Handling Precautions

Remote I/O RT series

Digital I/O unit

RT-X□DG□□□□

Thank you for purchasing CKD product.
Please review the precautions in this Handling Precautions thoroughly for safe operation of this product.
Incorrect usage may result in malfunction and dangers.
Keep this Precautions in a safe and convenient place for future reference.
For further information, refer to the instruction manual and product catalog.

Refer to the Handling Precautions of End unit for assembling and installing devices, and the Handling Precautions of Power supply unit for wiring power supply.

⚠ CAUTION

- An electric shock may occur by touching the electrical wiring connection (bare live part). Make sure to power off before wiring. Also, do not touch the live parts with bare hands.
- This product is DC dedicated. Use the product within the specified power supply voltage.
- Fully understand the contents of other units connected to this product before use.
- For details on the entire remote IO system including this product, refer to the "Remote I/O RT Series Instruction Manual: System Construction".
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Accessories	This Handling Precautions, tie rod (2 pieces)

1 Specifications

Always use the product within its specifications.

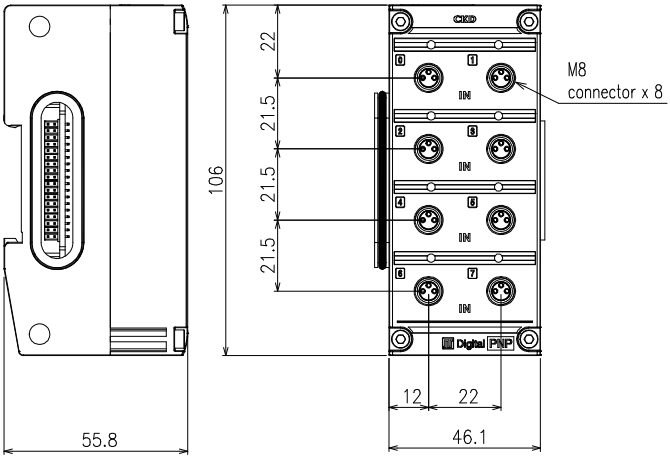
Item		Specifications		
Model No.		RT-XADGA16A/B	RT-XADGB08A/B	RT-XBDGA16A/B
Size (W x H x D)	mm	46.1×106×55.8		
Net weight	g	Approx. 245		
Degree of protection		IP65 / IP67 (when connected) Note 1		
Working temperature range	℃	-10 to +55		
Relative humidity	%RH	30 to 85		
Ambient atmosphere		No corrosive gases or heavy dust		
Installation location		Indoor use		
Altitude	m	Up to 2000		
Pollution degree		3		
Input/output		input		output
Polarity		PNP/NPN		
Connector		M12 (A) 5pin female	M8 3pin female	M12 (A) 5pin female
Number of points		16 points (2 bytes)	8 points (2 bytes)	16 points (2 bytes)
Response time	ms	ON: 0.8 or less/ OFF 0.8 or less		ON/ OFF: 0.5 or less
Protection/Error detection functions		Yes		
Forced input/output setting		Input value can be set regardless of the actual input		Output can be set regardless of the process data
Maximum sensor supply current	A	0.5 /connector, 2 /unit Note 2		-
Input resistance	kΩ	5.6		-
Rated Input voltage	V	DC24		-
Rated Input current	mA	5 or less		-
Sampling cycle	μs	100		-
Input filter time	ms	0.1/ 1/ 5/ 10/ 20		-
Input hold time	ms	1/ 15/ 100/ 200		-

Power supply (for unit/input)	V	24 VDC		-
Maximum load current	A	-		0.5/point, 2/unit
Leakage current	mA	-		0.1 or less
Power supply (for output)	V	-		DC24
Internal current consumption (for unit/input)	mA	110 or less	80 or less	20 or less
Internal current consumption (for output)	mA	1 or less	5 or less	45 or less
LED For indicating device and Input/output status	pc	16	8	16

Note 1 IP65/IP67 is not part of the UL certification.
Note 2 RT-XADGA16A/B : If the ambient temperature exceeds 40°C but is 55°C or less, use at a maximum of 1.5 /unit.
RT-XADGB08A/B : If the ambient temperature exceeds 45°C but is 55°C or less, use at a maximum of 1.5 /unit.

