

# EtherCAT® Remote I/O Terminals

## GX-Series

CSM\_GX\_DS\_E\_9\_9

### 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.

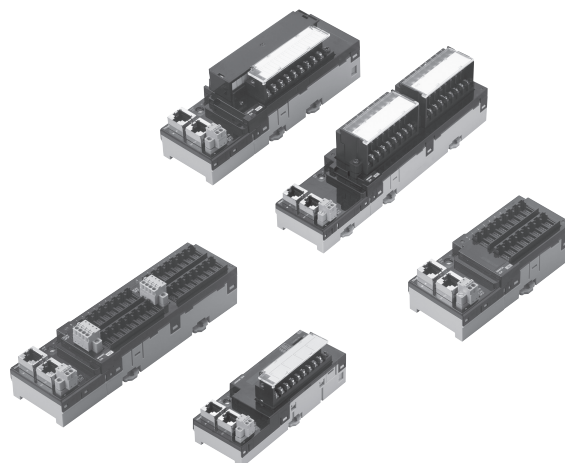
- **Encoder Input Terminal**

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 Digital I/O Terminal, Analog I/O Terminal and Encoder Input Terminal GX-Series. Refer to the pages of specifications for individual I/O terminals for details.

For General Specification of IO-Link Master Unit(GX-ILM08C), refer to page 31.

| 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                      | 10 to 60 Hz with amplitude of 0.7 mm, 60 to 150Hz and 50 m/s <sup>2</sup> in X, Y, and Z directions for 80 minutes<br><Relay Output Unit GX-OC1601 only><br>10 to 55 Hz with double-amplitude of 0.7 mm X, Y, and Z directions for 80 minutes |
| Impact resistance                         | 150 m/s <sup>2</sup> with amplitude of 0.7 mm<br><Relay Output Unit GX-OC1601 only><br>100 m/s <sup>2</sup> (3 times each in 6 directions on 3 axes)                                                                                          |
| Dielectric strength                       | 600 VAC (between isolated circuits)                                                                                                                                                                                                           |
| Isolation resistance                      | 20 M $\Omega$ 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<br>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.

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# 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<br>CN IN: EtherCAT input<br>CN OUT: EtherCAT output                                       |
| Topology                    | Daisy chain                                                                                                           |
| 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<br>1 to 65535: Set with Sysmac Studio                                                 |
| LED display                 | PWR × 1<br>L/A IN (Link/Activity IN) × 1<br>L/A OUT (Link/Activity OUT) × 1<br>RUN × 1<br>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)<br>Encoder Input Slave Unit: DC mode 1 |

## Version Information

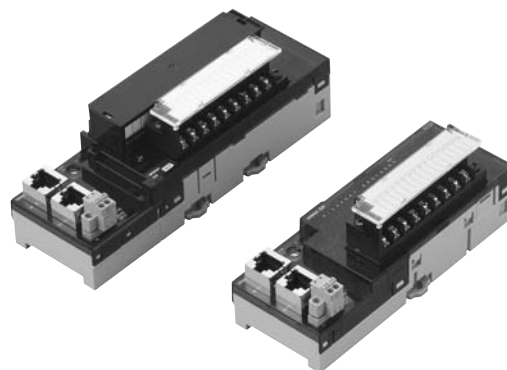
| EtherCAT Slave Unit model | Unit version | Compatible version of Support Software |                    |
|---------------------------|--------------|----------------------------------------|--------------------|
|                           |              | Sysmac Studio                          | Cx-ConfiguratorFDT |
| GX-ID□□□□                 | Ver.1.2      | Ver.1.25                               | –                  |
|                           | Ver.1.1      | Ver.1.01                               | –                  |
|                           | Ver.1.0      |                                        |                    |
| GX-OD□□□□                 | Ver.1.2      | Ver.1.25                               | –                  |
|                           | Ver.1.1      | Ver.1.01                               | –                  |
|                           | Ver.1.0      |                                        |                    |
| GX-OC□□□□                 | Ver.1.2      | Ver.1.25                               | –                  |
|                           | Ver.1.1      | Ver.1.01                               | –                  |
|                           | Ver.1.0      |                                        |                    |
| GX-MD□□□□                 | Ver.1.2      | Ver.1.25                               | –                  |
|                           | Ver.1.1      | Ver.1.01                               | –                  |
|                           | Ver.1.0      |                                        |                    |
| GX-AD□□□□                 | Ver.1.2      | Ver.1.25                               | –                  |
|                           | Ver.1.1      | Ver.1.01                               | –                  |
|                           | Ver.1.0      |                                        |                    |
| GX-DA□□□□                 | Ver.1.2      | Ver.1.25                               | –                  |
|                           | Ver.1.1      | Ver.1.01                               | –                  |
|                           | Ver.1.0      |                                        |                    |
| GX-EC□□□□                 | Ver.1.2      | Ver.1.25                               | –                  |
|                           | Ver.1.1      | Ver.1.01                               | –                  |
|                           | Ver.1.0      |                                        |                    |
| GX-ILM□□□                 | Ver.1.2      | Ver.1.25                               | Ver.2.2            |
|                           | Ver.1.1      | Ver.1.20                               | Ver.2.2            |
|                           | Ver.1.0      | Ver.1.16                               | Ver.2.2            |

**Note:** Refer to User's Manual for details on the functions that have been added or changed due to the unit version upgrade of the EtherCAT Slave Units.

# 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)<br>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.<br>(0.5 ADC, between each output terminal and the G terminal) | 1.2 V max.<br>(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                            | DRTA-NY5W-K                                                                        |
| Rated load                                | Resistance load<br>250 VAC 2 A/output, common 8 A<br>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                                                                                 |

#### 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.<br>(between each input terminal and the V terminal)                         | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                          | 5 VDC max.<br>(between each input terminal and the V terminal)                          | 5 VDC max.<br>(between each input terminal and the G terminal)  |
| OFF current                          | 1.0 mA max.                                                                             |                                                                 |
| Input current                        | 6.0 mA max./input (at 24-VDC)<br>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<br>(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

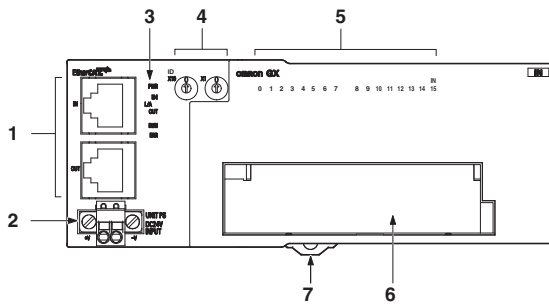
| Item                                      | Specification                                                         |                                                                       |
|-------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|
|                                           | 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

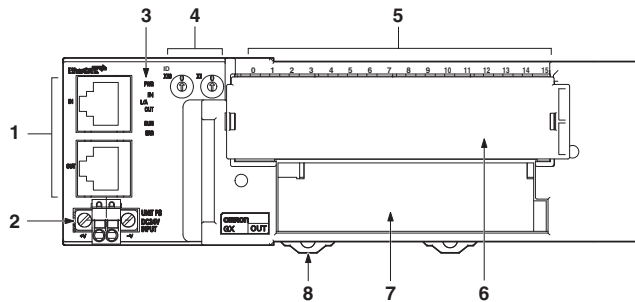
16 Inputs Terminal GX-ID1611/ID1621

16 Outputs Terminal GX-OD1611/OD1621



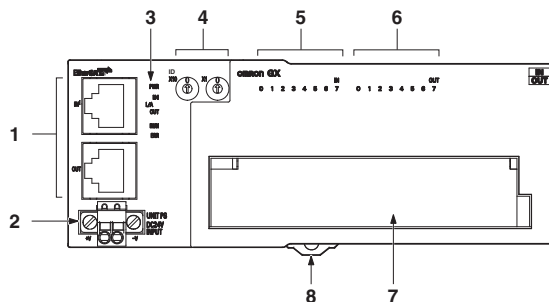
| No. | Name                                                                                           | Function                                                                                                                                                                                                                                                                       |
|-----|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications connector                                                                       | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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:<br>Input indicator (0 to 15)<br>Output terminal:<br>Output indicator (0 to 15) | Indicates the state of input/output contact (ON/OFF).<br>Input terminal:<br>Not lit: Contact OFF (input OFF state)<br>Lit in yellow: Contact ON (input ON state)<br>Output terminal:<br>Not lit: Contact OFF (output OFF state)<br>Lit in yellow: Contact ON (output ON state) |
| 6   | Terminal Block                                                                                 | Connects external devices and the I/O power supply.<br>V, G: I/O power supply terminals<br>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.<br>(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).<br>Not lit: Contact OFF (input OFF state)<br>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.<br>COM0, COM1: Common terminals<br>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.<br>(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).<br>Not lit: Contact OFF (input OFF state)<br>Lit in yellow: Contact ON (input ON state)                                                                   |
| 6   | Output indicator (0 to 7)   | Indicates the state of output contact (ON/OFF).<br>Not lit: Contact OFF (output OFF state)<br>Lit in yellow: Contact ON (output ON state)                                                                |
| 7   | Terminal Block              | Connects external devices and the I/O power supply.<br><Left side><br>V1, G1: Input I/O terminals<br>0 to 7: Input terminals<br><Right side><br>V2, G2: Output I/O terminals<br>0 to 7: Output terminals |
| 8   | DIN track mounting hook     | Fixes a slave to a DIN track.                                                                                                                                                                            |

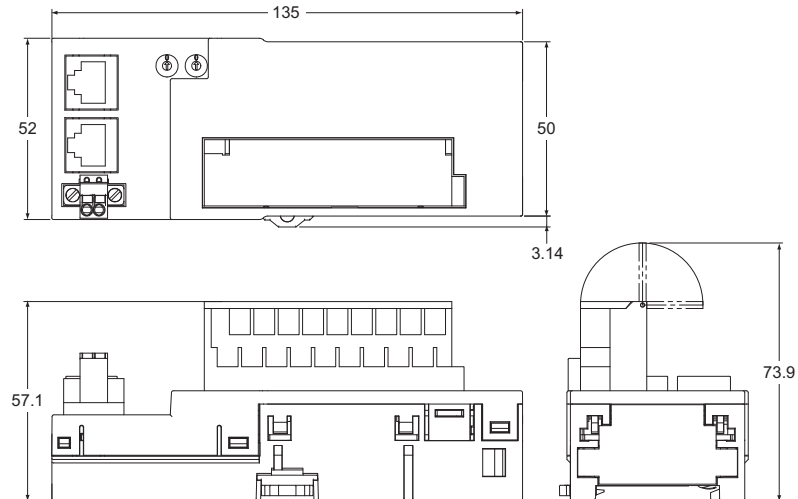
## Wiring

# GX-Series Digital I/O Terminal 2-tier Terminal Block Type

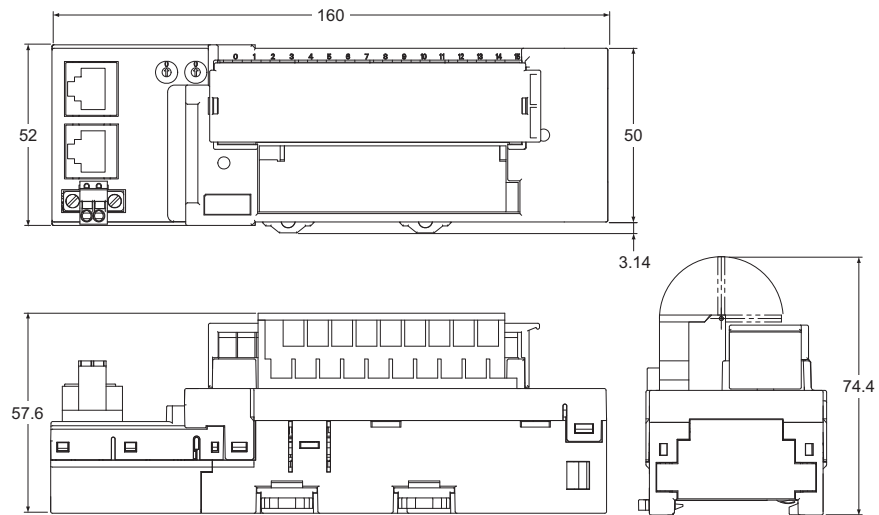
## Dimensions

(Unit: mm)

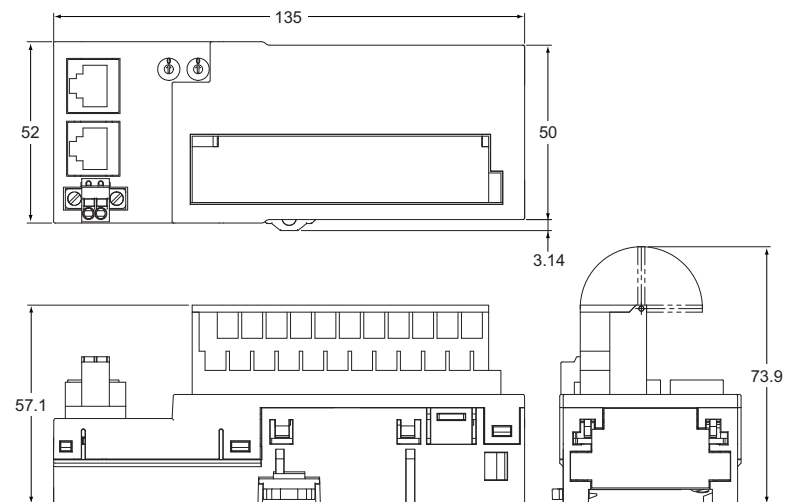
GX-ID1611/ID1621  
GX-OD1611/OD1621



GX-OC1601



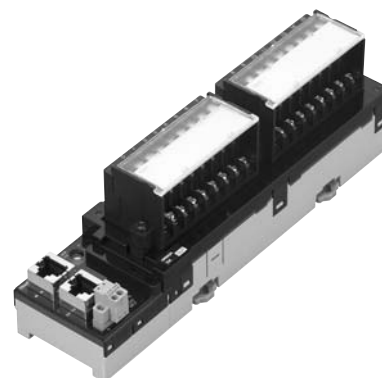
GX-MD1611/MD1621



**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.<br>(between each input terminal and the V terminal)                      | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                           | 5 VDC max.<br>(between each input terminal and the V terminal)                       | 5 VDC max.<br>(between each input terminal and the G terminal)  |
| OFF current                           | 1.0 mA max.                                                                          |                                                                 |
| Input current                         | 6.0 mA max./input (at 24-VDC)<br>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.<br>(0.5 ADC, between each output terminal and the G terminal) | 1.2 V max.<br>(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.<br>(between each input terminal and the V terminal)                      | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                          | 5 VDC max.<br>(between each input terminal and the V terminal)                       | 5 VDC max.<br>(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)<br>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)                                |                                                                 |

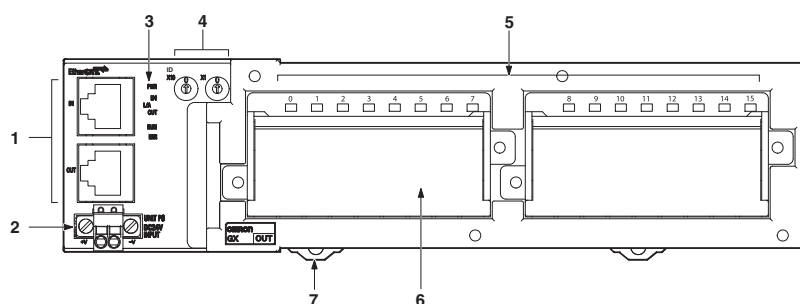
#### Output Section

| 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).

