



# PEAK OEM 32 24 Volt SMART Equipment Controller Installation Guide

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## Application

The PEAK OEM 32 24 Volt SMART Equipment Controller is part of the SMART Equipment Controller family. The PEAK 32 Series controllers run pre-engineered applications and provide the inputs and outputs required to monitor and control a wide variety of HVAC equipment.

PEAK OEM 32 field controllers operate on an RS-485 BACnet® MS/TP Bus as BACnet Advanced Application Controllers (B-AACs) and integrate into Johnson Controls® and third-party BACnet systems.

PEAK OEM 32 controllers include an integral real-time clock, which enables the controllers to monitor and control schedules, calendars, trends, multi-protocol support, and operate for extended periods of time as stand-alone controllers when offline from the system network.

Attention: Use this PEAK OEM 32 24 Volt Controller only as an operating control. Where failure or malfunction of the PEAK OEM controller could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the PEAK OEM controller.

Attention: Utiliser ce PEAK OEM 32 24 Volt Controller uniquement en tant que dispositif de contrôle de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du controller risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du PEAK OEM controller.

# Communication protocols and tools

CCT Release 10.3 with the OEM package can be used to switch the Field Bus communications protocol in PEAK OEM Controllers to act as either standard BACnet MS/TP devices, Modbus® RTU devices, or as N2 protocol devices. BACnet MS/TP is the default for all new controllers. Switchable communications protocols provide a cost-effective upgrade and modernization path for customers with existing N2 controllers. The OEM package is required to make changes to the application. The PEAK OEM 32 controllers can be used as HVAC/R application controllers. The BACnet standard PEAK OEM 32 24 Volt controllers include:

- I/O quantities and characteristics of the PEAK OEM 32 family controllers
- Real-time clock with local display
- Built-in BACnet schedule objects and calendars
- Mobile Access Portal (MAP) Gateway compatibility for configuration through smart mobile devices and remote connectivity
- Multi-protocol support for BMS integration, BACnet MS/TP, N2, and Modbus RTU (configuration change through on-board display or MAP)
- Dedicated SA bus for Johnson Controls smart end-devices
- Dedicated Modbus port for third-party end-device integration with Modbus Master

## Installation

Observe these guidelines when installing a PEAK SMART Equipment controller:

- Transport the controller in the original container to minimize vibration and shock damage.
- Verify that all parts shipped with the controller.
- Do not drop the controller or subject it to physical shock.

## Parts included

- One PEAK OEM 32 24 Volt controller
- One installation instructions sheet

## Materials and special tools needed

- Three fasteners appropriate for the mounting surface (M4 screws or #8 screws)
- One 20 cm (8 in.) or longer piece of 35 mm DIN rail and appropriate hardware for DIN rail mount (only)
- Small straight-blade screwdriver for securing wires in the terminal blocks

# Mounting

**Important:** Only qualified personnel should install or service PEAK products. These instructions are a guide for such personnel. Mount the PEAK controllers on a wall or DIN rail inside an enclosure (rated at least IP20). Carefully follow all instructions in this document and all instructions for the controller.

Observe these guidelines when mounting a field controller:

- Ensure the mounting surface can support the controller, DIN rail, and any user-supplied enclosure.
- Mount the controller horizontally on 35 mm DIN rail whenever possible.
- Mount the controller in the proper mounting position ([Figure 1](#)).
- Use shims or washers to mount the controller securely and evenly on the mounting surface.
- Mount the controller in an area free of corrosive vapors and observe the Ambient Condition requirements in [Table 1](#).
- Provide for sufficient space around the controller for cable and wire connections for easy cover removal and good ventilation through the controller (50 mm [2 in.] minimum on the top, bottom, and front of the controller).
- Do not mount the controller on surfaces prone to vibration, such as duct work.
- Do not mount the controller in areas where electromagnetic emissions from other devices or wiring can interfere with controller communication.

Observe these additional guidelines when mounting a field controller in a panel or enclosure:

- Mount the controller so that the enclosure walls do not obstruct cover removal or ventilation through the controller.
- Mount the controller so that the power transformer and other devices do not radiate excessive heat to the controller.
- Do not install the controller in an airtight enclosure.
- Use a zip-tie to secure the controller when shipping.

## Figure 1. PEAK SMART Equipment Controller Mounting Position



## Horizontal Mount Position Required for DIN Rail Mounting

### DIN rail mount applications

#### About this task

Mounting the field controller horizontal on 35 mm DIN rail is the preferred mounting method.

To mount a field controller on 35 mm DIN rail:

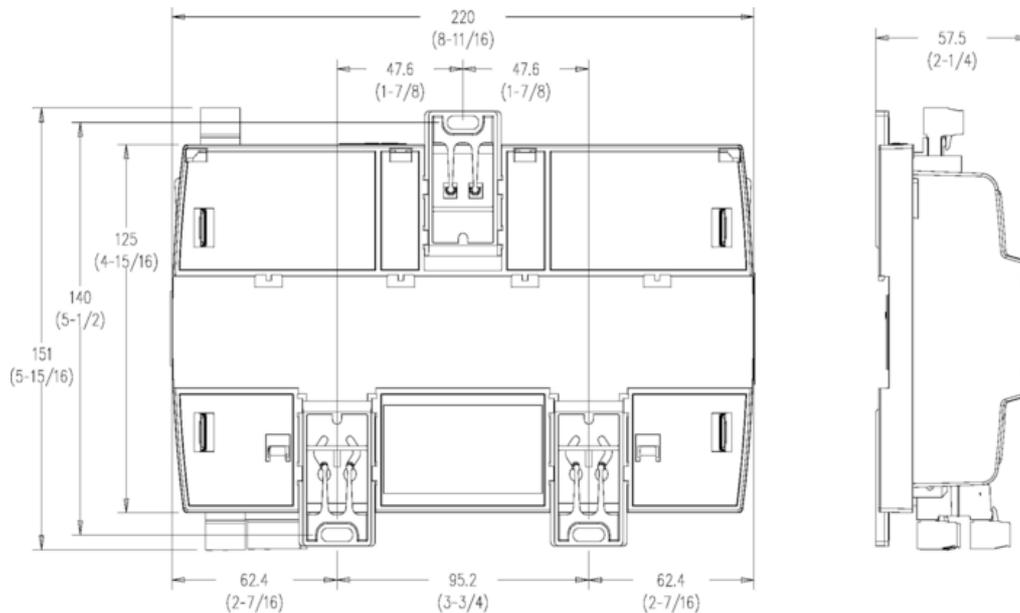
#### Procedure

1. Securely mount a 20 cm (8 in.) or longer section of 35 mm DIN rail horizontal and centered in the desired space, so that the controller mounts in the horizontal position shown in [Figure 1](#).
2. Pull the two bottom mounting clips outward from the controller to the extended position.
3. Hang the controller on the DIN rail by the hooks at the top of the (DIN rail) channel on the back of the controller and position the controller snugly against the DIN rail.
4. Zip tie the controller to the DIN rail, when shipping.
5. Push the bottom mounting clips inward (up) to secure the controller on the DIN rail.

**Note:** To remove the controller from the DIN rail, pull the bottom mounting clips out to the extended position and carefully lift the controller off the DIN rail.

**Important:** Do not overtighten the mounting screws. Overtightening the screws may damage the mounting clips.

**Figure 1. Back of controller showing extended mounting clips, DIN rail channel, and mounting dimensions, mm (in.)**



## Wiring

Observe the following guidelines when wiring a field controller:

### WARNING

#### **Risk of Electric Shock**

Disconnect power from the controller before making any adjustments. Do not touch any part of the printed circuit board while power is applied. Failure to follow these precautions can result in personal injury or death.

### AVERTISSEMENT

#### **Risque de décharge électrique**

Déconnecter l'alimentation du contrôleur avant toute opération de réglage. Veiller à ne toucher aucune partie du circuit imprimé lorsque celui-ci est sous tension. Le non-respect de ces précautions peut provoquer des blessures graves, voire mortelles.

### WARNING

#### **Risk of Electric Shock**

Disconnect or isolate all power supplies before making electrical connections. More than one disconnection or isolation may be required to completely de-energize equipment. Contact with components carrying hazardous voltage can cause electric shock and may result in severe personal injury or death.

## AVERTISSEMENT

### Risque de décharge électrique

Débrancher ou isoler toute alimentation avant de réaliser un branchement électrique. Plusieurs isolations et débranchements sont peut-être nécessaires pour -couper entièrement l'alimentation de l'équipement. Tout contact avec des composants conducteurs de tensions dangereuses risque d'entraîner une décharge électrique et de provoquer des blessures graves, voire mortelles.

**Important:** Do not exceed the controller electrical ratings. Exceeding controller electrical ratings can result in permanent damage to the controller and void any warranty.

**Important:** Use copper conductors with a rating of at least 75°C (167°F). Make all wiring in accordance with local, national, and regional regulations.

**Important:** Electrostatic discharge can damage controller components. Use proper electrostatic discharge precautions during installation, setup, and servicing to avoid damaging the controller.

For detailed information on configuring and wiring an MS/TP Bus, FC bus, and SA bus, refer to the *MS/TP Communications Bus Technical Bulletin (LIT-12011034)*.

## PEAK OEM 32 24 Volt SMART Equipment controller terminal blocks and bus ports

See [Figure 1](#) for terminal block, spade location, and bus port locations on the PK-OEM32x0-0 controller. Observe the following guidelines when wiring a controller.

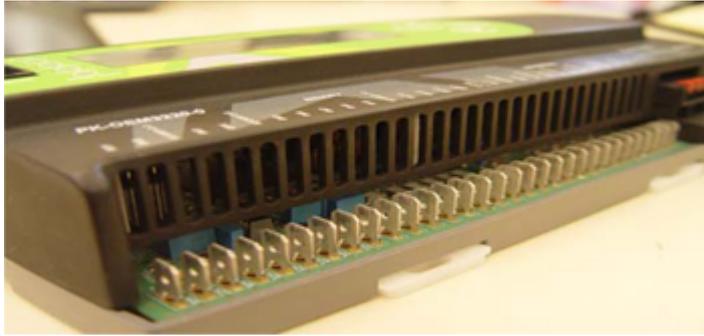
### Input and output terminal blocks

On most field controller models, all of the input terminal blocks or spade terminals are mounted on the bottom of the controller and the output terminal blocks and spade terminals are mounted on the top of the controller. See [Table 1](#) for more information about I/O terminal functions, requirements, and ratings.

### Factory wiring

For all the I/O terminals listed in [Table 1](#), use the appropriate gauge wiring. For each spade terminal in this application, follow the guidelines in [Table 1](#) and use a spade connector with screw terminals. [Figure 1](#) shows I/O spade terminals.

