

Autonics DeviceNet Digital Remote I/O Sensor Connector Type ARD SERIES

INSTRUCTION MANUAL



Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

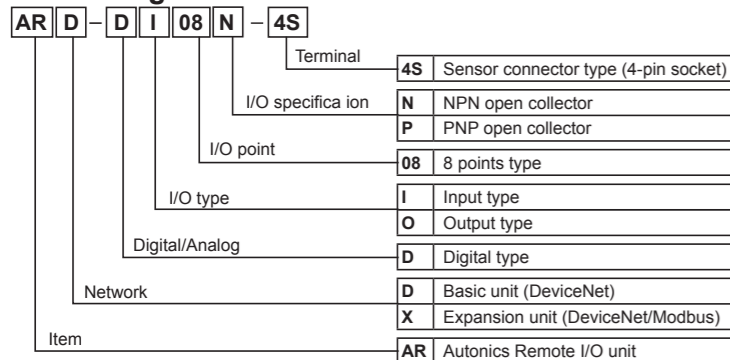
Safety Considerations

- ※Please observe all safety considerations for safe and proper product operation to avoid hazards.
- ※⚠ symbol represents caution due to special circumstances in which hazards may occur.
- Warning** Failure to follow these instructions may result in serious injury or death.
- Caution** Failure to follow these instructions may result in personal injury or product damage.
- Warning**
 - 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 fire, personal injury, or economic loss.
 - Do not disassemble or modify the unit. Failure to follow this instruction may result in fire.
 - Do not connect, repair, or inspect the unit while connected to a power source. Failure to follow this instruction may result in fire.
 - Check 'Connections' before wiring. Failure to follow this instruction may result in fire.

Caution

- Use the unit within the rated specifications. Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent. Failure to follow this instruction may result in fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present. Failure to follow this instruction may result in fire or explosion.
- Keep metal chip, dust, and wire residue from flowing into the unit. Failure to follow this instruction may result in fire or product damage.
- Do not disconnect connector or power, when the product is operating. Failure to follow this instruction may result in fire or malfunction.

Ordering Information



Models

Models	Expansion unit	Specification
ARD-D 08N-4S	ARX-DI08N-4S	10-28VDC NPN input 8-point (10mA/point)
ARD-D 08P-4S	ARX-DI08P-4S	10-28VDC PNP input 8-point (10mA/point)
ARD-DO08N-4S	ARX-DO08N-4S	10-28VDC NPN output 8-point (0.3A/point)
ARD-DO08P-4S	ARX-DO08P-4S	10-28VDC PNP output 8-point (0.3A/point)

Functions

- Auto communication speed recognition: The unit enables to recognize communication speed automatically when connecting with master unit.
- Network power voltage monitoring: If PV is lower than setting value, the unit enables to receive abnormal flag for network power voltage monitoring as Explicit message.
- Single byte I/O: Reads / Writes on single byte
- Multi-byte I/O: Reads / Writes on several bytes
- Additional expansion units: Available to connect expansion units up to 7. I/O points can be expanded up to max. 64.
- Reading the number of expansion units: Reads the number of connected expansion units
- Reading the unit model name: Reads the model name of connected units
- Reading unit specification: Read the specification of connected units
- ※The above specifications are subject to change and some models may be discontinued without notice.
- ※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