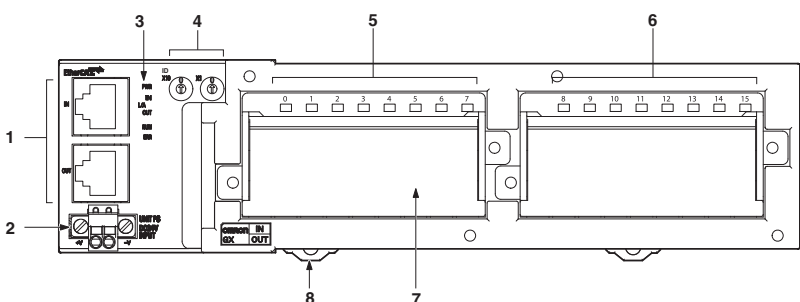
## Components and Functions

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.<br>(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).<br>Setting range is 00 to 99.                                                                                                                                                                                                   |
| 5   | Input terminal:<br>Input indicator (0 to 15)<br>Output terminal:<br>Output indicator (0 to 15) | Indicates the state of input/output contact (ON/OFF).<br>Input terminal:<br>Not lit: Contact OFF (input OFF state)<br>Lit in yellow: Contact ON (input ON state)<br>Output terminal:<br>Not lit: Contact OFF (output OFF state)<br>Lit in yellow: Contact ON (output ON state) |
| 6   | Terminal Block                                                                                 | Connects external devices and the I/O power supply.<br><Left side><br>V1, G1: I/O power supply terminals<br>0 to 7: Output terminals<br><Right side><br>V2, G2: I/O power supply terminals<br>8 to 15: Input terminals (Output terminals)                                      |
| 7   | DIN track mounting hook                                                                        | Fixes a slave to a DIN track.                                                                                                                                                                                                                                                  |

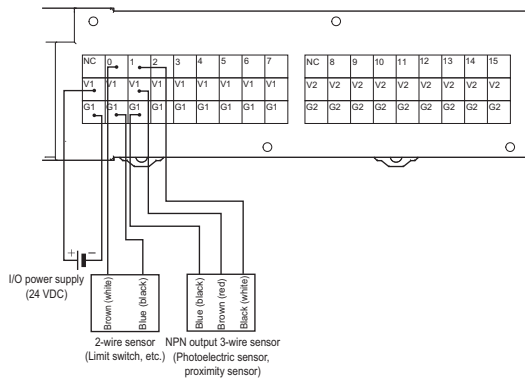
### 8 Inputs Terminal / 8 Outputs Terminal GX-MD1612/MD1622



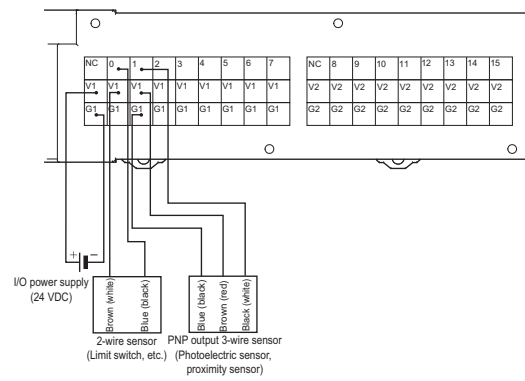
| No. | Name                        | Function                                                                                                                                                                                                                           |
|-----|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications connector    | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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).<br>Setting range is 00 to 99.                                                                                                                                                       |
| 5   | Input indicator (0 to 7)    | Indicates the state of input contact (ON/OFF).<br>Not lit: Contact OFF (input OFF state)<br>Lit in yellow: Contact ON (input ON state)                                                                                             |
| 6   | Output indicator (0 to 7)   | Indicates the state of output contact (ON/OFF).<br>Not lit: Contact OFF (output OFF state)<br>Lit in yellow: Contact ON (output ON state)                                                                                          |
| 7   | Terminal Block              | Connects external devices and the I/O power supply.<br><Left side><br>V1, G1: Input I/O power supply terminals<br>0 to 7: Input terminals<br><Right side><br>V2, G2: Output I/O power supply terminals<br>0 to 7: Output terminals |
| 8   | DIN track mounting hook     | Fixes a slave to a DIN track.                                                                                                                                                                                                      |

## Wiring

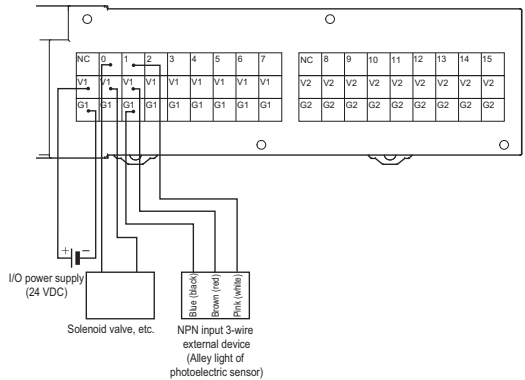
### GX-ID1612 (NPN)



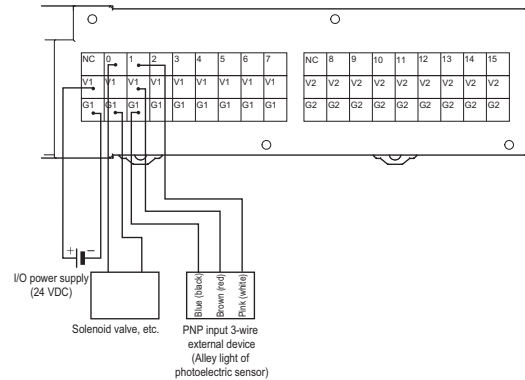
### GX-ID1622 (PNP)



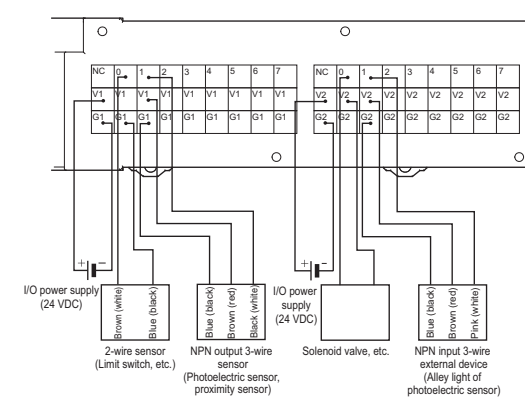
### GX-OD1612 (NPN)



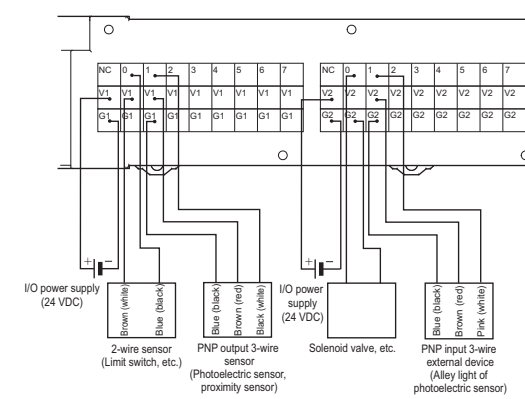
### GX-OD1622 (PNP)



### GX-MD1612 (NPN)



### GX-MD1622 (PNP)

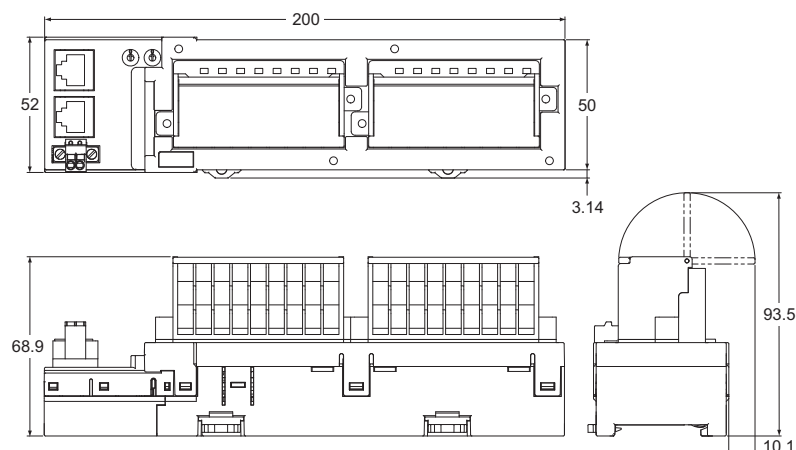


**Note:** Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

## Dimensions

(Unit: mm)

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

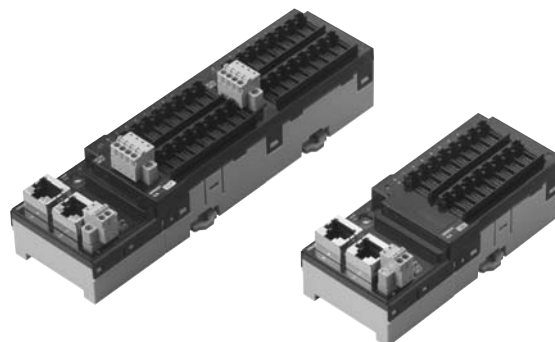


## Easy wiring using industry standard e-CON connectors.

## 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.<br>(between each input terminal and the V terminal)                      | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                           | 5 VDC max.<br>(between each input terminal and the V terminal)                       | 5 VDC max.<br>(between each input terminal and the G terminal)  |
| OFF current                           | 1.0 mA max.                                                                          |                                                                 |
| Input current                         | 6.0 mA max./input (at 24-VDC)<br>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.<br>(between each input terminal and the V terminal)                      | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                           | 5 VDC max.<br>(between each input terminal and the V terminal)                       | 5 VDC max.<br>(between each input terminal and the G terminal)  |
| OFF current                           | 1.0 mA max.                                                                          |                                                                 |
| Input current                         | 6.0 mA max./input (at 24-VDC)<br>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)                |                                                                       |
| Current consumption from I/O power supply | 10 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)               |                                                                       |
| Current consumption from I/O power supply | 10 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.) |           |

# GX-Series Digital I/O Terminal e-CON Connector Type

## Input Section

| Item                                 | Specification                                                                        |                                                                 |
|--------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------|
|                                      | GX-MD1618                                                                            | GX-MD1628                                                       |
| Input capacity                       | 8 points                                                                             |                                                                 |
| ON voltage                           | 15 VDC min.<br>(between each input terminal and the V terminal)                      | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                          | 5 VDC max.<br>(between each input terminal and the V terminal)                       | 5 VDC max.<br>(between each input terminal and the G terminal)  |
| OFF current                          | 1.0 mA max.                                                                          |                                                                 |
| Input current                        | 6.0 mA max./input (at 24-VDC)<br>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.<br>(between each input terminal and the V terminal)                      | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                          | 5 VDC max.<br>(between each input terminal and the V terminal)                       | 5 VDC max.<br>(between each input terminal and the G terminal)  |
| OFF current                          | 1.0 mA max.                                                                          |                                                                 |
| Input current                        | 6.0 mA max./input (at 24-VDC)<br>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)                                |                                                                 |

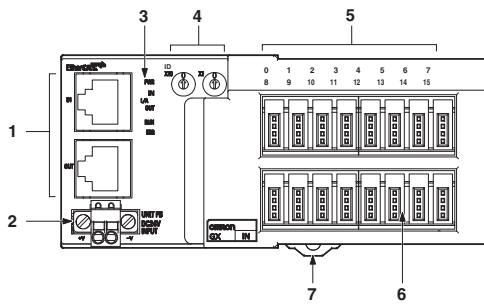
## Output Section

| 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).

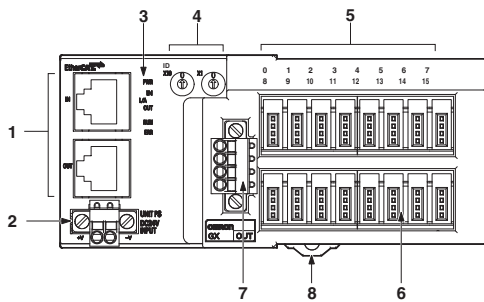
## Components and Functions

### 16 Inputs Terminal GX-ID1618/ID1628



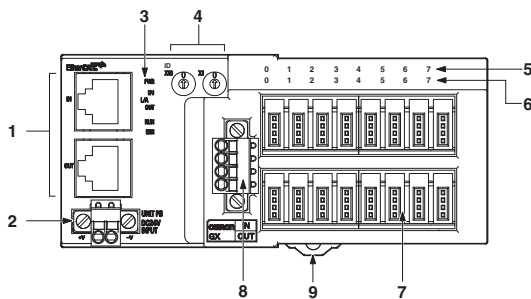
| No. | Name                        | Function                                                                                                                                                 |
|-----|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications connector    | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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).<br>Not lit: Contact OFF (input OFF state)<br>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



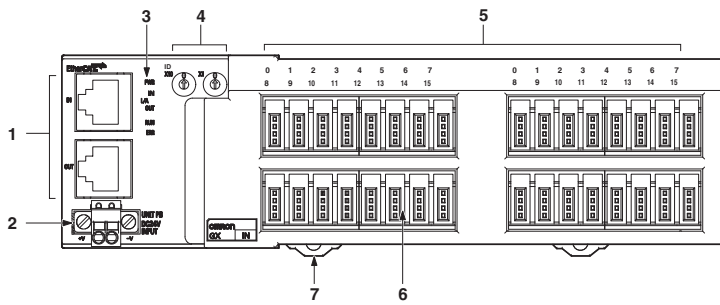
| No. | Name                        | Function                                                                                                                                                 |
|-----|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications connector    | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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).<br>Not lit: Contact OFF (output OFF state)<br>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



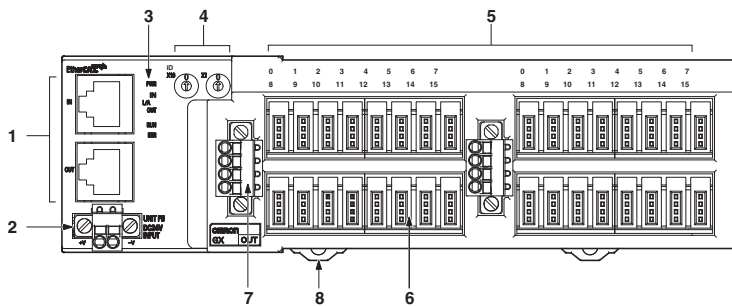
| No. | Name                        | Function                                                                                                                                                 |
|-----|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications connector    | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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).<br>Not lit: Contact OFF (input OFF state)<br>Lit in yellow: Contact ON (input ON state)                   |
| 6   | Output indicator (0 to 7)   | Indicates the state of output contact (ON/OFF).<br>Not lit: Contact OFF (output OFF state)<br>Lit in yellow: Contact ON (output ON state)                |
| 7   | I/O connector (0 to 15)     | Connects an external device.<br><Top side> For input device<br><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



