Handling Precautions

Remote I/O RT series

EtherNet/IP compatible device unit

RT- XTENN00N

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

- Thoroughly read and understand the instruction manual for the industrial network communication system used before using the device unit.
- Do not leave the USB port open.
- 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	QR label, tie rod (2 pieces)

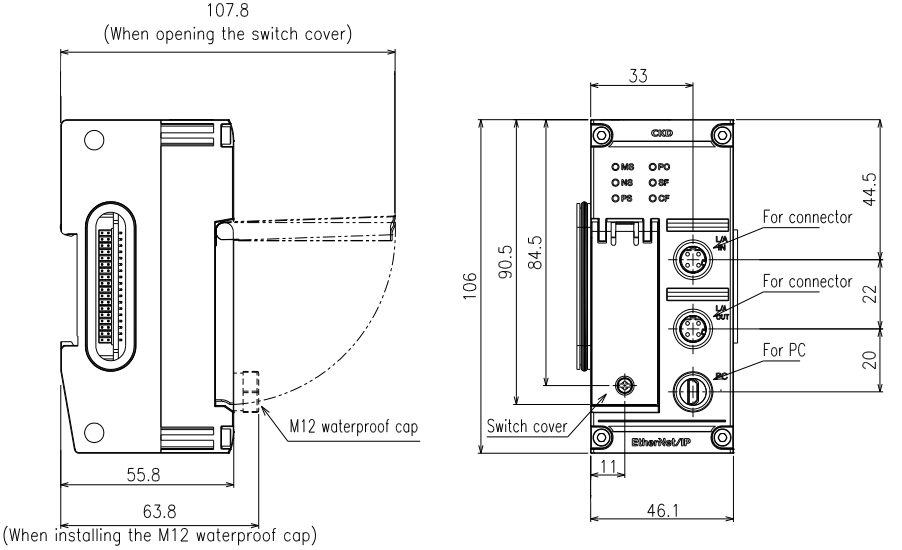
1 Specifications

Always use the product within its specifications.

Item		Specifications
Model No.		RT-XTENN00N
Size (W x H x D)	mm	46.1×106×55.8
Net weight	g	Approx. 230
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
Network communication		EtherNet/IP™ DLR, QoS supported: Use up to 513 bytes
Network connector		M12 (D) 4pin female x 2
Maximum number of points		Up to 4096 points (512 bytes) for input and output combined
Internal current consumption (for unit/input)	mA	100 or less
Internal current consumption (for output)	mA	20 or less
LED		For indicating device and communication status / 8 pieces
Number of I/O units that can be connected	units	17
Unit automatic recognition		Type / order recognition and monitoring
PC software:		Connect to PC via USB
Data synchronization interval between units	ms	Approx. 0.5 (minimum)
Web API function		Yes

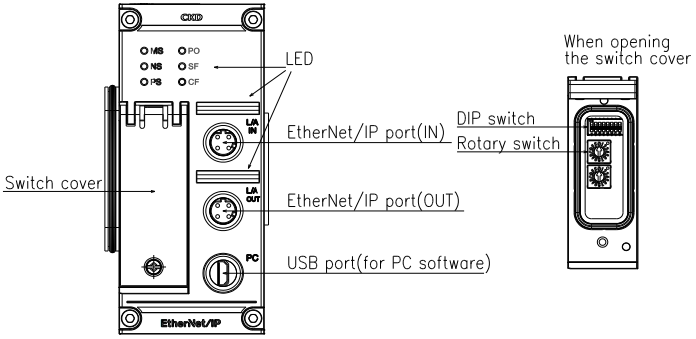
Note 1 IP65/IP67 is not part of the UL certification.

2 External dimensions



Dimensional unit: mm

3 Names and functions of each part



Name	Function
LED	Eight LEDs indicate the status of communication and system.
Switch cover	Protects the switch inside the unit. Tighten the screw to the specified torque (0.10 ± 0.02 N/m) after setting the switches.
EtherNet/IP port (IN/OUT)	To be input from EtherNet/IP originator(scanner) or another target(adapter). Or outputs from the product to another target(adapter).
USB port	Connects to RTXTools, a PC software dedicated to the RT series. Download from CKD website (https://www.ckd.co.jp/kiki/jp/) (free of charge)
Dip switches	Set the operation of the product and the remote I/O system.
Rotary switches	Set the IP address of the product as an EtherNet/IP target(adapter)

4 LED indicators and switch settings

4.1 LED indicators

These LEDs indicate the status of the product and network.