Specifications

Model	Basic unit	ARD-DI08N-4S	ARD-DI08P-4S	ARD-DO08N-4S	ARD-DO08P-4S
Power supply	Expansion unit	ARX-DI08N-4S	ARX-DI08P-4S	ARX-DO08N-4S	ARX-DO08P-4S
Power consumption	Rated voltage: 24VDC=, Voltage range: 12-28VDC=				
Isolation type	Max. 3W				
I/O points	Photocoupler isolated				
Control I/O	Voltage	NPN input 8-point		PNP input 8-point	
	Current	10mA/point (sensor current: 150mA/points)		10-28VDC= output (voltage drop: max. 0.5VDC=)	
	Common	8-point, common		0.3A/point (leakage current: max. 0.5mA)	
Insulation resistance	Over 200MΩ (at 500VDC megger)				
Noise immunity	±240V the square wave noise (pulse width: 1μs) by the noise simulator				
Dielectric strength	1,000VAC 50/60Hz for 1 minute				
Vibration	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours				
Shock	500m/s ² (approx. 50G) in each X, Y, Z direction for 3 times				
Environment	Ambient temperature	-10 to 50°C, Storage: -25 to 75°C			
	Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH			
Protection	IP20 (IEC standard)				
Protection circuit	Surge, short-circuit, overheat and ESD protection, reverse polarity protection circuit		Overcurrent protection circuit (operated at min. 0.17A)		
	Overcurrent protection circuit (operated at min. 0.17A)		Overcurrent protection circuit (operated at min. 0.7A)		
Indicator	Network status (NS) LED (green, red), unit status (MS) LED (green, red) I/O status LED (input: green, output: red)				
Material	Front case, body case: Polycarbonate				
Mounting	DIN rail or bolt mounting type				
Approval	CE DeviceNet				
Unit weight	Basic unit	Approx. 64g	Approx. 64g	Approx. 65g	Approx. 67g
	Expansion unit	Approx. 56g	Approx. 57g	Approx. 58g	Approx. 59g

※ Environment resistance is rated at no freezing or condensation.

DeviceNet Communication

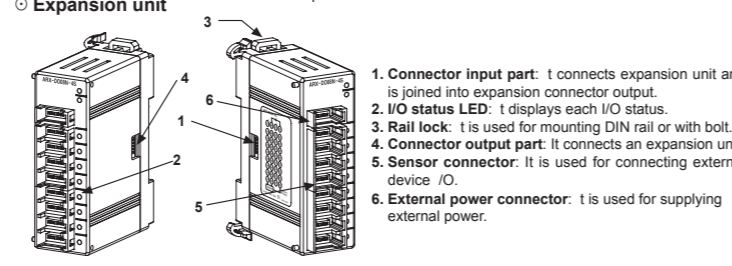
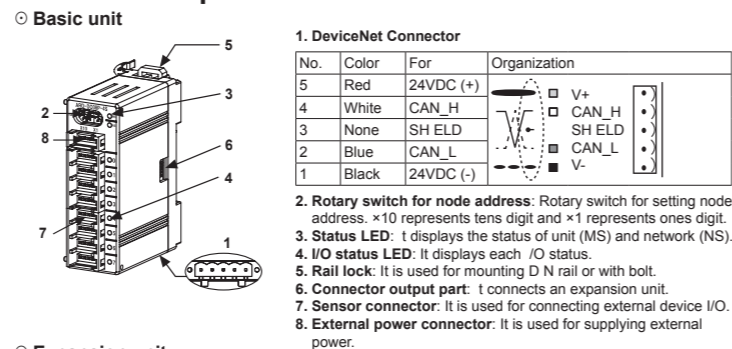
Item	Specification
Communication	I/O Slave messaging (Group 2 Only slave) Poll command: Yes Bit_strobe command: Yes Cyclic command: Yes COS command: Yes
Communication distance	Max. 500m (125kbps), Max. 250m (250kbps), Max.100m (500kbps)
NOE ADDRESS setting	Max. 64 node (set by front rotary switch)
Communication speed ^{※1}	125, 250, 500kbps (automatic setting when connecting with Master)
Insulation	I/O and inner circuit: Photocoupler insulation, DeviceNet and inner circuit: Non-insulated, power of DeviceNet: Non-insulated
Power supply	Rated voltage: 24VDC= Voltage range: 12-28VDC= Power consumption: Max. 3W
Approval	ODVA Conformance tested

※1. The communication speed is automatically set to the communication speed 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.

