.	
Expansion functions	No	
Short-circuit protection function	Available at input section only (Operates at 50 mA/point min.)	

Input Section

Item	Specification	
	GX-MD1618	GX-MD1628
Input capacity	8 points	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	6.0 mA max./input (at 24-VDC) 3.0 mA min./input (at 17-VDC)	
ON delay	0.1 ms max.	
OFF delay	0.2 ms max.	
Input filter value	Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms)	
Number of circuits per common	8 points/common	
Isolation method	No-isolation	
I/O power supply method	Supplied from unit power supply	
Input device supply current	50 mA/point	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	

Output Section

Item	Specification	
	GX-MD1618	GX-MD1628
Output capacity	8 points	
Rated output current	0.5 A/output, 2.0 A/common	
Residual voltage	1.2 V max. (0.5 ADC, between each output terminal and the G terminal)	1.2 V max. (0.5 ADC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 points/common	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Output device supply current	100 mA/point	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Output handling for communications errors	Select either hold or clear	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

16-point Input and 16-point output Terminals

General Specifications

Item	Specification	
	GX-MD3218	GX-MD3228
Internal I/O common	NPN	PNP
I/O indicators	LED display (yellow)	
Unit power supply current consumption	140 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
e-CON Connector insertion durability	50 times	
Weight	220 g max.	
Expansion functions	No	
Short-circuit protection function	Available at input section only (Operates at 50 mA/point min.)	

Input Section

Item	Specification	
	GX-MD3218	GX-MD3228
Input capacity	16 points	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	6.0 mA max./input (at 24-VDC) 3.0 mA min./input (at 17-VDC)	
ON delay	0.1 ms max.	
OFF delay	0.2 ms max.	
Input filter value	Without filter, 0.5 ms, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms (Default setting: 1 ms)	
Number of circuits per common	16 points/common	
Isolation method	No-isolation	
I/O power supply method	Supplied from unit power supply	
Input device supply current	50 mA/point	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	

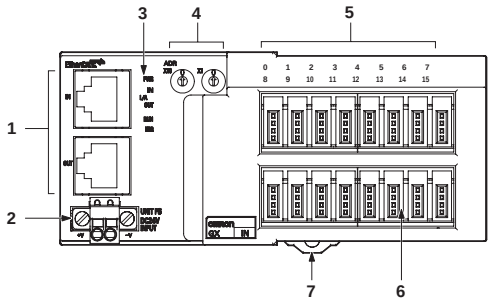
Output Section

Item	Specification	
	GX-MD3218	GX-MD3228
Output capacity	16 points	
Rated output current	0.5 A/output, 2.0 A/common	
Residual voltage	1.2 V max. (0.5 ADC, between each output terminal and the G terminal)	1.2 V max. (0.5 ADC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	16 points/common	
Isolation method	Photocoupler isolation	
I/O power supply method	Supply by I/O power supply	
Output device supply current	100 mA/point	
I/O power supply current consumption	5 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Output handling for communications errors	Select either hold or clear	

Note: For the I/O power supply current value to V and G terminals, refer to GX Series Operation Manual (Cat. No. W488).

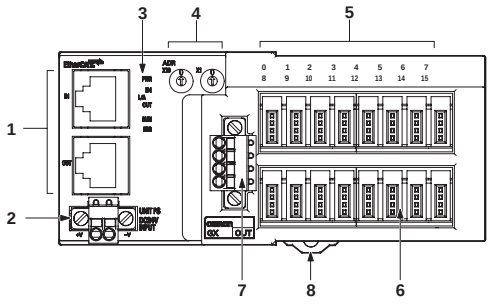
Components and Functions

16 Inputs Terminal GX-ID1618/ID1628



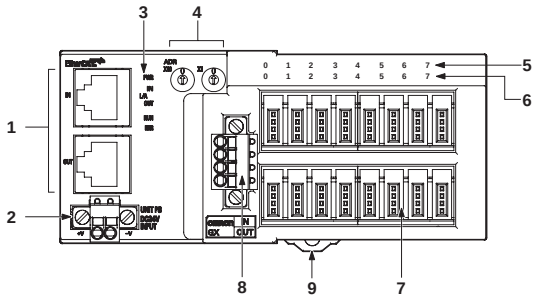
No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input indicator (0 to 15)	Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
6	I/O connector (0 to 15)	Connects an external device.
7	DIN track mounting hook	Fixes a slave to a DIN track.

16 Outputs Terminal GX-OD1618/OD1628



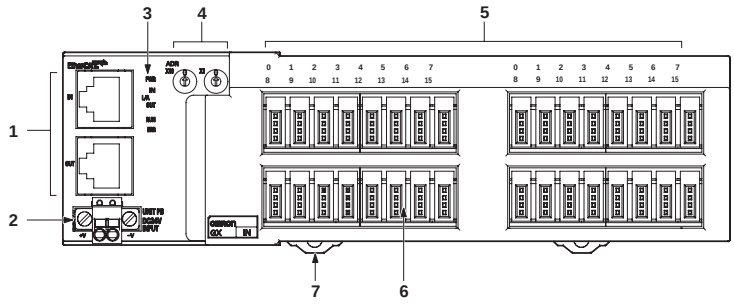
No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Output indicator (0 to 15)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
6	I/O connector (0 to 15)	Connects an external device.
7	I/O power supply connector	Supplies the I/O power.
8	DIN track mounting hook	Fixes a slave to a DIN track.

8 Inputs/8 Outputs Terminal GX-MD1618/MD1628



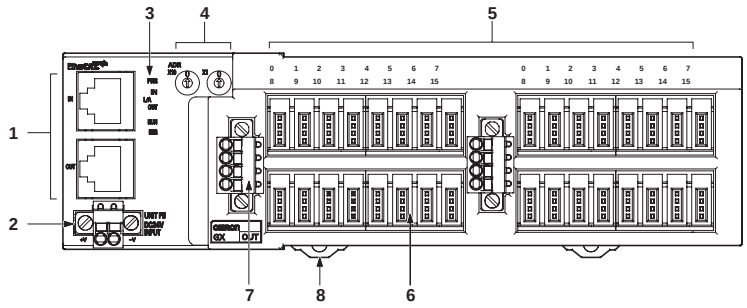
No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input indicator (0 to 7)	Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
6	Output indicator (0 to 7)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
7	I/O connector (0 to 15)	Connects an external device. <Top side> For input device <Bottom side> For output device
8	I/O power supply connector	Supplies the I/O power. (For output device)
9	DIN track mounting hook	Fixes a slave to a DIN track.

32 Inputs Terminal GX-ID3218/ID3228



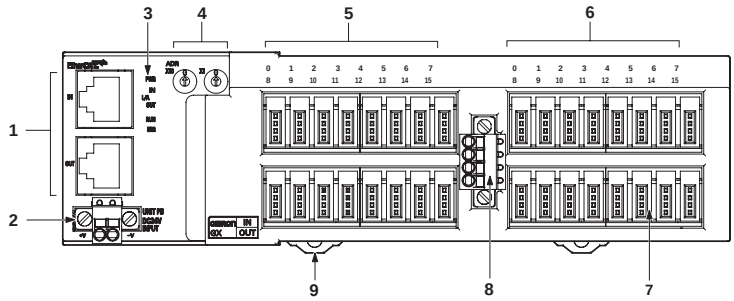
No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input indicator (IN1 0 to 15, IN2 0 to 15)	Indicates the state of input contact (ON/OFF). Input terminal: Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
6	I/O connector (0 to 15× 2)	Connects an external device.
7	DIN track mounting hook	Fixes a slave to a DIN track.

32 Outputs Terminal GX-OD3218/OD3228



No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Output indicator (OUT1 0 to 15, OUT2 0 to 15)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
6	I/O connector (0 to 15 × 2)	Connects an external device.
7	I/O power supply connector	Supplies the I/O power.
8	DIN track mounting hook	Fixes a slave to a DIN track.