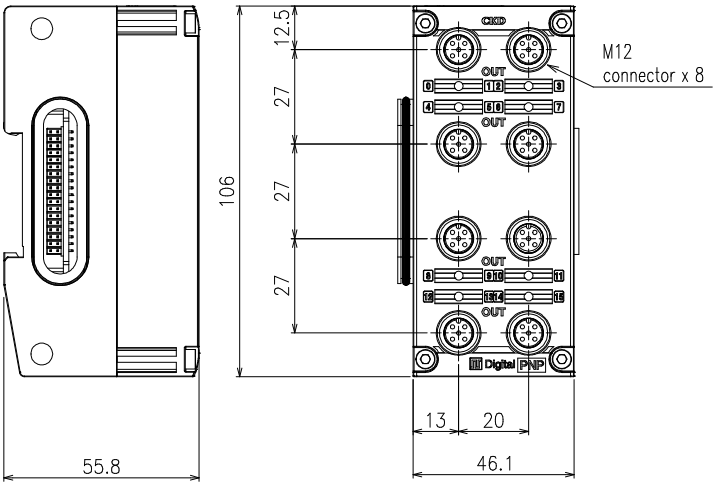
2 External dimensions

2.1 M8 type



Dimensional unit: mm

2.2 M12 type

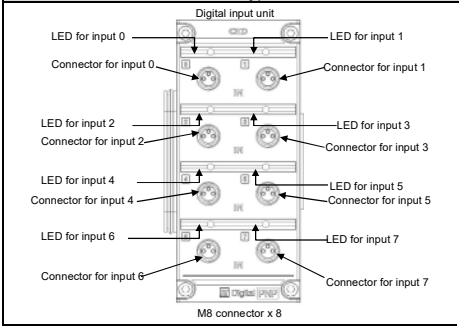


Dimensional unit: mm

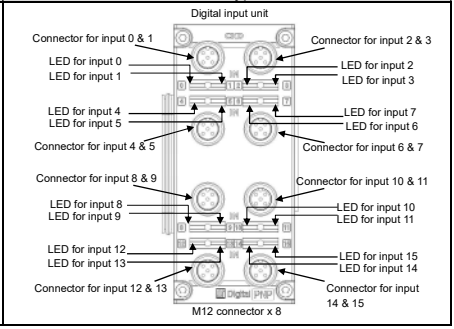
3 Names and functions of each part

3.1 Input unit

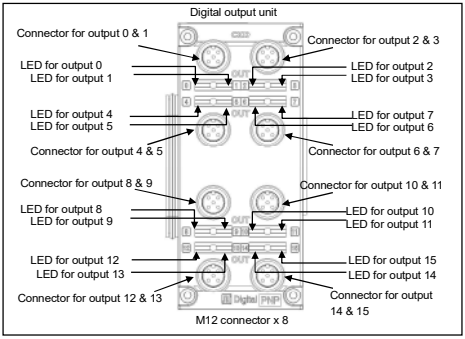
M8 type



M12 type



3.2 Output unit



4 LED indicators

These LEDs indicate the status of each point.

Input unit

Status	Meaning
Red on	Internal bus communication disconnected
Red blinking (fast)	Hardware error
Red blinking (slow)	Power line error detection or disconnection detection (power line error detection is given priority)
Yellow blinking (fast)	Off_On cycle threshold over detection
Green on	Input ON
OFF	Power is OFF, or input is OFF

Output unit

Status	Meaning
Red on	Internal bus communication disconnected
Red blinking (fast)	Hardware error
Red blinking (slow)	Signal line error detection
Yellow on	Output power supply voltage error (detected by the device unit)
Yellow blinking (fast)	Off_On cycle threshold over detection
Green on	Output ON
OFF	Power is OFF, or output is OFF

5 Wiring

Function description and connection of the terminals are as following.

⚠ CAUTION

- An electric shock may occur by touching the electrical wiring connection (bare live part). Make sure to power off before wiring. Also, do not touch the live parts with bare hands.
- Do not apply tension or impact to the M12 connector and network cable. Long cables can exert unexpected momentum and impact due to its weight, and this can consequently damage the connectors and devices. Take appropriate measures such as secure the wiring to the machine or device midway.
- Do not wire the input/output line and other power line in parallel to prevent problems caused by noise.
- Discharge static electricity that has built up on your body by touching a grounded metal object before handling the device. Static electricity may cause damage to the product.
- Use a cable suitable for the working voltage and current.
- Provide sufficient bending radius for the cable and do not bend it forcibly.