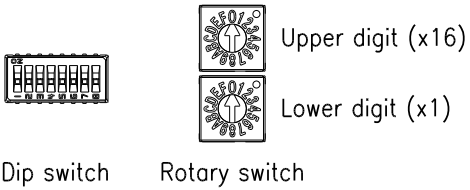
Name	Status	Meaning
MS	Red blinking	Invalid switch status or setting status
	Red on	Unit failure such as hardware failure
	Green on	Normal condition
	Green blinking	No IP address settings or communication setting in progress
	Off	The valve power is off.
NS	Red blinking	EtherNet/IP connection timed out
	Green on	Communicating EtherNet/IP
	Green blinking	IP address has set but no EtherNet/IP connection
	Off	Status when the power is off, or the IP address is not set.
L/A IN L/A OUT	Green blinking (fast)	Link, Activity
	Green on	Link, No activity
	Off	No link, No activity
PS	Red blinking (fast)	Unit/input voltage is outside the range of 24 V ± 25%.
	Yellow on	Unit/input voltage restored from voltage error.
	Green on	Unit/input voltage is normal.
	Off	Power OFF status
PO	Red blinking (fast)	Output voltage is outside the range of 24 V ± 25%.
	Yellow on	Output voltage restored from voltage error.
	Green on	Output voltage is normal.
	Off	Power OFF status
SF	Red blinking (fast)	Internal bus communication error
	Red blinking (slow)	Hardware error
	Red blinking (twice)	Factory setting error
	Yellow on	Operation waiting
	Yellow blinking (fast)	Unit configuration error
	Green blinking (fast)	Started with initialized set memory status.
	Green blinking (slow)	Process data overflow
	Green on	Normal condition
	Off	Power OFF status
CF	Red blinking (slow)	WebAPI/PC concurrent access
	Yellow on	Being set to the forced I/O settings
	Green blinking (fast)	Being accessed to WebAPI
	Green blinking (slow)	Being accessed from PC
	Off	Power OFF status or no access status

4.2 Switch settings

Conduct the operation settings of remote I/O system including the product and the IP address settings as an EtherNet/IP target(adapter). The setting is read into memory at power-up. Refer to the following table for the settings of each switch.

⚠ CAUTION

- Make sure to set the switches with the power off.
- Keep the cover closed and tighten the screw to the specified torque, except when setting the switches.
- Be careful not to allow any foreign object to get inside when setting the switches.
- Be careful when changing the settings, as the setting switch may be damaged.
- Never touch the internal circuit board other than switch when setting the switches.



Dip switch (DIPSW) settings

No.	Name	Settings	Setting range
1	WebAPI	Specifies whether the WebAPI function is enabled or disabled OFF: Disable (factory setting) ON: Enable	ON/OFF
2	Reserved	Not used	OFF
3	Output settings in the event of a communication error/ priority to hardware	Selects whether the operation of all connected I/O units is specified at once by using No.4 or individually by unit. OFF: Set individually by unit (factory setting) ON: Specified all units at once (specified by dip switch 4)	ON/OFF
4	HOLD/CLEAR	Selects the output operation (Note 2) in the event of a communication error (Note 1). OFF: CLEAR (Refer to the instruction manual of each unit for details. Factory setting) ON: HELD at the last value Note 1: Refers to a communication error of industrial network or internal bus. Note 2: For units with output function.	ON/OFF
5	Parameter initialization at startup	Restores all the units to the factory setting. OFF: Will not initialize (factory setting) ON: All units will be restored to the factory setting.	ON/OFF
6	Reserved	Not used	OFF
7	IP address 3rd octet selection	Selects the third octet of the IP address. OFF: 192.168.0XXX (factory setting) ON:192.168.1.XXX Note: XXX is the value specified by the above rotary switches	ON/OFF
8	Remote I/O system diagnostic information ON/OFF	OFF: Does not add diagnostic information (factory setting) ON: Diagnostic information for the entire remote I/O system is added to the data transmitted to the originator(scanner) via PDO communication.	ON/OFF

Rotary switch settings

Name	Settings	Setting range
×16	Set the IP address of the EtherNet/IP compatible device. Set 0 to 255 with x1 and x16 switches. 0: Use the setting value of a software. 1 to 254: 192.168.A.1 to 192.168.A.254 (Note: Select 0 or 1 with Dip switch No.7 for A.) 255: Determined by DHCP Factory setting: 0 (using software setting value: 192.168.1.10)	0 (0x0) to 15 (0xF)
×1		0 (0x0) to 15 (0xF)

5 Wiring

Function description and connection of the terminal 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 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; for example, secure the wiring to the machine or device midway.
- Do not wire the network cable and the 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.