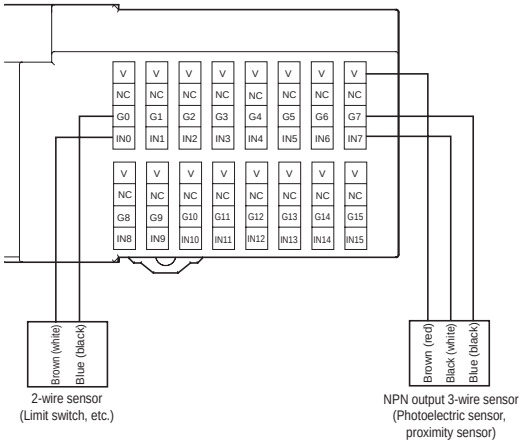
16 Inputs/16 Outputs Terminal GX-MD3218/MD3228



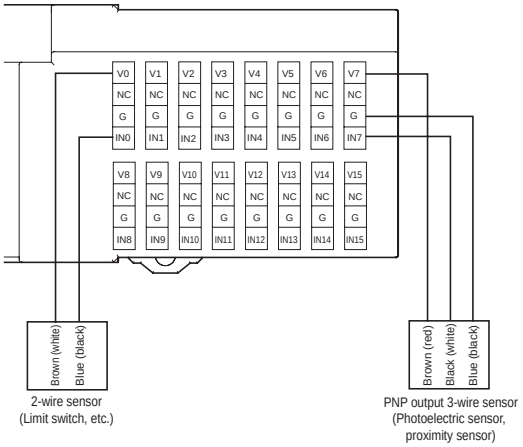
No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input indicator (0 to 15)	Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
6	Output indicator (0 to 15)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
7	I/O connector (0 to 15 × 2)	Connects an external device. <Top side> For input device <Bottom side> For output device
8	I/O power supply connector	Supplies the I/O power. (For output device)
9	DIN track mounting hook	Fixes a slave to a DIN track.

Wiring

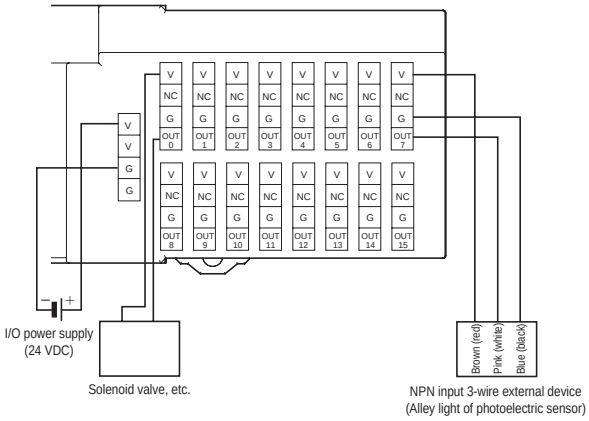
GX-ID1618 (NPN)



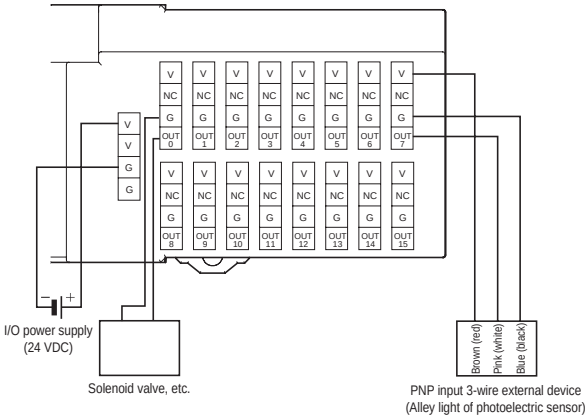
GX-ID1628 (PNP)



GX-OD1618 (NPN)



GX-OD1628 (PNP)



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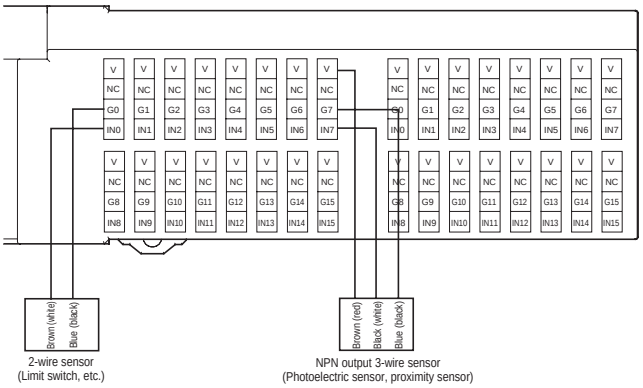
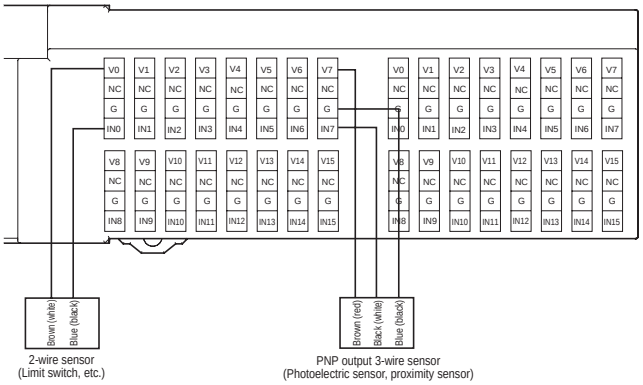
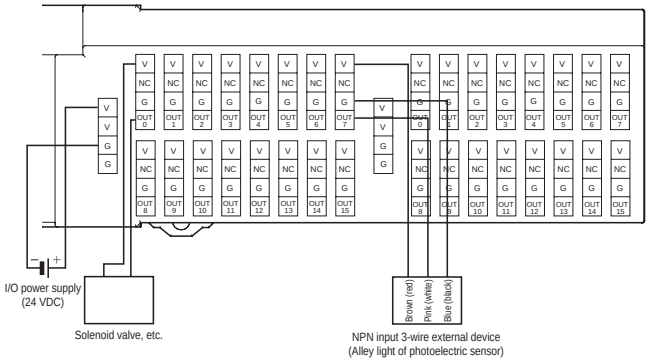


GX-ID3228 (PNP)



GX-OD3218 (NPN)



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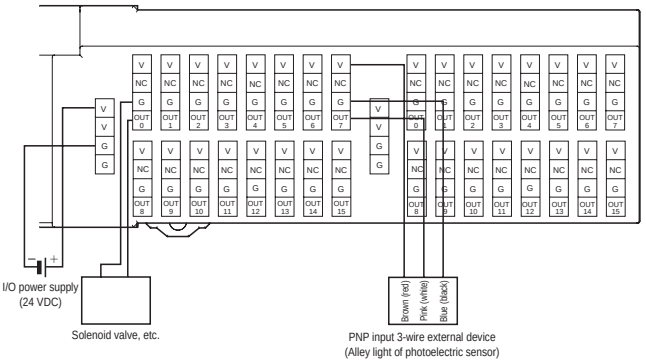
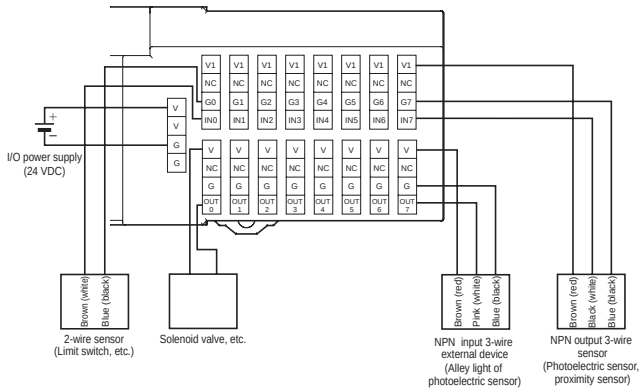
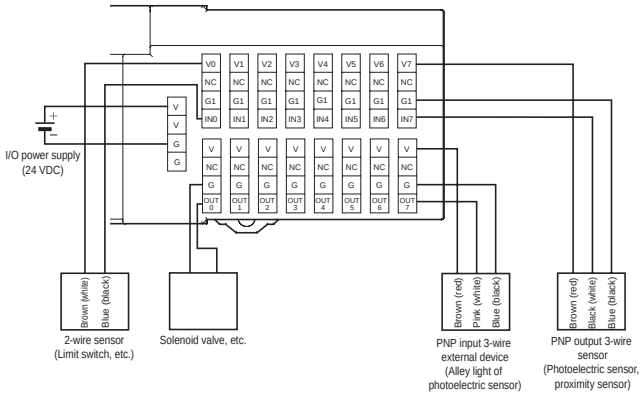