5.1 Connecting and wiring to the M12 connector

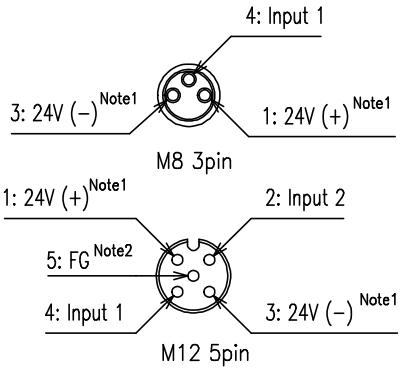
The connector plug for input/output is not supplied with the product. Separately purchase a plug that satisfies the specifications. Wiring the cable to the connecter plug enables the plug to connect to the connector socket for input/output on the product.

Recommended connector with cable

- XS3H-M321-□□□ (For M8, cable with connector plug at one end) Mfd by Omron Corporation
- XS2H-D421-□□□/XS2H-D521-□□□ (For M12, cable with connector plug at one end) Mfd by Omron Corporation

5.2 Pin arrangement and connecting example

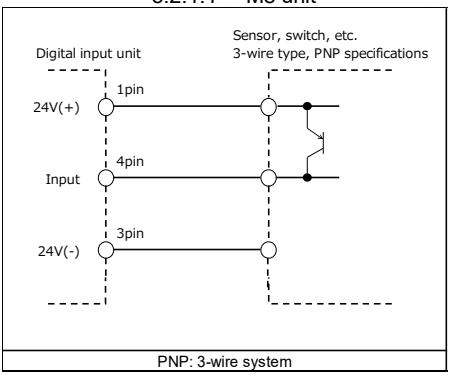
5.2.1 Input unit



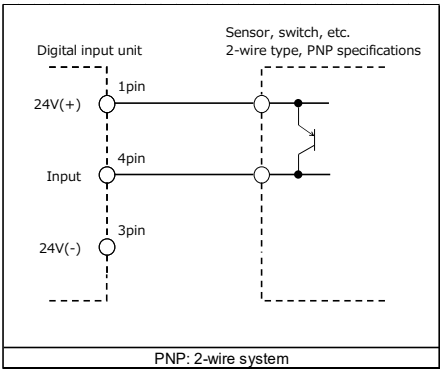
Note 1 Power supply for unit/input (ex.sensor)
Note 2 FG terminal (for improving noise resistance)