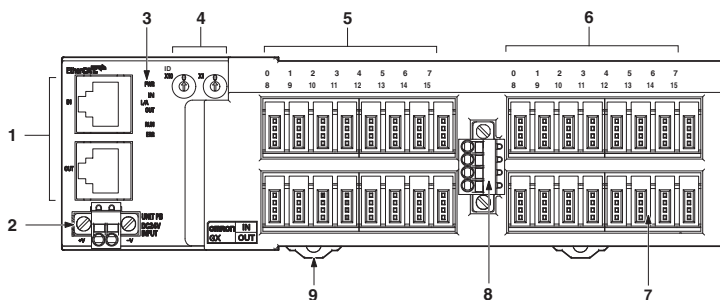
| No. | Name                                       | Function                                                                                                                                                  |
|-----|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications connector                   | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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).<br>Input terminal:<br>Not lit: Contact OFF (input OFF state)<br>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.<br>(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).<br>Not lit: Contact OFF (output OFF state)<br>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.                                                                                                                            |

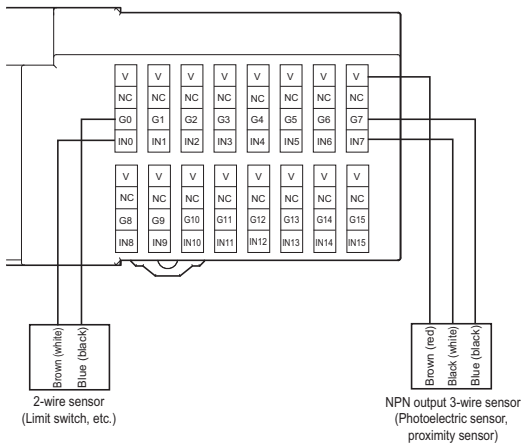
## 16 Inputs/16 Outputs Terminal GX-MD3218/MD3228



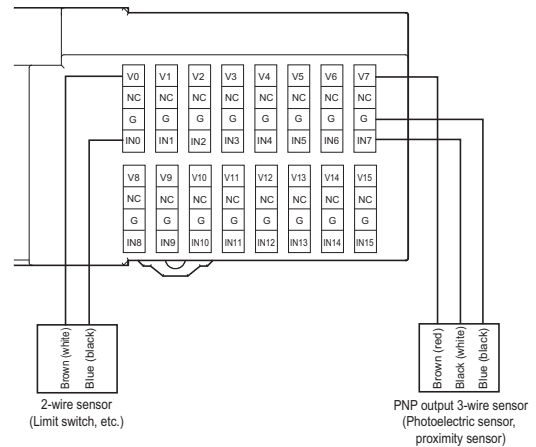
| No. | Name                        | Function                                                                                                                                                 |
|-----|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications connector    | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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).<br>Not lit: Contact OFF (input OFF state)<br>Lit in yellow: Contact ON (input ON state)                   |
| 6   | Output indicator (0 to 15)  | Indicates the state of output contact (ON/OFF).<br>Not lit: Contact OFF (output OFF state)<br>Lit in yellow: Contact ON (output ON state)                |
| 7   | I/O connector (0 to 15 × 2) | Connects an external device.<br><Top side> For input device<br><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

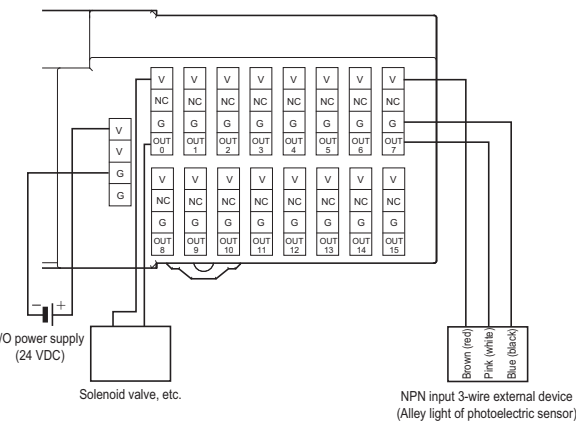
### GX-ID1618 (NPN)



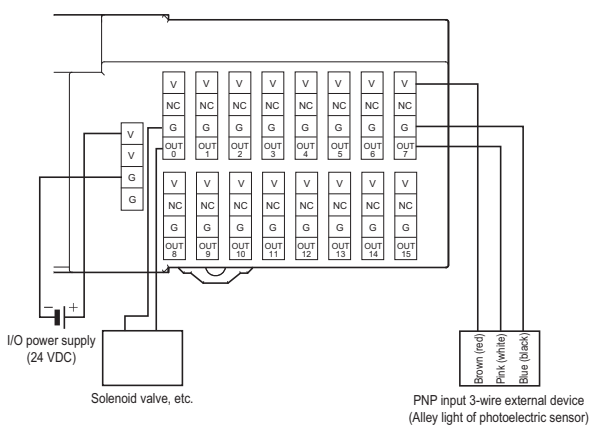
### GX-ID1628 (PNP)



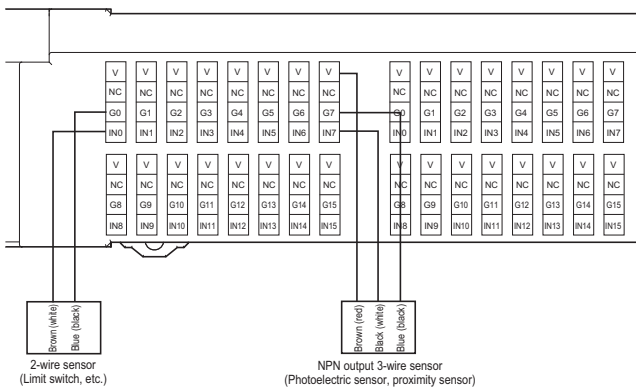
### GX-OD1618 (NPN)



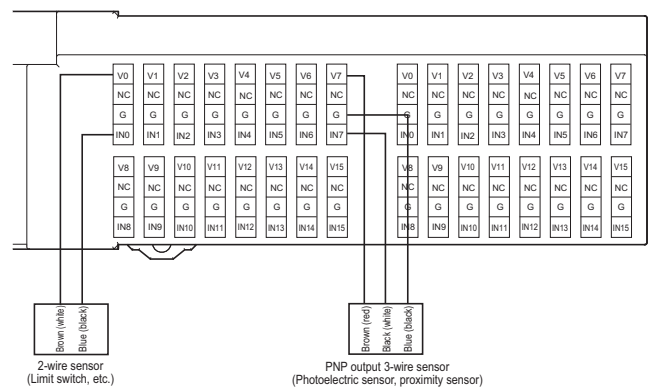
### GX-OD1628 (PNP)



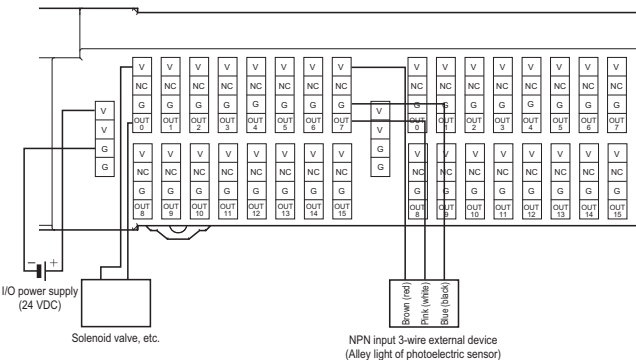
### GX-ID3218 (NPN)



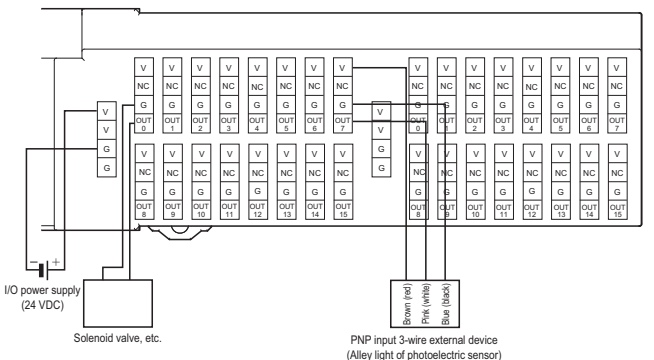
### GX-ID3228 (PNP)



### GX-OD3218 (NPN)

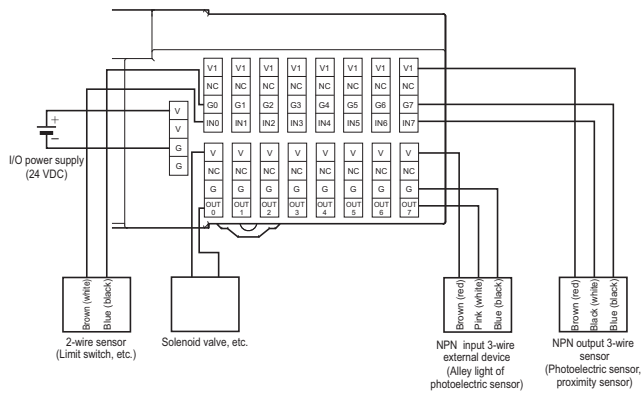


### GX-OD3228 (PNP)

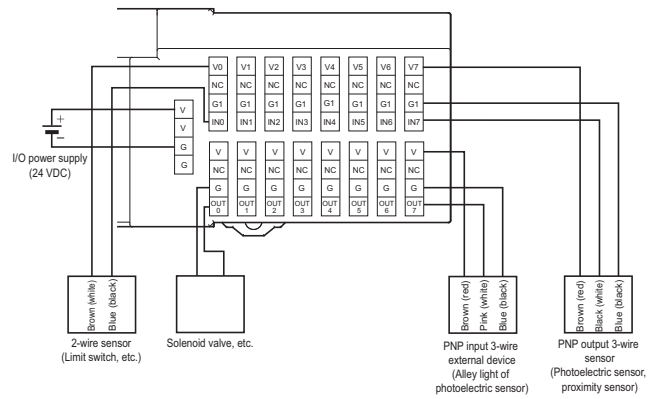


# GX-Series Digital I/O Terminal e-CON Connector Type

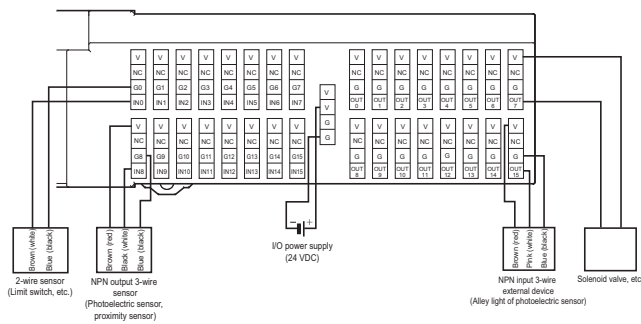
**GX-MD1618 (NPN)**



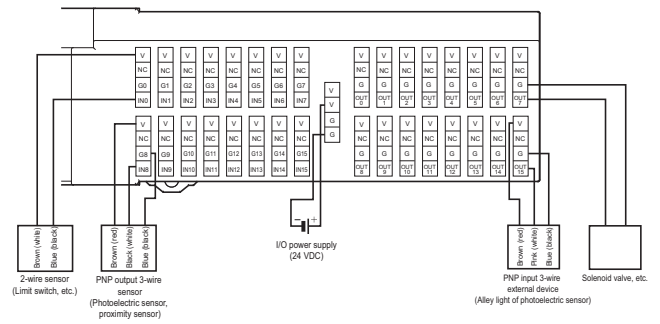
**GX-MD1628 (PNP)**



**GX-MD3218 (NPN)**



**GX-MD3228 (PNP)**

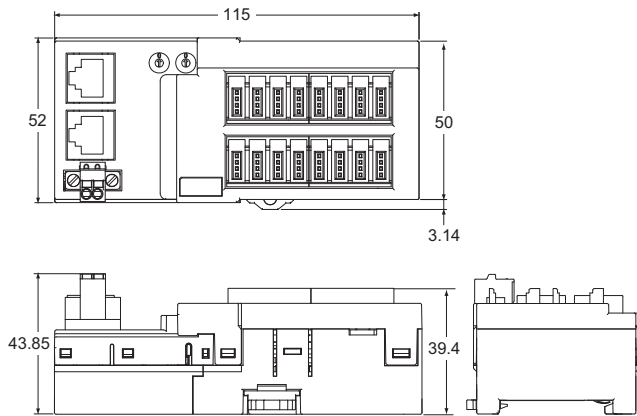


**Note:** Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

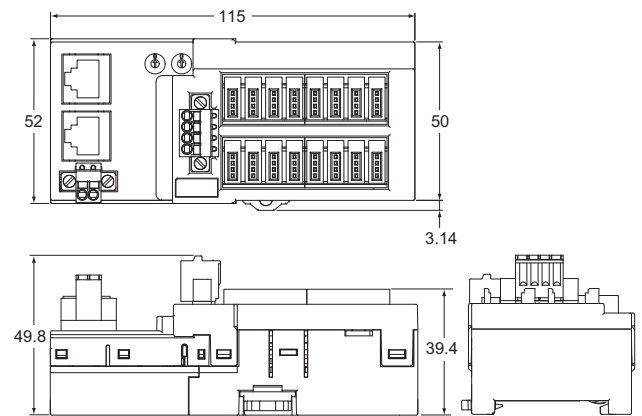
## Dimensions

(Unit: mm)

