EcoStruxure™
Innovation At Every Level

EasyLogic RP-IO
I/O Expansion Modules

EcoStruxure™ Building

Introduction

EasyLogic™ RP-IO module provides I/O expansion to your HVAC application over BACnet MS/TP. The I/O module can share its I/O resources across applications running in automation servers, RP and MP controllers, or third-party systems. With the support of local alarms and local trend logs, the I/O module avoids unnecessary traffic over the network while being able to log important information locally. The I/O module can be installed near facilities in the field, away from the automation server or the RP or MP controller.

The RP-IO has the following features:

- Native BACnet MS/TP support
- Full range of I/O module models

- Versatile onboard I/O point mix
- Built-in isolated power supply
- Optional covers
- Advanced monitoring
- EasyLogic living space sensors
- Full EcoStruxure Building Operation software support, providing efficient engineering tools
- Upgrade with signed firmware

A maximum of three RP-IO modules can be used with an RP or MP controller. For more information, see the Architectural Guidelines.

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EasyLogic RP-IO

## Native BACnet MS/TP support

The EasyLogic range of RP and MP controllers and RP-IO I/O modules natively communicate with automation servers and field devices using the BACnet MS/TP protocol.

The RS-485 port with 3-pole screw terminal block is used for connection to the BACnet MS/TP network.

Full range of I/O module models

The EasyLogic RP-IO range of BACnet MS/TP based I/O modules includes two different models, which offer two different sets of I/O point types, named 12A and 16E. The two models support 24 VAC/DC power supply.

RP-IO-12A-M-24V

- Power supply: 24V
- BACnet MS/TP (M)
- I/O set: 12A or 16E
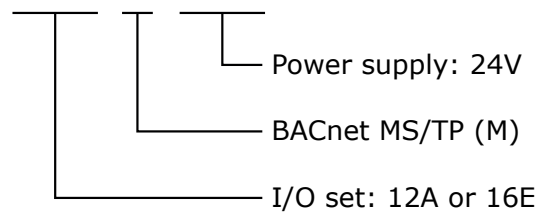
Models with a versatile mix of I/O points

The RP-IO-12A and -16E models provide 12 or 16 I/O points, consisting of two different sets of I/O point types. The versatile mix of I/O point types match a wide variety of applications. The universal inputs/outputs are highly flexible and can be configured as either inputs or outputs.

I/O Point Types by RP-IO Models

I/O Point Types	RP-IO-12A model	RP-IO-16E model
Universal I/O Type Ub	8	16
Solid-state relay outputs (MOSFET)	4	-

Configurations by I/O Point Types

Configurations	Universal I/O Type Ub	Solid-state Relay Outputs (MOSFET)
Digital inputs	yes	-
Counter inputs	yes	-
Supervised inputs	yes	-
Voltage inputs (0 to 10 VDC)	yes	-
Current inputs (0 to 20 mA)	yes	-
Temperature inputs	yes	-
Resistive inputs	yes	-
Voltage outputs (0 to 10 VDC)	yes	-
Digital outputs	-	yes
Digital pulsed outputs	-	yes
PWM outputs	-	yes
Tristate outputs	-	yes
Tristate pulsed outputs	-	yes

EasyLogic RP-IO

Universal inputs/outputs

The universal inputs/outputs are ideal for any mix of temperature, pressure, flow, status points, and similar point types in a building control system.

As counter inputs, the universal inputs/outputs are commonly used in energy metering applications. As supervised inputs, they are used for security applications where it is critical to know whether or not a wire has been cut or shorted. These events provide a separate indication of alarms and events in the system.

For all analog inputs, maximum and minimum levels can be defined to automatically detect over-range and under-range values.

The universal inputs/outputs are capable of supporting analog outputs of type voltage outputs. Therefore, the universal inputs/outputs support a wide range of devices, such as actuators.

Only devices with safe extra low voltage equipment (SELV/PELV) inputs/outputs should be connected to the universal inputs/outputs.