5.1 Communication distance and wiring

Although the product accepts a standard Ethernet cable and supports flexible wiring methods, there are limits depending on the wiring material, devices, master(originator(scanner)), hub etc. Always understand their specifications thoroughly before wiring. (For details, refer to the instruction manual issued by the originator(scanner) manufacturer and the ODVA's specification relates to wiring.)

5.2 Unit/input power supply and output power supply

The power supply from the power supply unit (RT-XP24A01N) operates the product. The power supply unit that supplies power to the product needs to be located on the left side of the product. For details, refer to the "Remote I/O RT Series Instruction Manual: System Construction".

5.3 Connecting and wiring to EtherNet/IP port (M12 connector)

The network plug is not supplied with the product. Separately purchase a network plug that satisfies the specifications. Wiring the network cable to the network plug enables the plug to connect to the network connector socket on the product.

Refer to the following network connector pin arrangement and wiring example of network cable for the wiring. Use a network cable of CAT5 or higher.

Recommended network cable with connector M12-RJ45

- XS5W-T421-□MC-K (M12 straight) Mfd by Omron Corporation
- 0945 700 50□□ (M12 straight) Mfd by HARTING K.K.

Recommended network plug and network cable

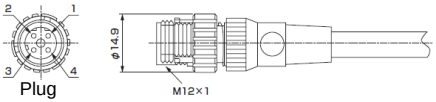
- 0945 600 01□□ (cable only) Mfd by HARTING K.K.
- 2103 281 1405 (assembly type M12 connector) Mfd by HARTING K.K.
- 0945 151 1100 (assembly type RJ-45 connector) Mfd by HARTING K.K.

Follow the steps below to connect the network cable to the network plug.

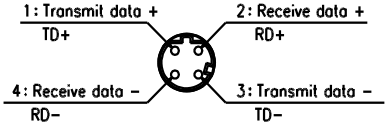
<Network cable>

(1) After confirming safety, stop network communication and turn off all peripheral equipment.

(2) Refer to the figure below and connect the EtherNet/IP compliant cable to M12 connector.



Cable side,



Product side

Port	Pin	Signal	Function
IN/ OUT	1	TD+	Transmission data, plus
	2	RD+	Reception data, plus
	3	TD-	Transmission data, minus
	4	RD-	Reception data, minus

⚠ CAUTION

- Use a dedicated network cable that complies with EtherNet/IP specifications.
- Provide sufficient bending radius for the network cable and do not bend it forcibly.

6 Maintenance

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

⚠ CAUTION

- Do not remove the device by pulling cable or connector that may cause disconnection or damage.
- Touching the electrical wiring (bare live part) or the connector connected between units may cause an electric shock or malfunction.
- Do not install the unit with dirt or dust on the unit opening, gasket, O-ring, etc.

7 Setting by EDS file

In order for an EtherNet/IP target(adapter) to participate in a network, registering to the EtherNet/IP originator(scanner) is necessary using the EDS file containing the target's communication specifications. For the registration, refer to the instruction manual of EtherNet/IP originator(scanner). Use the latest EDS file to ensure a suitable network configuration.

7.1 Registering the device

The registration procedure may differ depending on the type, number of connected units, and diagnostic information ON/OFF.

Check the connected units and DIP switch settings before starting work.

7.2 Size and allocation of process data

When connecting the product and an EtherNet/IP originator(scanner), it is necessary to specify the input and output process data sizes. Use the table below to calculate the size, or check the I/O memory tab in RTXTools[Note1]. RTXTools is used by connecting the PC and the product via LAN or USB.