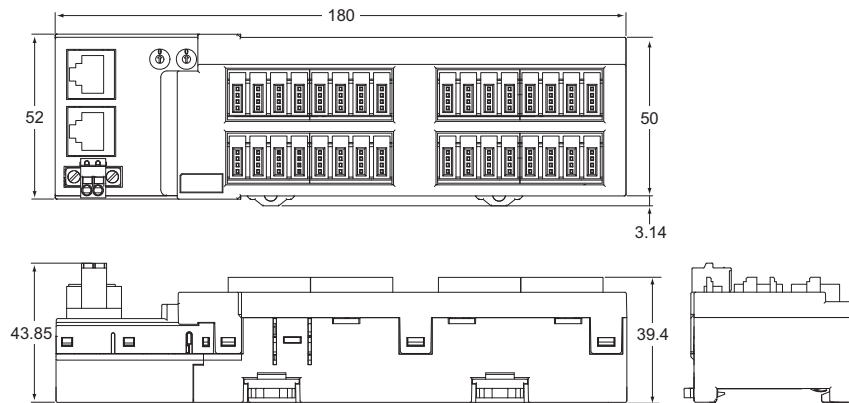
**GX-ID1618/ID1628**



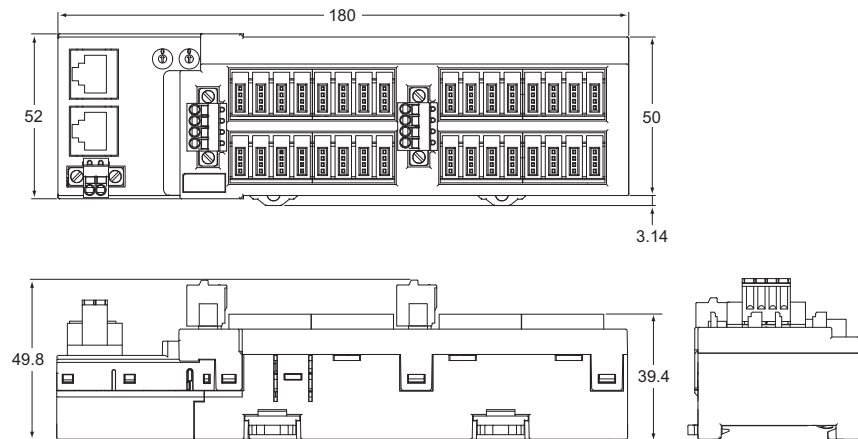
**GX-OD1618/OD1628  
GX-MD1618/MD1628**



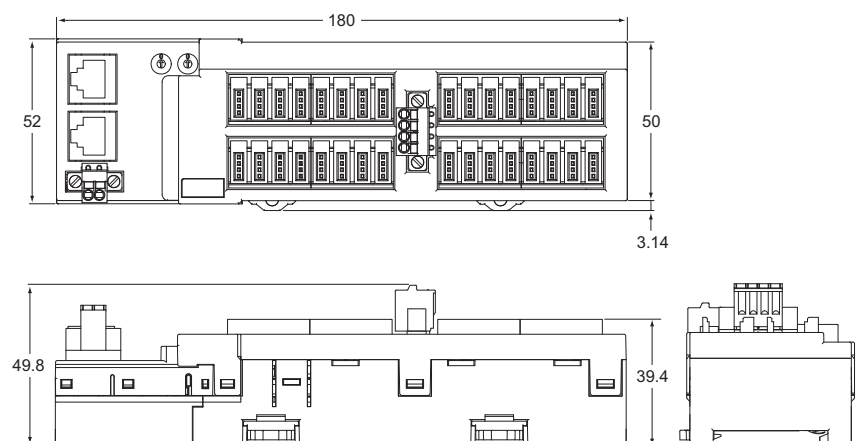
**GX-ID3218/ID3228**



**GX-OD3218/OD3228**



**GX-MD3218/MD3228**

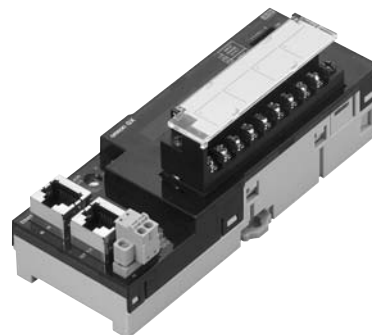


# Analog I/O Terminal 2-tier Terminal Block Type

# GX-AD0471/DA0271

## Analog I/O terminal with screw terminal block for EtherCAT communications

- 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 100 $\mu$ s-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<br>1 to 5V<br>0 to 10V<br>-10 to +10V                                                                                                                                              | 4 to 20mA            |
| Input range setting method            |               | Input range switch: Common to input CH1/CH2, common to input CH3/CH4<br>SDO communication: Possible to set input CH1 to CH4 individually                                                   |                      |
| Maximum signal input                  |               | $\pm 15$ V                                                                                                                                                                                 | $\pm 30$ mA          |
| Input impedance                       |               | 1 M $\Omega$ min.                                                                                                                                                                          | Approx. 250 $\Omega$ |
| Resolution                            |               | 1/8000 (full scale)                                                                                                                                                                        |                      |
| Overall accuracy                      | 25 °C         | $\pm 0.3\%$ FS                                                                                                                                                                             | $\pm 0.4\%$ FS       |
|                                       | -10 to +55 °C | $\pm 0.6\%$ FS                                                                                                                                                                             | $\pm 0.8\%$ FS       |
| Analog conversion cycle               |               | 500 $\mu$ s/input<br>When 4 points are used: 2 ms max.                                                                                                                                     |                      |
| A/D converted data                    |               | Other than $\pm 10$ V: 0000 to 1F40 Hex full scale (0 to 8000)<br>$\pm 10$ V: F060 to 0FA0 Hex full scale (-4000 to +4000)<br>A/D conversion range: $\pm 5\%$ FS of the above data ranges. |                      |
| Isolation method                      |               | Photocoupler isolation (between input and communications lines)<br>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.

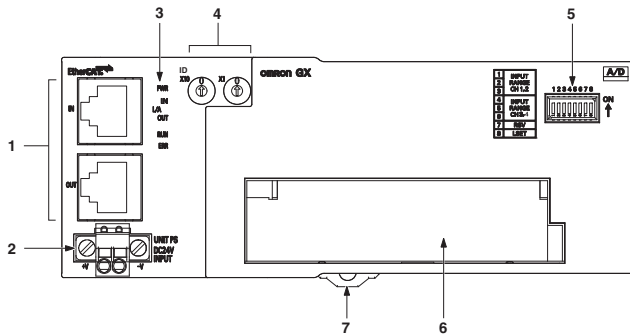
### Output Section Specifications

#### 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<br>1 to 5V<br>0 to 10V<br>-10 to +10V                                                                                                                                             | 4 to 20mA         |
| Output range setting method               |               | Output range switch, SDO communications:<br>Possible to set outputs CH1 and CH2 separately.                                                                                               |                   |
| External output allowable load resistance |               | 5 k $\Omega$ min.                                                                                                                                                                         | 600 $\Omega$ max. |
| Resolution                                |               | 1/8000 (full scale)                                                                                                                                                                       |                   |
| Overall accuracy                          | 25 °C         | $\pm 0.4\%$ FS                                                                                                                                                                            |                   |
|                                           | -10 to +55 °C | $\pm 0.8\%$ FS                                                                                                                                                                            |                   |
| Analog conversion cycle                   |               | 500 $\mu$ s/input<br>When 2 points are used: 1 ms max.                                                                                                                                    |                   |
| D/A converted data                        |               | Other than $\pm 10$ V: 0000 to 1F40 Hex full scale (0 to 8000)<br>$\pm 10$ V: F060 to 0FA0 Hex full scale (-4000 to +4000)<br>D/A conversion range: $\pm 5\%$ FS of the above data ranges |                   |
| Isolation method                          |               | Photocoupler isolation (between output and communications lines)<br>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.                                                                                                                                                                                |                   |

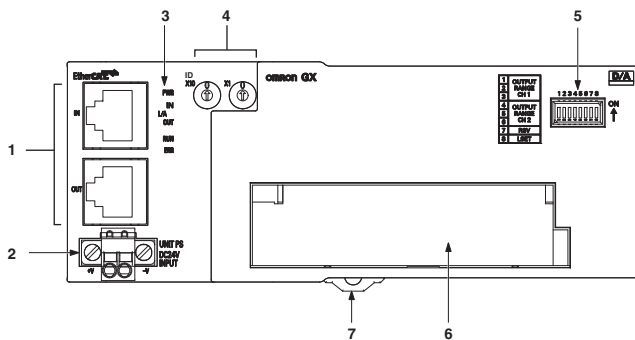
## Components and functions

### 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.<br>(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<br>V1 to V4: Voltage input terminals<br>I1 to I4: Current input terminals<br>AG: Analog GND<br>NC: Not used      |
| 7   | DIN track mounting hook     | Fixes a slave to a DIN track.                                                                                                                            |

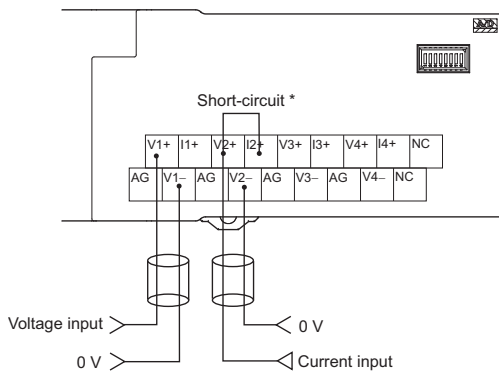
### 2-points Analog Inputs Terminal GX-DA0271



| No. | Name                        | Function                                                                                                                                                                                                    |
|-----|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications connector    | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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<br>V1+, V2+: Voltage output positive terminals<br>I1+, I2+: Current output positive terminals<br>1-, 2-: Voltage/current output negative terminals<br>NC: Not used |
| 7   | DIN track mounting hook     | Fixes a slave to a DIN track.                                                                                                                                                                               |

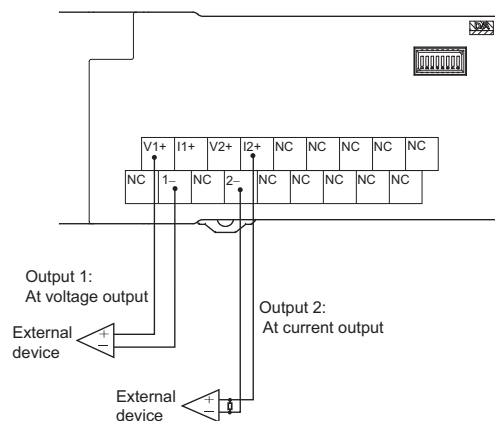
## Wiring

### 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.

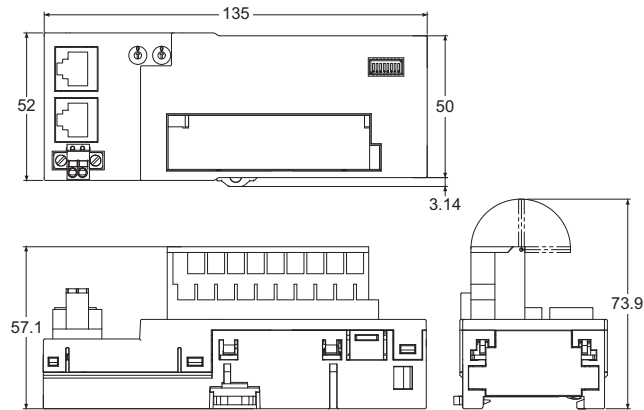
### GX-DA0271



## Dimensions

(Unit: mm)

GX-AD0471  
GX-DA0271

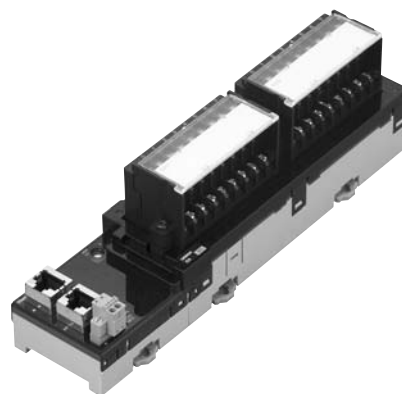


# Encoder Input Terminal 3-tier Terminal Block Type

# 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<br>Counter phase B<br>Counter phase Z<br>Latch input (A/B)<br>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<br>(24 VDC -15 to +10%)                                       | 4.5 to 5.5 VDC<br>(5 VDC $\pm 5\%$ ) | 20.4 to 26.4 VDC<br>(24 VDC -15 to +10%) | 4.5 to 5.5 VDC<br>(5 VDC $\pm 5\%$ ) |
| Input current                | 8.4 mA<br>(at 24 VDC)                                                          | 8.6 mA<br>(at 5 VDC)                 | 8.4 mA<br>(at 24 VDC)                    | 8.6 mA<br>(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 k $\Omega$                                                                 | 430 $\Omega$                         | 2.7 k $\Omega$                           | 430 $\Omega$                         |
| Maximum response frequency   | Single phase 500 kHz<br>(phase difference Multiplication $\times 4$ , 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 k $\Omega$                        | 3.3 k $\Omega$                        |
| 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 $\mu$ s max.                        | 15 $\mu$ s max.                       |
| OFF response time       | 3 $\mu$ s max.                        | 90 $\mu$ s 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<br>Counter phase B<br>Counter phase Z<br>Latch input (A/B)<br>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 $\Omega$ $\pm$ 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<br>(phase difference Multiplication $\times$ 4, 1 MHz) | 1 MHz           |
| Filter switching           | NA                                                                        |                 |

### Latch/reset input specifications

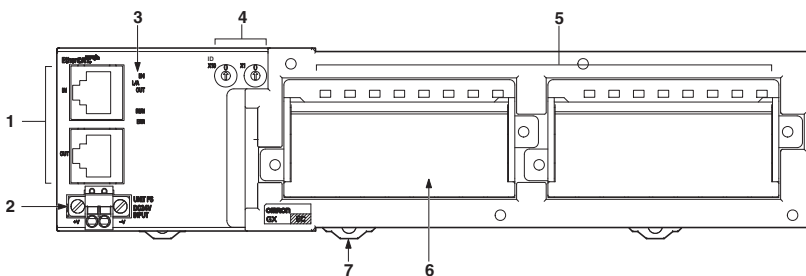
| Item                    | Specification                               |                                             |
|-------------------------|---------------------------------------------|---------------------------------------------|
|                         | Latch input (A/B)                           | 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 k $\Omega$                              | 3.3 k $\Omega$                              |
| 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 $\mu$ s max.                              | 15 $\mu$ s max.                             |
| OFF response time       | 3 $\mu$ s max.                              | 90 $\mu$ s 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

