

EasyLogic RP-C for Niagara Framework® Room Controllers

I/A Series



Introduction

EasyLogic™ RP-C for Niagara Framework® is a room-purpose, fully programmable, BACnet MS/TP based field controller that suits a wide range of HVAC applications. The RP-C can either be used as a standalone field controller or as part of an I/A Series Niagara BMS with a JACE or Niagara Supervisor as the parent server.

The RP-C has the following features:

- Native BACnet MS/TP support
- Full range of controller models
- Versatile onboard I/O point mix
- Built-in isolated power supply
- Optional covers
- Advanced monitoring
- RS-485 port to support Sensor Bus
- Sensor bus for SpaceLogic living space sensors
- EasyLogic living space sensors
- Commission mobile application for commissioning of the controller before the BMS is in place
- Seamless integration with I/A Series Niagara software
- Upgrade with signed firmware

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EasyLogic RP-C for Niagara Framework®

Native BACnet MS/TP support

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

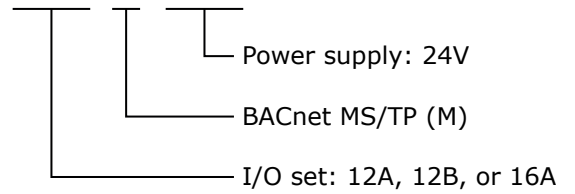
The RS-485 port with 3-pole screw terminal block is used for connection to the BACnet MS/TP network.

The other RS-485 port (Com A), with RJ45 interface, can be configured to support the sensor bus. For more information, see section “RS-485 port to support Sensor Bus”.

Full range of controller models

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

RP-C-12A-M-24V



Models with a versatile mix of I/O points

The RP-C-12A, -12B, and -16A models provide 12 or 16 I/O points, consisting of three 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-C Models

I/O Point Types	RP-C-12A model	RP-C-12B model	RP-C-16A model
Universal I/O Type Ub	8	8	8
Solid-state relay outputs (MOSFET)	4	-	4
Relay outputs Form A	-	3	3
High power relay outputs Form C	-	1	1

Configurations by I/O Point Types

Configurations	Universal I/O Type Ub	Solid-state Relay Outputs (MOSFET)	Relay Outputs Form A	High Power Relay Outputs Form C
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	yes	yes
Digital pulsed outputs	-	yes	yes	yes
PWM outputs	-	yes	yes	yes

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Configurations	Universal I/O Type Ub	Solid-state Relay Outputs (MOSFET)	Relay Outputs Form A	High Power Relay Outputs Form C
Tristate outputs	-	yes	yes	-
Tristate pulsed outputs	-	yes	yes	-

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.

Relay outputs

The relay outputs support digital Form A point types. The Form A relays are designed for direct load applications.

High power relay output

The high power relay output is of type Form C. The normally-open (NO) contact is ideal for switching resistive loads of up to 12 A, such as electrical heating elements. The normally-closed (NC) contact can be used to switch inductive loads of up to 3 A.

I/O expansion

For applications that require more I/O resources, the EasyLogic RP-IO modules provide a versatile mix of I/O points for any application. For more information, see the EasyLogic RP-IO for Niagara Framework Specification Sheet.

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

Advanced monitoring

The RP and MP controllers support local trends, schedules, and alarms, enabling local operation when the controller is offline or used in standalone applications.

The battery-free power backup of the memory and real-time clock (only available on RP-C-16A-M-24V) helps prevent data loss and allows seamless and quick recovery after a power disruption.

RS-485 port to support Sensor Bus

The RP-C controller has one RS-485 port (Com A), which can be configured to support the Sensor Bus.