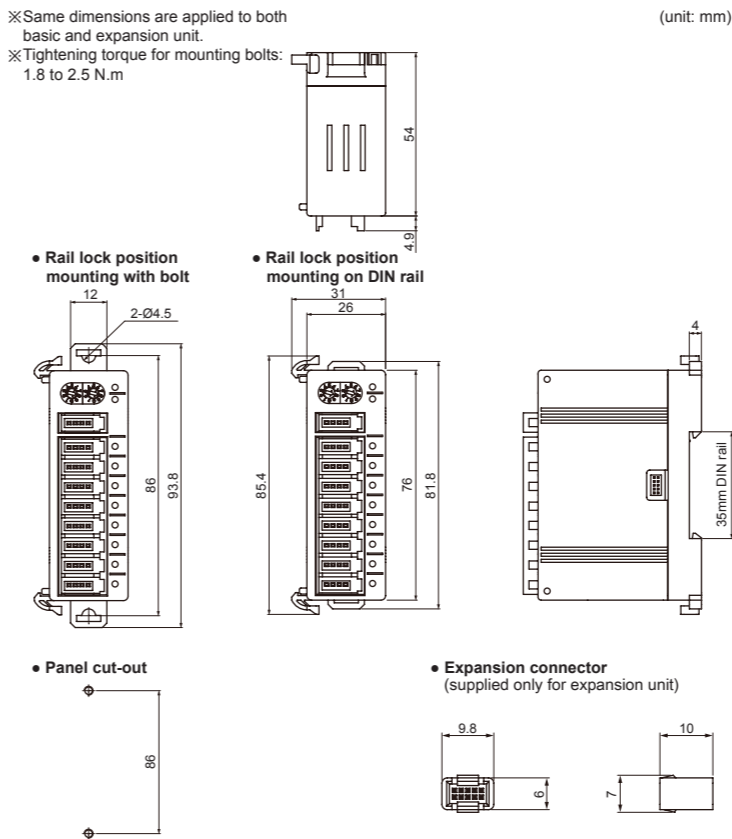
Communication Distance

Baud rate	Max. network length	Max. branch line length	Max. extended branch line length
125kbps	500m	6m	156m
250kbps	250m	6m	78m
500kbps	100m	6m	39m

Unit Description



Dimensions



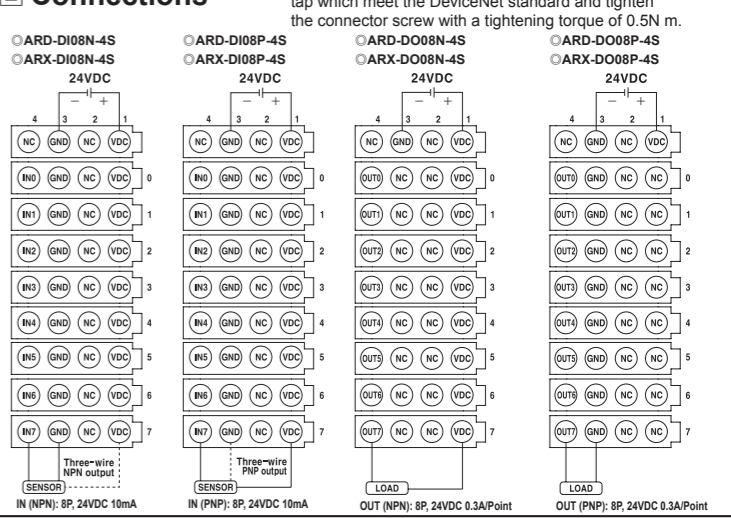
Setup and Installation

- #### Setting node address
- Two rotary switches are used for setting node address. The ×10 switch represents tens digit and the ×1 switch represents ones digit. The node address can be set 00 to 63. (e.g. $5 \times 10 + 3 = 53$) The X10 and X1 switches point both at "3", so the node address is "33".
 - After setting the desired node address, re-supply the unit power for applying the changed 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 to the NODE ADDRESS before the change.
- #### Unit Installation
- Mounting on panel**
 - Pull two rail locks on the rear part of a unit, there is a fixing bolt hole.
 - Place the unit on a panel to be mounted.
 - Make a hole on a fixing bolt hole position.
 - Fasten the bolt to fix the unit tightly. Please set the tightening torque under 0.5N.m.
 - Mounting on DIN rail**
 - Pull two rail locks on the rear part of a unit.
 - Place the unit on DIN rail to be mounted.
 - Press rail locks to fix the unit tightly.
 - Mounting of expansion unit**
 - Turn OFF the power of a basic unit.
 - Remove the cover of connector for extension with nippers.
 - Connect connector input part of an expansion unit and connector output part of a basic unit with the connector which is enclosed with an expansion unit box.
 - Connected expansion units are installed as the right figure.
 - Supply power to the basic unit.
 - ※Re-supply power to the basic unit, and it recognizes expansion units.
- ※Connect terminating resistance on the both ends of the trunk line.