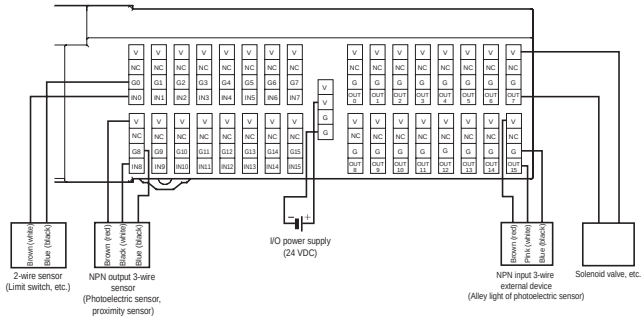
GX-MD1618 (NPN)



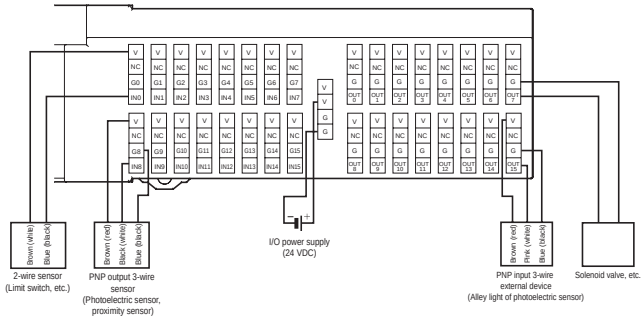
GX-MD1628 (PNP)



GX-MD3218 (NPN)



GX-MD3228 (PNP)

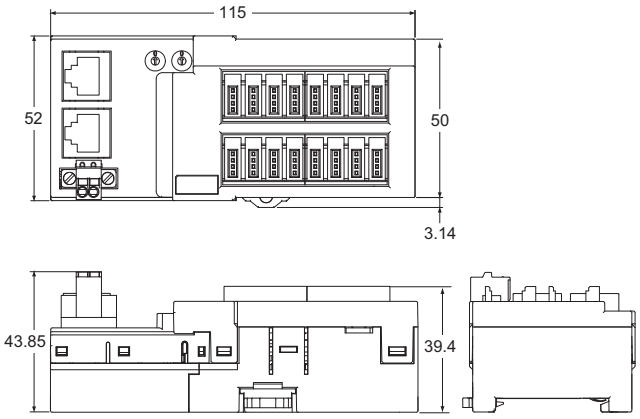


Note: Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

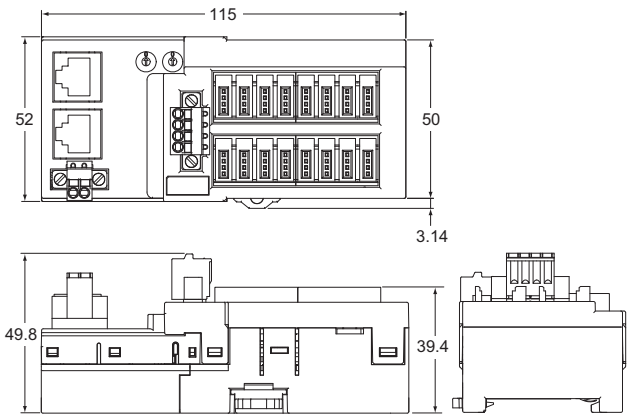
Dimensions

(Unit: mm)

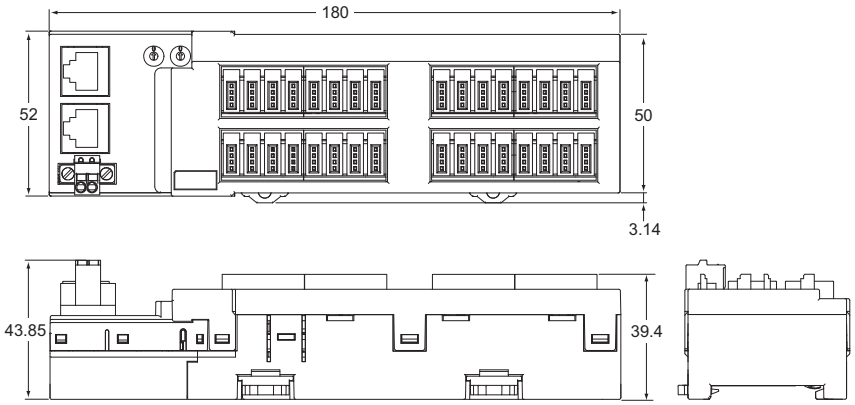
GX-ID1618/ID1628



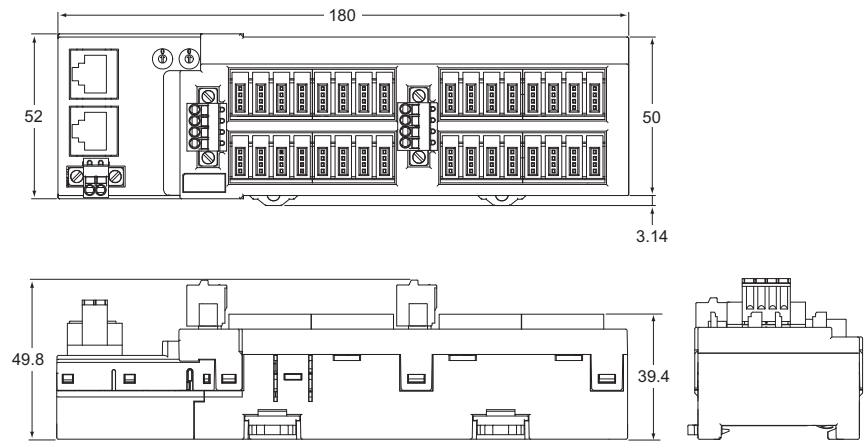
GX-OD1618/OD1628
GX-MD1618/MD1628



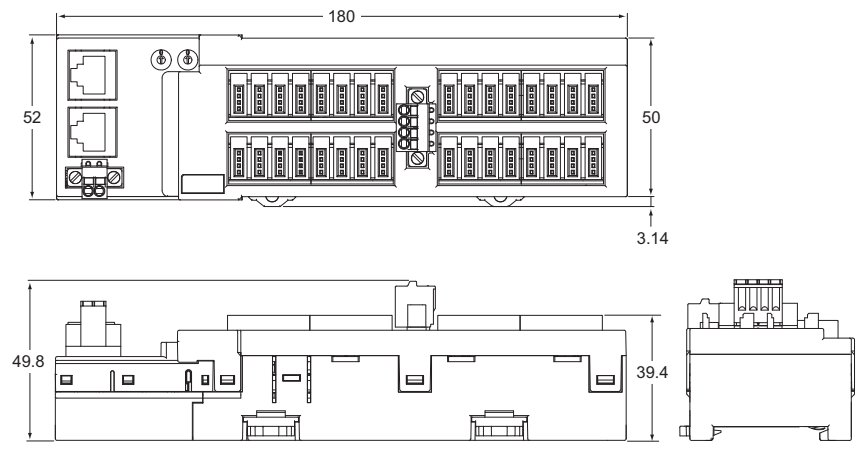
GX-ID3218/ID3228



GX-OD3218/OD3228



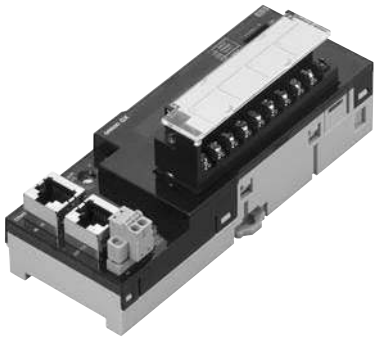
GX-MD3218/MD3228



GX-AD0471/DA0271

Analog I/O terminal with screw terminal block for EtherCAT communicaitons

- The input/output range can be easily changed by the setting with the switch.
- Detachable screw terminal block facilitates the maintenance.
- Moving average calculation function.
  Settings within the range of 100µs-64ms. (For input only.)
- Disconnection detection function.
  (For input only and for usage with 1-5V or 4-20mA ranges.)
- Selectable node address setting methods: setting with rotary switch and with tool software.
  When setting the nodes with rotary switch, setting is easy and node identification becomes possible for maintenance.