Solid-state relay outputs

The solid-state relay (SSR) outputs can be used in many applications to switch 24 VAC or 24 VDC on or off for external loads such as actuators, relays, or indicators. SSRs are silent and are not adversely affected by relay contact wear.

Built-in isolated power supply

The device has a built-in power supply designed to accommodate 24 VAC or 24 VDC input power. The AC/DC power input is galvanically isolated from the electronics. This minimizes the risk of damage due to earth currents and permits the input power to be wired without concern for AC polarity matching. With the isolated AC/DC power input, you can use a central transformer for many devices, instead of one transformer for each device, to reduce installation costs.

Optional covers

All RP-IO models can be equipped with optional covers to reduce access to the screw terminals and wires.

Advanced monitoring

The I/O module supports local trends and alarms, enabling local operation when the I/O module is offline.

With user-defined fallback values, the I/O module outputs will be in a predictable state in cases of network disruption.

The battery-free power backup of the memory helps prevent data loss and allows seamless and quick recovery after a power disruption.

In WorkStation, you update the firmware of multiple I/O modules at the same time and with minimum down time. The EcoStruxure BMS server keeps track of the installed firmware to support backup, restore, and replacement of the I/O modules. The server can host I/O modules of different firmware versions.

EasyLogic living space sensors

The EasyLogic Sensor devices provide a cost-effective solution to measure, control, and communicate the temperature. The sensors are connected to analog inputs of the RP or MP controller. The EasyLogic Sensor devices are available in two models with different user interfaces, a blank cover or an LCD display with buttons for setpoint control. For more information, see the EasyLogic Sensors - Temperature Sensors – Analog - Specification Sheet.

EasyLogic Sensor devices

Full EcoStruxure Building Operation software support

The power of the I/O module is fully realized when it is part of an EcoStruxure BMS, which provides the following benefits:

• WorkStation/WebStation interface

• Device discovery

• Engineering efficiency

WorkStation/WebStation interface

WorkStation and WebStation provide a consistent user experience regardless of which EcoStruxure BMS server the user is logged on to. The user can log on to the parent EcoStruxure BMS server to engineer, commission, supervise, and monitor the I/O modules and RP and MP controllers. For more information, see the WorkStation and WebStation specification sheets.

EasyLogic RP-IO

Device discovery

The enhanced Device Discovery in WorkStation enables you to easily identify the I/O modules on a BACnet network and to associate the I/O modules with their parent server.

Engineering efficiency

The engineering and maintenance of the I/O modules can be done very efficiently using the EcoStruxure Building Operation reusability features. With these features, you can create library items (Custom Types) for a complete I/O module application that contains I/O point configurations and all necessary objects such as trends and alarms. The I/O module application in the Custom Types library is reusable across all I/O modules of the same model. You can use the I/O module application as a base for creating new I/O modules intended for similar applications. You can then edit the I/O module application, and the changes are automatically replicated to all I/O modules, while each I/O module keeps its local values.

WorkStation supports both online and offline engineering of the I/O modules. You can make the configuration changes online or use database mode to make the changes offline. In database mode, the changes are saved to the EcoStruxure Building Operation database so that you can apply the changes to the I/O modules later.

Project Configuration Tool enables you to perform all the engineering off site, without the need for physical hardware, which minimizes the time you need to spend on site. You can run the EcoStruxure BMS servers virtually and engineer the RP and MP controllers and the I/O modules before you deploy your server, controller, and I/O module applications to the servers, controllers, and I/O modules on site. For more information, see the Project Configuration Tool specification sheet.

Upgrade with signed firmware

Using digitally signed firmware provides more secure upgrading of the device. During an upgrade, the device verifies that the firmware is authentic and uncompromised Schneider Electric firmware. If the device detects discrepancies in the authenticity or integrity of the firmware, it will reject the upgrade. Once the device is upgraded with signed firmware, all upgrades thereafter must be with a signed firmware version.