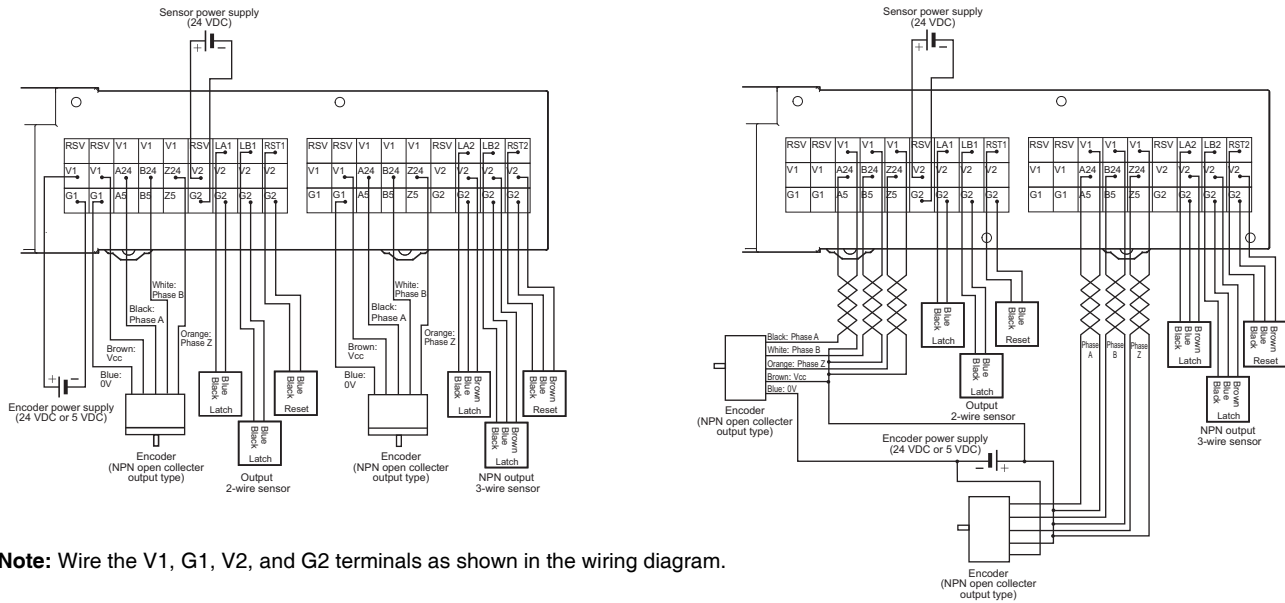
Line driver inputs Type GX-EC0241



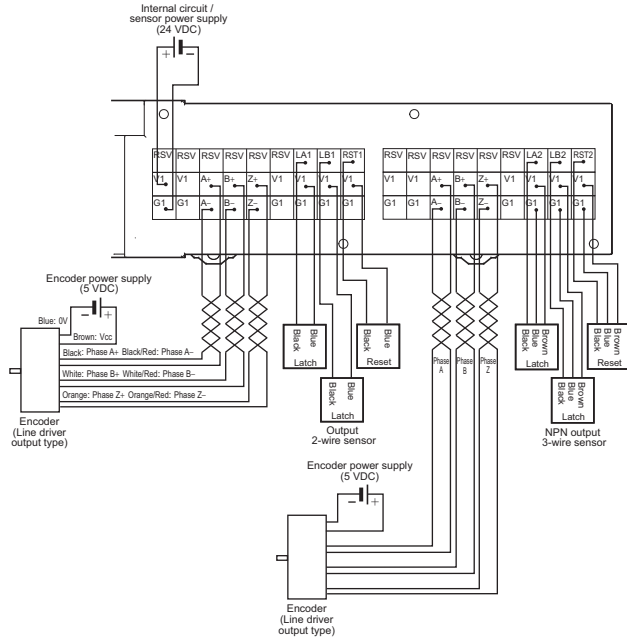
| No. | Name                        | Function                                                                                                                                                 |
|-----|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Communications Connectors   | (CN IN) Connects the communications cable which comes from the Master Unit side.<br>(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).<br>Setting range is 00 to 99.                                                                             |
| 5   | Inputs Indicators           | The indicators show the status of the inputs of each channel.<br>For details, refer to GX Series Operation Manual (Cat.No.W488).                         |
| 6   | Terminal Block              | Connects external devices and the I/O power supply.<br>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



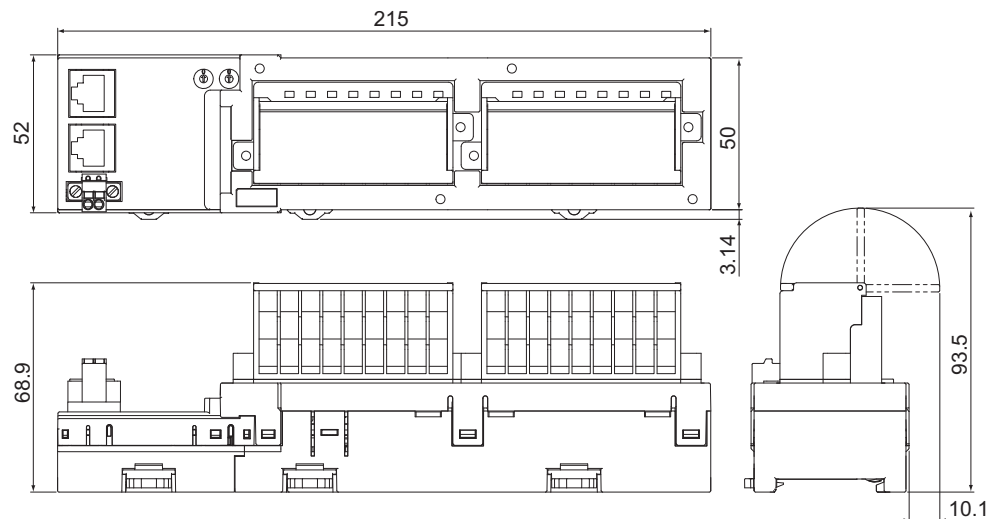
### Line driver inputs Type GX-EC0241



## Dimensions

(Unit: mm)

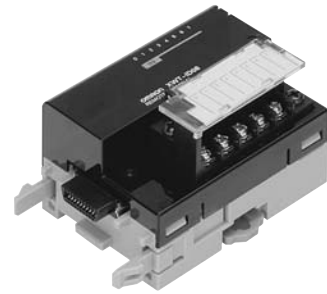
### GX-EC0211/EC0241



# 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.<br>(between each input terminal and the V terminal) | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                                     | 5 VDC max.<br>(between each input terminal and the V terminal)  | 5 VDC max.<br>(between each input terminal and the G terminal)  |
| OFF current                                     | 1.0 mA max.                                                     |                                                                 |
| Input current                                   | At 24 VDC: 6.0 mA max./input<br>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.<br>(between each input terminal and the V terminal) | 15 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                                     | 5 VDC max.<br>(between each input terminal and the V terminal)  | 5 VDC max.<br>(between each input terminal and the G terminal)  |
| OFF current                                     | 1.0 mA max.                                                     |                                                                 |
| Input current                                   | At 24 VDC: 6.0 mA max./input<br>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

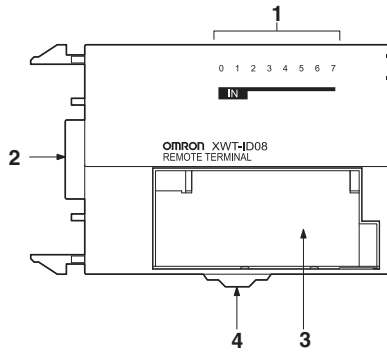
| Item                                            | Specification                                                          |                                                                        |
|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
|                                                 | 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.                                                             |                                                                        |

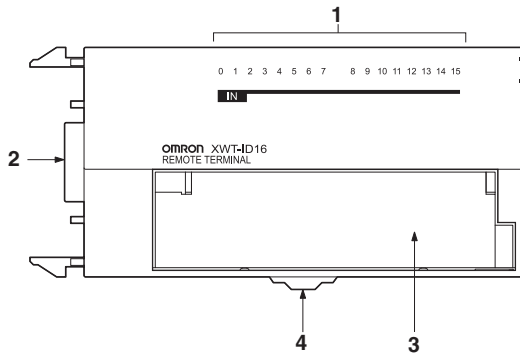
# Components and functions

## XWT-ID08/ID08-1



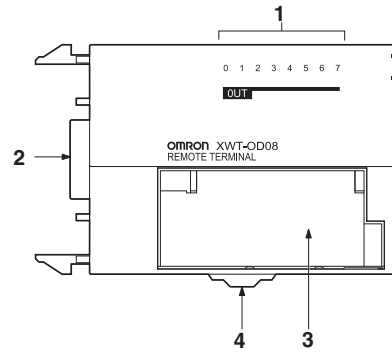
| No. | Name                     | Function                                                                                                                               |
|-----|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Input indicator (0 to 7) | Indicates the state of input contact (ON/OFF).<br>Not lit: Contact OFF (input OFF state)<br>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.<br>V, G: I/O power supply terminals<br>0 to 7: Input terminals                     |
| 4   | DIN track mounting hook  | Fixes a slave to a DIN track.                                                                                                          |

## XWT-ID16/ID16-1



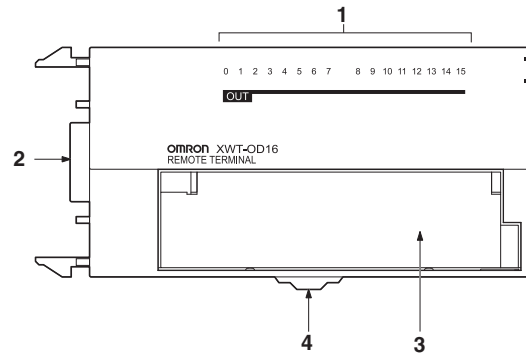
| No. | Name                      | Function                                                                                                                               |
|-----|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Input indicator (0 to 15) | Indicates the state of input contact (ON/OFF).<br>Not lit: Contact OFF (input OFF state)<br>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.<br>V, G: I/O power supply terminals<br>0 to 15: Input terminals                    |
| 4   | DIN track mounting hook   | Fixes a slave to a DIN track.                                                                                                          |

## XWT-OD08/OD08-1



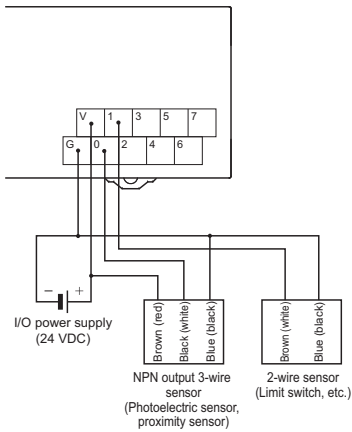
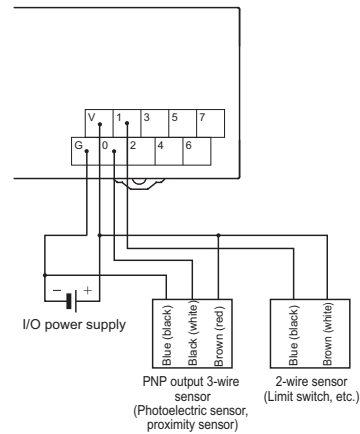
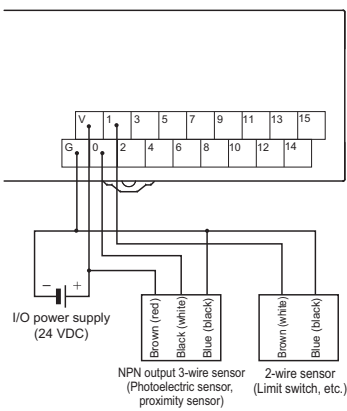
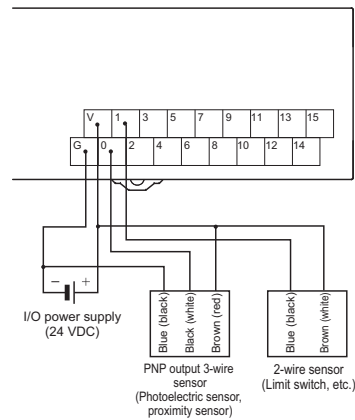
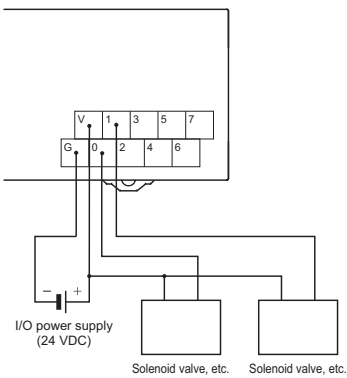
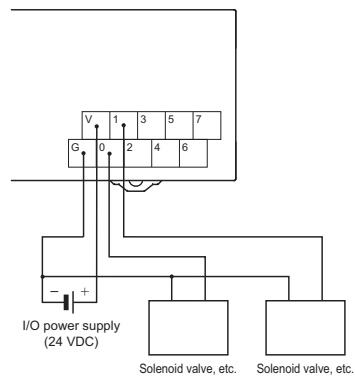
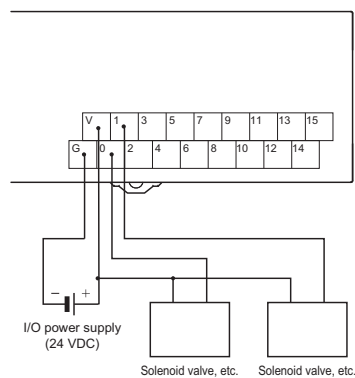
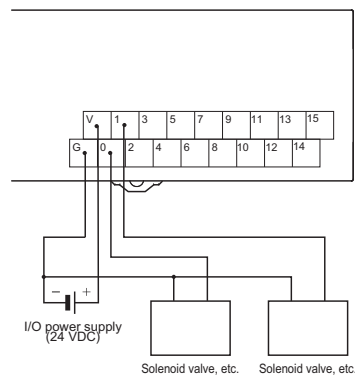
| No. | Name                      | Function                                                                                                                                  |
|-----|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Output indicator (0 to 7) | Indicates the state of output contact (ON/OFF).<br>Not lit: Contact OFF (output OFF state)<br>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.<br>V, G: I/O power supply terminals<br>0 to 7: Output 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).<br>Not lit: Contact OFF (output OFF state)<br>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.<br>V, G: I/O power supply terminals<br>0 to 15: Output terminals                      |
| 4   | DIN track mounting hook    | Fixes a slave to a DIN track.                                                                                                             |

# Wiring

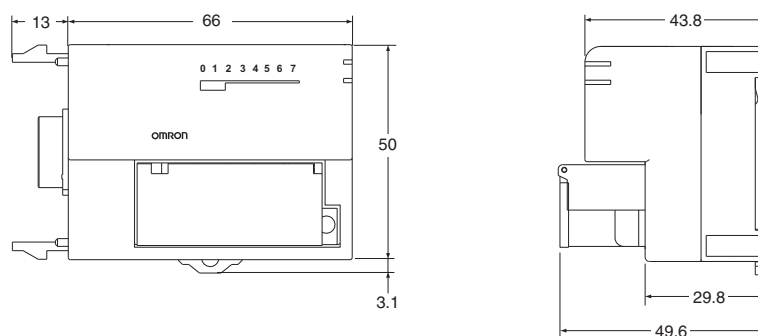
**XWT-ID08 (NPN)**

**XWT-ID08-1 (PNP)**

**XWT-ID16 (NPN)**

**XWT-ID16-1 (PNP)**

**XWT-OD08 (NPN)**

**XWT-OD08-1 (PNP)**

**XWT-OD16 (NPN)**

**XWT-OD16-1 (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.

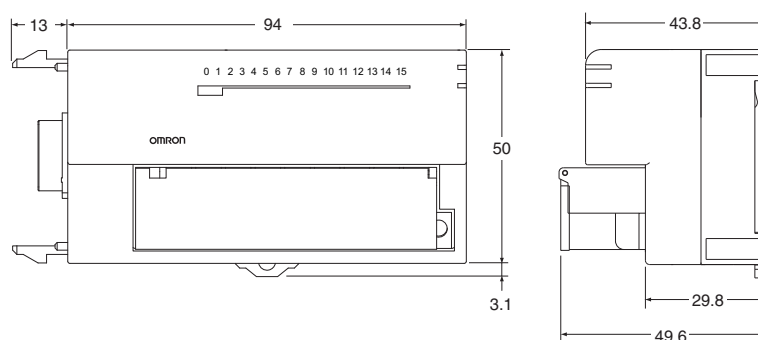
## Dimensions

(Unit: mm)

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



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



# IO-Link Master Unit

# GX-ILM08C

**IO-Link makes sensor level information visible and solves the three major issues at manufacturing sites!**

**The unit for M12 Smartclick connector can be used in watery, and dusty environments.**



- Downtime can be reduced.  
Notifies you of faulty parts and such phenomena in the Sensor in real time.
- The frequency of sudden failure can be decreased.  
Condition monitoring of sensors and equipment to prevent troubles.
- The efficiency of changeover can be improved.  
The batch check for individual sensor IDs significantly decreases commissioning time.

