DeviceNet Remote I/O Sensor Connector Type

ARD-D Series
INSTRUCTION MANUAL

Autonics

Thank you for choosing our Autonics product.
Read and understand the instruction manual and manual thoroughly before using the product.
For your safety, read and follow the below safety considerations before using.
For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.
Keep this instruction manual in a place where you can find easily.
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.
Follow Autonics website for the latest information.

Safety Considerations

• Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
• ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ Warning Failure to follow instructions may result in serious injury or death.

01. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**
Failure to follow this instruction may result in personal injury, economic loss or fire.
02. **Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.**
Failure to follow this instruction may result in explosion or fire.
03. **Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.
04. **Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire.
05. **Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.

⚠ Caution Failure to follow instructions may result in injury or product damage.

01. **Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
02. **Use a dry cloth to clean the unit, and do not use water or organic solvent.**
Failure to follow this instruction may result in fire.
03. **Keep the product away from metal chip, dust, and wire residue which flow into the unit.**
Failure to follow this instruction may result in fire or product damage.
04. **Do not cut off power or disconnect connectors while operating the unit.**
Failure to follow this instruction may result in fire or malfunction.

Cautions during Use

• Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
• 24 VDC⎓ model power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
• Use only designated connector and do not apply excessive power when connecting or disconnecting the connectors..
• Keep away from high voltage lines or power lines to prevent inductive noise.
In case installing power line and input signal line closely, use line filter or varistor at power line and shielded wire at input signal line. Do not use near the equipment which generates strong magnetic force or high frequency noise.
• Do not connect or disconnect the expansion unit when power is being supplied.
• This unit may be used in the following environments.
- Indoors (in the environment condition rated in 'Specifications')
- Altitude max. 2,000 m
- Pollution degree 2
- Installation category Ⅱ

Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

| AR | ❶ | - | D | ❷ | 08 | ❸ | - | 4S |

❶ Network
D: Basic unit - DeviceNet
X: Expansion unit - DeviceNet / Modbus compatible
❸ I/O specifications
N: NPN open collector
P: PNP open collector
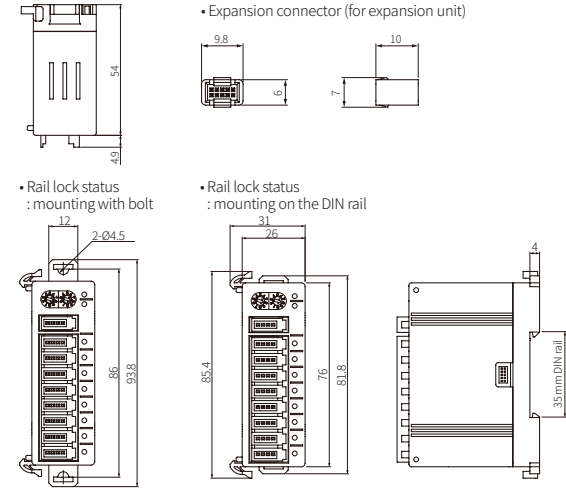**❷ I/O**
I: input
O: output

Product Components

Model	ARD-D□08□-4S	ARX-D□08□-4S
Product components	Product, instruction manual	
Network connector	× 1	-
Expansion connector	-	× 1
Terminating resistance	× 2	-

Sold Separately

• Sensor connector: CNE Series

Dimensions

• Unit: mm, For the detailed drawings, follow the Autonics website.
• Same dimensions are applied to both basic and expansion unit.

• Expansion connector (for expansion unit)