Pin arrangement

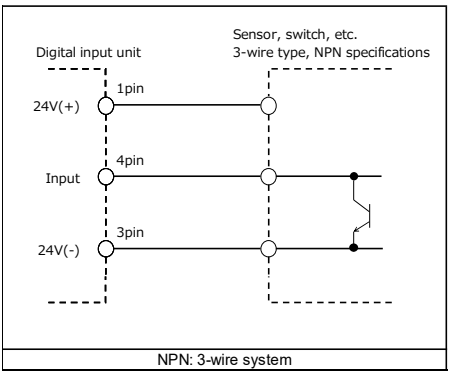
5.2.1.1 M8 unit



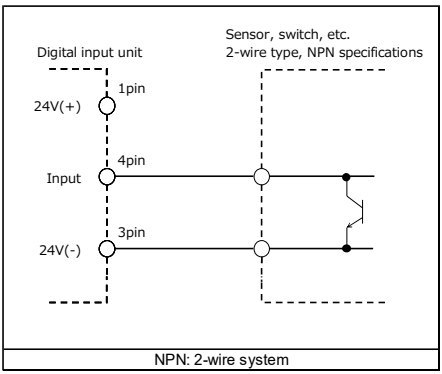
PNP: 3-wire system



PNP: 2-wire system

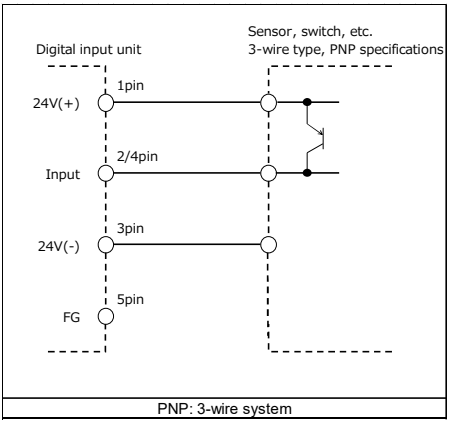


NPN: 3-wire system

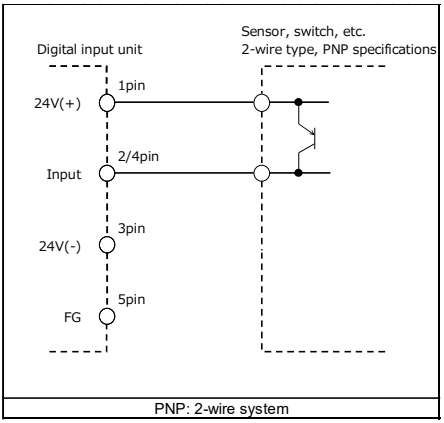


NPN: 2-wire system

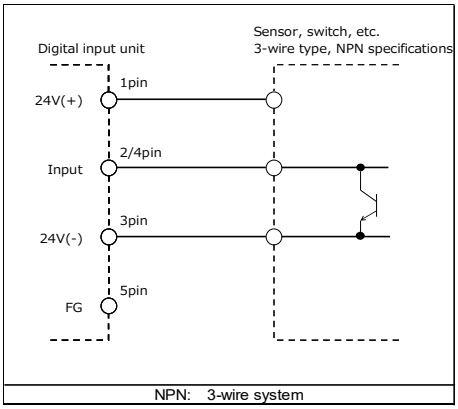
5.2.1.2 M12 unit

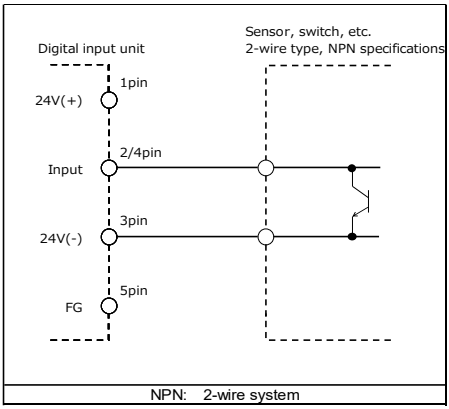


PNP: 3-wire system



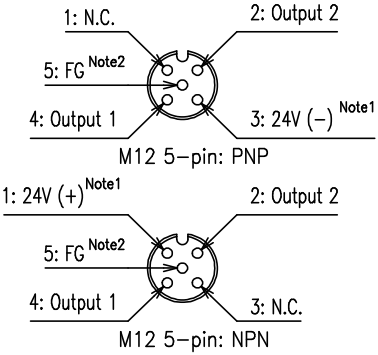
PNP: 2-wire system





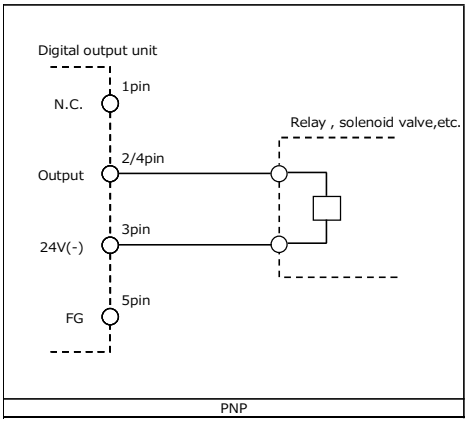
Connecting example

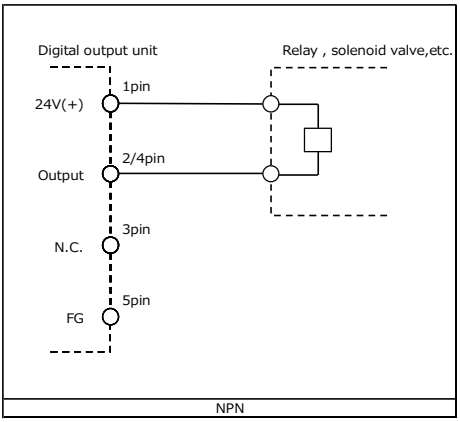
5.2.2 Output unit



Pin arrangement

Note 1 Power supply for output (ex.actuator)
Note 2 FG terminal (for improving noise resistance)





Connecting example

6 Maintenance

Refer to the "Remote I/O RT Series Instruction Manual: System Construction" for installing and removing this product.

