

Autonics

Modbus sensor connector type digital remote I/O

ARM SERIES

M A N U A L



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

Caution for your safety

※Please keep these instructions and review them before using this unit.

※Please observe the cautions that follow;

Warning Serious injury may result if instructions are not followed.

Caution Product may be damaged, or injury may result if instructions are not followed.

※The following is an explanation of the symbols used in the operation manual.

Caution: Injury or danger may occur under special conditions.

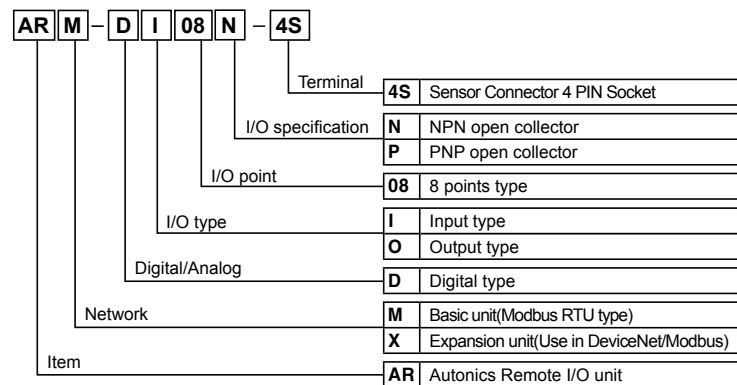
Warning

- In case of using this unit with machinery (Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention, equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device. It may cause a fire, human injury and damage of property.
- Do not connect, inspect and repair this unit when power is ON. It may cause a fire, human injury or damage to property.
- Do not disassemble or modify this unit. Please contact us if it is required. It may cause electric shock or a fire.
- Do not insert metallic substance into the unit. It may cause electric shock, a fire, or malfunction.

Caution

- This unit shall not be used outdoors. It may shorten the life cycle of the product or cause electric shock.
- Do not use this unit in place where there is flammable or explosive gas. It may cause a fire or explosion.
- Do not use this unit in place where there is vibration or impact. It may cause a breakdown of the product.
- Please connect power terminal and communication cable exactly after checking the connection diagram. It may cause a fire and malfunction.
- Tighten communication cable connector as tight as possible for stable cable connection. In case of unstable cable connections, it may cause serious communication or network malfunction.
- In cleaning the unit, do not use water or organic solvent. And use dry cloth. It may cause electric shock and breakdown of the product.
- Please observe the rated specifications. It may cause electric shock, human injury and breakdown of the product.
- Please separate as industrial waste when disusing this unit.

Ordering information



※The above specifications are subject to change without notice.

Functions

- Auto communication speed recognition:** The unit enables to recognize communication speed automatically when connecting with upper system (PC, PLC).
- Network power voltage monitoring:** If PV is lower than setting value, the caution parameter for network low current is ON.
- 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 the unit specification:** Reads the specification of connected units.
- Setting for address in the EEPROM:** For setting the address, user can set directly in the EEPROM MAC ID parameter besides the rotary switch for address.

Model

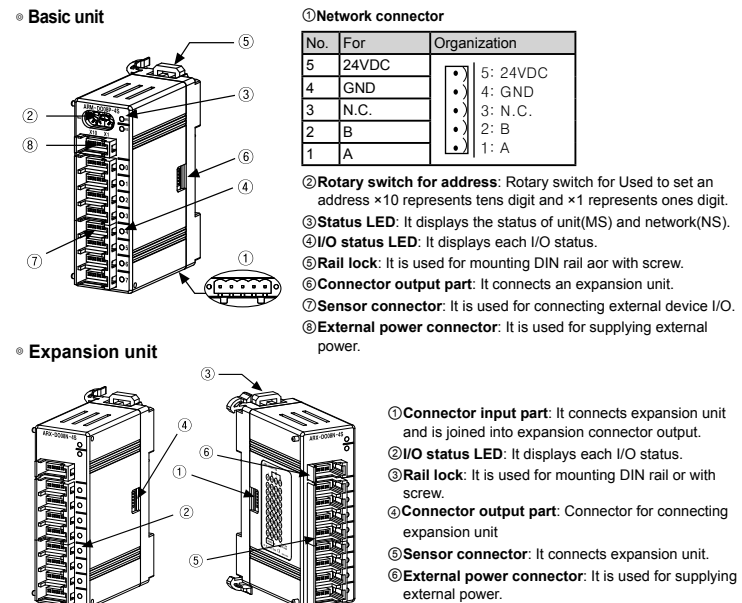
Model	Basic unit	Expansion unit	Specification
ARM-DI08N-4S	ARX-DI08N-4S		8 points of 10-28VDC NPN input (10mA/point)
ARM-DI08P-4S	ARX-DI08P-4S		8 points of 10-28VDC PNP input (10mA/point)
ARM-DO08N-4S	ARX-DO08N-4S		8 points of 10-28VDC NPN output (0.3A/point)
ARM-DO08P-4S	ARX-DO08P-4S		8 points of 10-28VDC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