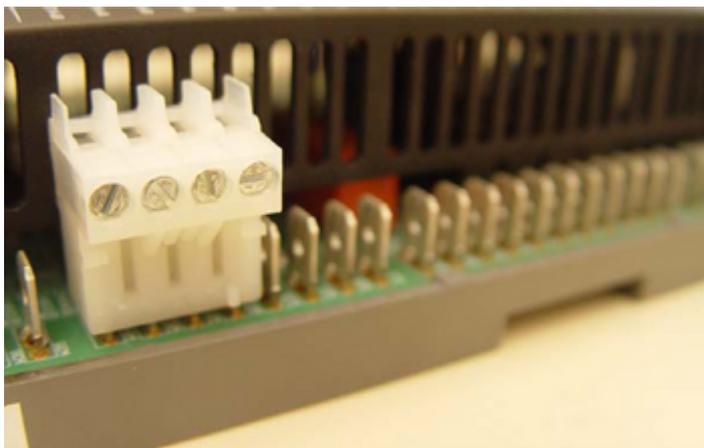
### Figure 1. PEAK OEM controller spade terminals



### Field wiring

For all I/O terminals listed in [Table 1](#), use the appropriate gauge wiring. For each spade terminal in this application, follow the guidelines in [Table 1](#) and use a spade connector with screw terminals.

**Figure 1. PEAK OEM controller spade connector with screw terminals**

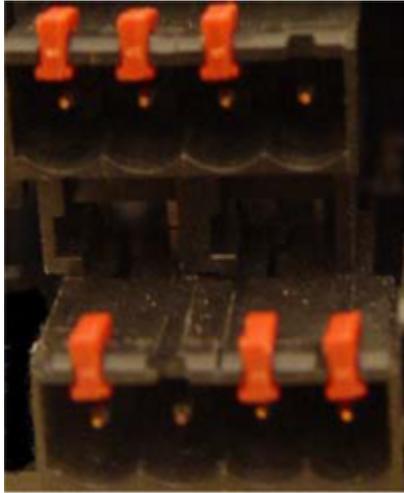


**Note:** Use WECO® 130 Series or WIELAND® Electric 8105B. A maximum rated torque of 4.5 lb·in is acceptable when you use the WECO 130 Series terminal blocks.

### Stacked FC/SA bus terminal block

A dual-stacked connector serves as the FC Bus and SA Bus port on the PEAK OEM 32 controllers. The upper row on the connector is the FC Bus Port. The lower connector row is the SA Bus port.

**Figure 1. Stacked FC/SA Bus terminal block**



The FC Bus connection is software switchable for BACnet MS/TP, Modbus subordinate mode, and N2 communication. [Figure 1](#) shows the BACnet MS/TP connection, and [Figure 1](#) shows the Modbus connection for the three terminals. The Shield (Shld) is not required for Modbus.

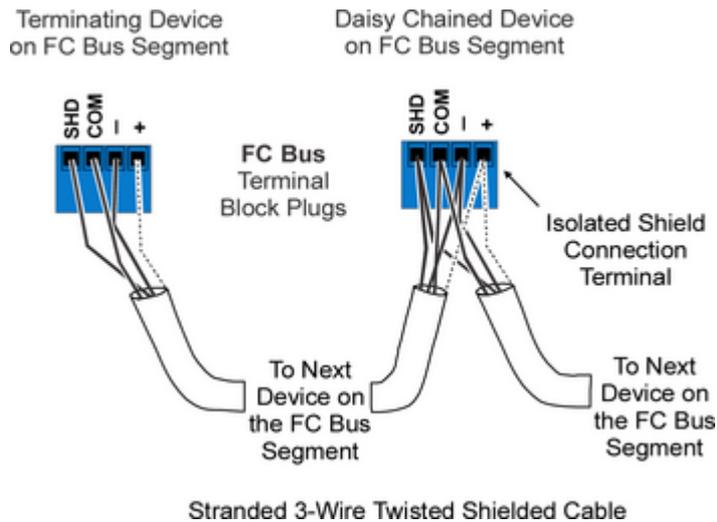
When the FC Bus is configured for Modbus protocol, the PEAK controller connects to the network as a subordinate device. The Modbus register table is not standard but strictly depends on the application loaded on the controller. The Modbus table is generated during the application development phase.

The PEAK support team identifies the configuration and application for Modbus. The controllers are programmed based on OEM applications.

### **FC bus terminal block**

The FC Bus terminal block is a blue, removable, 4-terminal plug that fits into a board-mounted jack. Wire the removable FC bus terminal block plugs on the controller on the top row of the stacked connector, and other field controllers in a daisy-chain configuration using 3-wire twisted, shielded cable, as shown in [Figure 1](#). See [Table 1](#) for more information.

### **Figure 1. FC Bus Terminal Block Wiring**



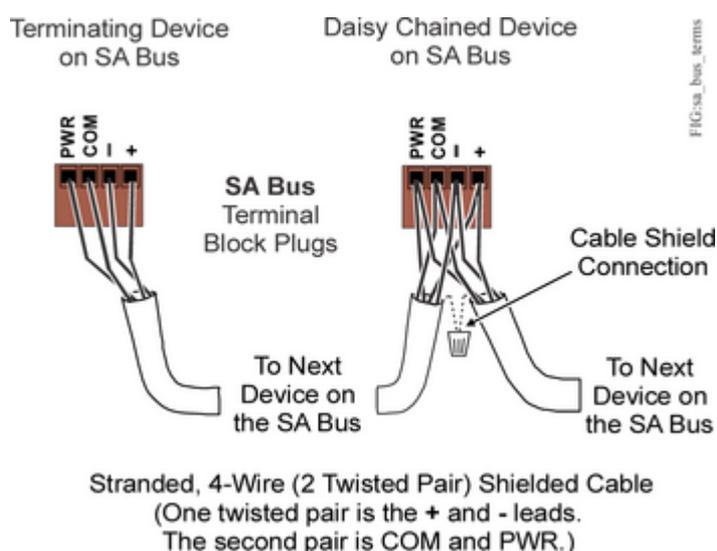
**Note:** The FC bus Shield (SHD) terminal is isolated and can be used to connect (daisy chain) the shields for FC bus wiring.

