

EasyIO Neo Series IO-2000 Installation Guide

IO-2000

Building Technologies & Solutions

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IO-2000 overview

The EasyIO Neo Series IO-2000 is an input and output module. Use this guide to complete the following tasks:

- Mount and install the module
- Understand the module components
- Mount the module on a DIN rail or enclosure base plate
- View a wiring diagram of the module in a system

Figure 1: IO-2000 front view

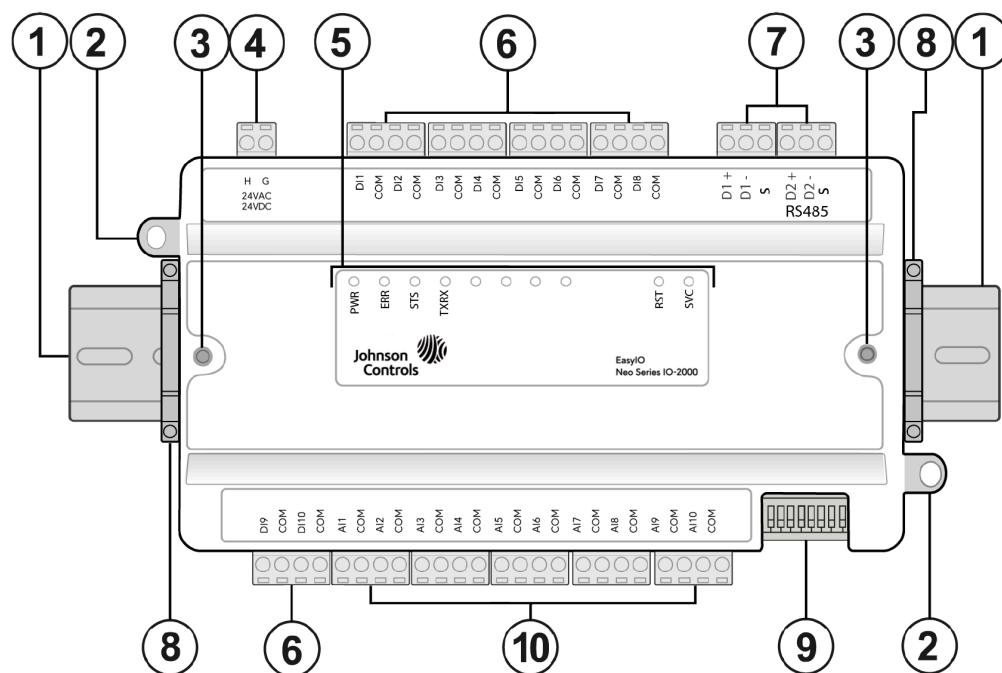
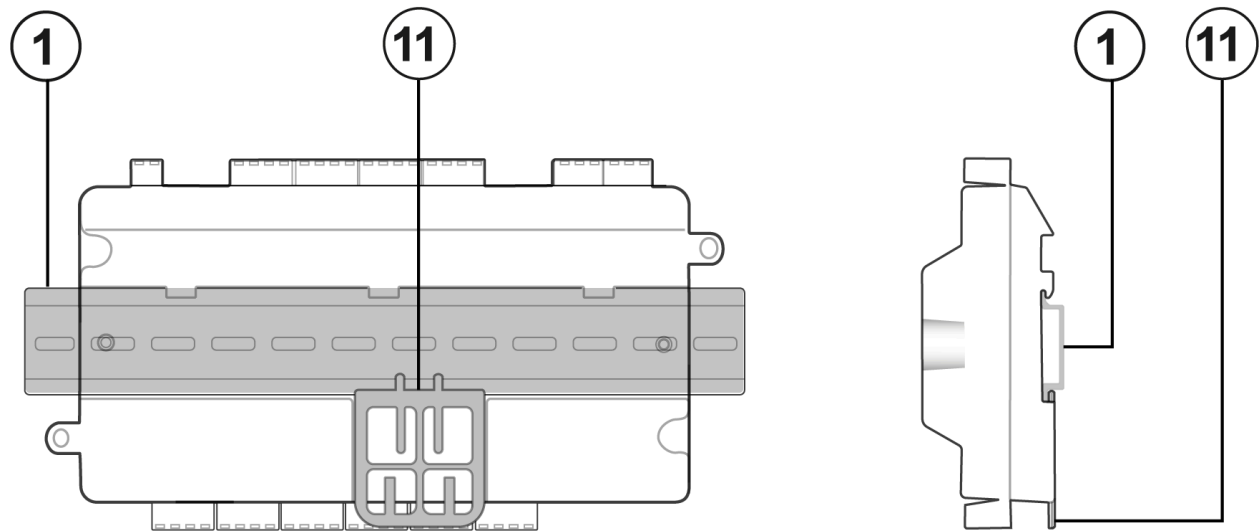