Part Numbers for EasyLogic RP-IO

Product	Part number
RP-IO-12A-M-24V	SXWRIOF12AM10001
RP-IO-16E-M-24V	SXWRIOF16EM10001

Part Numbers for RP-IO Accessories
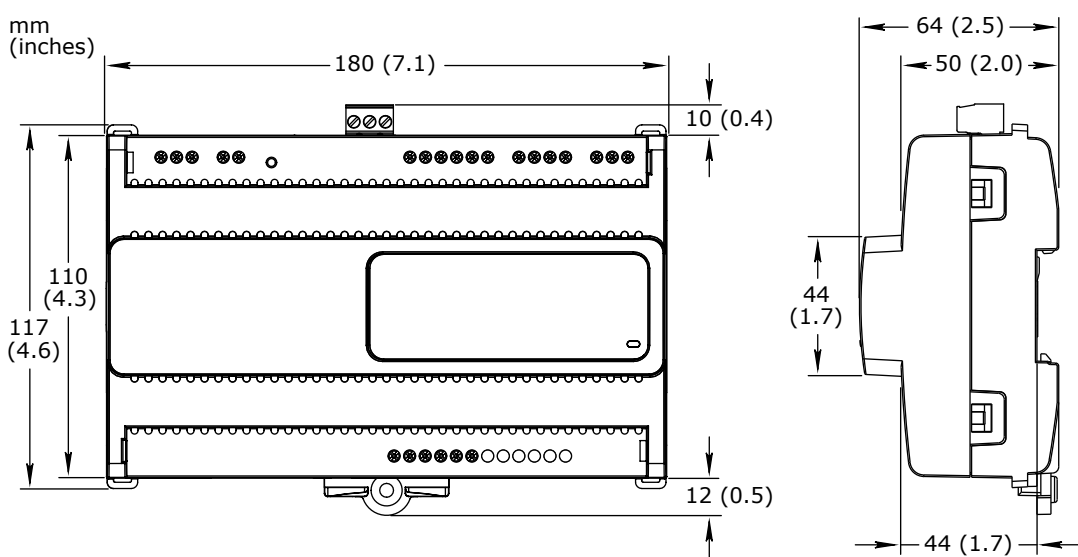
Product	Part number
Optional covers	SXWRPCCOV10001
DIN-RAIL-CLIP, DIN-rail end clip package of 25 pieces	SXWDINEND10001

For more information on part numbers for Network Connectivity Accessories, see the Product Selection Guide - EcoStruxure Building.

Specifications

EasyLogic RP-IO	
AC input	
Nominal voltage	24 VAC
Operating voltage range	+/-15 %
Frequency	50/60 Hz
Maximum power consumption	7 VA

EasyLogic RP-IO

Power input protection	MOV suppression and internal fuse

DC input	
Nominal voltage	24 to 30 VDC
Operating voltage range	21 to 33 VDC
Maximum power consumption	3 W
Power input protection	MOV suppression and internal fuse

Environment	
Ambient temperature, operating	0 to 50 °C (32 to 122 °F)
Ambient temperature, storage	-40 to +70 °C (-40 to +158 °F)
Maximum humidity	95 % RH non-condensing

Material	
Plastic flame rating	UL94 V-0
Ingress protection rating	IP 20

Mechanical	
Dimensions	180 W x 110 H x 64 D mm (7.1 W x 4.3 H x 2.5 D in.)

Weight, RP-IO-12A-M-24V	0.336 kg (0.741 lb)
Weight, RP-IO-16E-M-24V	0.334 kg (0.736 lb)
Recommended installation	DIN rail or flat surface in a cabinet[a]

a) It is recommended to install the device in an enclosure (cabinet), unless local regulations allow an exception.