• Rail lock status : mounting with bolt
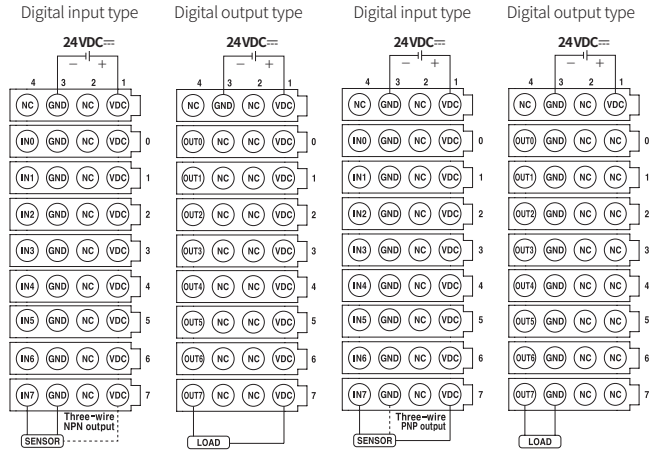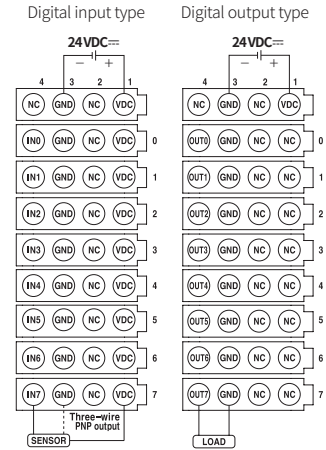• Rail lock status : mounting on the DIN rail

Connections

• For more information, refer to the 'Specifications.'
• When wiring the communication connector, use cable and tap which meet DeviceNet standard, and tighten the connector screw with a tightening torque of 0.5 N m.
• Connect terminating resistances (recommended: 120 Ω, 1 % of the metallic film, 1/4 W) on both ends of the network cables. Otherwise, impedance fluctuation could cause communication errors.
• Refer to the table below for the cable depending on the communication speed.

Comm. speed	Comm. distance	Length of branch line	Length of extended branch line
125 kbps	≤ 500 m	≤ 6 m	≤ 156 m
250 kbps	≤ 250 m	≤ 6 m	≤ 78 m
500 kbps	≤ 100 m	≤ 6 m	≤ 39 m

■ NPN open collector

Digital input type / Digital output type

■ PNP open collector

Digital input type / Digital output type
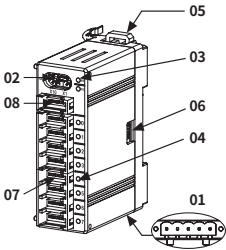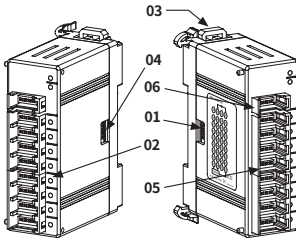

Unit Descriptions

■ Basic unit

01. **Network connector**
02. **Rotary switch**
For setting NODE ADDRESS
03. **Status indicator**
For unit status (MS) and network status (NS)
04. **I/O Status indicator**
For I/O status
05. **Rail lock**
For the DIN rail and panel mount
06. **Connector output part**
For connecting the expansion unit
07. **Sensor connector**
For I/O with the external device
08. **External power connector**
For connecting the external power

■ Expansion unit

01. **Connector input part**
For connecting the basic and expansion units
02. **I/O status indicator**
For I/O status
03. **Rail lock**
For the DIN rail and panel mount
04. **Connector output part**
For connecting the expansion unit
05. **Sensor connector**
For I/O with the external device
06. **External power connector**
For connecting the external power

■ Network connector

No.	Color	Function	Pinout
5	Red	24 VDC⎓ (+)	5: V +
4	White	CAN_H	4: CAN_H
3	None	SHIELD	3: SHIELD
2	Blue	CAN_L	2: CAN_L
1	Black	24 VDC⎓ (-)	1: V -

■ I/O status indicator

Input	Green LED, ON
Output	Red LED, ON

■ Status indicator

	Red LED	Green LED	Description
Unit status (MS) indicator	ON	OFF	Unrecoverable error
	Flashing	OFF	Recoverable error & expansion unit communication error
	OFF	ON	Normal operation
	OFF	OFF	Power is not supplied.
Network status (NS) indicator	OFF	Flashing	Normal operation standby
	OFF	ON	Network On-Line
	ON	OFF	Dupl, MAC ID / Bus-Off
	Flashing	OFF	Time out
	OFF	OFF	Network Off-Line

Set NODE ADDRESS

• The NODE ADDRESS of the connected unit must not be duplicated.
• When changing the NODE ADDRESS during operation, the unit status (MS) LED flashes in red, and the unit communicates as the address before. To apply the changed NODE ADDRESS, be sure to power on again.
• The communication speed is automatically set to that of the Master (PC, PLC, etc.). When changing the communication speed during operation, the network status (NS) LED flashes in red, and communication is not possible.
Power on again to operate in the normal state.