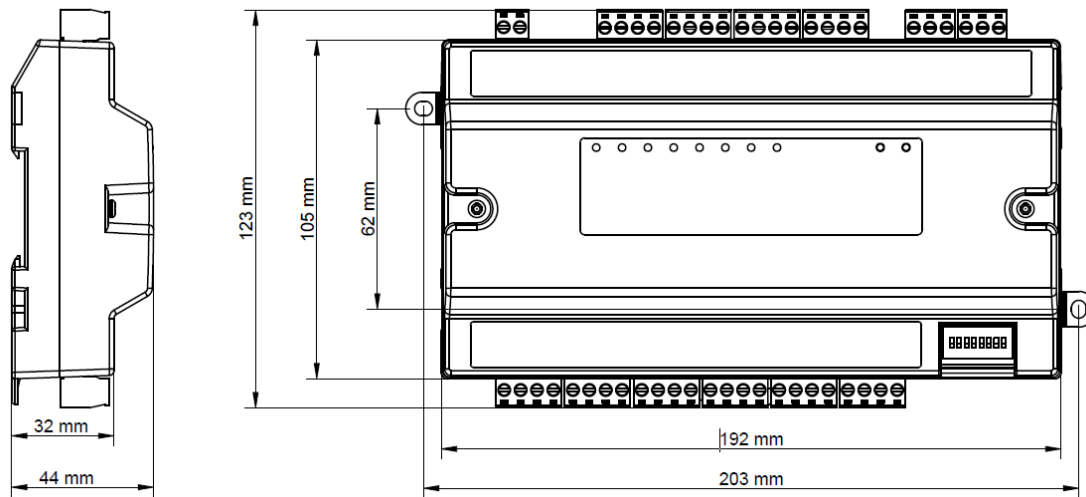
Figure 2: IO-2000 back and side views



Callout	Description
1	DIN rail
2	Enclosure mount
3	Cover screw
4	Hot (H) and ground (G) terminals
5	LED indicators
6	Digital inputs (DI) terminals and COM terminals
7	RS-485 serial port terminals
8	DIN rail end clips
9	DIP switch
10	Analog input (AI) and COM terminals
11	Mounting clips

IO-2000 dimensions

Figure 3: IO-2000 dimensions, mm



Parts included

- One IO-2000 module with removable terminal blocks
- One Pack Sheet

Required tools and parts

One small flathead screwdriver to secure wires to terminal blocks.

Mounting guidelines

The following section lists location considerations, mounting the module on a DIN rail and mounting the module on an enclosure base plate.