## SA bus terminal block

The SA Bus terminal block is a brown, removable, 4-terminal plug that fits into a board-mounted jack.

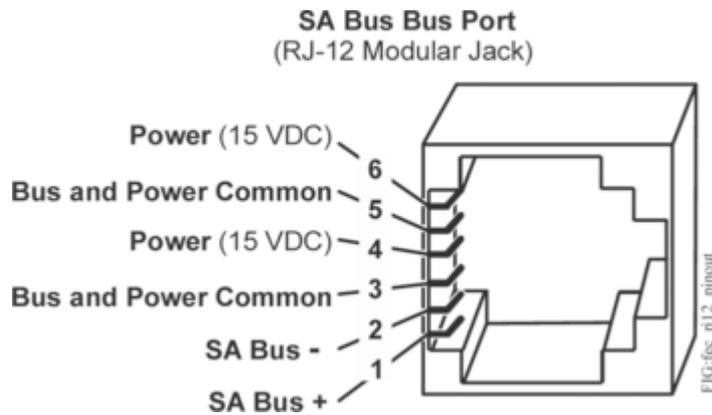
Wire the removable SA Bus terminal block plugs on the lower port of the Dual Stacked Connector to the controller, and other SA bus devices in a daisy-chain configuration using 4-wire twisted, shielded cable as shown in [Figure 1](#). See [Table 1](#) for more information.

**Figure 1. SA bus terminal block wiring**



**Note:** The SA BUS PWR terminal supplies 15 VDC. The PWR terminal can be used to connect (daisy chain) the 15 VDC power leads on the SA bus.

**Figure 2. Pin number assignments for SA bus ports on PEAK SMART Equipment controllers**



## Sensor port

The Sensor (SA Bus) port on the middle left side of the controller ([Figure 1](#)) is an RJ-12, 6-position modular jack that provides a connection for the Bluetooth® Commissioning Converter, the VAV Balancing Tool, specified network sensors, or other SA Bus devices with RJ-12 plugs.

The Sensor port is connected internally to the SA bus terminal block. See [Table 1](#) for more information. The Port pin assignment is shown in [Figure 2](#).

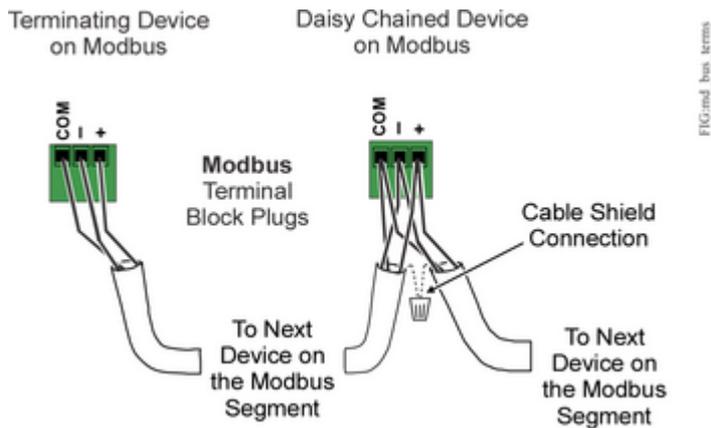
## Modbus terminal block

The Modbus terminal block is a green, removable, 3-terminal plug that fits into a board-mounted jack.

Wire the removable Modbus terminal block plugs on the controller, and wire the other field controllers in a daisy-chain configuration using 3-wire twisted, shielded cable as shown in [Figure 1](#). See [Table 1](#) for more information.

The Modbus port communicates as a Master Modbus device and connects to the Modbus network, which may consist of one-to-many subordinate Modbus devices. Each Modbus subordinate device has a unique Modbus Register table and must be configured within the application of the PEAK controller. The configuration and application of Modbus is identified by the PEAK support team and programmed based on OEM applications.

### Figure 1. Modbus Terminal Block



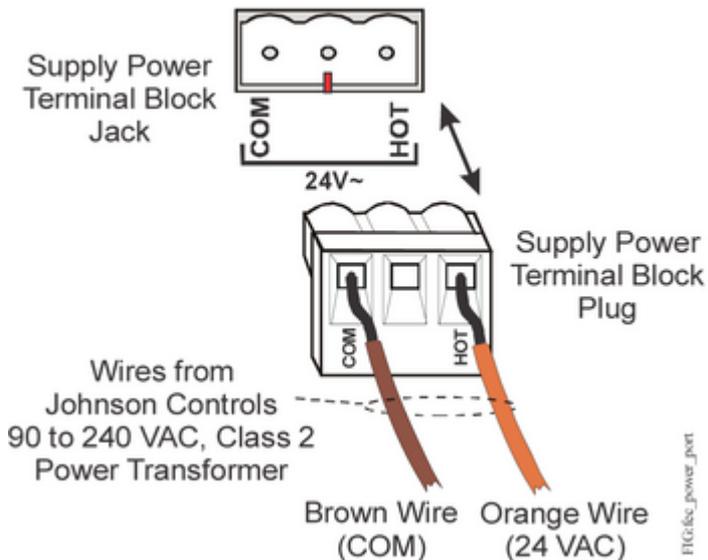
## Supply power terminal block

The 24 VAC supply power terminal block is a gray, removable, 3-terminal plug that fits into a board-mounted jack on the top right of the controller.