Terminal blocks	Power and I/O: Fixed BACnet MS/TP communications: Removable

EasyLogic RP-IO

Optional covers

Dimensions	181 W x 164 H x 64 D mm (7.1 W x 6.5 H x 2.5 D in.)

mm
(inches)
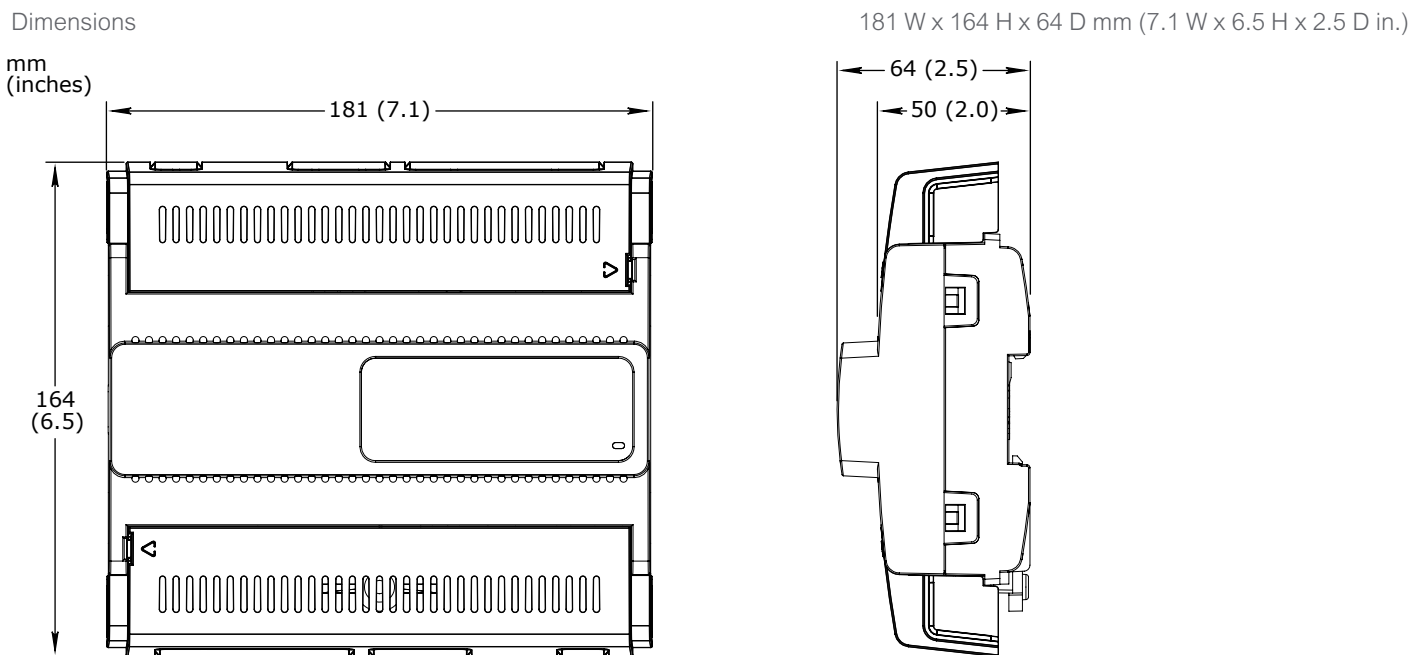
Weight, optional covers	0.070 kg (0.154 lb)

Compatibility

EcoStruxure BMS server communication EcoStruxure Building Operation	version 5.0.1 and later

Agency compliances

Emission	RCM; BS/EN 61000-6-3; BS/EN IEC 63044-5-2; FCC Part 15, Sub-part B, Class B
Immunity	BS/EN 61000-6-2; BS/EN IEC 63044-5-3
Safety standards	BS/EN 60730-1; BS/EN 60730-2-11; BS/EN IEC 63044-3; UL 916 C-UL US Listed[a]

a) The RP-IO-12A and -16E models are marked "Open Energy Management Equipment".

Fire performance in air-handling spaces[a]	UL 2043

a) The RP-IO-12A and -16E models are approved for plenum applications.