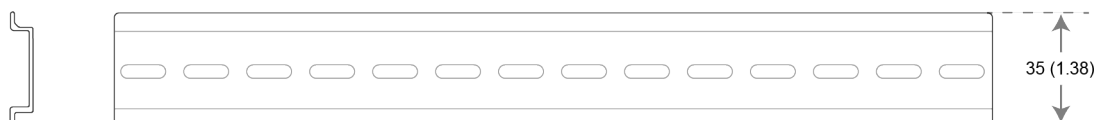
Mounting locations to avoid

- Areas with excessive moisture, corrosive fumes, or explosive vapors
- Locations where excessive vibration or shock occurs
- Locations with excessive electrical noise, such as large magnetic interference or variable speed drive modules

Mounting the module on a 35mm DIN rail

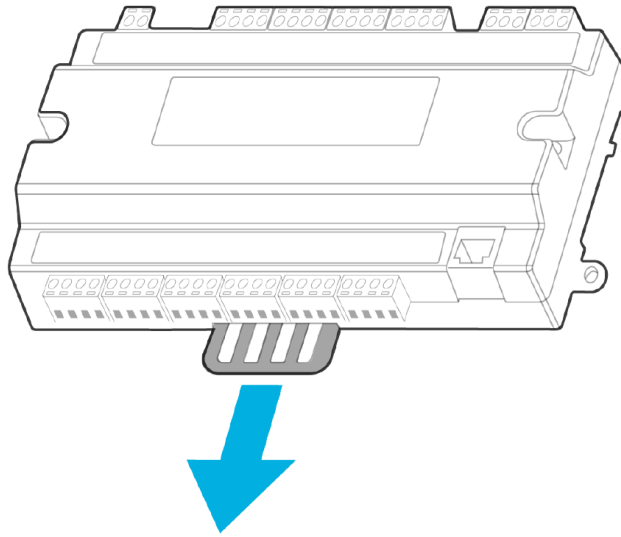
1. Mount a section of 35 mm (1.38 in.) DIN rail horizontally on the enclosure base plate.

Figure 4: 35 mm DIN rail



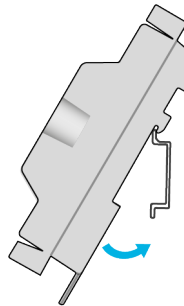
2. On the back of the module, pull down the mounting clips.

Figure 5: Pulling down the mounting clips



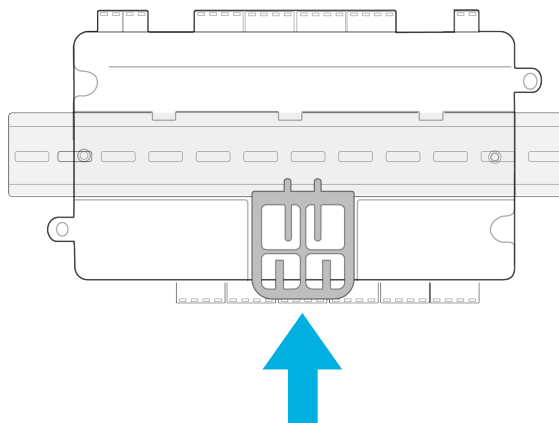
3. Hang the module on the DIN rail by the hooks at the top of the DIN rail channel on the back of the module and position the module firmly against the DIN rail.

Figure 6: Placing the module on the DIN rail



4. To secure the module to the DIN rail, push the mounting clip up.

Figure 7: Pushing the mounting clips up (rear view)



5. **Optional:** For added security, use DIN rail end clips. For more information, see DIN rail end clips in [Figure 1](#).

Mounting the module to an enclosure base plate

About this task:

If a DIN rail mount is not practical, the module features two mounting holes to screw mount the module to an enclosure base plate.

1. Place the module on the enclosure surface and mark the enclosure mounting holes on the surface. For more information, see Enclosure mounting holes in [Figure 1](#).
2. Drill both holes in the enclosure base plate.
3. Screw the module to the enclosure base plate.

Removing the module cover

1. Use a Philips screwdriver to unscrew both of the cover screws.
2. Hold both ends of the cover and remove it. If the cover is stuck, separate the cover from the base with a flathead screwdriver.