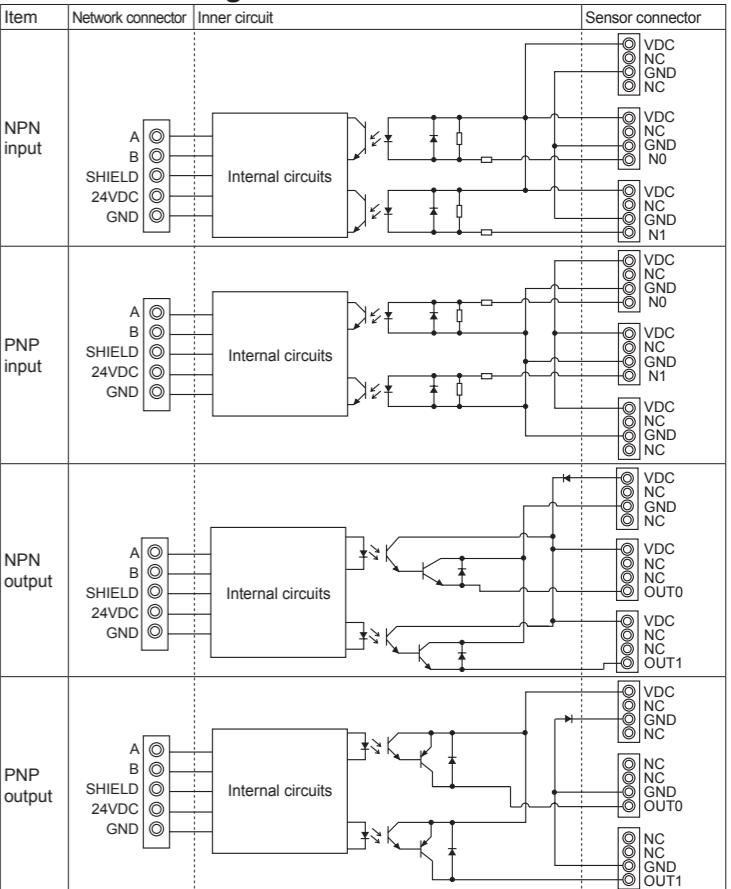
Status LED

Item	LED status		Descriptions
	Red	Green	
Unit status (MS) LED	●	●	Unrecoverable error
	●	●	Recoverable error & communication error of expansion unit
	●	●	Normal operation
	●	●	Power is not supplied
Network Status (NS) LED	●	●	Normal standby
	●	●	Network On-Line
	●	●	Dupl. MAC / Bus-off
	●	●	Time out

Connections



I/O Circuit Diagram



Caution during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 24VDC 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. 2,000m
 - Pollution degree 2
 - Installation category II

Major Products

- Photoelectric sensors
- Fiber optic sensors
- Door sensors
- Door side sensors
- Area sensors
- Proximity sensors
- Pressure sensors
- Rotary encoders
- Connector/Sockets
- Switching mode power supplies
- Control switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper motors/drivers/motion controllers
- Graphic/Logic panels
- Field network devices
- Laser marking system (Fiber, CO₂, Nd:YAG)
- Laser welding/soldering system
- Temperature controllers
- Temperature/Humidity transducers
- SSR/Power controllers
- Counters
- Timers
- Panel meters
- Tachometer/Pulse (Rate) meters
- Display units
- Sensor controllers