Communication ports

RS-485 port	RS-485 (3-pole screw terminal block) Transient voltage suppressors on communication signals

RS-485 transceiver characteristics

Transceiver type	Failsafe Non-isolated
External biasing	None required
Total Unit Load (UL) per device	Maximum 0.5 UL

EasyLogic RP-IO

Communications

BACnet	BACnet MS/TP, maximum bus length: 1200 m (4000 ft), maximum baud rate: 76800
	BTL B-ASC (BACnet Application Specific Controller)[a]

a) See the BTL Product Catalog for up-to-date details on BTL listed firmware revisions on BACnet International's home page.

CPU

Frequency	500 MHz
Type	ARM Cortex-A7 single-core
Internal SRAM	6 MB
NOR flash memory	32 MB
Memory backup	128 kB[a], FRAM, non-volatile

a) RP-IO-12A-M-24V with hardware version earlier than 01 and RP-IO-16E-M-24V with hardware version earlier than 03 have a FRAM memory with a size of 8 kB. For these hardware versions, the use of Script programs is recommended to save FRAM memory space.

Universal inputs/outputs

Channels, RP-IO-12A-M-24V	8 Ub, Ub1 to Ub8
Channels, RP-IO-16E-M-24V	16 Ub, Ub1 to Ub16
Absolute maximum ratings	-0.5 to +24 VDC
A/D converter resolution	16 bits
Universal input/output protection	Transient voltage suppressor on each universal input/output

Digital inputs

Range	Dry contact switch closure or open collector/open drain, 24 VDC, typical wetting current 2.4 mA
Minimum pulse width	150 ms

Counter inputs

Range	Dry contact switch closure or open collector/open drain, 24 VDC, typical wetting current 2.4 mA
Minimum pulse width	20 ms
Maximum frequency	25 Hz

Supervised inputs

5 V circuit, 1 or 2 resistors Monitored switch combinations	Series only, parallel only, and series and parallel
Resistor range For a 2-resistor configuration, each resistor must have the same value +/- 5 %	1 to 10 kohm

Voltage inputs

Range	0 to 10 VDC
Accuracy	+/-(7 mV + 0.2 % of reading)
Resolution	1.0 mV
Impedance	1 Mohm

EasyLogic RP-IO

Current inputs	
Range	0 to 20 mA
Accuracy	+/-(0.01 mA + 0.4 % of reading)
Resolution	1 µA
Impedance	47 ohm

Resistive inputs	
10 ohm to 10 kohm accuracy R = Resistance in ohm	$+/-(7 + 4 \times 10^{-3} \times R)$ ohm
10 kohm to 60 kohm accuracy R = Resistance in ohm	$+/-(4 \times 10^{-3} \times R + 7 \times 10^{-8} \times R^2)$ ohm

Temperature inputs (thermistors)	
Range	-50 to +150 °C (-58 to +302 °F)

Supported thermistors	
Honeywell	20 kohm
Type I (Continuum)	10 kohm
Type II (I/NET)	10 kohm
Type III (Satchwell)	10 kohm
Type IV (FD)	10 kohm
Type V (FD w/ 11k shunt)	Linearized 10 kohm
Satchwell D?T	Linearized 10 kohm
Johnson Controls	2.2 kohm
Xenta	1.8 kohm
Balco	1 kohm

Measurement accuracy	
20 kohm	-50 to -30 °C: +/-1.5 °C (-58 to -22 °F: +/-2.7 °F) -30 to 0 °C: +/-0.5 °C (-22 to +32 °F: +/-0.9 °F) 0 to 100 °C: +/-0.2 °C (32 to 212 °F: +/-0.4 °F) 100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)
10 kohm, 2.2 kohm, and 1.8 kohm	-50 to -30 °C: +/-0.75 °C (-58 to -22 °F: +/-1.35 °F) -30 to +100 °C: +/-0.2 °C (-22 to +212 °F: +/-0.4 °F) 100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)
Linearized 10 kohm	-50 to -30 °C: +/-2.0 °C (-58 to -22 °F: +/-3.6 °F) -30 to 0 °C: +/-0.75 °C (-22 to +32 °F: +/-1.35 °F) 0 to 100 °C: +/-0.2 °C (32 to 212 °F: +/-0.4 °F) 100 to 150 °C: +/-0.5 °C (212 to 302 °F: +/-0.9 °F)
1 kohm	-50 to +150 °C: +/-1.0 °C (-58 to +302° F: +/-1.8 °F)