Input, and 24 VAC Class 2 transformer power input wiring diagrams

WARNING

Risk of Electric Shock

Disconnect the power supply before you make electrical connections. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

NOTICE

Risk of Property Damage.

Do not apply power to the module before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

Important

Do not exceed module electrical ratings, this can result in permanent damage to the module and void warranties.

► Important

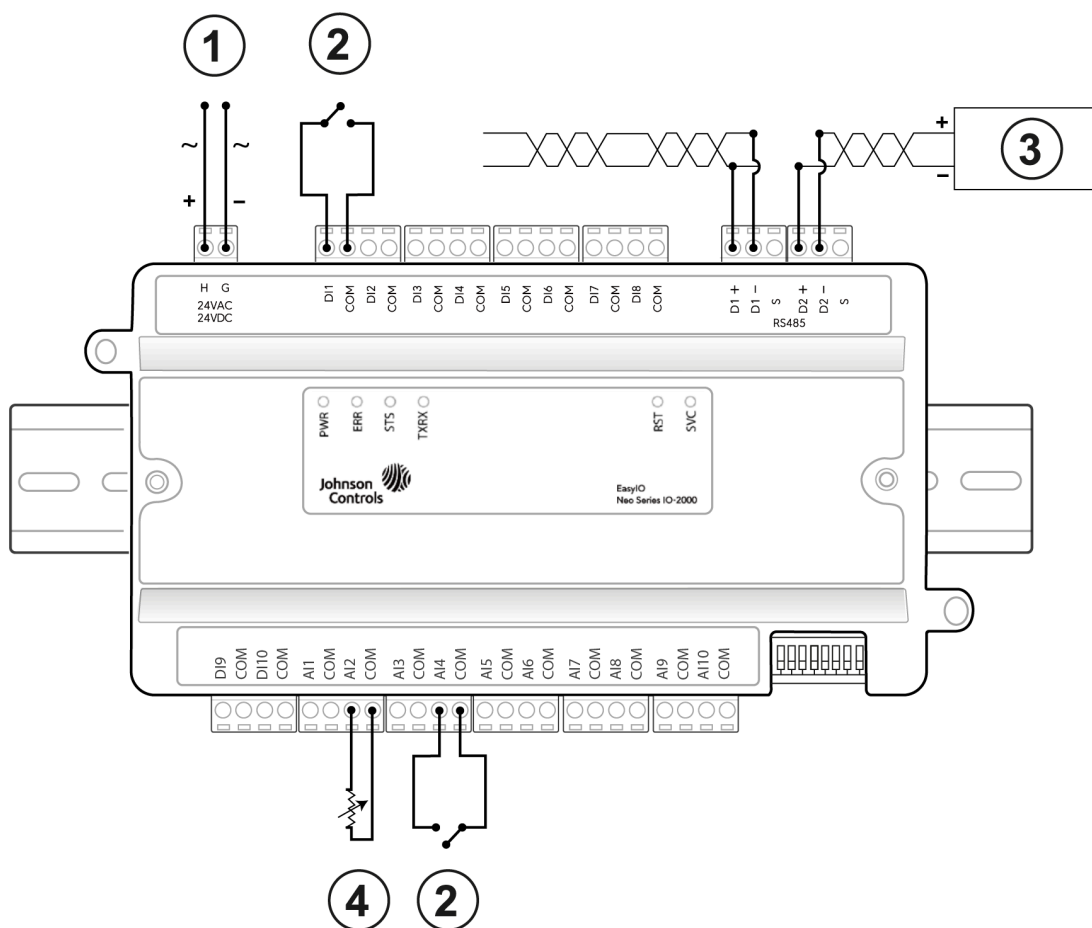
Only use copper conductors. Wire the module in accordance with local, national, and regional regulations

► Important

Use the correct electrostatic discharge precautions throughout installation, setup, and service to avoid damage to the module and module components.