Sensor bus for SpaceLogic living space sensors

The RP and MP controllers provide an interface designed for the SpaceLogic Sensor family of living space sensors. The SpaceLogic Sensor devices offer an efficient way to sense the temperature, humidity, CO₂, and occupancy in a room. The SpaceLogic Sensor devices are available with different combinations of sensor types and various covers and user interface options, such as touchscreen, setpoint and override buttons, and blank covers. For more information, see the SpaceLogic Sensors - SXWS Sensors for MP and RP IP Controllers - Specification Sheet.

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SpaceLogic Sensor devices

The RP controller sensor bus provides both power and communications for up to four sensors that are daisy-chained using standard Cat 5 (or higher) cables. This maximum number of sensors that can be connected to a controller is regardless of the sensor model and the combination of cover and sensor base type:

- Blank covers: Up to four sensors of any combination of sensor base types
- 3-button and touchscreen covers: Up to four sensors of any combination of sensor base types
- SpaceLogic LCD temperature sensors: Up to four sensors are supported

The maximum total length of the sensor bus is 61 m (200 ft). For more information, see the SpaceLogic Sensors - SXWS Sensors for MP and RP IP Controllers - Specification Sheet.

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.

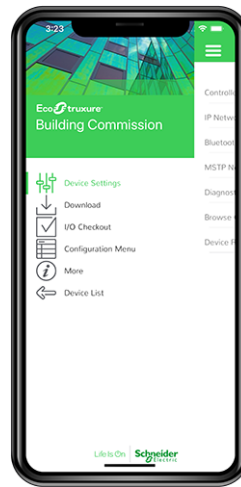


EasyLogic Sensor devices

Commission mobile application

The Commission mobile application is designed for local configuration, field deployment, and commissioning of RP and MP controllers. The mobile application reduces the commissioning time, allows flexibility in project execution, and minimizes dependencies on network infrastructure.

The mobile application is designed for use with Android, Apple (iOS), and Microsoft Windows devices. For more information, see the EcoStruxure Building Commission Specification Sheet.



Commission mobile application

Using the Commission mobile application, you can connect to an RP controller. To connect to the RP controller, you use the SpaceLogic Bluetooth Adapter connected to a SpaceLogic Sensor.

Device configuration

With the Commission mobile application, you can easily discover RP controllers on the BACnet network. You can change the configuration of each controller, including the BACnet network settings, location, and parent server. To save engineering time, you can save common device settings and then reuse them for controllers of the same model.

EasyLogic RP-C for Niagara Framework®

Field I/O checkout

The Commission mobile application does not require an I/A Series Niagara server or a network infrastructure to be in place. You can use the mobile application to browse objects and view device status information. You can also perform an I/O checkout to verify that the controller's I/O points are configured, wired, and operating correctly.

Seamless integration with I/A Series Niagara software

The power of the RP and MP controllers is fully realized when part of an I/A Series Niagara BMS, which provides the following benefits:

- Device discovery
- Full engineering capability from Workbench
- Graphical programming from a Wiresheet
- Support for custom Script programs
- Engineering efficiency

Device discovery

The enhanced Device Discovery in Workbench enables you to easily identify RP and MP controllers on a BACnet network and to associate the controllers with their parent server.

Full engineering capability from Workbench

Workbench provides a consistent user experience regardless of which I/A Series Niagara BMS server the user is logged on to. The user can log on to the parent Niagara BMS server to engineer, commission, supervise, and monitor the RP or MP controller and its I/O as well as its attached SpaceLogic or EasyLogic Sensor devices.