Voltage outputs	
Range	0 to 10 VDC

EasyLogic RP-IO

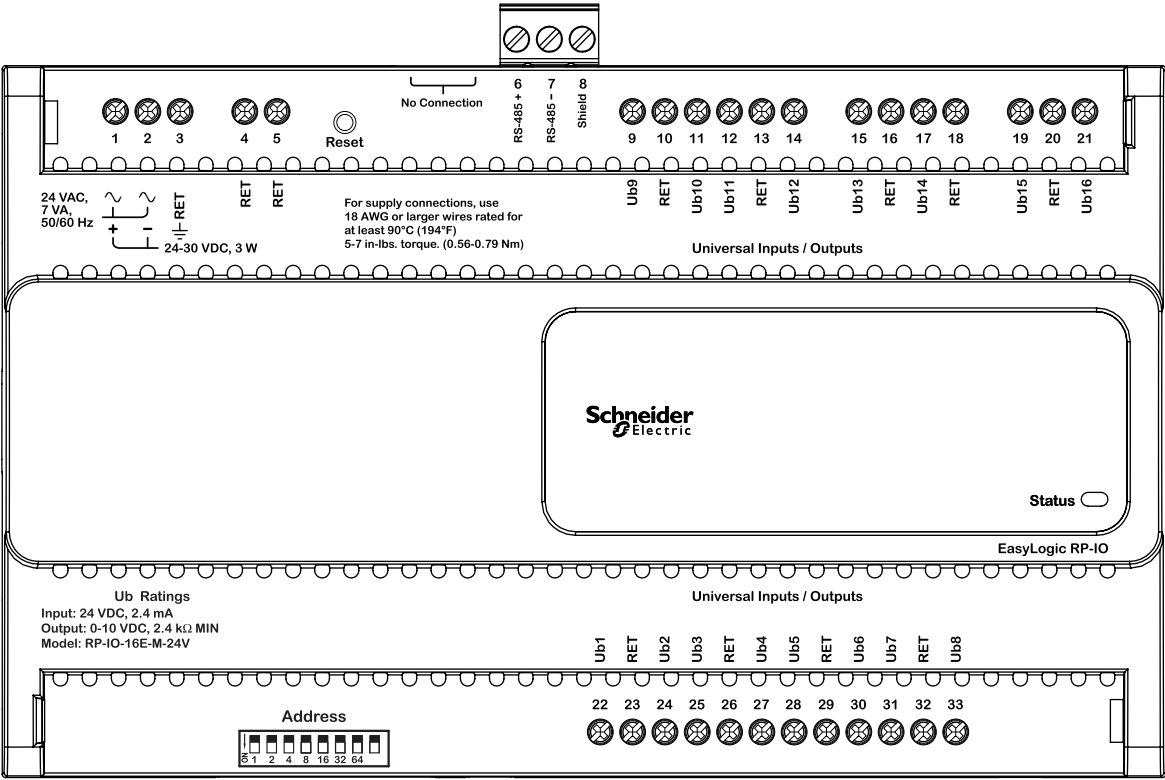|	
Accuracy	+/-60 mV
Resolution	10 mV
Minimum load resistance	2.4 kohm
Source current	+4.2 mA
Sink current	-1 mA (0 to 0.4 VDC) -4.2 mA (0.4 to 10 VDC)
Solid-state relay outputs, DO	
Channels, RP-IO-12A-M-24V	4, DO1 to DO4
Channels, RP-IO-16E-M-24V	0
Output rating	Maximum 2 A load per output Maximum 4 A total load for the 4 outputs
AC voltage range	Maximum 30 VAC
DC voltage range	Maximum 30 VDC
Commons	COM1 for DO1 and DO2 (on RP-IO-12A model) COM2 for DO3 and DO4 (on RP-IO-12A model)
When the SSR outputs are used to switch AC, the common terminals can be connected to 0 to 30 VAC. When the SSR outputs are used to switch DC, the common terminals can be connected to -30 VDC to +30 VDC.	
Common voltage range (AC)	0 to 30 VAC
Common voltage range (DC)	-30 to +30 VDC
Minimum pulse width	100 ms
Solid-state relay output protection	Transient voltage suppressor across each solid-state relay (SSR) output

Terminals

For more information on wiring, see the SpaceLogic and EasyLogic - Hardware Installation System Guide.