Wire the 24 VAC supply power wires from the transformer to the HOT and COM terminals on the terminal plug, as shown in [Figure 1](#). The middle terminal on the supply power terminal block is not used. See [Table 1](#) for more information about the Supply Terminal Block.

### Figure 1. 24 VAC supply power terminal block

Disconnect supply power to controller by unplugging Supply Power Plug from Supply Power Jack.

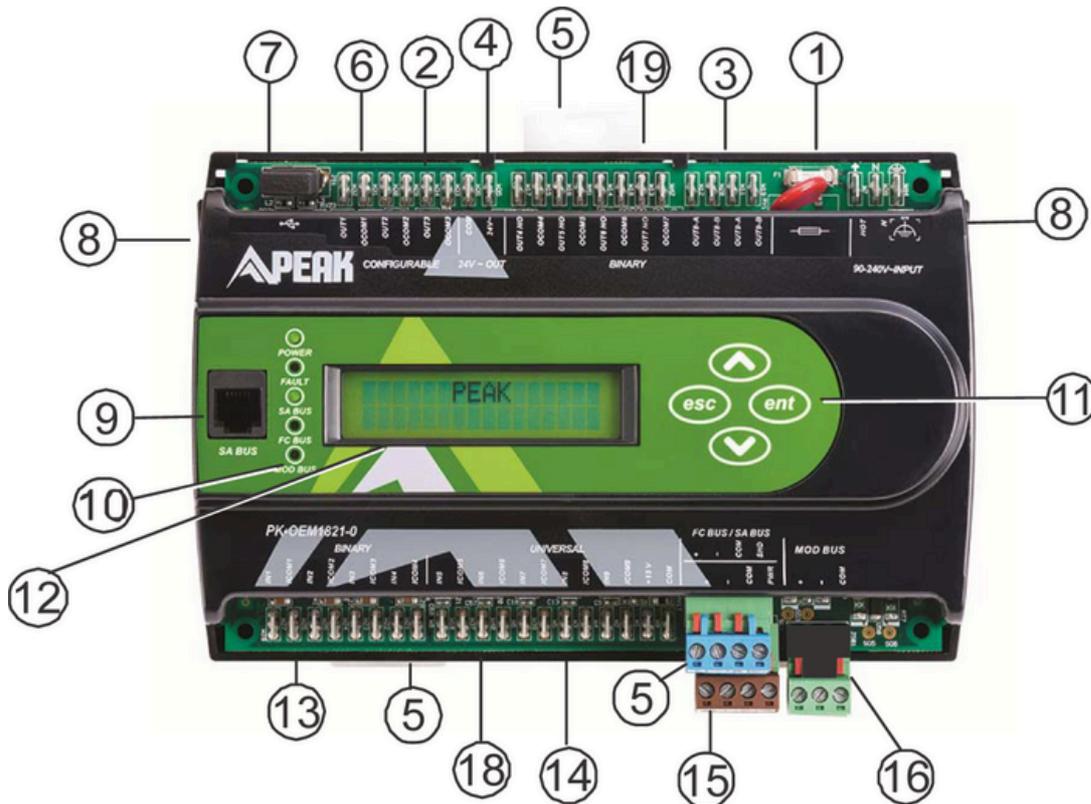


**Note:** The supply power wire colors may be different on transformers from other manufacturers. Refer to the transformer manufacturer's instructions and the project installation drawings for wiring details.

## EOL terminator module

The MS-BACEOL-0 RS-485 EOL Terminator provides the EOL termination on the FC Bus or N2 segments when the device connected at the end of a bus segment does not have an integral EOL termination feature. The EOL terminator is a compact, lightweight, module wrapped in a protective cover that you can quickly install in a variety of ways. The EOL connects directly to the terminating device on a bus segment with the attached wire leads. The EOL requires 24 VAC, Class 2 power, which is supplied by the field device or another 24 VAC source.

**Figure 1. PK-OEM32x0-0 physical features**



**Table 1. OEM32x0-0 physical features**

Callout	Physical feature: description and reference
1	24 VAC, Class 2 Power supply terminal block. See the <a href="#">Supply power terminal block</a> section.
2	24 VAC Utility Output Power for Actuator Supply
3	Four Binary Outputs: 0.5 A Triac (24 or 240 VAC, externally powered). See <a href="#">Table 1</a> .
4	Four Binary Outputs: Relays SPST 5 (3A) (240 VAC), externally powered. Two relays support the selectable hardware interlocking function. Each relay contact is independent with its own terminal.
5	Mounting clips (three)
6	Four Configurable Outputs: 0 to 10 VDC, 10 mA, 24 VAC externally sourced Triac Outputs 0.5A (maximum) output current.
7	USB Host Port

