

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



Thank you very much for selecting Autonics products. For your safety, please read the following before using.

## 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.

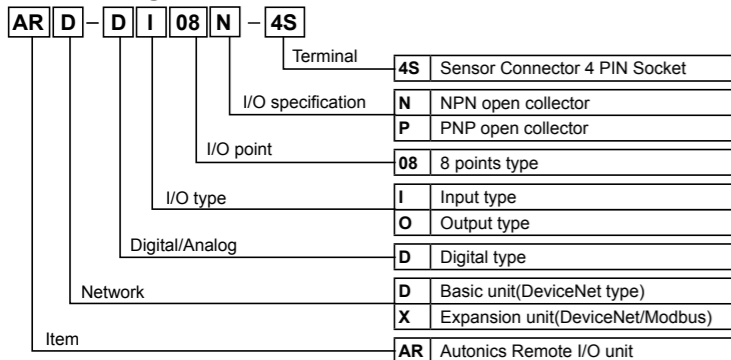
### Warning

- 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 electric shock or 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



## 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).

## Models

Model	Expansion unit	Specification
ARD-DI08N-4S	ARX-DI08N-4S	8 points of 10-28VDC NPN input(10mA/point)
ARD-DI08P-4S	ARX-DI08P-4S	8 points of 10-28VDC PNP input(10mA/point)
ARD-DO08N-4S	ARX-DO08N-4S	8 points of 10-28VDC NPN output(0.3A/point)
ARD-DO08P-4S	ARX-DO08P-4S	8 points of 10-28VDC PNP output(0.3A/point)

## Specifications

Model	ARD-DI08N-4S	ARD-DI08P-4S	ARD-DO08N-4S	ARD-DO08P-4S
Power supply	Rated voltage: 24VDC±, Voltage range: 12-28VDC±			
Power consumption	Max. 3W			
Isolation type	Photocoupler isolated			
I/O points	8 points of NPN input	8 points of PNP input	8 points of NPN output	8 points of PNP output
Control I/O	Voltage	10-28VDC Input (Voltage drop: Max. 0.5VDC)		
	Current	10mA/point (Sensor current: 150mA/points) 0.3A/point (Leakage current: Max. 0.5mA)		
COMMON	8 points Common			
Insulation resistance	Min. 200MΩ (at 500VDC megger)			
Noise strength	±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 in each of X, Y, Z directions for 2 hours			
Shock	500m/s <sup>2</sup> (Approx. 50G) in X, Y, Z directions 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, Overheating and ESD protection, Reverse polarity protection circuit			
Indicator	Overcurrent protection circuit (Operated at min. 0.17A)		Overcurrent protection circuit (Operated at min. 0.7A)	
	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: PC			
Mounting	DIN rail or Screw lock type			
Approval	CE, DeviceNet			
Unit weight	Basic: 64g	Basic: 64g	Basic: 65g	Basic: 67g
	Expansion: 56g	Expansion: 57g	Expansion: 58g	Expansion: 59g

※ Environment resistance is rated at no freezing or condensation.

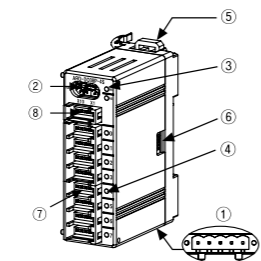
## DeviceNet Communication

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)
Node address setting	Max. 64node(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.

## Part Descriptions

### Basic unit

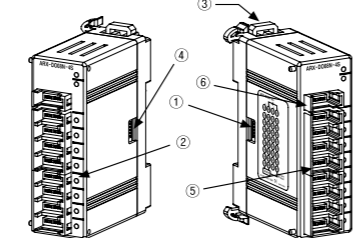


### DeviceNet Connector

No.	Color	For	Organization
5	Red	24VDC(+)	V+
4	White	CAN_H	CAN_H
3	None	SHIELD	SHIELD
2	Blue	CAN_L	CAN_L
1	Black	24VDC(-)	V-

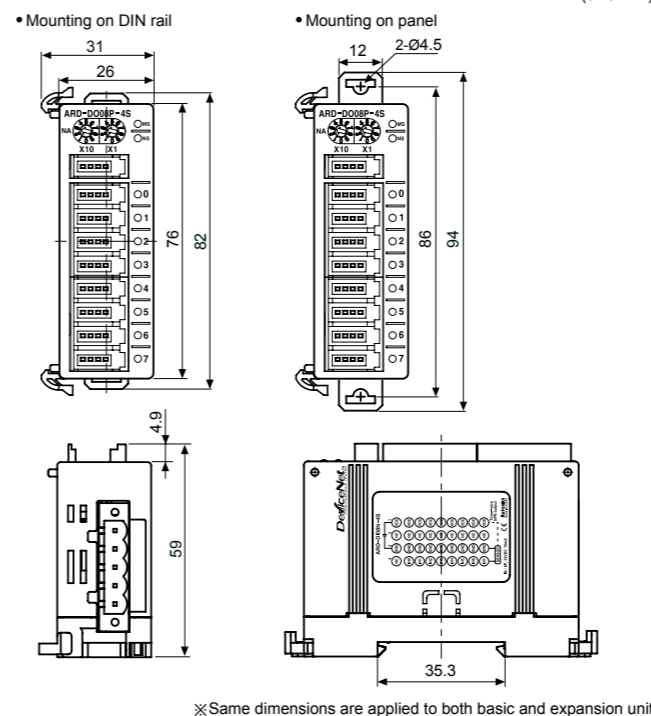
- Rotary switch for node address:** Rotary switch for setting node address. \*10 represents tens digit and \*1 represents ones digit.
- Status LED:** It displays the status of unit(MS) and network(NS).
- I/O status LED:** It displays each I/O status.
- Rail lock:** It is used for mounting DIN rail or with screw.
- Connector output part:** It connects an expansion unit.
- Sensor connector:** It is used for connecting external device I/O.
- External power connector:** It is used for supplying external power.