Specifications

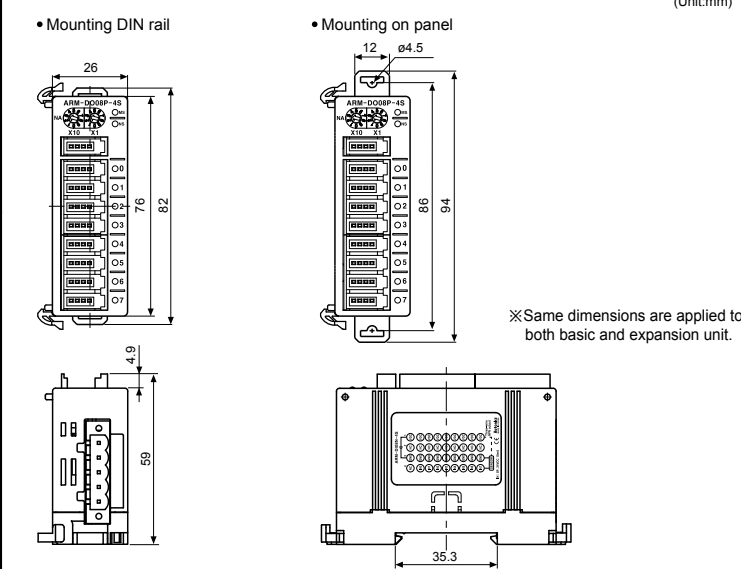
Model	Basic unit	ARM-DI08N-4S	ARM-DI08P-4S	ARM-DO08N-4S	ARM-DO08P-4S
	Expansion unit	ARX-DI08N-4S	ARX-DI08P-4S	ARX-DO08N-4S	ARX-DO08P-4S
Power supply	Rated voltage: 24VDC, Voltage range: 12-28VDC				
Power consumption	Max. 3W				
I/O points	8 points of NPN input	8 points of PNP input	8 point of NPN output	8 point of PNP output	
Control I/O	Voltage: 10-28VDC Input Current: 10mA/point (Sensor current: 150mA/points)		10-28VDC Output (Voltage Drop: Max. 0.5V) 0.3A/point (Leakage current: Max. 0.5mA)		
Common	8 points, Common				
Communication speed	2400, 4800, 9600, 19200, 38400, 57600, 115200bps (Default 9600bps)				
Communication method	2 wire half duplex				
Communication distance	Max. 800m				
Multi-drop	Max. 32 Multi-Drop				
Medium access	POLL				
Application standard	Compliance with EIA RS485				
Protocol	Modbus RTU				
Data bit	8 bits				
Stop bit	1 or 2 bits (Default 2)				
Parity bit	None/Odd/Even (Default None)				
Isolation type	I/O and inner circuit: Photocoupler insulation Modbus to internal bus and inner circuit: Insulation Unit power: Non-insulation				
Insulation resistance	Min. 200MΩ (at 500VDC megger)				
Noise strength	±240V the square wave noise (pulse width: 1us) by the noise simulator				
Dielectric strength	1,000VAC 50/60Hz for 1 minute				
Vibration resistance	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours				
Shock resistance	500m/s ² (Approx. 50G) in X, Y, Z directions for 3 times				
Environment	Ambient temperature: -10 to 55°C, Storage: -25 to 75°C Ambient humidity: 35 to 85%RH, Storage: 35 to 85%RH				
Protection	IP20 (IEC standards)				
Protection circuit	Surge, Short-circuit, Overheating and static protection, Reversed polarity protection circuit				
Indicator	Network status (NS) LED (Green, Red), Module status (MS) LED (Green, Red) I/O status LED (Input: Green, Output: Red)				
Material	Front case, PC, Body case: PC				
Mounting	DIN rail or Screw lock type				
Approval	CE				
Unit weight	Basic	Approx. 65g	Approx. 65g	Approx. 65g	Approx. 66g
	Expansion	Approx. 55g	Approx. 55g	Approx. 55g	Approx. 56g