Graphical programming from a Wiresheet

The RP and MP controllers can be programmed directly using the familiar Wiresheet interface and an extensive palette of graphical program objects. Users can quickly drag, drop, and

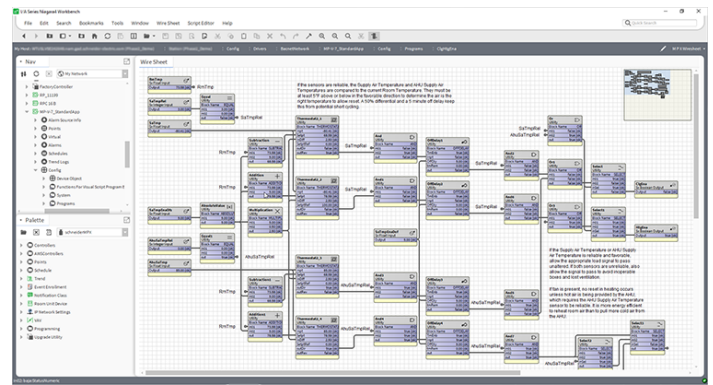
configure program objects to create full applications and download to the controllers.

Support for custom Script programs

The RP and MP controllers also support custom Script programs. Users can write their own custom Script programs, compile, and download them to the controller. These custom Script programs will appear graphically on a Wiresheet where they can be bound with other objects.

Engineering efficiency

Workbench supports both online and offline engineering of RP and MP controllers. You can create and engineer controllers offline and then associate with an online controller when complete.



Workbench

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. 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-C

Product	Part number
RP-C-12A-M-24V	SXWRCF12AM10001
RP-C-12B-M-24V	SXWRCF12BM10001
RP-C-16A-M-24V	SXWRCF16AM10001

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Part Numbers for RP-C Accessories

Product	Part number
Optional covers	SXWRPCCOV10001
DIN-RAIL-CLIP, DIN-rail end clip package of 25 pieces	SXWDINEND10001
SpaceLogic Bluetooth Adapter	SXWBTAECXX10001

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

Specifications

EasyLogic RP-C for Niagara Framework®			
AC input			
Nominal voltage			24 VAC
Operating voltage range			+/-15 %
Frequency			50/60 Hz
Maximum power consumption			14 VA
Base Load Including All I/O	SpaceLogic Sensors on Sensor Bus	Total	
9.4 VA	4.6 VA ^a	14 VA	
a) The example of 4.6 VA for the Sensor Bus (Com A) is based on a 2.8 W load on Com A. This gives an approximate conversion factor of 1.644 VA per Watt, which can be applied to the Com A load, which should not exceed 3 W.			
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			8 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

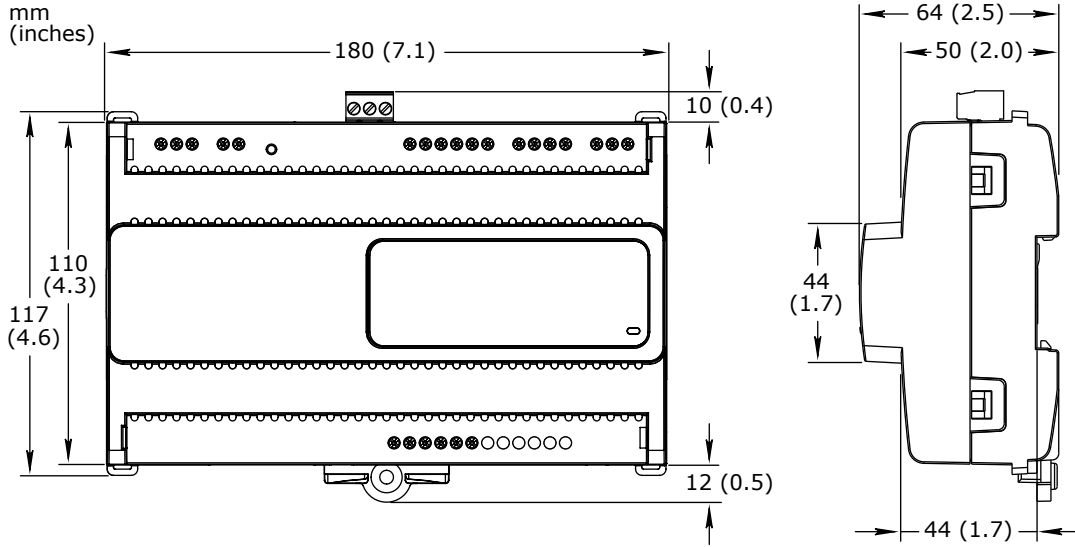
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Mechanical