⚠ CAUTION

- Do not pull the cable or connector forcibly as it may cause cable disconnection or damage.
- An electric shock may occur by touching the electrical wiring connection (bare live part).
- Do not install the unit with dirt or dust on the unit opening, gasket, O-ring, etc.

7 Function List

Input unit

Function	Description	Related settings
Power line error detection	Detects short circuits, disconnections, and overheating in the digital input unit's power lines (pin 1 line of each connector). Whether detection is performed depends on the "Power line error detection" setting. The disconnection detection function only works at start-up.	[Power line error detection]
Input filtering	Sets the time before ON or OFF of the digital input unit's input signal is confirmed. Choose from 0.1 ms, 1 ms, 5 ms, 10 ms, or 20 ms.	[Input filter time]
Input hold time	Sets the minimum hold time after the digital input unit's input signal has been confirmed ON or OFF. Choose from 1 ms, 15 ms, 100 ms, or 200 ms.	[Input hold time]
Off_On cycle counts/over detection	Counts the number of times the digital input unit's input signal has changed from OFF to ON. The counted number is stored in non-volatile memory once every 30 minutes. It can also detect when the set threshold is exceeded.	[Input Off_On cycle threshold]
Forced input setting	Forces the digital input unit's input signal to be either ON or OFF (regardless of the actual input value) from the PC software.	-
Point diagnostic information for the unit	The diagnostic information for each of the digital input unit's points. 16 bits per point, and each bit corresponds to an error type. If an error is detected, the corresponding bit is 1 (ON). The information can be read from the PC software or upper master. The types of errors are as follows: Bit: Error description (genres of device diagnostics) 15: Power line error (power supply) 14: Over Off_On cycle threshold (unit input) 13: Hardware error (hardware) 12: Hold forcibly non-output (disconnection detection) (user operation waiting)	-

Output unit

Function	Description	Related settings
Signal line error detection	Detects short circuits, disconnections, and overheating in the digital output unit's signal lines.	[Signal line error detection]
Signal line error recovery operation setting	Specifies whether to maintain the same behavior as during the signal line error when it has been recovered from, or return to normal from the most recent data update after recovery. If it maintains the same behavior as during the error, it will wait for the user to turn the power off and on again.	[Error recovery operation]
Off_On cycle counts/over detection	Counts the number of times the digital output unit's output signal has changed from OFF to ON. The counted number is stored in non-volatile memory once every 30 minutes. It can also detect when the set threshold is exceeded.	[Output Off_On cycle threshold]
Forced output setting	Forces the digital output unit's output signal to be either ON or OFF (regardless of the actual output) from the PC software.	-
Operation setting in the event of a communication error	If the device unit's DIP switch setting SW3 is OFF (set individually for each unit), the output operation in the event of a communication (upper communication or internal bus communication) error is set on the Digital output unit side.	[Communication error operation]
Point diagnostic information for the unit	The diagnostic information for each of the digital output unit's points. 16 bits per point, and each bit corresponds to an error type. If an error is detected, the corresponding bit is 1 (ON). The information can be read from the PC software or upper master. The types of errors are as follows: Bit: Error description (genres of device diagnostics) 15: Signal line error (unit output) 14: Over Off_On cycle threshold (unit output) 13: Hardware error (hardware) 12: On signal line error recovery, same behavior maintained as during error (operation waiting)	-

PRECAUTIONS

- Make sure that cables and connectors are securely connected before turning on the power.
- Do not disassemble, modify, or repair the product as that may cause failure or malfunction.
- Do not drop or apply excessive vibrations or shocks to the product as the part inside are made precisely.
- Do not attach or detach the connector while the power is ON as that may cause a failure or malfunction.
- Mold and rust may develop on the product if it is exposed to high humidity during transportation. Include moisture absorbers and tightly seal the package.

For inquiries regarding this product, please contact the following or the nearest sales office.

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