General Specifications

For Common Specifications of I/O terminals, refer to page 1.

Input Section Specifications

4-point Input Terminals

Item		Specification	
		Voltage input	Current input
Input capacity		4 points (possible to set number of enabled channels)	
Input range		0 to 5V 1 to 5V 0 to 10V –10 to +10V	4 to 20mA
Input range setting method		Input range switch: Common to input CH1/CH2, common to input CH3/CH4 SDO communication: Possible to set input CH1 to CH4 individually	
Maximum signal input		± 15 V	± 30 mA
Input impedance		1 MΩ min.	Approx. 250 Ω
Resolution		1/8000 (full scale)	
Overall accuracy	25 °C	± 0.3% FS	± 0.4% FS
	–10 to +55 °C	± 0.6% FS	± 0.8% FS
Analog conversion cycle		500 µs/input When 4 points are used: 2 ms max.	
A/D converted data		Other than ± 10 V: 0000 to 1F40 Hex full scale (0 to 8000) ± 10 V: F060 to 0FA0 Hex full scale (–4000 to +4000) A/D conversion range: ± 5% FS of the above data ranges.	
Isolation method		Photocoupler isolation (between input and communications lines) No isolation between input signals	
Unit power supply current consumption		120 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Weight		180 g max.	
Accessories		Four short-circuit metal fixtures (for current input) ✻	

✻ Short-circuit metal fixtures are used for current input only, but store in a safe place when using for voltage inputs as well.

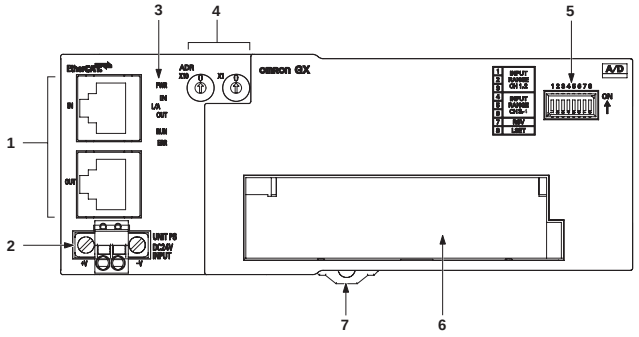
Output Section Specifications

2-point Output Terminals

Item		Specification	
		Voltage output	Current output
Output capacity		2 points (possible to set number of enabled channels)	
Output range		0 to 5V 1 to 5V 0 to 10V –10 to +10V	4 to 20mA
Output range setting method		Output range switch, SDO communications: Possible to set outputs CH1 and CH2 separately.	
External output allowable load resistance		5 kΩ min.	600 Ω max.
Resolution		1/8000 (full scale)	
Overall accuracy	25 °C	± 0.4% FS	
	–10 to +55 °C	± 0.8%FS	
Analog conversion cycle		500 µs/input When 2 points are used: 1 ms max.	
D/A converted data		Other than ± 10 V: 0000 to 1F40 Hex full scale (0 to 8000) ± 10 V: F060 to 0FA0 Hexfull scale (–4000 to +4000) D/A conversion range: ± 5% FS of the above data ranges	
Isolation method		Photocoupler isolation (between output and communications lines) No isolation between output signals	
Unit power supply current consumption		150 mA max. (for 20.4 to 26.4-VDC power supply voltage)	
Weight		190 g max.	

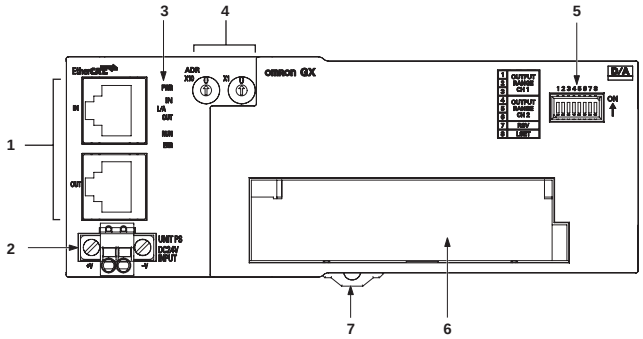
Components and functions

4-points Analog Inputs Terminal GX-AD0471



No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Input range switch	DIP switch for setting input range.
6	Terminal Block	Terminal block for analog input signals V1 to V4: Voltage input terminals I1 to I4: Current input terminals AG: Analog GND NC: Not used
7	DIN track mounting hook	Fixes a slave to a DIN track.

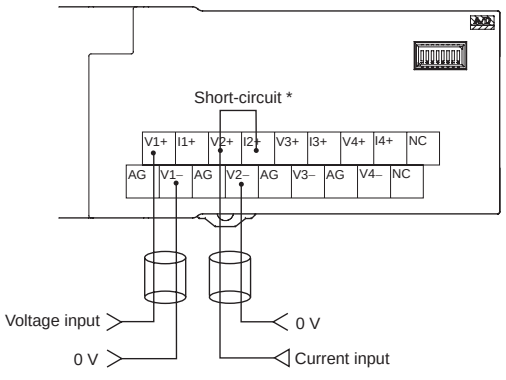
2-points Analog Inputs Terminal GX-DA0271



No.	Name	Function
1	Communications connector	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status indicator	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switch	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Output range switch	DIP switch for setting output range.
6	Terminal Block	Terminal block for analog output signals V1+, V2+: Voltage output positive terminals I1+, I2+: Current output positive terminals 1–, 2–: Voltage/current output negative terminals NC: Not used
7	DIN track mounting hook	Fixes a slave to a DIN track.

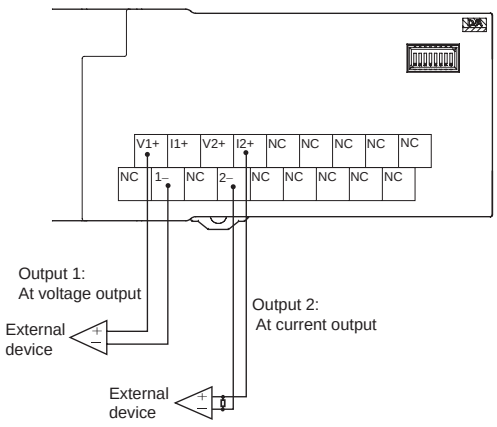
Wiring

GX-AD0471



* Short-circuit the “V positive” terminal and “I positive” terminal at current input.
Use the attached short-circuit metal fixture to short-circuit terminals.

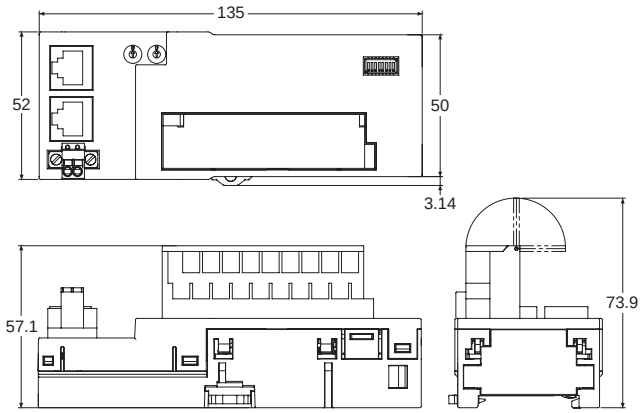
GX-DA0271



Dimensions

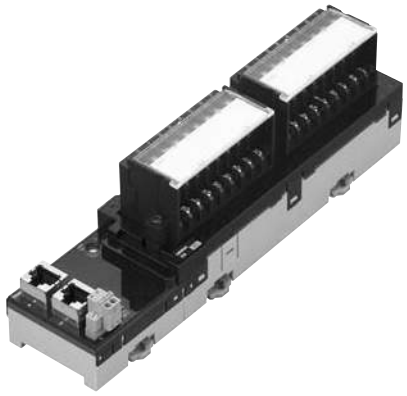
(Unit: mm)

GX-AD0471
GX-DA0271



GX-EC0211/EC0241

EtherCAT-compatible encoder input terminal which enables high-speed and accurate control



- Two counter function available. Pulse count within 32 bit range.
- Maximum input pulse frequency of 4MHz (Line driver input after quadrature). High-speed network EtherCAT enables high-speed and accurate control.
- Selectable two input types: Open collector input and line driver input.
- Built-in two external latch inputs and one reset input .
- Selectable node address settings: setting with rotary switches and setting on tool software.
- Detachable screw terminal will facilitate the maintenance work.