IO-2000 basic input, power, and serial device wiring setup

Figure 8: IO-2000 wiring guide



Callout	Description
1	Power input
2	Switch

Callout	Description
3	Master device
4	Thermistor, RTD, or potentiometer

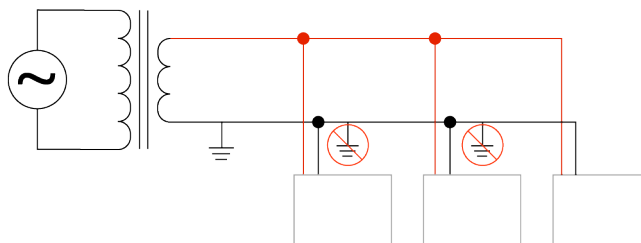
- ❗ **Note:** If you configure the module as a subordinate device and it is at the end of a daisy chain, install a 120 ohm resistor in parallel with the RS-485 terminal.

Power supply terminal wiring

Connect the 24 VAC supply power wires from the transformer to the HOT and COM power terminals as shown in [Figure 9](#).

- ❗ **Note:** The supply power wire colors may differ on transformers from other manufacturers. Refer to the transformer manufacturer's instructions and the project installation drawings for wiring details.
- **Important:** To reduce noise, interference, and ground loop problems, connect a 24 VAC supply power to the module and to all other network devices so that transformer phasing is uniform across network devices. The module does not require an earth ground connection. However, when you need to ground the secondary of the 24 VAC transformer, make only one ground connection near the transformer. For more information, see the following figure.

Figure 9: Transformer grounding



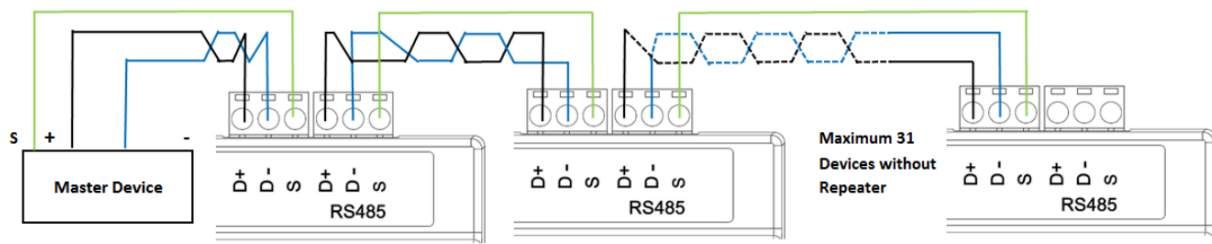
⚠ CAUTION

To avoid property damage, check all wiring connections before you apply power to the system. If you wire this terminal incorrectly, a short circuit can occur across the 24 VAC power supply on the module. A short circuit can cause a tripped circuit breaker or a blown fuse. If you use a transformer with a built-in fuse, you may need to replace the transformer.

IO-2000 RS-485 bus terminals

Wire the RS-485 terminals in a daisy-chain configuration. Use a stranded three-wire twisted and shielded cable as shown in [Figure 10](#). The three different wires are the positive bus, the negative bus, and the COM.

Figure 10: RS-485 wiring



RS-485 serial port settings

The IO-2000 module comes with two RS-485 ports, D1 and D2. For each serial port configuration see [Table 1](#).

Table 1: RS 485 serial port settings

Port number	Protocol communications supported	Default serial port settings
Port 1 (D1+, D1-)	Modbus or BACnet. Use DIP switch 1 to select a protocol. - DIP 1 off = Modbus RTU - DIP 1 on = BACnet MSTP	Modbus
		Baud rate: 19.2 K
		Parity: even
		Data bit: 8 not editable
		Stop bit: 1
		BACnet
Port 2 (D2+, D2-)	Modbus RTU protocol	Baud rate: 19.2 K
		Modbus
		Baud Rate: 19.2K
		Parity: even
		Data bit: 8 not editable
		Stop bit: 1

BACnet or Modbus selection and ID setting

Use the dual in-line package (DIP) switch to select the BACnet or the Modbus protocol. By default, the Modbus protocol is selected. To switch to BACnet, toggle switch 1 upwards to the on position.