Dimensions

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



Weight, RP-C-12A-M-24V

0.336 kg (0.741 lb)

Weight, RP-C-12B-M-24V

0.358 kg (0.789 lb)

Weight, RP-C-16A-M-24V

0.360 kg (0.794 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

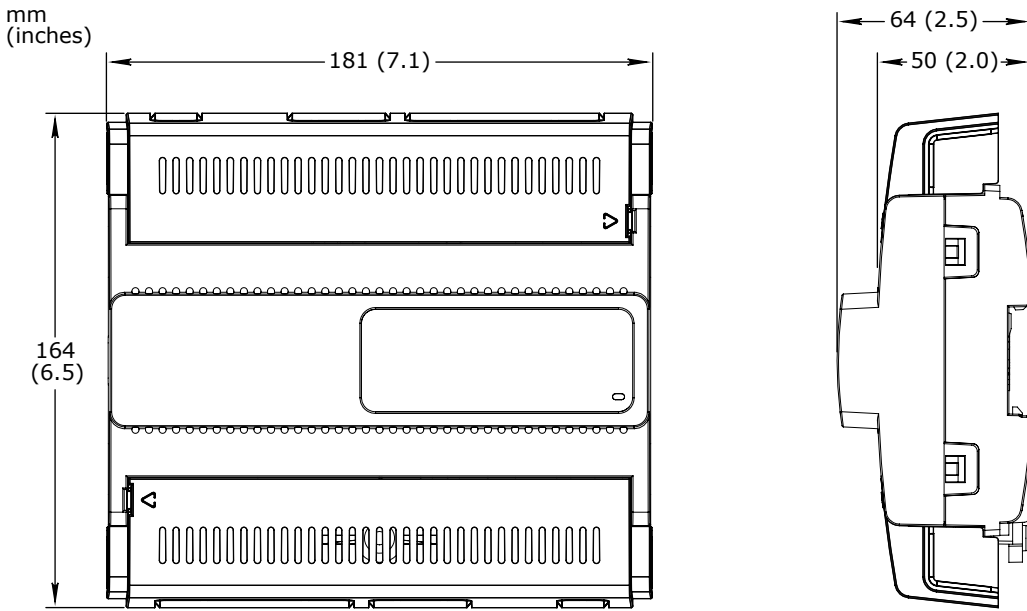
Optional covers

Dimensions

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

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Weight, optional covers	0.070 kg (0.154 lb)
Compatibility	
I/A Series Niagara software	version 4.10 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-C-12A, -12B, and -16A models are marked "Open Energy Management Equipment".	
Fire performance in air-handling spaces ^a	UL 2043
a) The RP-C-12A, -12B, and -16A models are approved for plenum applications.	
Real-time clock	
RP-C-16A-M-24V Only	
Accuracy, at 25 °C (77 °F)	+/-1 minute per month
Backup time, at 25 °C (77 °F)	7 days minimum
Communication ports	
RS-485 port Com A	24 VDC, 3 W, RS-485 (RJ45) Transient voltage suppressors on communication and power signals
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

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External biasing	None required
Total Unit Load (UL) per device	Maximum 0.5 UL

Communications

BACnet	BACnet MS/TP, maximum bus length: 1200 m (4000 ft), maximum baud rate: 76800 BTL B-AAC (BACnet Advanced Application 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-C-12A-M-24V and RP-C-12B-M-24V with hardware version earlier than 01 and RP-C-16A-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-C-12A-M-24V	8 Ub, Ub1 to Ub8
Channels, RP-C-12B-M-24V	8 Ub, Ub1 to Ub8
Channels, RP-C-16A-M-24V	8 Ub, Ub1 to Ub8
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
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Accuracy	+/- (7 mV + 0.2 % of reading)
Resolution	1.0 mV
Impedance	1 Mohm
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 x 10 ⁻³ x R) ohm
10 kohm to 60 kohm accuracy R = Resistance in ohm	+/- (4 x 10 ⁻³ x R + 7 x 10 ⁻⁸ x 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)