General Specifications

For Common Specifications of I/O terminals, refer to page 1.

Open collector inputs Type

Terminal specifications

Item	Specification
Counter point	2 points
Input signal	Counter phase A Counter phase B Counter phase Z Latch input (A/B) Counter reset input
Counter enabled status display	LED display (green)
Input indicators	LED display (yellow)
Unit power supply current consumption	130 mA max. (for 20.4 to 26.4 VDC power supply voltage)
Weight	390 g max.

Pulse input specifications

Item	Specification			
	Counter phase A/B		Counter phase Z	
Input voltage	20.4 to 26.4 VDC (24 VDC −15 to +10%)	4.5 to 5.5 VDC (5 VDC ±5%)	20.4 to 26.4 VDC (24 VDC −15 to +10%)	4.5 to 5.5 VDC (5 VDC ±5%)
Input current	8.4 mA (at 24 VDC)	8.6 mA (at 5 VDC)	8.4 mA (at 24 VDC)	8.6 mA (at 5 VDC)
ON voltage	19.6 V min.	4.5 V min.	18.6 V min.	4.5 V min.
OFF voltage	4 V max.	1.5 V max.	4 V max.	1.5 V max.
Input restriction resistance	2.7 kΩ	430 Ω	2.7 kΩ	430 Ω
Maximum response frequency	Single phase 500 kHz (phase difference Multiplication × 4, 125 kHz)		125 kHz	
Filter switching	NA		NA	

Latch/reset input specifications

Item	Specification	
	Latch input (A/B)	Reset input
Internal I/O common	NPN	
Input voltage	20.4 to 26.4 VDC (24 VDC −15 to +10%)	20.4 to 26.4 VDC (24 VDC −15 to +10%)
Input impedance	4.0 kΩ	3.3 kΩ
Input current	5.5 mA (at 24 VDC)	7 mA (at 24 VDC)
ON voltage/ON current	17.4 VDC min./3 mA min.	14.4 VDC min./3 mA min.
OFF voltage/OFF current	5 VDC max./1 mA max.	5 VDC max./1 mA max.
ON response time	3 μs max.	15 μs max.
OFF response time	3 μs max.	90 μs max.

Note: For the pulse input timing specifications, refer to USER'S MANUAL (Cat. No. W488).

Line Driver inputs Type

Terminal specifications

Item	Specification
Counter point	2 points
Input signal	Counter phase A Counter phase B Counter phase Z Latch input (A/B) Counter reset input
Counter enabled status display	LED display (green)
Input indicators	LED display (yellow)
Unit power supply current consumption	100 mA max. (for 20.4 to 26.4 VDC power supply voltage)
Weight	390 g max.

Pulse input specifications

Item	Specification	
	Counter phase A/B	Counter phase Z
Input voltage	EIA standard RS-422-A line driver level	
Input impedance	120 Ω ±5%	
gH level input voltage	0.1 V	
gL level input voltage	−0.1 V	
Hysteresis voltage	60 mV	
Maximum response frequency	Single phase 4 MHz (phase difference Multiplication ×4, 1 MHz)	1 MHz
Filter switching	NA	

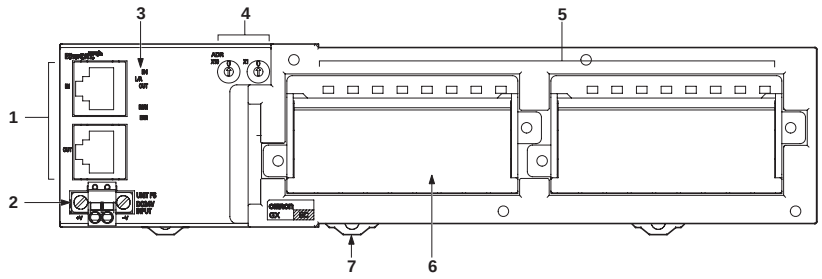
Latch/reset input specifications

Item	Specification	
	Latch input (A/B)	Reset input
Internal I/O common	PNP	
Input voltage	20.4 to 26.4 VDC (24 VDC −15 to +10%)	20.4 to 26.4 VDC (24 VDC −15 to +10%)
Input impedance	4.0 kΩ	3.3 kΩ
Input current	5.5 mA (at 24 VDC)	7 mA (at 24 VDC)
ON voltage/ON current	17.4 VDC min./3 mA min.	14.4 VDC min./3 mA min.
OFF voltage/OFF current	5 VDC max./1 mA max.	5 VDC max./1 mA max.
ON response time	3 μs max.	15 μs max.
OFF response time	3 μs max.	90 μs max.

Note: For the pulse input timing specifications, refer to USER'S MANUAL (Cat. No. W488).

Components and functions

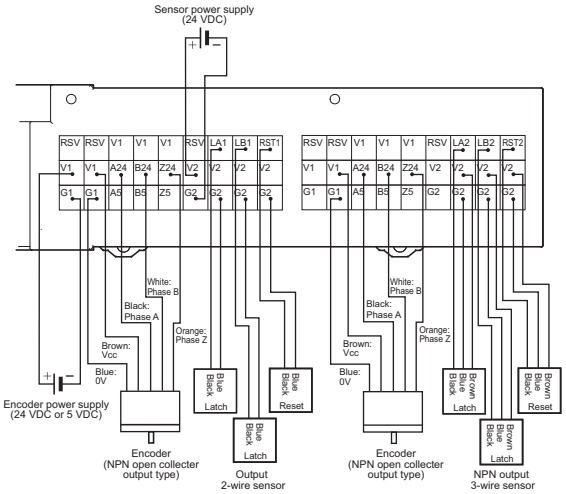
Open collector inputs Type GX-EC0211
Line driver inputs Type GX-EC0241

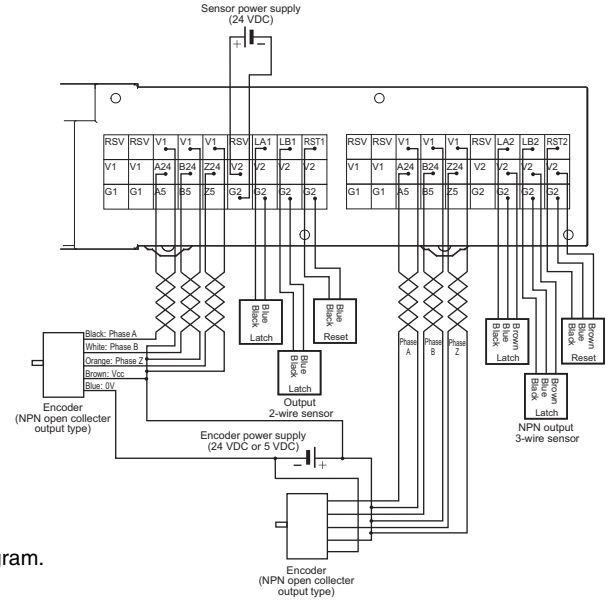


No.	Name	Function
1	Communications Connectors	(CN IN) Connects the communications cable which comes from the Master Unit side. (CN OUT) Connects the communications cable of the next I/O terminal.
2	Unit Power Supply Connector	Connect the unit power supply (24 VDC).
3	Status Indicators	It indicates the communication state and the operation state of I/O terminals.
4	Node address Switches	It sets node addresses of terminals (decimal). Setting range is 00 to 99.
5	Inputs Indicators	The indicators show the status of the inputs of each channel. For details, refer to GX Series Operation Manual (Cat.No.W488).
6	Terminal Block	Connects external devices and the I/O power supply. For details, refer to GX Series Operation Manual (Cat.No.W488).
7	DIN track mounting hook	Fixes Slave Unit to a DIN track.