Note1: PC software dedicated to RT series. Download from CKD website (https://www.ckd.co.jp/kiki/jp/) (free of charge)

Model No.	Name	Input (byte)	Output (byte)	Remarks
RT-XTENN00N	Device unit	0(1)	0	Input 1 byte when dip switch No. 8 is ON
RT-XADGA16A/B	Digital input unit (M12)	2	0	
RT-XADGA08A/B	Digital input unit (M8)	1	0	
RT-XADGC32A/B	Digital input unit (Push-in terminal block)	4	0	
RT-XBDGA16A/B	Digital output unit	0	2	
RT-XBDGC32A/B	Digital Output unit (Push-in terminal block)	0	4	
RT-XAAGA02N	Analog input unit	4	0	
RT-XBAGA02N	Analog output unit	0	4	
RT-XVVCN32A/B	Valve I/F unit	0	4	
RT-XLMSA08N	IO-Link master unit	6 to 64	2 to 64	Variable depending on settings

The product can adjust the process data size to an even number of bytes. Refer to the table below and set the corresponding parameters of the EtherNet/IP originator(scanner).

Instance	in/out	Description
100(0x64)	Output	Process output data
101(0x65)	Output	Process output data If the data length is an odd number of bytes, add 1 byte (0xFF) at the end.
110(0x6E)	Input	process input data
111(0x6F)	Input	Process input data If the data length is an odd number of bytes, add 1 byte (0xFF) at the end.

8 Object

The product supports the following objects. Refer to the instruction manual for the details.

Class ID	Class name	Description
0x01(1)	Identity Object	-
0x02(2)	Message Router Object	-
0x04(4)	Assembly Object	-
0x06(6)	Communication Manager Object	-
0x47(71)	Device Level Ring (DLR) Object	-
0x48(72)	QoS Object	-
0x64(100)	Diagnosis History	Gets log data
0x65(101)	Manifold Diagnosis	Gets manifold diagnostic information
0x66(102)	Unit Diagnosis	Gets diagnostic information of each unit
0x67(103)	Points Channel Port Diagnosis	Gets diagnostic information of each CH
0x68(104)	Specific Diagnosis	Gets diagnostic information of unit-specific
0x70(112)	Own Parameters	Reads/writes the settings of the EtherNet/IP compatible device
0x71(113)	Digital Input Parameters	Reads/writes the settings of digital input unit
0x72(114)	Digital Output Parameters	Reads/writes the settings of digital output unit
0x73(115)	Analog Input Parameters	Reads/writes the settings of analog input unit
0x74(116)	Analog Output Parameters	Reads/writes the settings of analog output unit
0x75(117)	Valve Interface parameters	Reads/writes the settings of valve I/F unit
0x76(118)	IO-Link master parameters	Reads/writes the settings of IO-Link master unit

Class ID	Class name	Description
0x77(119)	Digital Input 32 points Parameters	Reads/writes the settings of digital input unit (Push-in terminal block)
0x78(120)	Digital Output 32 points Parameters	Reads/writes the settings of digital output unit (Push-in terminal block)
0x7F(127)	General unit parameters	Reads/writes the settings of a unit
0x80(128)	IO-Link Master ISDU Tx/Rx	Sends/receive ISDU of IO-Link master
0x90(144)	Digital Input Data Object	Digital input value
0x91(145)	Digital Output Data Object	Digital output value
0x94(148)	Analog Input Data Object	Analog input value
0x95(149)	Analog Output Data Object	Analog output value
0x98(152)	IO-Link Master Input Object	IO-Link master input value
0x99(153)	IO-Link Master Output Object	IO-Link master output value
0xA0(160)	Detected Module ID List Object	Gets a list of connected units
0xF4(244)	Port Object Class	-
0xF5(245)	TCP/IP Interface Object	-
0xF6(246)	EtherNet Link Object	-

9 WebAPI

When starting the product while the dip switch No.1 is ON, the WebAPI function will be enabled. It supports to obtain the status and settings of the product and set the operation via LAN if the WebAPI function is enabled. WebAPI can be accessed from RTXTools and applications that can communicate with HTTP. Refer to the instruction manual for the details.

PRECAUTIONS

- For the delay time, refer to the instruction manual for the EtherNet/IP originator(scanner). Transmission delay as a system varies depending on the PLC scan time and other devices connected to the same network.
- 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 the product, please contact the following or the nearest sales office.

CKD Corporation

Head Office and Plant
250, Ouji 2-chome, Komaki, Aichi, 485-8551, Japan
Phone: +81-(0)568-77-1111 /Fax: +81-(0)568-77-1123
Overseas Sales Dept.
250, Ouji 2-chome, Komaki, Aichi, 485-8551, Japan
Phone: +81-(0)568-74-1338 /Fax: +81-(0)568-74-1165
Please check global distributers with our catalog or the website below.
https://www.ckd.co.jp/en/