Callout	Physical feature: description and reference
8	Cover Lift Tabs
9	Sensor Actuator (SA) Bus Port (RJ-12 6-pin Modular Jack) See <a href="#">Table 1</a> .
10	LED Status Indicators. See <a href="#">Table 1</a> .
11	Four keypad buttons
12	Display with backlight
13	Six Binary Inputs Terminal blocks (IN1–IN6). Dry contact maintained or pulse counter/accumulator mode. See <a href="#">Table 1</a> .
14	Six Universal Inputs (UI) terminal blocks. Voltage Analog Input 0–10 VDC. Current Analog Input 4–20 mA. Resistive Analog Inputs (0 to 600 ohms) or Dry Contact Binary Input. See <a href="#">Table 1</a> .
15	Dual-Stacked Connector. See the <a href="#">Stacked FC/SA bus terminal block</a> section.
16	Modbus Communication Port
17	PWM 0 to 15 VDC selectable 5V, 12V, and 15V at 10 mA, maximum 100 Hz
18	Six non-critical 24 VAC Binary Inputs
19	1 SPDT 240 VAC relay (separate from other circuits and double insulated), 5 (3) A (240 VAC), externally powered (OUT 10 NC, OUT 10 NO, OCOM 10).

## Termination details

A set of Johnson Controls termination diagrams provide details for wiring inputs and outputs to the controllers. See the figures in this section for the applicable termination diagrams.

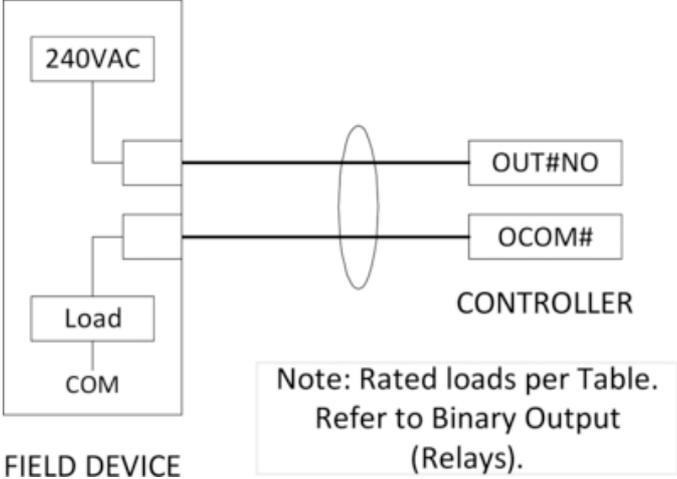
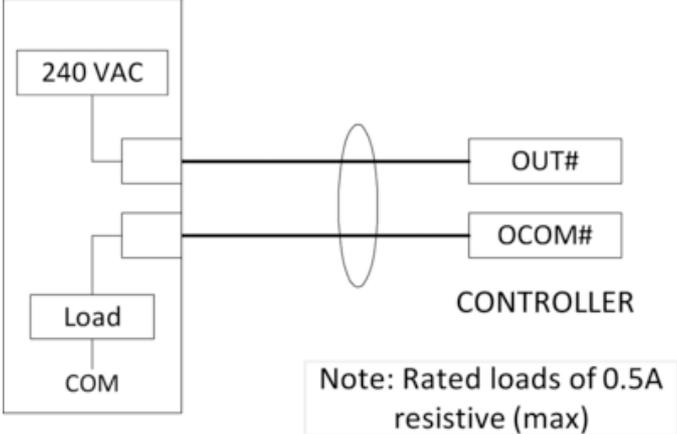
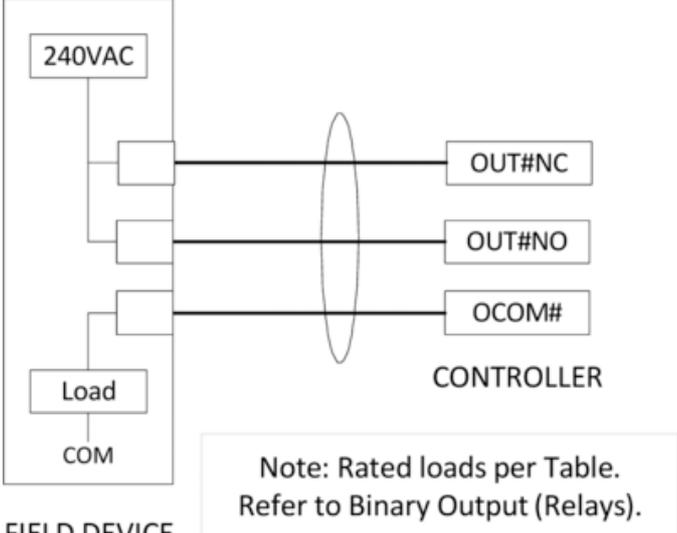
**Table 1. Termination Details**

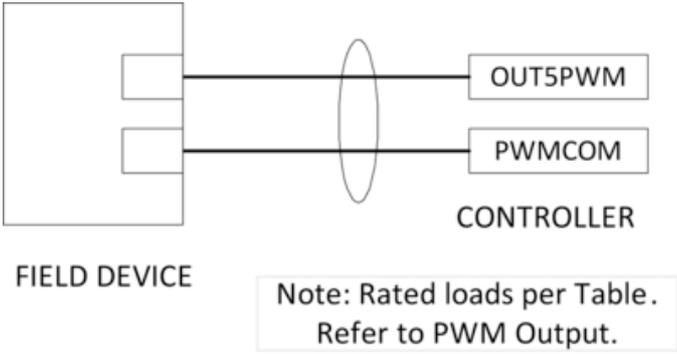
Type of Field Device	Type of Input/Output	Termination Diagrams
<b>Resistive Input –RTD Monitor</b>	<b>UI</b>	
<b>Voltage Input – External Source</b>	<b>UI</b>	