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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
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)
Relay outputs, DO	
Channels, RP-C-12A-M-24V	0
Channels, RP-C-12B-M-24V	3, DO1 to DO3
Channels, RP-C-16A-M-24V	3, DO5 to DO7
Contact rating	Pilot Duty (C300) Resistive load: 250 VAC/30 VDC, 4 A (cos phi = 1) Inductive load: 250 VAC/30 VDC, 4 A (cos phi = 0.4)
Switch type	Form A Relay Single Pole Single Throw Normally Open
Commons	COM1 for DO1, DO2, and DO3 (on RP-C-12B model) COM3 for DO5, DO6, and DO7 (on RP-C-16A models)
Isolation contact to system ground	3,000 VAC
Cycle life	At least 100,000 cycles
Minimum pulse width	100 ms
High power relay outputs, DO	
Channels, RP-C-12A-M-24V	0
Channels, RP-C-12B-M-24V	1, DO4
Channels, RP-C-16A-M-24V	1, DO8
Contact rating	Pilot Duty (B300) Minimum current: 100 mA (5 VDC) Normally Open contact, resistive load: 250 VAC/24 VDC, 12 A (cos phi = 1) Normally Closed contact, inductive load: 250 VAC/24 VDC, 3 A (cos phi = 0.4)
Switch type	Form C Relay Single Pole Double Throw Normally Open and Normally Closed
Isolation contact to system ground	5,000 VAC

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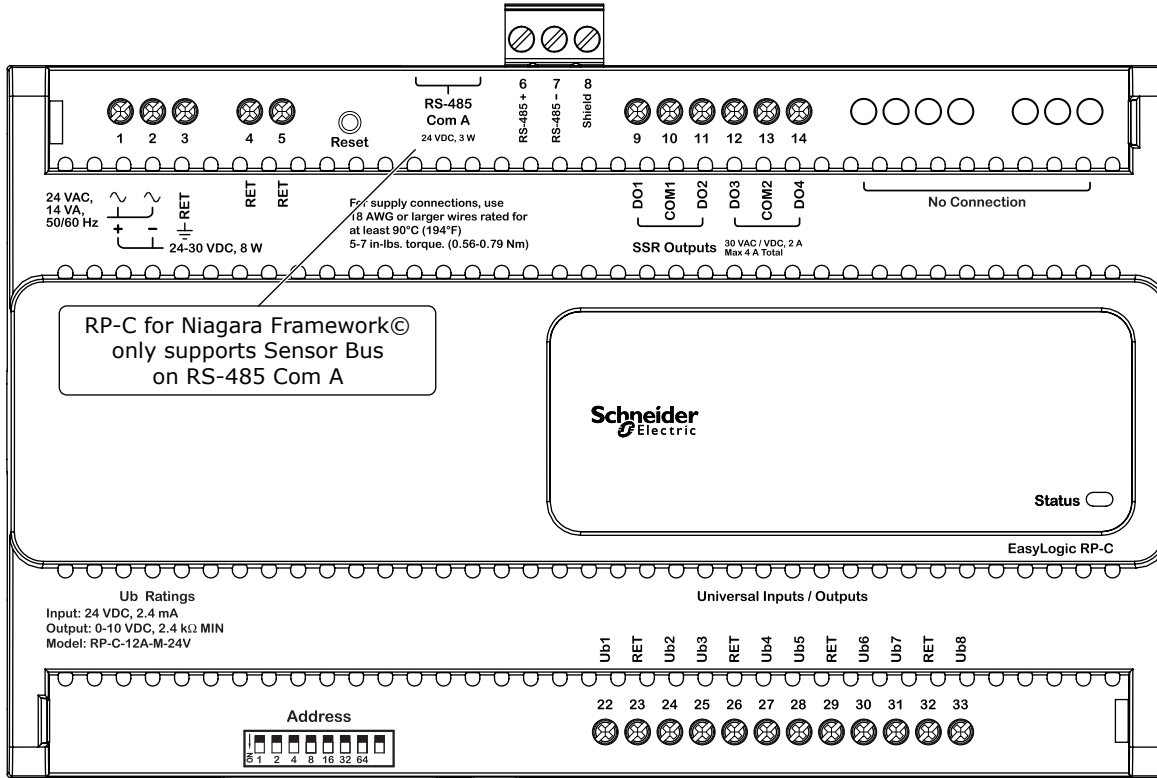
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Cycle life	At least 100,000 cycles
Minimum pulse width	100 ms
Solid-state relay outputs, DO	
Channels, RP-C-12A-M-24V	4, DO1 to DO4
Channels, RP-C-12B-M-24V	0
Channels, RP-C-16A-M-24V	4, DO1 to DO4
Output rating	Maximum 2 A load per output Maximum 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-C-12A and -16A models) COM2 for DO3 and DO4 (on RP-C-12A and -16A models)
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