Use the switches 2 to 8 to set the BACnet MSTP ID when the switch 1 is on or the Modbus Serial ID when the switch 1 is off. Each of the switches 2 to 8 stand for a binary bit. Toggle the switches upwards to the on position to make that address digit 1 or leave it in the off position to make that address digit 0. The most significant bit (MSB) is DIP 2 and the least significant bit (LSB) is DIP 8.

Table 2:

DIP switch number	Function
1	Protocol selection
2	ID 64
3	ID 32
4	ID 16
5	ID 8

Table 2:

DIP switch number	Function
6	ID 4
7	ID 2
8	ID 1

IO-2000 LED states

The following table displays the IO-2000 LED states:

Table 3: IO-2000 LED states

LED label	LED color	Normal state	State	Description
PWR	Green	On steady	Off steady	No power
			On steady	Power is supplied by primary voltage
ERR	Red	Off steady	Constant rapid blinks	RS-485 communication error
			Off steady	No errors
STS	Green	1 Hz blinks	1 Hz blinks	Normal operation
			Off steady	Module fault
TXRX	Yellow	1 Hz to 5 Hz blinks	1 Hz to 5 Hz blinks	Normal data communication
			Off steady	No data transmission

Technical specifications

Table 4: IO-2000 UL input, output, and communication ratings

Description	Specification			Terminal
Power supply	• 24 VAC, plus or minus 5% • 24 VDC, plus 20% or minus 15%			H and G
	12 VA, Class 2			
Analog inputs	Resistance mode	400 ohm to 300,000 ohm	3% accuracy	AI1 and COM to AI10 and COM
	Thermistor sensor supported	NTC 10k Type 2/3 and NTC 20k		
Digital inputs	Digital, voltage free contact			DI1 and COM to DI10 and COM
EIA/RS-485 port 1	Class 2			D+
				D-
				S

Table 5: IO-2000 Technical specifications

Description	Specification
Module processor and memory specifications	
Main processor	48Mhz ARM Cortex M0

Table 5: IO-2000 Technical specifications

Description	Specification
Flash memory	256 KB
RAM	144 KB
Product temperature and humidity specifications	
Operating temperature	0°C to 65°C (32°F to 149°F)
Storage temperature	-20°C to 85°C (-4°F to 185°F)
Operating humidity	10% to 90% relative humidity, non-condensing
Physical specifications	
Dimensions	192 mm x 104 mm x 44 mm (7.5 in. x 4.1 in. x 1.7 in.)
Material	UL certified
Weight	410g / 14.4 oz

Compliance

Table 6: IO-2000 Compliance

North America: UL 916 Energy Management Equipment; FCC Class B, Part 15, Subpart C 15.247
FCC This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device. L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : 1) L'appareil ne doit pas produire de brouillage; 2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
CE Compliant
UKCA Directive Electromagnetic Compatibility Regulations 2016: BS EN 55032:2015+A11:2020, BS EN IEC 61000-3-2:2019+A1:2021, BS EN 61000-3-3:2013+A1:2019+A2:2021, BS EN 55035:2017+A11:2020

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Software terms

Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable end-user license, open-source software information, and other terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

Contact information

Contact your local Johnson Controls representative: www.johnsoncontrols.com/locations

Contact Johnson Controls: www.johnsoncontrols.com/contact-us

Patents

Patents: <https://jciapat.com>

Single point of contact

APAC	EU	UK	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS VOLTAWEG 20 6101 XK ECHT THE NETHERLANDS	JOHNSON CONTROLS TYCO PARK GRIMSHAW LANE MANCHESTER M40 2WL UNITED KINGDOM	JOHNSON CONTROLS 5757 N GREEN BAY AVE. GLENDALE, WI 53209 USA