Wiring

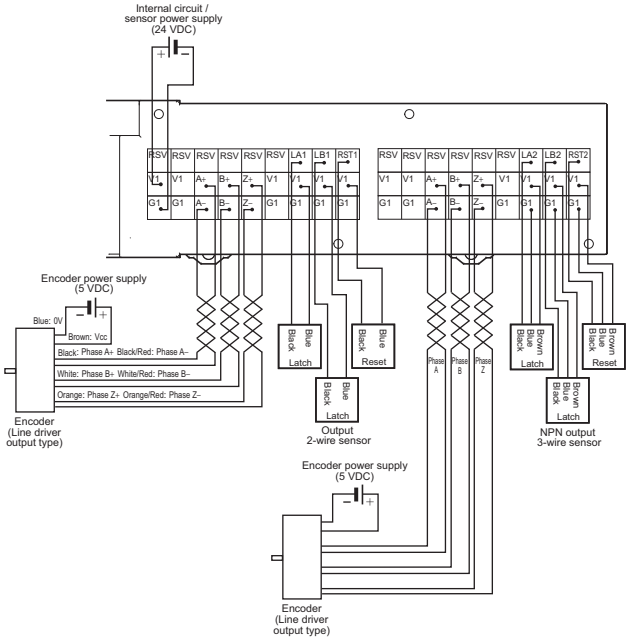
Open collector inputs Type GX-EC0211





Note: Wire the V1, G1, V2, and G2 terminals as shown in the wiring diagram.

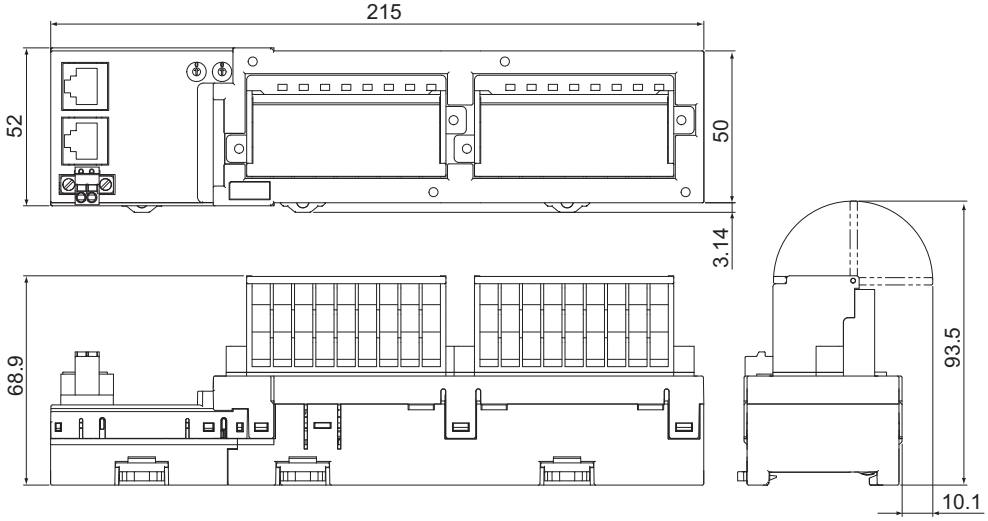
Line driver inputs Type GX-EC0241



Dimensions

(Unit: mm)

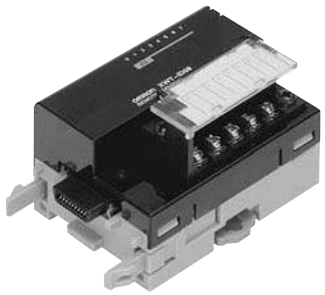
GX-EC0211/EC0241



XWT-□D08(-1)/□D16(-16)

Expansion I/O Units make expansion easy!

- Flexible expansion with many different combinations.
- Removable I/O terminal block enables faster startup time and improved maintainability.
- Common expansion unit with DeviceNet (DRT2-Series) and CompoNet (CRT1-Series).



General Specifications

For Common Specifications of I/O terminals, refer to page 1.

Input Section Specifications

8-point Input Expansion Units

Item	Specification	
	XWT-ID08	XWT-ID08-1
Internal I/O common	NPN	PNP
I/O capacity	8 inputs	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input	
ON delay	1.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 inputs/common	
Communications power supply current consumption	5 mA	
Weight	80 g max.	

16-point Input Expansion Units

Item	Specification	
	XWT-ID16	XWT-ID16-1
Internal I/O common	NPN	PNP
I/O capacity	16 inputs	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input	
ON delay	1.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	16 inputs/common	
Communications power supply current consumption	10 mA	
Weight	120 g max.	

Output Section Specifications

8-point Input Expansion Units

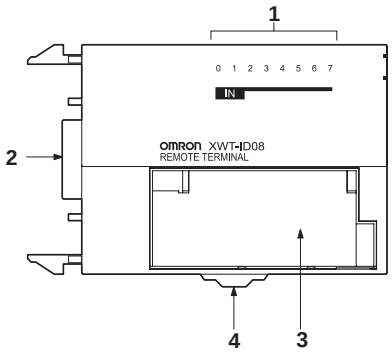
Item	Specification	
	XWT-OD08	XWT-OD08-1
Internal I/O common	NPN	PNP
I/O capacity	8 outputs	
Rated output current	0.5 A/output, 2.0 A/common	
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 outputs/common	
Communications power supply current consumption	5 mA	
Weight	80 g max.	

16-point Input Expansion Units

Item	Specification	
	XWT-OD16	XWT-OD16-1
Internal I/O common	NPN	PNP
I/O capacity	16 outputs	
Rated output current	0.5 A/output, 4.0 A/common	
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	16 outputs/common	
Communications power supply current consumption	10 mA	
Weight	120 g max.	

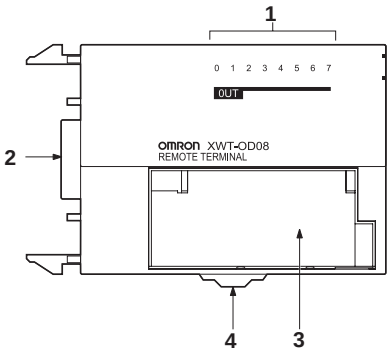
Components and functions

XWT-ID08/ID08-1



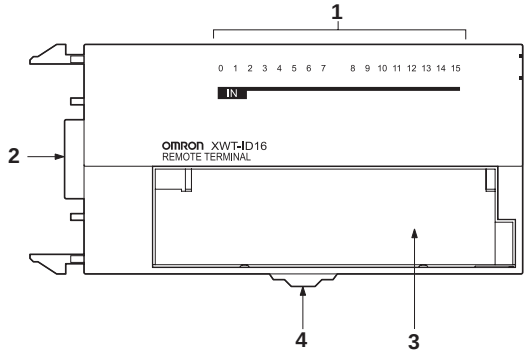
No.	Name	Function
1	Input indicator (0 to 7)	Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
2	Terminal connector	Connects the connector on the right side of the slave.
3	Terminal block	Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 7: Input terminals
4	DIN track mounting hook	Fixes a slave to a DIN track.

XWT-OD08/OD08-1



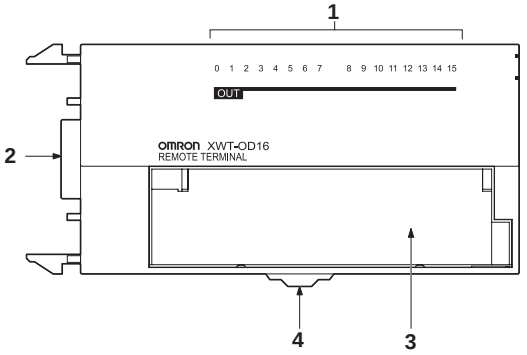
No.	Name	Function
1	Output indicator (0 to 7)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
2	Terminal connector	Connects the connector on the right side of the slave.
3	Terminal block	Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 7: Output terminals
4	DIN track mounting hook	Fixes a slave to a DIN track.

XWT-ID16/ID16-1



No.	Name	Function
1	Input indicator (0 to 15)	Indicates the state of input contact (ON/OFF). Not lit: Contact OFF (input OFF state) Lit in yellow: Contact ON (input ON state)
2	Terminal connector	Connects the connector on the right side of the slave.
3	Terminal block	Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 15: Input terminals
4	DIN track mounting hook	Fixes a slave to a DIN track.