※Environment resistance is rated at no freezing or condensation.

Part description



Dimensions

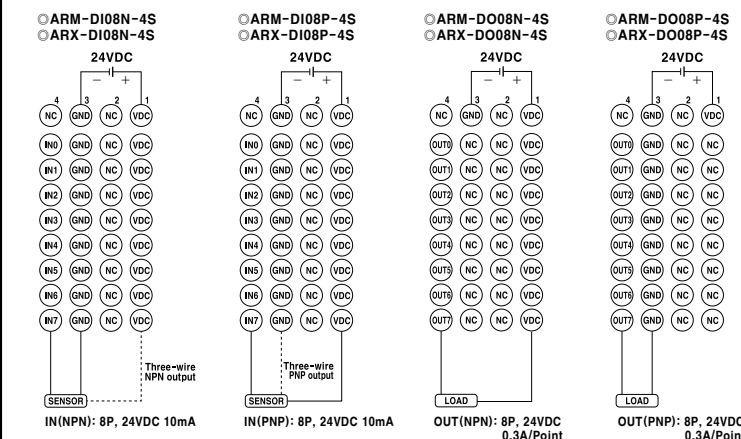


Installation and setup

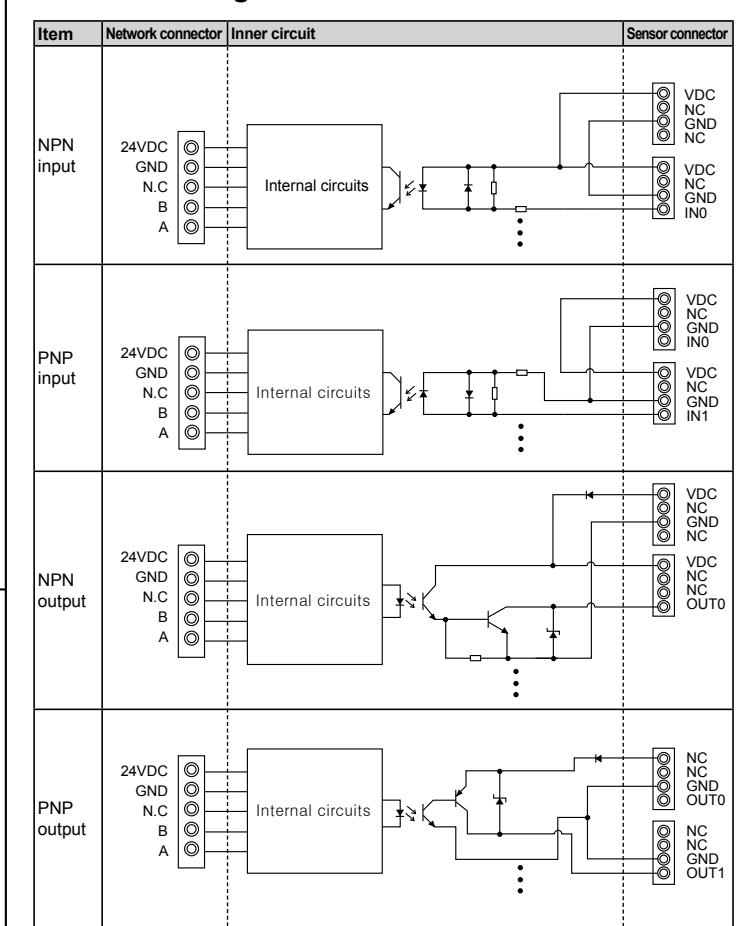
- ① **Setting address**
 -Setting address is able to be done by rotary switch for address, or by in the EEPROM.
 -If the rotary switch for address' number is '00', the address is available to set by in the EEPROM. The others, the desired number of rotary switch is that address.
- **By rotary switch for address**
 ① Two rotary switches are used for setting address. X10 switch represents tens digit and X1 switch represents ones digit. The address can be set 01 to 99.
 Ex) The X10 and X1 switches point both at '3', the address is '33'.