## Features

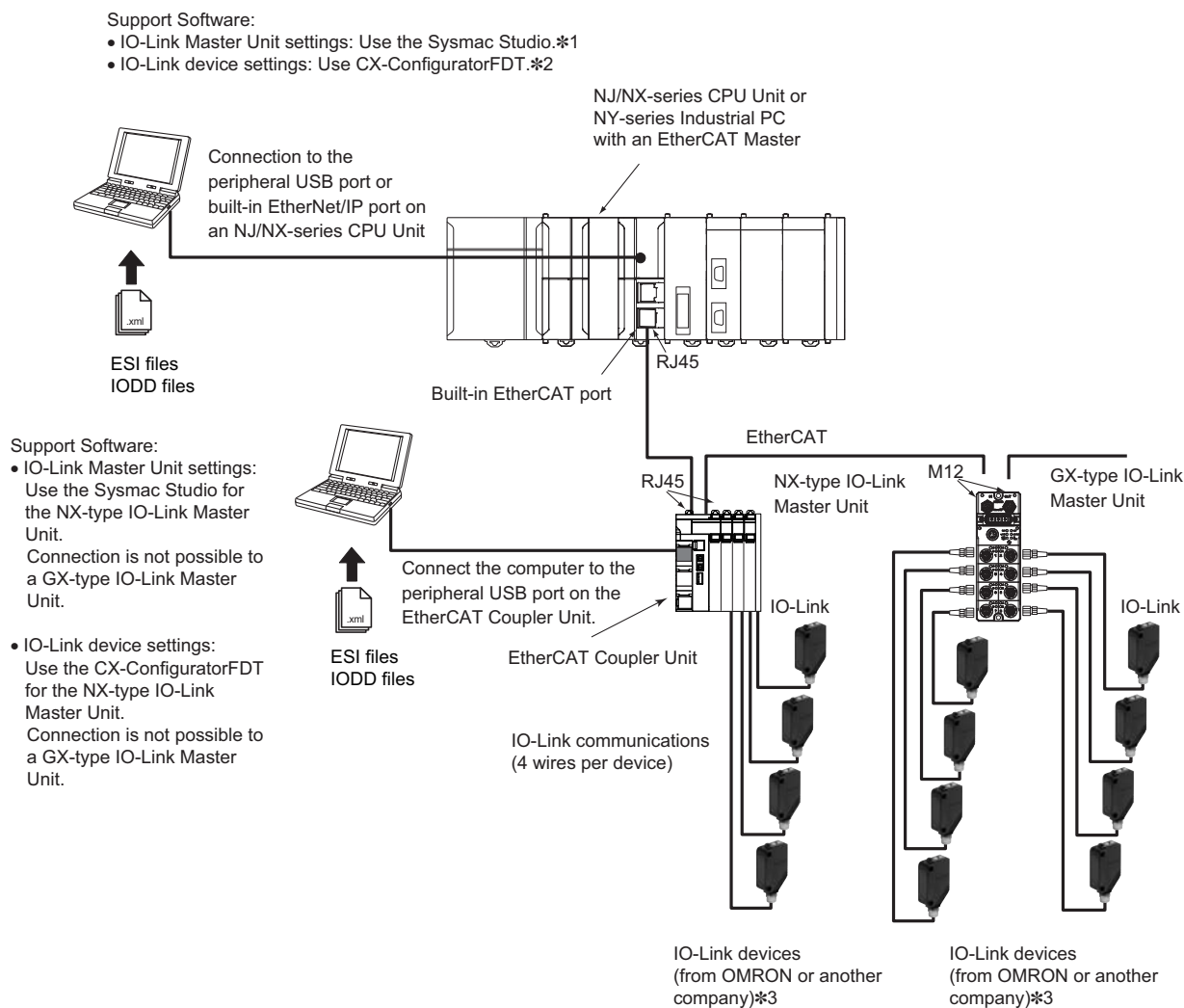
- The host controller can cyclically read control signals, status \*1, wiring, and power supply status of IO-Link sensors. Because an IO-Link System can cyclically read analog data such as the amount of incident light in addition to ON/OFF information, it can be used for predictive maintenance based on detection of such things as decreases in the amount of light.
- User-specified data in IO-Link devices can be read and written from the host controller when necessary.
- Digital signals can be input rapidly from IO-Link sensors \*2 during IO-Link communications.
- IO-Link sensors can be combined with non-IO-Link sensors.
- Incorrect connections of IO-Link sensors can be checked when IO-Link communications start.
- Backup and restoration of IO-Link device parameters make replacement of IO-Link sensors easier.
- IO-Link sensors can be easily replaced with non-IO-Link sensors without changing the data address settings. \*3
- Sensors can report their errors to the master, which facilitates locating errors from the host.
- The total number of retries in cyclic communications can be recorded. You can use this value to check for the influences of noise and other problems.  
(When EtherCAT is used as the host communication interface)
- Up to eight sensors can be connected. IP67 protection.

\*1 Examples for Photoelectric Sensors: Instability detection and sensor errors

\*2 IO-Link sensors that support digital inputs that use pin 2 of IO-Link Master Unit ports

\*3 Bit data of IO-Link sensor can be reflected in the address of the digital input data by using digital input collection.  
This function is supported with the unit version 1.1 or later.

## System Configuration



\*1. When a host controller from another company is used with EtherCAT host communications, use the EtherCAT software application from the other company for a GX-type IO-Link Master Unit.

**Note.** For an NX-type IO-Link Master Unit, connect the Sysmac Studio to the EtherCAT Coupler Unit, as shown above.

\*2. When a host controller from another company is used with EtherCAT host communications, for a GX-type IO-Link Master Unit, make the IO-Link device settings with message communications from the host controller from the other company.

**Note.** For an NX-type IO-Link Master Unit, connect CX-ConfiguratorFDT to the EtherCAT Coupler Unit, as shown above.

\*3. You can also connect a combination of general-purpose sensors and other devices.

## General Specification

| Item                              | Specification                                                                                                                                                                                         |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit power supply voltage         | 20.4 to 26.4 VDC (24 VDC $-15\%/+10\%$ )                                                                                                                                                              |
| I/O power supply                  | 20.4 to 26.4 VDC (24 VDC $-15\%/+10\%$ )                                                                                                                                                              |
| Noise resistance                  | Conforms to IEC 61000-4-4, 2 kV (power line).                                                                                                                                                         |
| Vibration resistance              | 10 to 60 Hz with amplitude of 0.7 mm, 60 to 150 Hz and 50 m/s <sup>2</sup> for 80 minutes each in X, Y, and Z directions                                                                              |
| Shock resistance                  | 150 m/s <sup>2</sup> with amplitude of 0.7 mm                                                                                                                                                         |
| Dielectric strength               | 600 VAC (between isolated circuits)                                                                                                                                                                   |
| Insulation resistance             | 20 MΩ min. (between isolated circuits)                                                                                                                                                                |
| Ambient operating temperature     | -10 to 55°C                                                                                                                                                                                           |
| Ambient operating humidity        | 25% to 85% (with no condensation)                                                                                                                                                                     |
| Ambient operating atmosphere      | No corrosive gases                                                                                                                                                                                    |
| Altitude                          | 2,000 m max.                                                                                                                                                                                          |
| Storage temperature               | -25 to 65°C                                                                                                                                                                                           |
| Storage humidity                  | 25% to 85% (with no condensation)                                                                                                                                                                     |
| Degree of protection              | IP67                                                                                                                                                                                                  |
| Mounting                          | M5 screw mounting                                                                                                                                                                                     |
| Mounting strength                 | 100 N                                                                                                                                                                                                 |
| Communications connector strength | 30 N                                                                                                                                                                                                  |
| Connector types                   | Connectors for EtherCAT communications: M12 (D-coding, female) × 2<br>Power supply connector: M12 (A-coding, male) × 1<br>I/O connectors: M12 (A-coding, female) *1 × 8                               |
| Screw tightening torque *2        | Round connectors (communications connector, power supply, and I/O): 0.39 to 0.49 N·m<br>M5 (Unit mounted from the front): 1.47 to 1.96 N·m<br>Cover for node address setting switches: 0.4 to 0.6 N·m |
| Applicable standards *3           | UL 61010-2-201, EU: EN 61131-2, RCM, KC, IO-Link conformance, and EtherCAT conformance                                                                                                                |

\*1 Confirms to Class A when used as an IO-Link connector.

\*2 For SmartClick Connectors, insert the Connector all the way and turn it approx. 1/8 of a turn. Torque management is not required.

\*3 Refer to the OMRON website ([www.ia.omron.com](http://www.ia.omron.com)) or ask your OMRON representative for the most recent applicable standards for each model.

## Unit Specification

| Item                                                   |                                      | Specification                                                                                                                                                |
|--------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unit name                                              |                                      | IO-Link Master Unit                                                                                                                                          |
| Model                                                  |                                      | GX-ILM08C                                                                                                                                                    |
| Number of IO-Link ports                                |                                      | 8                                                                                                                                                            |
| Communications specifications                          | Communications protocol              | IO-Link protocol                                                                                                                                             |
|                                                        | Baud rate                            | COM1: 4.8 kbps<br>COM2: 38.4 kbps<br>COM3: 230.4 kbps                                                                                                        |
|                                                        | Topology                             | 1:1                                                                                                                                                          |
|                                                        | Compliant standards                  | <ul style="list-style-type: none"> <li>IO-Link Interface and System Specification Version 1.1.2</li> <li>IO-Link Test Specification Version 1.1.2</li> </ul> |
| Device power supply * in IO-Link Mode or SIO (DI) Mode | Rated voltage                        | 24 VDC (20.4 to 26.4 VDC)                                                                                                                                    |
|                                                        | Maximum load current                 | 0.2 A/port                                                                                                                                                   |
|                                                        | Short-circuit protection             | Yes                                                                                                                                                          |
| Digital inputs (in SIO (DI) Mode)                      | Internal I/O common                  | PNP                                                                                                                                                          |
|                                                        | Rated voltage                        | 24 VDC (20.4 to 26.4 VDC)                                                                                                                                    |
|                                                        | Input current                        | 5 mA typical (at 24 VDC)                                                                                                                                     |
|                                                        | ON voltage/ON current                | 15 VDC min., 5 mA min.                                                                                                                                       |
|                                                        | OFF voltage                          | 5 VDC max.                                                                                                                                                   |
|                                                        | Input filter time                    | No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, or 256 ms                                                         |
| Digital outputs (in SIO (DIO) Mode)                    | Internal I/O common                  | PNP                                                                                                                                                          |
|                                                        | Output type                          | Push-pull                                                                                                                                                    |
|                                                        | Rated voltage                        | 24 VDC (20.4 to 26.4 VDC)                                                                                                                                    |
|                                                        | Maximum load current                 | 0.3 A/port                                                                                                                                                   |
|                                                        | Short-circuit protection             | Provided.                                                                                                                                                    |
|                                                        | Leakage current                      | 0.1 mA max.                                                                                                                                                  |
|                                                        | Residual voltage                     | 1.5 V max.                                                                                                                                                   |
| Digital inputs for pin 2 (in IO-Link Mode)             | Internal I/O common                  | PNP                                                                                                                                                          |
|                                                        | Rated voltage                        | 24 VDC (20.4 to 26.4 VDC)                                                                                                                                    |
|                                                        | Input current                        | 2 mA (24 VDC)                                                                                                                                                |
|                                                        | ON voltage/ON current                | 15 VDC min., 2 mA min.                                                                                                                                       |
|                                                        | OFF voltage                          | 5 VDC max.                                                                                                                                                   |
|                                                        | Input filter time                    | No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, or 256 ms                                                         |
| Cable specifications                                   | Cable type                           | Unshielded                                                                                                                                                   |
|                                                        | Cable length                         | 20 m max.                                                                                                                                                    |
|                                                        | Electrostatic capacity between lines | 3 nF max.                                                                                                                                                    |
|                                                        | Loop resistance                      | 6 Ω max.                                                                                                                                                     |
| Dimensions                                             |                                      | 175 × 33 × 60 mm (W×H×D) (The height is 49.1 mm when the connectors are included.)                                                                           |
| Isolation method                                       |                                      | Photocoupler isolation                                                                                                                                       |
| I/O power supply method                                |                                      | Supplied from the power supply connector.                                                                                                                    |
| Unit power supply current consumption                  |                                      | 60 mA                                                                                                                                                        |
| I/O power supply current consumption                   |                                      | 100 mA                                                                                                                                                       |
| Weight                                                 |                                      | 430 g                                                                                                                                                        |
| Circuit layout                                         |                                      |                                                                                                                                                              |
| Installation orientation and restrictions              |                                      | Installation orientation: 6 possible orientations<br>Restrictions: No restrictions                                                                           |
| Protective functions                                   |                                      | L+ terminal short-circuit protection<br>C/Q terminal short-circuit protection                                                                                |

\* I/O power supply to devices:

This is the voltage and current value supplied to devices when the communications modes of the ports on the IO-Link Master Unit are IO-Link Mode or SIO (DI) Mode.