Type of Field Device	Type of Input/Output	Termination Diagrams
Voltage Input – Internal Source	UI	
Voltage Input (Self-Powered)	UI	
Current Input – External Source (Isolated)	UI	
Current Input – Internal Source (2 wire)	UI	
Current Input – Internal Source (3 wire)	UI	
Current Input – External Source (in Loop)	UI	

Type of Field Device	Type of Input/Output	Termination Diagrams
Feedback from EPP-100	UI	<p>EPP - 100</p> <p>Retracted Wh/Vio</p> <p>Wh/Org</p> <p>Stroked Wh/Bm</p> <p>ICOM#</p> <p>IN#</p> <p>+15V</p> <p>Controller</p>
Dry Contact (Binary Input)	UI/BI	<p>FIELD DEVICE</p> <p>ICOM#</p> <p>IN#</p> <p>Controller</p> <p>DRY CONTACT (N.O. or N.C. as required)</p>
Binary Inputs (24V Non-Critical)	BI	<p>24VAC</p> <p>24 VAC External Power Supply</p> <p>IN#</p> <p>ICOM#</p> <p>Valid for IN7 – IN12</p> <p>FIELD DEVICE</p> <p>CONTROLLER</p> <p><b>Note:</b> If the 24 VAC External Power Supply and the PEAK 24 VAC Supply are both grounded to Functional Earth , ensure that the phasing between the two supplies are aligned .</p>
0–10 VDC Output to Actuator (External Source)	CO	<p>Common 1</p> <p>Power 2</p> <p>Calibration Output 3</p> <p>Current Input 4</p> <p>Voltage Input 5</p> <p>Feedback 6</p> <p>Terminal Block 1</p> <p>24 VAC COM</p> <p>24 VAC HOT</p> <p>OCOM#</p> <p>OUT#</p> <p>Controller</p>
0–10 VDC Output to Actuator (Internal Source)	CO	<p>Common 1</p> <p>Power 2</p> <p>Calibration Output 3</p> <p>Current Input 4</p> <p>Voltage Input 5</p> <p>Feedback 6</p> <p>Terminal Block 1</p> <p>24 VAC Com</p> <p>24 VAC Hot</p> <p>OCOM#</p> <p>OUT#</p> <p>Controller</p> <p>Add Jumper from 24 VAC COM to only one AO COM per Transformer.</p>
0–20 mA Output to Actuator	CO	<p>Common 1</p> <p>Power 2</p> <p>Calibration Output 3</p> <p>Current Input 4</p> <p>Voltage Input 5</p> <p>Feedback 6</p> <p>Terminal Block 1</p> <p>24 VAC Com</p> <p>24 VAC Hot</p> <p>OCOM#</p> <p>OUT#</p> <p>Controller</p> <p>Add Jumper from 24 VAC COM to only one AO COM per Transformer.</p>

Type of Field Device	Type of Input/Output	Termination Diagrams
0–20 mA Output to Actuator	CO	<p>Terminal Block 1</p>
24 VAC Triac Output	CO	<p>FIELD DEVICE</p> <p>CONTROLLER</p> <p>Note: Rated loads of 0.5A resistive (max)</p>
240 VAC Triac Output	BO	<p>FIELD DEVICE</p> <p>CONTROLLER</p> <p>Note: Rated loads of 0.5A resistive (max)</p>
24 VAC Triac Output	BO	<p>FIELD DEVICE</p> <p>CONTROLLER</p> <p>Note: Rated loads of 0.5A resistive (max)</p>

Type of Field Device	Type of Input/Output	Termination Diagrams
<p><b>240 VAC Relay Output (SPST)</b></p> <p><b>Note:</b> Specific to BO 8 and BO 9</p>	<p><b>BO</b></p>	 <p><b>Note:</b> Rated loads per Table. Refer to Binary Output (Relays).</p>
<p><b>240 VAC Relay Output (SPST)</b></p> <p><b>Note:</b> Specific to BO 6 and BO 7(Hardware Interlock Relays)</p>	<p><b>BO</b></p>	 <p><b>Note:</b> Rated loads of 0.5A resistive (max)</p> <p>See <a href="#">Table 2</a> for Selectable Operating Modes.</p>
<p><b>240 VAC Relay Output (SPDT)</b></p> <p><b>Note:</b> Specific to BO 10</p>	<p><b>BO</b></p>	 <p><b>Note:</b> Rated loads per Table. Refer to Binary Output (Relays).</p>

Type of Field Device	Type of Input/Output	Termination Diagrams
PWM Output to Drive an EEV	PWM	 <p data-bbox="639 562 831 589">FIELD DEVICE</p> <p data-bbox="1091 501 1273 528">CONTROLLER</p> <p data-bbox="911 577 1299 645">Note: Rated loads per Table. Refer to PWM Output.</p> <p data-bbox="639 696 1182 723">See <a href="#">Table 3</a> for PWM Output Voltages.</p>

**Table 2. Selectable operating mode**

BO Relay Number	Hardware Jumper State		Relay Operating Mode
6	J1.1 and J1.2	J1.2 and J1.3	
	Open	Open	BO Relays #6 remains de-energized in default state (NO), cannot be controlled.
	Short	Open	Normal Operating BO Relay #6
	Open	Short	BO Relay #6 energizes when BI11 is Active(24 VAC present on BI11).
7	J2.1 and J2.2	J2.2 and J2.3	
	Open	Open	BO Relays #7 remains de-energized in default state (NO), cannot be controlled.
	Short	Open	Normal Operating BO Relay #7
	Open	Short	BO Relay #7 energizes when BI12 is Active (24 VAC is present on BI12).