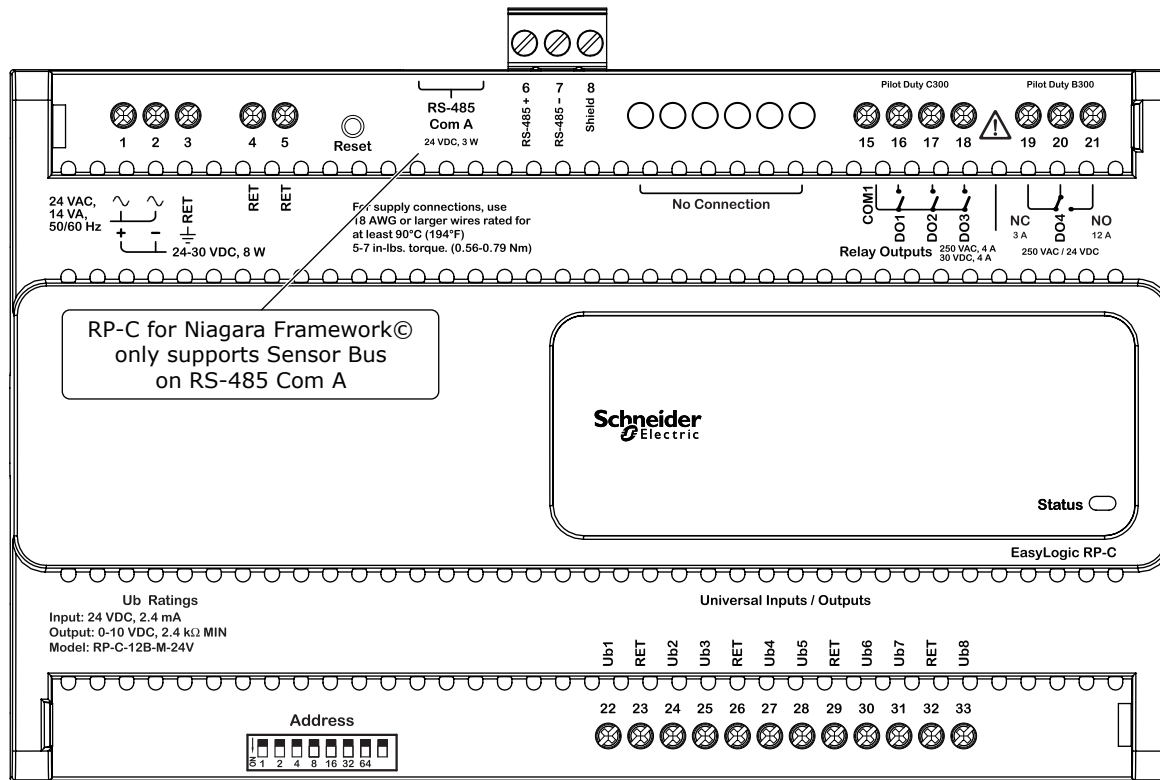
For more information on wiring, see the SpaceLogic and EasyLogic - Hardware Installation System Guide.