## Function Specification

| Function                                                        |                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communications                                                  | Cyclic communications  | I/O data (process data) in the IO-Link devices is cyclically exchanged with the IO-Link Master Unit as the IO-Link communications master.<br>At the same time, this data and the status of the IO-Link Master Unit is cyclically exchanged with the controller, with the IO-Link Master Unit operating as a slave of the controller.<br>Cyclic communications can be used to check the amount of detection performance deterioration in devices, and to check changes in usage conditions such as the amount of incident light for photoelectric sensors, stability detection margins, and excessive proximity for proximity sensors.                   |
|                                                                 | Message communications | The controller can send messages (commands) to the IO-Link Master Unit and receive the response from the IO-Link Master Unit. The IO-Link Master Unit can also function as a gateway to send messages (commands and responses) between the controller and the IO-Link devices.<br>Refer to <i>6-3 Message Communications</i> in the <i>IO-Link System User's Manual</i> (Cat. No. W568).<br>During operation, you can change and adjust device parameters, such as threshold settings, tuning execution, and ON-delay time changes, from a program.<br>Or, during operation, you can check the internal status, such as the operating times of devices. |
| Communications mode settings                                    |                        | You can select any of the following modes for each port:<br>IO-Link Mode, SIO (DI) Mode, SIO (DO) Mode, and Disable Port<br>This allows you to combine IO-Link communications and digital I/O in a single unit.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Digital inputs for pin 2                                        |                        | In IO-Link Mode, you can perform digital input with pin 2 while performing IO-Link communications.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Automatic baud rate setting for IO-Link communications          |                        | The IO-Link Master Unit automatically matches the specific baud rates (COM1, COM2, or COM3) of the IO-Link devices to communicate with the IO-Link devices.<br>Therefore, it is not necessary to set the baud rate of the connected device for each port.                                                                                                                                                                                                                                                                                                                                                                                               |
| Connected device verification                                   |                        | This function is used to verify the configuration of IO-Link devices that are connected to the IO-Link Master Unit against the registered IO-Link Device Configuration Settings when the power supply is turned ON.<br>The user can enable or disable connected device verification.                                                                                                                                                                                                                                                                                                                                                                    |
| IO-Link communications error detection                          |                        | This function detects I/O cable breaks, disconnections from IO-Link device ports, error-level device events, device configuration verification errors, and IO-Link device malfunctions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Detection of short-circuits in I/O cables                       |                        | This function detects short-circuits in I/O cables.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Notification of input data validity                             |                        | The controller can use the Input Data Enabled Flags to determine whether the process input data for IO-Link communications is valid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Load rejection for controller communications error              |                        | This function turns OFF outputs from the IO-Link Master Unit when a communications error occurs in communications with the controller in IO-Link Mode or in an SIO mode.<br>This prevents incorrect output operations when communications error occurs.                                                                                                                                                                                                                                                                                                                                                                                                 |
| IO-Link total communications lost frames                        |                        | The IO-Link total communications lost frames can be read from the CX-ConfiguratorFDT.<br>You can use this function to determine communications status as affected by I/O cable noise or other factors.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Digital input filter                                            |                        | This function is used to eliminate chattering and noise of the input signal for digital inputs in SIO(DI) Mode or for digital inputs for pin 2 in IO-Link Mode. It prevents data change and stabilizes the input signal even in situations where the input data changes due to chattering or noise and the bit status is unstable.                                                                                                                                                                                                                                                                                                                      |
| Digital input collection *                                      |                        | In IO-Link Mode, this function reflects the specified bit data in the input data from the IO-Link device on the digital input data of the IO-Link Master Unit.<br>As a result, the bit data in the input data from the IO-Link device can be aggregated into the digital input data of the IO-Link Master Unit.<br>One bit for each IO-Link port can be aggregated.<br>This function cannot be used in SIO (DI) Mode and SIO (DO) Mode.<br>If you use this function, digital inputs with pin 2 cannot be used.                                                                                                                                          |
| Backup and restoration of parameter settings in IO-Link devices |                        | This function is used to back up parameter settings in IO-Link devices in the IO-Link Master Unit or restore them to IO-Link devices.<br>This eliminates the need to set parameters again after replacing an IO-Link device.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Event log                                                       |                        | This function records events, such as errors and status changes, that occur in the IO-Link Master Unit and IO-Link devices.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

\* This function is supported with the unit version 1.1 or later.

## EtherCAT Communications Specifications

| Item                        | Specification                                                                                                        |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------|
| Communications protocol     | EtherCAT protocol                                                                                                    |
| Modulation                  | Baseband                                                                                                             |
| Baud rate                   | 100 Mbps                                                                                                             |
| Physical layer              | 100BASE-TX (IEEE 802.3)                                                                                              |
| Connectors                  | M12 (D-coding, female) × 2 (shielded)<br>CN IN: EtherCAT input<br>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 (Slave Units): 100 m max.                                                                     |
| Noise resistance            | Conforms to IEC 61000-4-4, 1 kV or higher.                                                                           |
| Node address setting method | Set on hexadecimal node address switches or with a Configuration Tool.                                               |
| Node address range          | 000 to FFF hex (0 to 4,095 decimal): Set on node address switches or with a Configuration Tool.                      |
| Indicators                  | UNIT PWR × 1<br>IO PWR × 1<br>L/A IN (Link/Activity IN) × 1<br>L/A OUT (Link/Activity OUT) × 1<br>RUN × 1<br>ERR × 1 |
| Process data                | Variable PDO mapping                                                                                                 |
| PDO size/node               | 2 to 270 bytes                                                                                                       |
| Mailbox                     | Emergency messages, SDO requests, SDO responses, and SDO information                                                 |
| Synchronization mode        | Free Run Mode (asynchronous)                                                                                         |

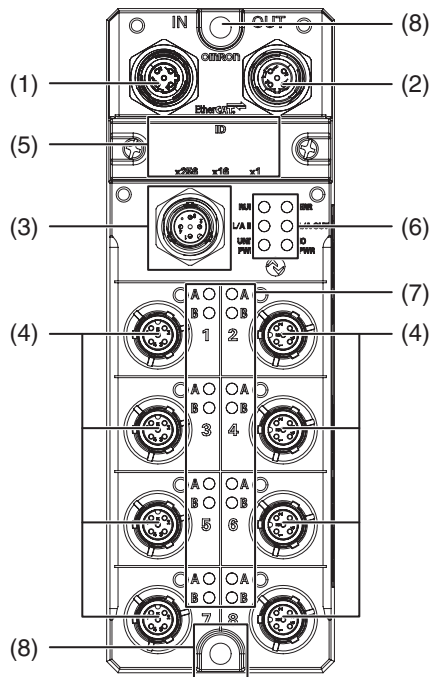
## Version Information

| GX Unit   |              | Corresponding versions * |                    |                    |
|-----------|--------------|--------------------------|--------------------|--------------------|
|           |              | EtherCAT                 |                    |                    |
| Model     | Unit version | CPU Units                | Sysmac Studio      | CX-ConfiguratorFDT |
| GX-ILM08C | Ver.1.1      | Ver.1.12 or later        | Ver.1.20 or higher | Ver.2.2 or higher  |
|           | Ver.1.0      | Ver.1.12 or later        | Ver.1.16 or higher | Ver.2.2 or higher  |

\* Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user's manuals for the specific Units for the relation between models and versions.

## Component Names and Functions

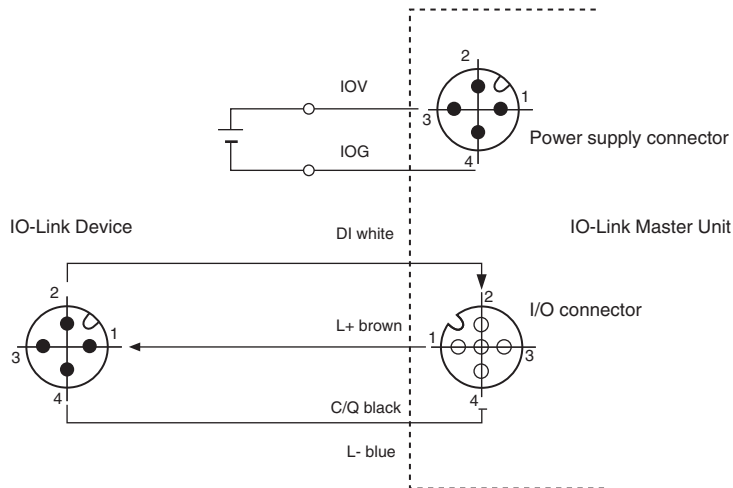
### GX-ILM08C



| No. | Name                                   | Function                                                                                                      |
|-----|----------------------------------------|---------------------------------------------------------------------------------------------------------------|
| (1) | EtherCAT communications connector, IN  | EtherCAT cable connection: IN side<br>M12 connector (D-coding, female)                                        |
| (2) | EtherCAT communications connector, OUT | EtherCAT cable connection: OUT side<br>M12 connector (D-coding, female)                                       |
| (3) | Power supply connector                 | Connects to Unit power supply and I/O power supply cable.<br>M12 connector (A-coding, male)                   |
| (4) | I/O connectors                         | Connect to IO-Link sensor cables (IO-Link connector type: Class A)<br>M12 connectors (A-coding, female)       |
| (5) | Node address setting switches          | Used to set the EtherCAT node address.                                                                        |
| (6) | Status indicators                      | Indicate the current status of the EtherCAT Slave Unit.<br>(RUN, ERR, L/A IN, L/A OUT, UNIT PWR, and I/O PWR) |
| (7) | I/O indicators                         | Indicate the I/O status.<br>(C/E and C/Q)                                                                     |
| (8) | Mounting holes                         | Used to mount the Unit with M5 screws.                                                                        |

## Wiring

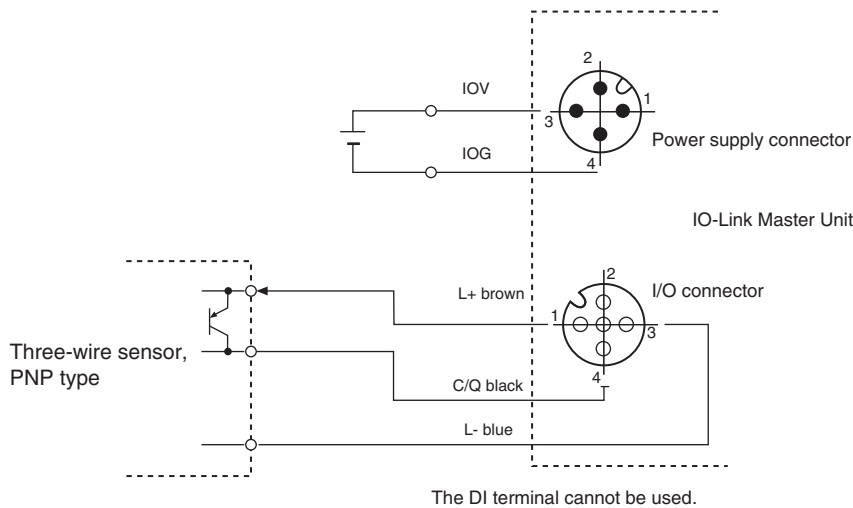
### IO-Link Mode



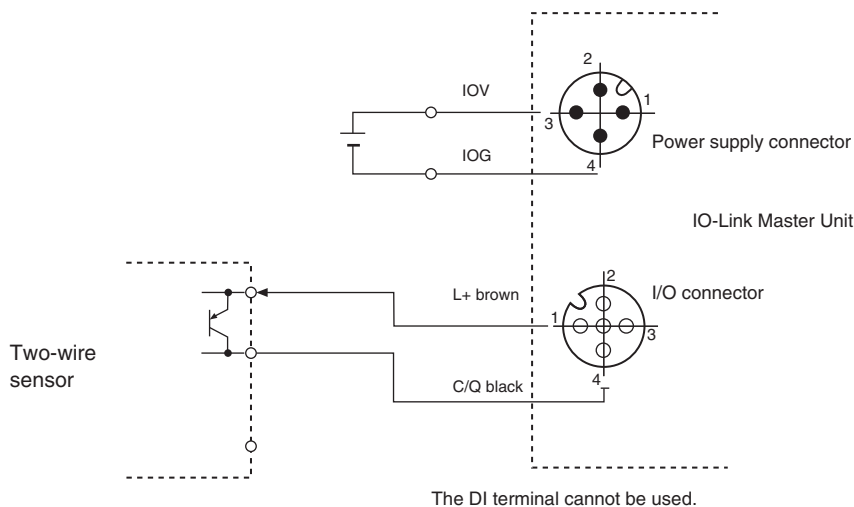
**Note:** Even if you connect to IO-Link devices without digital inputs for pin 2, connect pin 2 as shown in the above figure. This is because connectors on the IO-Link devices and the cable with connectors on both ends connect pin 2. However, because no data enters pin 2 of the IO-Link Master Unit, digital IO-Link input data is always OFF.

### SIO (DI) Mode

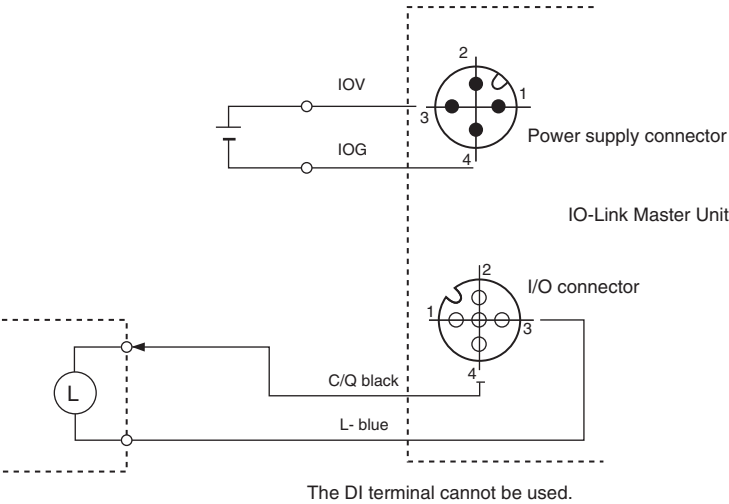
#### Wiring Three-wire Sensors



#### Wiring Two-wire Sensors



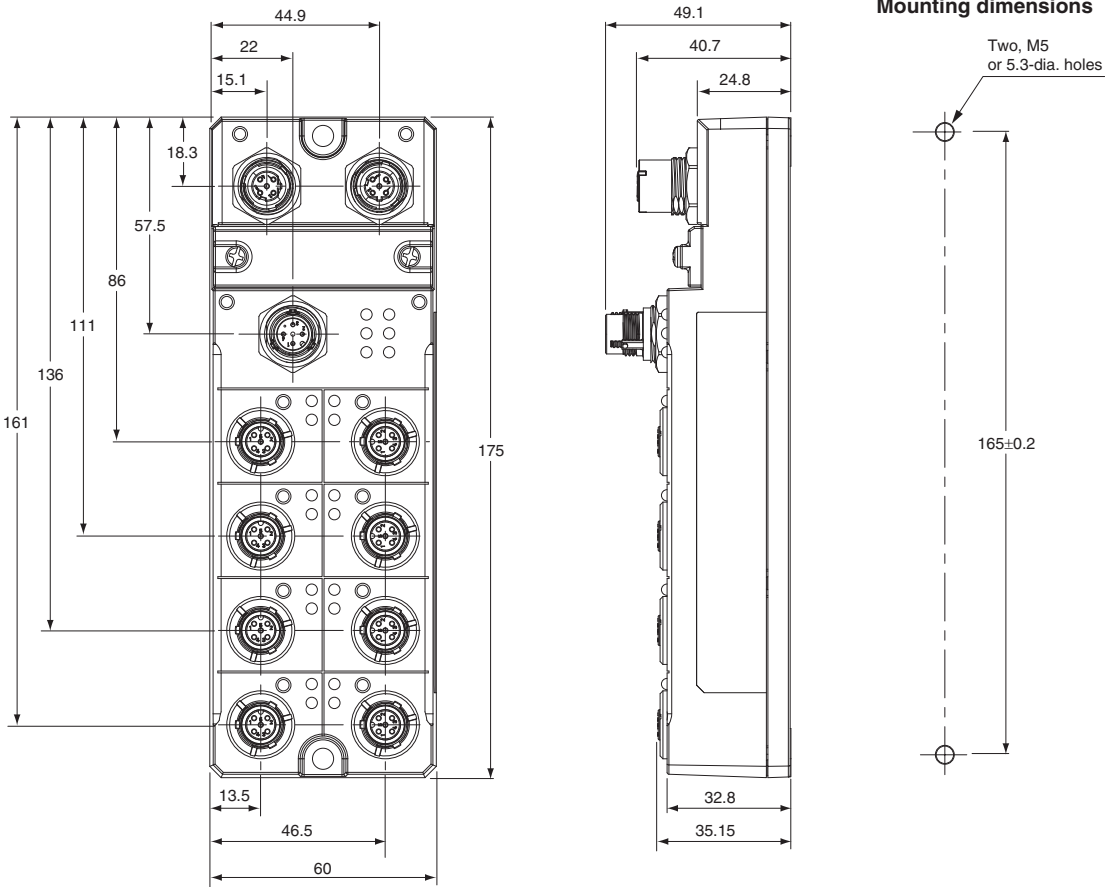
SIO (DO) Mode  
Wiring Output Devices



Dimensions

(Unit: mm)

GX-ILM08C



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# Ordering Information

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|                                                  |           |
|--------------------------------------------------|-----------|
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## Interpreting Model Numbers

**GX-**            

1      2      3      4      5

### 1) Type

| Code      | Specifications  |
|-----------|-----------------|
| <b>ID</b> | DC Input        |
| <b>OD</b> | DC Output       |
| <b>MD</b> | DC Input/Output |
| <b>OC</b> | Relay Output    |
| <b>AD</b> | Analog Input    |
| <b>DA</b> | Analog Output   |
| <b>EC</b> | Encoder Input   |

### 2) Number of I/O point

| Code      | Specifications |
|-----------|----------------|
| <b>02</b> | 2 points (2CH) |
| <b>04</b> | 4 points (4CH) |
| <b>16</b> | 16 points      |
| <b>32</b> | 32 points      |

### 3) Input/Output type

| Code     | Digital Input/<br>Digital Output type | Analog Input/<br>Analog Output type | Encoder Input Type        |
|----------|---------------------------------------|-------------------------------------|---------------------------|
| <b>1</b> | NPN/Sinking                           | —                                   | Open collector input, NPN |
| <b>2</b> | PNP/Sourcing                          | —                                   | —                         |
| <b>4</b> | —                                     | —                                   | Line driver input, PNP    |
| <b>7</b> | —                                     | Multi 1 (Current/Voltage)           | —                         |

### 4) Connecting

| Code     | Specifications                                 |
|----------|------------------------------------------------|
| <b>1</b> | Screw (Common) (2-tier Terminal Block)         |
| <b>2</b> | Screw (Divided common) (3-tier Terminal Block) |
| <b>8</b> | e-CON                                          |

### 5) Figure/Function

| Code        | Digital Input/<br>Digital Output type | Analog Input/<br>Analog Output type | Encoder Input Type |
|-------------|---------------------------------------|-------------------------------------|--------------------|
| <b>None</b> | 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: EU Directives, RCM: RCM mark, and KC: KC Registration.
- 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<br>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<br>terminal blocks | Inputs             | 16 inputs | NPN       |               |
| 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.