01. **Turn the two rotary switches to set the NODE ADDRESS.**
(NODE ADDRESS range: 01 to 99)

• [e.g.]

Rotary switch	X10 (tens digit)	X1 (ones digit)	NODE ADDRESS
X10 X1	3	3	33

Installation

■ Mounting on the DIN rail

01. **Pull two Rail locks on the rear part of a unit.**
02. **Place the unit on the DIN rail to be mounted.**
03. **Press the Rail locks to fix the unit tightly.**

■ Mounting on the panel

01. **Pull two rail locks on the rear part of a unit, and there is a fixing bolt hole.**
02. **Place the unit on a panel to be mounted.**
03. **Make a hole on a fixing bolt hole position.**
04. **Fasten the bolt to fix the unit tightly.**
(tightening torque: ≤ 0.5 N m or 1.8 to 2.5 N m)

Connect Expansion Unit

01. **Turn OFF the power of a basic unit.**
02. **Remove the cover of the expansion connector (accessory of the expansion unit) with nippers.**
03. **Mount the expansion connector and connector input part of the expansion unit.**
04. **Connect the expansion unit to the connector output part of the basic unit.**
05. **Power on the basic unit, recognizing the expansion unit.**

Specifications

Model		AR□-DI08□-4S	AR□-DO08□-4S
Power supply		Rated voltage: 24 VDC⎓, voltage range: 12-28 VDC⎓	
Power consumption		≤ 3 W	
I/O points		NPN or PNP input 8-point	NPN or PNP output 8-point
Control I/O	Voltage	10-28 VDC⎓ input	10-28 VDC⎓ output (voltage drop: ≤ 0.5 VDC⎓)
	Current	10 mA/point (sensor current: 150 mA/point)	0.3 A/point (leakage current: ≤ 0.5 mA)
	COMMON method	8-point, common	
Number of connected expansion unit		≤ 7 units	
I/O points		≤ 64-point	
Communication spec.		I/O Slave messaging (group 2 only slave) : supporting Poll command, Bit_strobe command, Cyclic command, COS command	
Communication speed (comm. distance)		125 kbps (≤ 500 m), 250 kbps (≤ 250 m), 500 kbps (≤ 100 m)	
Protocol		DeviceNet	
Approval		ODVA Conformance tested	
Insulation method		I/O and internal circuit: photocoupler insulation, DeviceNet and internal circuit: non-insulation, DeviceNet power: non-insulation	
Insulation resistance		≥ 200 MΩ (500 VDC⎓ megger)	
Noise immunity		± 240 VDC⎓ the square wave noise (pulse width: 1 μs) by the noise simulator	
Dielectric strength		1,000 VAC～ at 50/60 Hz for 1 min	
Vibration		1.5 mm amplitude at frequency 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours	
Shock		500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times	
Ambient temperature		-10 to 55 °C, storage: -25 to 75 °C (a non freezing or condensation environment)	
Ambient humidity		35 to 85 %RH, storage: 35 to 85 %RH (a non freezing or condensation environment)	
Protection structure		IP20 (IEC standard)	
Protection circuit		Surge, short-circuit, overheat and ESD protection, reverse power protection circuit	
		Overcurrent protection circuit (operation : ≥ 0.17 A)	Overcurrent protection circuit (operation: ≥ 0.7 A)
Indicator		Network status (NS) and unit status (MS) indicator (green, red LED), I/O status indicator (input: green LED, output: red LED)	
Material		Front and body case: PC	
Mounting method		DIN rail or panel mounting	
Approval		C€ ЕАС DeviceNet.	
Unit weight	Basic unit	≈ 64 g	NPN type: ≈ 65 g / PNP type: ≈ 67 g
	Expansion unit	NPN type: ≈ 56 g / PNP type: ≈ 57 g	NPN type: ≈ 58 g / PNP type: ≈ 59 g