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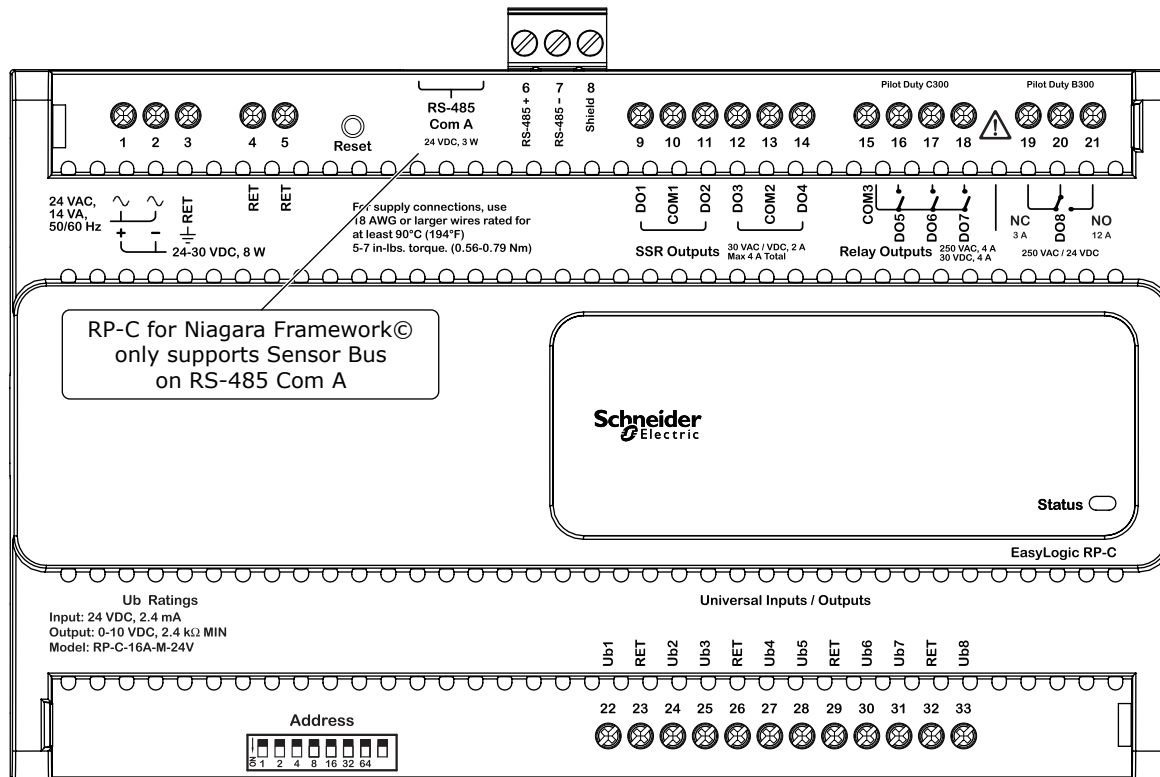
RP-C-12A-M-24V model

EasyLogic RP-C for Niagara Framework®



RP-C-12B-M-24V model

EasyLogic RP-C for Niagara Framework®



RP-C-16A-M-24V model

EasyLogic RP-C for Niagara Framework®

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

2014/35/EU Low Voltage 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. 2016/1101 - Electrical Equipment (Safety) 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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