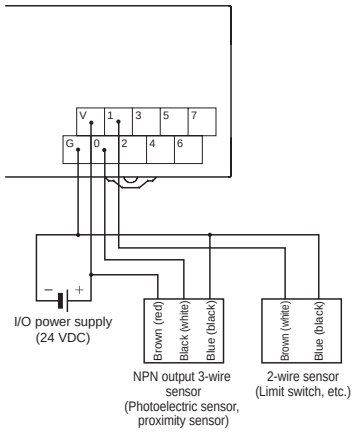
XWT-OD16/OD16-1



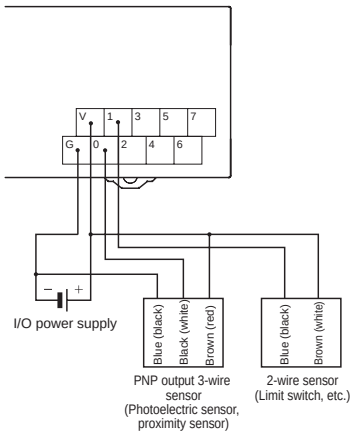
No.	Name	Function
1	Output indicator (0 to 15)	Indicates the state of output contact (ON/OFF). Not lit: Contact OFF (output OFF state) Lit in yellow: Contact ON (output ON state)
2	Terminal connector	Connects the connector on the right side of the slave.
3	Terminal block	Connects external devices and the I/O power supply. V, G: I/O power supply terminals 0 to 15: Output terminals
4	DIN track mounting hook	Fixes a slave to a DIN track.

Wiring

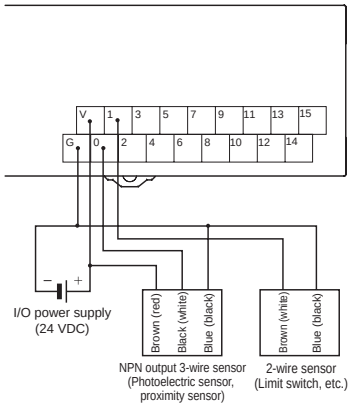
XWT-ID08 (NPN)



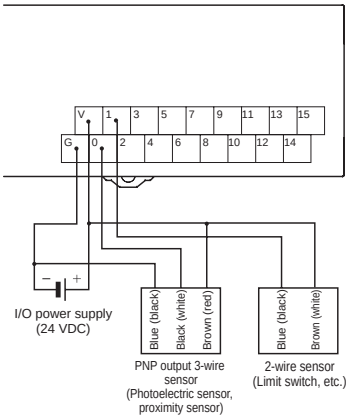
XWT-ID08-1 (PNP)



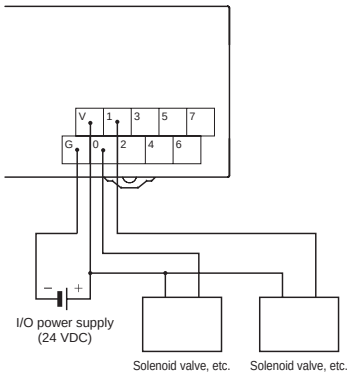
XWT-ID16 (NPN)



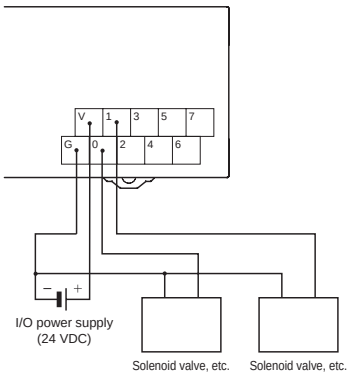
XWT-ID16-1 (PNP)



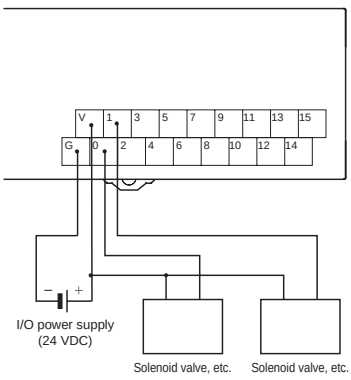
XWT-OD08 (NPN)



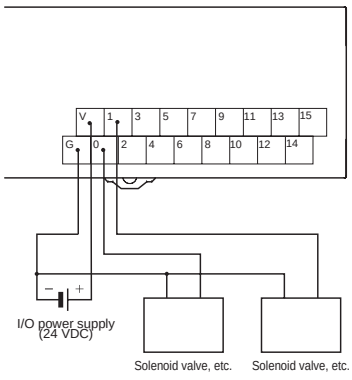
XWT-OD08-1 (PNP)



XWT-OD16 (NPN)



XWT-OD016-1 (PNP)

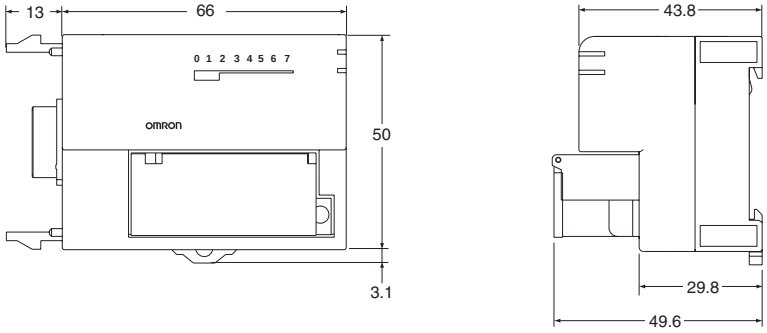


Note: Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

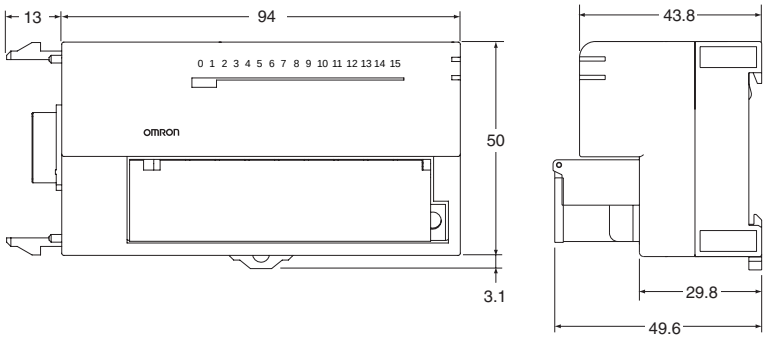
Dimensions

(Unit: mm)

XWT-ID08/ID08-1
XWT-OD08/OD08-1



XWT-ID16/ID16-1
XWT-OD16/OD16-1



Ordering Information

Interpreting Model Numbers

GX-□□ □□ □ □ □

1 2 3 4 5

1) Type

Code	Specifications
ID	DC Input
OD	DC Output
MD	DC Input/Output
OC	Relay Output
AD	Analog Input
DA	Analog Output
EC	Encoder Input

2) Number of I/O point

Code	Specifications
02	2 points (2CH)
04	4 points (4CH)
16	16 points
32	32 points

3) Input/Output type

Code	Digital Input/ Digital Output type	Analog Input/ Analog Output type	Encoder Input Type
1	NPN/Sinking	–	Open collector input, NPN
2	PNP/Sourcing	–	–
4	–	–	Line driver input, PNP
7	–	Multi 1 (Current/Voltage)	–

4) Connecting

Code	Specifications
1	Screw (Common) (2-tier Terminal Block)
2	Screw (Divided common) (3-tier Terminal Block)
8	e-CON

5) Figure/Function

Code	Digital Input/ Digital Output type	Analog Input/ Analog Output type	Encoder Input Type
None	Horizontal type	Standard type	–

Ordering Information

International Standards

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, and CE: EC Directives.
- Contact your OMRON representative for further details and applicable conditions for these standards.