 ② After setting the desired address, re-supply the unit power for applying the changed address.
- **By in the EEPROM for address**
 ① During communicate status with upper system (PLC or PC), set the desired address on the 41029 EEPROM MAC ID parameter.
 ② The set address is changed after unit power is supplied. Re-supply the unit power for applying the changed address.
- ① **Unit Installation**
 • **Mounting on panel**
 ① Pull two Rail locks on the rear part of a unit, there is a fixing screw hole.
 ② Place the unit on a panel to be mounted.
 ③ Make a hole on a fixing screw hole position.
 ④ Fasten the screw to fix the unit tightly. Please set the tightening torque under 0.5N·m.
- **Mounting on DIN rail**
 ① Pull two Rail locks on the rear part of a unit.
 ② Place the unit on DIN rail to be mounted.
 ③ Press Rail locks to fix the unit tightly.
- **Connection of expansion unit**
 ① Turn OFF the power of a basic unit.
 ② Remove the cover of connector for extension with nippers.
 ③ 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.
 ④ Connected expansion units are installed as the right figure.
 ⑤ Supply power to the basic unit.
 ※ Re-supply power to the basic unit, and it recognizes exp
- ① **Terminating resistance**
 • 120Ω • 1% of metallic film • 1/2W
 ※ Connect terminating resistances on the both ends of the network cables. If not connecting terminating resistances, impedance can be too high or low. It may cause network problems.

Connections



I/O circuit diagram



Status LED

Item	Status LED		Description
	Red	Green	
Unit Status (MS) LED	On	Off	Error of expansion units
	Flash	Off	Error of MAC ID
	Off	On	Normal operation
	Off	Off	Power is not supplied
Network Status (NS) LED	On	Off	Not supported communication speed (At auto baud rate)
	Flash	Off	Error of packet
	Off	On	Normal communication
	Off	Flash	Communication standby

User Manual for Communication

- Visit our website (www.autonics.com) to download 'ARM series user manual for communication' for Modbus communication.
- 'ARM series user manual for communication' describes Modbus RTU protocol, and Modbus Mapping Table.

Caution for using

- Turn OFF the power before connecting or disconnecting expansion units.
 - Addresses of connected units on network should not be duplicated. If you change an address with rotary switch or EEPROM during operation, unit status (MS) red LED flashes and it communicates with a previous node address. Re-supply power and the changed node address is applied.
 - Communication speed which is set on upper system (PC, PLC, etc) is set automatically. If you change the communication speed during operation, network status (NS) red LED turns ON and it does not communicate. Re-supply power and it operates normally.
 - Make sure to use standards communication cables. It may cause communication error if non-standards cables are used.
 - Make sure to examine disconnection or short-circuit before connecting cables.
 - Avoid installing the units where severe dust exists or where corrosion may occur.
 - Installation environment
 - ① It shall be used indoor.
 - ② Altitude Max. 2,000m
 - ③ Pollution Degree 2
 - ④ Installation category II
- ※It may cause malfunction if above instructions are not followed.

Major products

- Proximity sensors
- Area sensors
- Photoelectric sensors
- Fiber optic sensors
- Rotary encoders
- Sensor controllers
- Graphic/Logic panels
- Temperature controllers
- Tachometer/Pulse(Rate) meters
- Temperature/Humidity transducers
- Switching power supplies
- Stepping motors/drivers/motion controllers
- Field network devices
- Laser marking system (CO₂Nd: YAG)
- Laser welding/soldering system
- Counters
- Timers
- Display units
- Panel meters
- Pressure sensors
- Power controllers
- Door/Door side sensors

Autonics Corporation
<http://www.autonics.com>

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