### Expansion unit



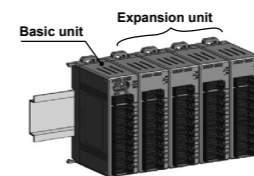
- Connector input part:** It connects expansion unit and is joined into expansion connector output.
- I/O status LED:** It displays each I/O status.
- Rail lock:** It is used for mounting DIN rail or with screw.
- Connector output part:** It connects an expansion unit.
- Sensor connector:** It is used for connecting external device I/O.
- External power connector:** It is used for supplying external power.

## Dimensions



## Installation and Setup

- ### Setting node address
- Two rotary switches are used for setting node address. \*10 switch represents tens digit and \*1 switch represents ones digit. The node address can be set 00 to 63.
  - E.g. 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 screw hole.
    - Place the unit on a panel to be mounted.
    - Make a hole on a fixing screw hole position.
    - Fasten the screw 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.

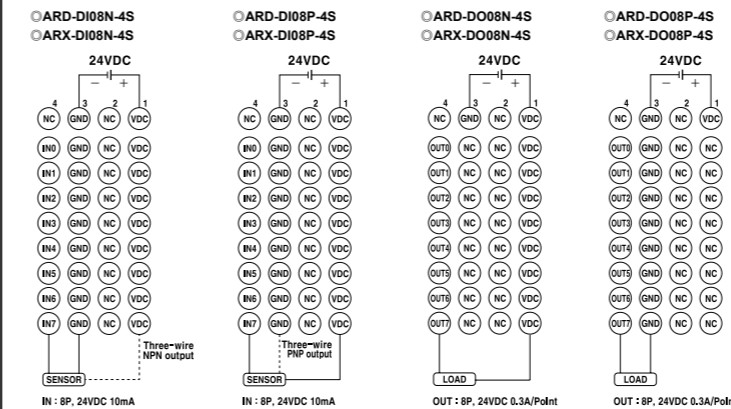


### Terminating resistance

- 120Ω ±1% of metallic film ±1/2W
- Do not install terminating resistance on the basic unit, or it may cause network terminating problems.(Impedance can be too high or low) and trouble.
- Connect terminating resistance on the both ends of the trunk line.

## Connections

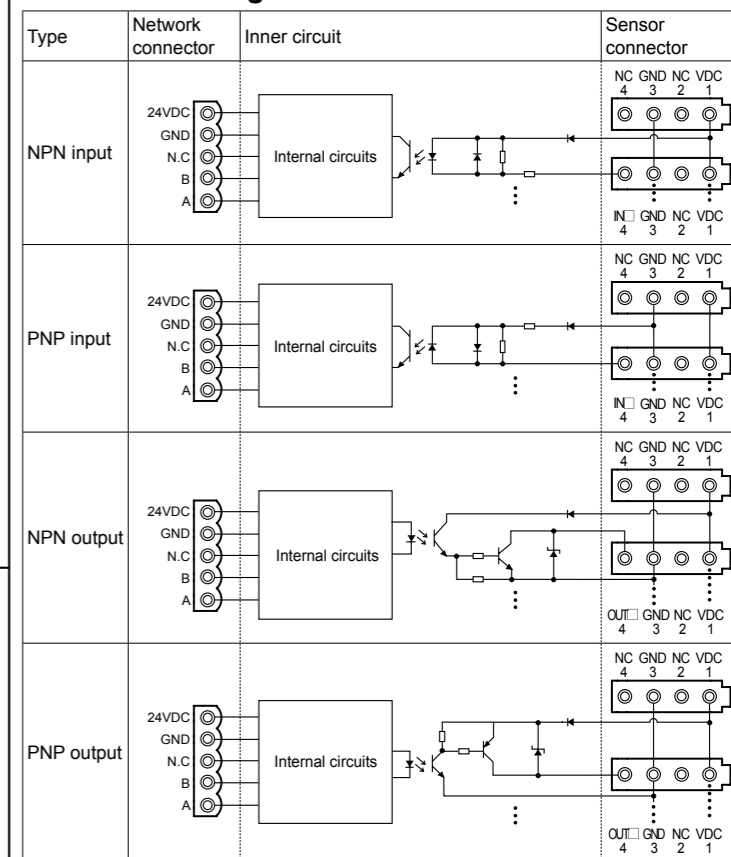
※When wiring the communication connector, use cable and tap which meet the DeviceNet standard and tighten the connector screw with a tightening torque of 0.5N.m.



## 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

## I/O Circuit Diagram



## 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 ID / Bus-off
	⚡	●	Time out
Network Off-Line	●	●	Network Off-Line

(⚡: ON, ⚡: Flash, ●: OFF)

## 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, CO<sub>2</sub>, 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

**Autonics Corporation**  
<http://www.autonics.com>  
**HEADQUARTERS:**  
 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, South Korea, 48002  
 TEL: 82-51-519-3232  
 E-mail: sales@autonics.com