EasyLogic RP-IO

No Connection

6 | 7 | 8
RS-485 + | RS-485 − | Shield

1 | 2 | 3   4 | 5   **Reset**

9 | 10 | 11 | 12 | 13 | 14

No Connection

24 VAC,
7 VA,
50/60 Hz

RET   RET

+ − 24-30 VDC, 3 W

RET

For supply connections, use
18 AWG or larger wires rated for
at least 90°C (194°F)
5-7 in-lbs. torque. (0.56-0.79 Nm)

DO1 | COM1 | DO2 | DO3 | COM2 | DO4

SSR Outputs   30 VAC / VDC, 2 A
Max 4 A Total

Schneider Electric

Status

EasyLogic RP-IO

Ub Ratings
Input: 24 VDC, 2.4 mA
Output: 0-10 VDC, 2.4 kΩ MIN
Model: RP-IO-12A-M-24V

Universal Inputs / Outputs

Ub1 | RET | Ub2 | Ub3 | RET | Ub4 | Ub5 | RET | Ub6 | Ub7 | RET | Ub8

22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33

Address
5 1   2   4   8   16   32   64

RP-IO-12A-M-24V model

EasyLogic RP-IO

RP-IO-16E-M-24V model

24 VAC, 7 VA, 50/60 Hz

24-30 VDC, 3 W

Reset

No Connection

RS-485 +
RS-485 −
Shield

For supply connections, use 18 AWG or larger wires rated for at least 90°C (194°F) 5-7 in-lbs. torque. (0.56-0.79 Nm)

Universal Inputs / Outputs

Ub Ratings
Input: 24 VDC, 2.4 mA
Output: 0-10 VDC, 2.4 kΩ MIN
Model: RP-IO-16E-M-24V

Universal Inputs / Outputs

Status

EasyLogic RP-IO

Address

EasyLogic RP-IO

Regulatory Notices

Federal Communications Commission
FCC Rules and Regulations CFR 47, Part 15, Class B
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. (2) This device must accept any interference received, including interference that may cause undesired operation.
Industry Canada
This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Regulatory Compliance Mark (RCM) - Australian Communications and Media Authority (ACMA)
This equipment complies with the requirements of the relevant ACMA standards made under the Radiocommunications Act 1992 and the Telecommunications Act 1997. These standards are referenced in notices made under section 182 of the Radiocommunications Act and 407 of the Telecommunications Act.

CE - Compliance to European Union (EU)
2014/30/EU Electromagnetic Compatibility Directive
2011/65/EU Restriction of Hazardous Substances (RoHS) Directive
2015/863/EU amending Annex II to Directive 2011/65/EU
This equipment complies with the rules, of the Official Journal of the European Union, for governing the Self Declaration of the CE Marking for the European Union as specified in the above directive(s).

WEEE - Directive of the European Union (EU)
This equipment and its packaging carry the waste of electrical and electronic equipment (WEEE) label, in compliance with European Union (EU) Directive 2012/19/EU, governing the disposal and recycling of electrical and electronic equipment in the European community.

UK Conformity Assessed
S.I. 2016/1091 - Electromagnetic Compatibility Regulations 2016
S.I. 2012/3032 - Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012
S.I. 2013/3113 - Waste Electrical and Electronic Equipment Regulations 2013
This equipment complies with the rules, of the UK regulations, for governing the UKCA Marking for the United Kingdom specified in the above directive(s).

UL 916 Listed products for the United States and Canada, Open Class Energy Management Equipment. UL file E80146.

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