### Cable with Connectors

| Item                                                                                                                                                                                                                                  | Appearance                                                                         | Recommended manufacturer | Cable length (m) | Model                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------|------------------|----------------------|
| Cable with Connectors on Both Ends (RJ45/RJ45)<br>Standard RJ45 plugs type *1<br>Wire Gauge and Number of Pairs: AWG26, 4-pair Cable<br>Cable Sheath material: LSZH *2<br>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 |
| Cable with Connectors on Both Ends (RJ45/RJ45)<br>Rugged RJ45 plugs type *1<br>Wire Gauge and Number of Pairs: AWG22, 2-pair Cable<br>Cable color: Light blue                                                                         |   | 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      |
| Cable with Connectors on Both Ends<br>(M12 Straight/M12 Straight)<br>Shield Strengthening Connector cable *4<br>M12/Smartclick Connectors<br>Wire Gauge and Number of Pairs: AWG22, 2-pair Cable<br>Cable color: Black                |   | OMRON                    | 0.5              | XS5W-T421-BM2-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 1                | XS5W-T421-CM2-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 2                | XS5W-T421-DM2-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 3                | XS5W-T421-EM2-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 5                | XS5W-T421-GM2-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 10               | XS5W-T421-JM2-SS     |
| Cable with Connectors on Both Ends (M12 Straight/RJ45)<br>Shield Strengthening Connector cable *4<br>M12/Smartclick Connectors<br>Rugged RJ45 plugs type<br>Wire Gauge and Number of Pairs: AWG22, 2-pair Cable<br>Cable color: Black |  | OMRON                    | 0.5              | XS5W-T421-BMC-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 1                | XS5W-T421-CMC-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 2                | XS5W-T421-DMC-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 3                | XS5W-T421-EMC-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 5                | XS5W-T421-GMC-SS     |
|                                                                                                                                                                                                                                       |                                                                                    |                          | 10               | XS5W-T421-JMC-SS     |

\*1 Standard type cables length 0.2, 0.3, 0.5, 1, 1.5, 2, 3, 5, 7.5, 10, 15 and 20 m are available. Rugged type cables length 0.3, 0.5, 1, 2, 3, 5, 10 and 15 m are available. For details, refer to Cat.No.G019.

\*2 The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use. Although the LSZH cable is single shielded, its communications and noise characteristics meet the standards.

\*3 Cables colors are available in blue, yellow, or Green.

\*4 For details, contact your OMRON representative.

### Cables / Connectors

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

| Item            | Appearance | Recommended manufacturer     | Model                            |
|-----------------|------------|------------------------------|----------------------------------|
| Cables          | —          | Hitachi Metals, Ltd.         | NETSTAR-C5E SAB<br>0.5 x 4P CP * |
|                 | —          | 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 RJ45 Assembly 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Specifications     |        | Model          | Standards |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------|----------------|-----------|
|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Number of licenses | Media  |                |           |
| <b>FA Integrated Tool Package CX-One Ver.4.□</b> | <p>The CX-One is a comprehensive software package that integrates Support Software for OMRON PLCs and components.</p> <p>CX-One runs on the following OS.<br/>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)</p> <p>CX-One Version 4.□ includes CX-Programmer Ver.9.□<br/>For details, refer to the CX-One catalog (Cat. No. R134)</p> | 1 license *1       | DVD *2 | CXONE-AL01D-V4 | —         |

\*1 Multi licenses (3, 10, 30, or 50 licenses) and DVD media without licenses are also available for the CX-One.

\*2 The CX-One is also available on CD (CXONE-AL□□C-V4).

### 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                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Specifications     |       | Model         | Standards |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|---------------|-----------|
|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Number of licenses | Media |               |           |
| <b>Sysmac Studio Standard Edition Ver.1.□</b> | <p>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 CPU Units, NY-series Industrial PC, EtherCat Slave, and the HMI.</p> <p>Sysmac Studio runs on the following OS.<br/>OS: 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)</p> | —<br>(Media only)  | DVD   | SYSMAC-SE200D | —         |
|                                               | <p>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).<br/>For details, refer to your OMRON website.</p>                                                                                                                                                                                                         | 1 license *        | —     | SYSMAC-SE201L | —         |

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

## IO-Link Master Unit

| Name                          | Specifications           |                         |                                   | Model            | Standards       |
|-------------------------------|--------------------------|-------------------------|-----------------------------------|------------------|-----------------|
|                               | Environmental resistance | Number of IO-Link ports | I/O connection terminals          |                  |                 |
| GX-series IO-Link Master Unit | IP67                     | 8                       | M12 connector (A-cording, female) | <b>GX-ILM08C</b> | UC, CE, RCM, KC |

## 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.

| Item                                                                                                                                                            | Appearance                                                                         | Recommended manufacturer | Cable length (m) | Model            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------|------------------|------------------|
| Cable with Connectors on Both Ends<br>Shield Strengthening cable *1<br>Wire Gauge and Number of Pairs: AWG22, 2-pair Cable<br>Cable color: Black                |   | OMRON                    | 0.5              | XS5W-T421-BM2-SS |
|                                                                                                                                                                 |                                                                                    |                          | 1                | XS5W-T421-CM2-SS |
|                                                                                                                                                                 |                                                                                    |                          | 2                | XS5W-T421-DM2-SS |
|                                                                                                                                                                 |                                                                                    |                          | 3                | XS5W-T421-EM2-SS |
|                                                                                                                                                                 |                                                                                    |                          | 5                | XS5W-T421-GM2-SS |
|                                                                                                                                                                 |                                                                                    |                          | 10               | XS5W-T421-JM2-SS |
| Cable with Connectors on Both Ends<br>Rugged type<br>Shield Strengthening cable *1<br>Wire Gauge and Number of Pairs: AWG22, 2-pair Cable<br>Cable color: Black |   | OMRON                    | 0.5              | XS5W-T421-BMC-SS |
|                                                                                                                                                                 |                                                                                    |                          | 1                | XS5W-T421-CMC-SS |
|                                                                                                                                                                 |                                                                                    |                          | 2                | XS5W-T421-DMC-SS |
|                                                                                                                                                                 |                                                                                    |                          | 3                | XS5W-T421-EMC-SS |
|                                                                                                                                                                 |                                                                                    |                          | 5                | XS5W-T421-GMC-SS |
|                                                                                                                                                                 |                                                                                    |                          | 10               | XS5W-T421-JMC-SS |
| Cable with Connectors on Both Ends (RJ45/RJ45)<br>Rugged standard RJ45 plugs *2<br>Wire gauge and number of pairs: AWG22, 2-pair cable<br>Cable color: Yellow   |  | 3M Japan Limited         | 0.25             | 3RHS4-1100-0.25M |
|                                                                                                                                                                 |                                                                                    |                          | 0.5              | 3RHS4-1100-0.5M  |
|                                                                                                                                                                 |                                                                                    |                          | 1                | 3RHS4-1100-1M    |
|                                                                                                                                                                 |                                                                                    |                          | 2                | 3RHS4-1100-2M    |
|                                                                                                                                                                 |                                                                                    |                          | 5                | 3RHS4-1100-5M    |
|                                                                                                                                                                 |                                                                                    |                          | 10               | 3RHS4-1100-10M   |

\*1 For details, Contact your OMRON representative.

\*2 Cables are available from 0.25 m to 100 m. Ask the manufacturer for details.

## Power Supply Cables

| Item                                                                                           | Appearance                             | Recommended manufacturer | Cable length (m) | Model           |
|------------------------------------------------------------------------------------------------|----------------------------------------|--------------------------|------------------|-----------------|
| Connector connected to cable,<br>socket on one cable end<br>Fire-retardant, Robot cable        | Smartclick (M12 Straight)              | OMRON                    | 1                | XS5F-D421-C80-F |
|                                                                                                |                                        |                          | 2                | XS5F-D421-D80-F |
|                                                                                                |                                        |                          | 3                | XS5F-D421-E80-F |
|                                                                                                |                                        |                          | 5                | XS5F-D421-G80-F |
|                                                                                                |                                        |                          | 10               | XS5F-D421-J80-F |
| Connectors connected to cable,<br>socket and plug on cable ends<br>Fire-retardant, Robot cable | Smartclick (M12 Straight/M12 straight) | OMRON                    | 1                | XS5W-D421-C81-F |
|                                                                                                |                                        |                          | 2                | XS5W-D421-D81-F |
|                                                                                                |                                        |                          | 3                | XS5W-D421-E81-F |
|                                                                                                |                                        |                          | 5                | XS5W-D421-G81-F |
|                                                                                                |                                        |                          | 10               | XS5W-D421-J81-F |

**Note:** Refer to the *Round Water-resistant Connectors* in the category of *Sensor I/O Connector/Sensor Controller* on your local OMRON website for details.

## Sensor I/O Connectors

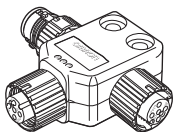
Order a cable with a connector on both ends to connect a sensor of connector type.

| Item                                                                                                  | Appearance                                          | Recommended manufacturer | Cable length (m) | Model           |
|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------|------------------|-----------------|
| Connectors connected to cable,<br>M8 socket and M12 plug on cable ends<br>Fire-retardant, Robot cable | M8 screw- M12 Smartclick (M8 Straight/M12 straight) | OMRON                    | 0.2              | XS3W-M42C-4C2-A |
| Connectors connected to cable,<br>socket and plug on cable ends<br>Fire-retardant, Robot cable        | Smartclick (M12 Straight/M12 straight)              | OMRON                    | 1                | XS5W-D421-C81-F |
|                                                                                                       |                                                     |                          | 2                | XS5W-D421-D81-F |
|                                                                                                       |                                                     |                          | 3                | XS5W-D421-E81-F |
|                                                                                                       |                                                     |                          | 5                | XS5W-D421-G81-F |
|                                                                                                       |                                                     |                          | 10               | XS5W-D421-J81-F |

**Note:** Refer to the *Ordering Information* in the catalog of the sensor to connect or the *Sensor I/O Connectors/Sensor Controllers* on your local OMRON website for details.

## Power Supply T-Joint Connector

This connector is used when branching a GX-type Unit power supply.

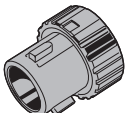
| Item                               | Appearance                                                                        | Specification | Connector type       | Model       |
|------------------------------------|-----------------------------------------------------------------------------------|---------------|----------------------|-------------|
| XS5R Plug/Socket T-Joint Connector |  | M12           | Smartclick connector | XS5R-D427-5 |

## Waterproof Cover for Connectors

This is a waterproof cover for unused M12 GX connectors (female).

When you use this waterproof cover, you can maintain the IP67 protective structure.

The following two types of covers are available. Either one can be mounted on an EtherCAT communications connector or I/O connector.

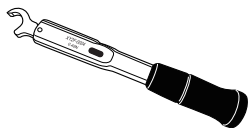
| Item                             | Appearance                                                                        | Specification | Connector type       | Materials           | Model   |
|----------------------------------|-----------------------------------------------------------------------------------|---------------|----------------------|---------------------|---------|
| M12 Threaded Waterproof Cover *1 |  | M12           | Screw-type connector | Brass/nickel plated | XS2Z-22 |
| Smartclick Waterproof Cover *2   |  | M12           | Smartclick connector | PBT                 | XS5Z-11 |

\*1 When mounting the M12 Threaded Waterproof Cover on a connector, always tighten it to a torque of 0.39 to 0.49 N·m.

\*2 When mounting a Smartclick Waterproof Cover on a connector, torque management is not required.

## Tool for M12 Threaded Connectors

The tool for tightening M12 Threaded Connectors is used when tightening to a specified torque.

| Item          | Appearance                                                                          | Model     |
|---------------|-------------------------------------------------------------------------------------|-----------|
| Torque Wrench |  | XY2F-0004 |

## Software

### 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                            | Specification                                                                                                                                                                                                                                                                                                                                                | Specification       |       | 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 CPU Units, NY-series Industrial PC, EtherCAT Slave, and the HMI.                                                                                                  | ---<br>(Media only) | DVD   | SYSMAC-SE200D | ---       |
|                                         | Sysmac Studio runs on the following OS.<br>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)<br><br>The Sysmac Studio Standard Edition DVD includes CX-ConfiguratorFDT to set up IO-Link Master Units and IO-Link devices.<br>For details, refer to your OMRON website. | 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                                                                         |
| W570     | NX-ILM400<br>GX-ILM08C                                             | IO-Link System User's Manual                                                                                   |
| W505     | NX701-□□□□<br>NX1P2-□□□□<br>NJ501-□□□□<br>NJ301-□□□□<br>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                                                                                 |
| W562     | NY532-□□□□<br>NY512-□□□□                                           | NY-series IPC Machine Controller Industrial Panel PC / Industrial Box PC Built-in EtherCAT® Port User's Manual |
| W560     | NY532-□□□□<br>NY512-□□□□                                           | NY-series Instructions Reference Manual                                                                        |

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