Digital I/O Terminal

Terminal Block Type

Name	Specifications			Model	Standards
2-tier terminal blocks	Inputs	16 inputs	NPN	**GX-ID1611**	UC1, N, L, CE
			PNP	**GX-ID1621**	
	Outputs	16 outputs	NPN	**GX-OD1611**	
			PNP	**GX-OD1621**	
	Outputs	16 outputs	Relay	**GX-OC1601**	
	Inputs/Outputs	8 inputs/8 outputs	NPN	**GX-MD1611**	
			PNP	**GX-MD1621**	
3-tier terminal blocks	Inputs	16 inputs	NPN	**GX-ID1612**	
			PNP	**GX-ID1622**	
	Outputs	16 outputs	NPN	**GX-OD1612**	
			PNP	**GX-OD1622**	
	Inputs/Outputs	8 inputs/8 outputs	NPN	**GX-MD1612**	
			PNP	**GX-MD1622**	

e-CON Connector Type

Name	Specifications			Model	Standards
e-CON Connector Type	Inputs	16 inputs	NPN	**GX-ID1618**	UC1, N, L, CE
			PNP	**GX-ID1628**	
	Outputs	16 outputs	NPN	**GX-OD1618**	
			PNP	**GX-OD1628**	
	Inputs/Outputs	8 inputs/8 outputs	NPN	**GX-MD1618**	
			PNP	**GX-MD1628**	
	Inputs	32 inputs	NPN	**GX-ID3218**	
			PNP	**GX-ID3228**	
	Outputs	32 outputs	NPN	**GX-OD3218**	
			PNP	**GX-OD3228**	
	Inputs/Outputs	16 inputs/16 outputs	NPN	**GX-MD3218**	
			PNP	**GX-MD3228**	

Analog I/O Terminal

2-tier Terminal Block Type

Name	Specifications		Model	Standards
2-tier terminal block type	Analog inputs	4 inputs	**GX-AD0471**	UC1, N, L, CE
	Analog outputs	2 outputs	**GX-DA0271**	

Encoder Input Terminal

3-tier Terminal Block Type

Name	Specifications		Model	Standards
3-tier Terminal Block Type	Open collector inputs	2 inputs	**GX-EC0211**	UC1, N, L, CE
	Line driver inputs	2 inputs	**GX-EC0241**	

Expansion Units

Name	Specifications				Model	Standards
Expansion Units	Inputs	8 inputs	NPN	One Expansion Unit can be mounted to one GX-ID16□1/OD16□1/OC1601 Digital I/O Terminal.	**XWT-ID08**	UC1, N, CE
			PNP		**XWT-ID08-1**	
	Outputs	8 outputs	NPN		**XWT-OD08**	
			PNP		**XWT-OD08-1**	
	Inputs	16 inputs	NPN		**XWT-ID16**	
			PNP		**XWT-ID16-1**	
	Outputs	16 outputs	NPN		**XWT-OD16**	
			PNP		**XWT-OD16-1**	

Recommended EtherCAT Communications Cables

Use Straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (braiding and aluminum foil tape) for EtherCAT.

Cabel with Connectors

Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

Item	Appearance	Recommended manufacturer	Cable length (m) ✻1	Model
Standard type Cable with Connectors on Both Ends (RJ45/RJ45) Wire Gauge and Number of Pairs: AWG27, 4-pair Cable Cable Sheath material: LSZH ✻2 Cable color: Yellow ✻3		OMRON	0.3	XS6W-6LSZH8SS30CM-Y
			0.5	XS6W-6LSZH8SS50CM-Y
			1	XS6W-6LSZH8SS100CM-Y
			2	XS6W-6LSZH8SS200CM-Y
			3	XS6W-6LSZH8SS300CM-Y
			5	XS6W-6LSZH8SS500CM-Y
Rugged type Cable with Connectors on Both Ends (RJ45/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	XS5W-T421-AMD-K
			0.5	XS5W-T421-BMD-K
			1	XS5W-T421-CMD-K
			2	XS5W-T421-DMD-K
			5	XS5W-T421-GMD-K
			10	XS5W-T421-JMD-K
Rugged type Cable with Connectors on Both Ends (M12 Straight/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	XS5W-T421-AMC-K
			0.5	XS5W-T421-BMC-K
			1	XS5W-T421-CMC-K
			2	XS5W-T421-DMC-K
			5	XS5W-T421-GMC-K
			10	XS5W-T421-JMC-K
Rugged type Cable with Connectors on Both Ends (M12 Right-angle/RJ45) Wire Gauge and Number of Pairs: AWG22, 2-pair Cable		OMRON	0.3	XS5W-T422-AMC-K
			0.5	XS5W-T422-BMC-K
			1	XS5W-T422-CMC-K
			2	XS5W-T422-DMC-K
			5	XS5W-T422-GMC-K
			10	XS5W-T422-JMC-K

✻1 Standard type cables length 0.2, 0.3, 0.5, 1, 1.5, 2, 3, 5, 7.5, 10, 15 and 20m are available.
Rugged type cables length 0.3, 0.5, 1, 2, 3, 5, 10 and 15m are available.
✻2 The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use.
✻3 Cables colors are available in blue, yellow, or Green

Note: For details, refer to Cat.No.G019.

Cables / Connectors

Wire Gauge and Number of Pairs: AWG24, 4-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables	–	Hitachi Metals, Ltd.	NETSTAR-C5E SAB 0.5 x 4P ✻
	–	Kuramo Electric Co.	KETH-SB ✻
	–	SWCC Showa Cable Systems Co.	FAE-5004 ✻
RJ45 Connectors	–	Panduit Corporation	MPS588 ✻

✻ We recommend you to use above cable and connector together.

Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables	–	Kuramo Electric Co.	KETH-PSB-OMR ✻
	–	JMACS Japan Co., Ltd.	PNET/B ✻
RJ45 Assembly Connector		OMRON	XS6G-T421-1 ✻

✻ We recommend you to use above cable and connector together.

Note: Connect both ends of cable shielded wires to the connector hoods.

Software

How to Select Required Support Software for Your Controller

The required Support Software depends on the Controller to connect. Please check the following table when purchasing the Support Software.

Product	Omron PLC System	Omron Machine Automation Controller System
Controller	CJ-series	NJ/NX-series
Software	FA Integrated Tool Package CX-One	Automation Software Sysmac Studio

FA Integrated Tool Package CX-One

Product name	Specifications			Model	Standards
		Number of licenses	Media		
FA Integrated Tool Package CX-One Ver.4.□	The CX-One is a comprehensive software package that integrates Support Software for OMRON PLCs and components. CX-One runs on the following OS. OS: Windows XP (Service Pack 3 or higher, 32-bit version) / Windows Vista (32-bit/64-bit version) / Windows 7 (32-bit/64-bit version) / Windows 8 (32-bit/64-bit version) / Windows 8.1 (32-bit/64-bit version) / Windows 10 (32-bit/64-bit version) CX-One Version 4.□ includes CX-Programmer Ver.9.□ For details, refer to the CX-One catalog (Cat. No. R134)	1 license ✻	DVD	CXONE-AL01D-V4	–

✻ Multi licenses (3, 10, 30, or 50 licenses) and DVD media without licenses are also available for the CX-One.

Automation Software Sysmac Studio

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. Each model of licenses does not include any DVD.

Product name	Specifications			Model	Standards
		Number of licenses	Media		
Sysmac Studio Standard Edition Ver.1.□	The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX Series, EtherCat Slave, and the HMI. Sysmac Studio runs on the following OS. OS: Windows XP (Service Pack 3 or higher, 32-bit version) / Windows Vista (32-bit version) / Windows 7 (32-bit/64-bit version) / Windows 8 (32-bit/64-bit version) / Windows 8.1 (32-bit/64-bit version) / Windows 10 (32-bit/64-bit version)	– (Media only)	DVD	SYSMAC-SE200D	–
	The Sysmac Studio Standard Edition DVD includes Support Software to set up EtherNet/IP Units, DeviceNet slaves, Serial Communications Units, and Support Software for creating screens on HMIs (CX-Designer). For details, refer to the Sysmac Integrated Catalogue (P072).	1 license ✻	–	SYSMAC-SE201L	–

✻ Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).

Related Manuals

Cat. No.	Model number	Manual
W488	GX-□□□□□□□	GX-Series EtherCAT Slave USER'S MANUAL
W505	NX701/NJ501/NJ301/NJ101-□□□□	NJ/NX-series CPU Unit Built-in EtherCAT Port User's Manual
W487	CJ1W-NC□81/NC□82	CJ Series Position Control Unit OPERATION MANUAL
W504	SYSMAC-SE2□□□	Sysmac Studio version 1 OPERATION MANUAL
W446	CXONE-AL□□D-V□	CX-Programmer Operation Manual

Terms and Conditions Agreement

Read and understand this catalog.
Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.
(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.
(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE
PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.
Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.
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