**Table 3. Selectable PWM output voltage**

Hardware Jumper State		PWM Output Voltage
J3.1 and J3.2	J3.2 and J3.3	
Open	Open	5 V

Hardware Jumper State		PWM Output Voltage
Short	Open	12 V (Default)
Open	Short	15 V

## Terminal wiring guidelines, functions, ratings, and requirements

### Input and output wiring guidelines

Table 1 and Table 1 provide information and guidelines about the functions, ratings, and requirements for the controller input and output terminal guidelines for determining proper wire sizes and cable lengths.

In addition to the wiring guidelines in Table 1 and Table 1, observe these guidelines when wiring controller inputs and outputs:

- Run all low-voltage wiring and cables separate from high-voltage wiring.
- All input and output cables, regardless of wire size or number of wires, should consist of stranded, insulated, and twisted copper wires.
- Shielded cable is not required for input or output cables.
- Shielded cable is recommended for input and output cables that are exposed to high electromagnetic or radio frequency noise.
- Inputs/outputs with cables less than 30 m (100 ft) typically do not require an offset in the software setup. Cable runs over 30 m (100 ft) may require an offset in the input/output software setup.

**Table 1. Peak controller terminal blocks, functions, ratings, requirements, and cables**

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
<b>Universal (Inputs)</b>	<b>+15 V</b>	15 VDC Power Source for active(3-wire) input devices connected to the Universal IN <sub>n</sub> terminals;  provides 80 mA total current.	Same as (Universal) IN <sub>n</sub>  <b>Note:</b> Use 3-wire cable for devices that source power from the +15V terminal.

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
		<p><b>Note:</b> 80mA current limit is shared between the BI + 15V supply and the UI + 15V supply.</p>	
	<b>COM</b>	<p>15 VDC Power Source for active(3-wire) input devices connected to the Universal IN<math>n</math> terminals;</p> <p>provides 80 mA total current.</p> <p><b>Note:</b> 80mA current limit is shared between the BI + 15V supply and the UI + 15V supply.</p>	Same as (Universal) IN $n$
	<b>IN <math>n</math></b>	<p>Analog Input - Voltage Mode (0–10 VDC)</p> <p>10 VDC maximum input voltage Internal 67k ohm pull-down</p>	See Guideline A in <a href="#">Table 1</a> .
		<p>Analog Input - Current Mode (4–20 mA)</p> <p>Internal 100 ohm load impedance</p>	See Guideline B in <a href="#">Table 1</a> .
	<p>Analog Input - Resistive Mode(0–600k ohm)</p> <p>Internal 12 V. 15k ohm pull-up</p>	See Guideline A in <a href="#">Table 1</a> .	

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
		<p>Qualified Sensors: 0–2k ohm potentiometer</p> <p>RTD (1k Nickel [Johnson Controls sensor] 1k Platinum, and A99B Silicon Temperature Sensor)</p> <p>Negative Temperature Coefficient (NTC) Sensor (10k Type L, 10k JCI Type II, 2.252k Type II)</p>	
		<p>Binary Input - Dry Contact Maintained Mode</p> <p>1 second minimum pulse width Internal 12 V. 15k ohm pull up</p>	See Guideline A in <a href="#">Table 1</a> .
	<b>ICOM <i>n</i></b>	Universal Input Common for all Universal Input terminals	Same as (Universal) IN <i>n</i>
<b>BINARY (Inputs)</b>	<b>IN <i>n</i></b>	<p>Binary Input - Dry Contact Maintained Mode</p> <p>0.01 second minimum pulse width Internal 17 V. 100k ohm pull-up</p> <p>Binary Input - Pulse Counter/Accumulator Mode</p> <p>0.01 second minimum pulse width(50 Hz at</p>	See Guideline A in <a href="#">Table 1</a> .

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
		50% duty cycle)  Internal 17 V. 100k ohm pull-up	
	<b>ICOM <i>n</i></b>	Binary Input Common for all Binary Input (IN) terminals  <b>Note:</b> Binary ICOM <i>n</i> are all internally interconnection and interconnected wiht the controller's power supply COM. (ICOM1-2- 3, ICOM4-5-6, ICOM7- 12, and COM).	
<b>BINARY (Inputs)</b>	<b>IN <i>n</i></b>	Binary Input - 24 VAC Non-Critical Mode  24 VAC Input Present: Logic 1 (Active)	
	<b>ICOM <i>n</i></b>	Binary Input Common for all Binary Input (IN) terminals	
	<b>+15 V</b>	15 VDC Power Source for active(3-wire) input devices connected to the Universal IN <i>n</i> terminals;  provides 80 mA total current.  <b>Note:</b> 80mA current	Same as Binary IN <i>n</i>  <b>Note:</b> Use 3-wire cable for devices that source power from the +15V terminal.

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
		limit is shared between the BI + 15V supply and the UI + 15V supply.	
	<b>COM</b>	<p>15 VDC Power Source for active(3-wire) input devices connected to the Universal IN<math>n</math> terminals;</p> <p>provides 80 mA total current.</p> <p><b>Note:</b> 80mA current limit is shared between the BI + 15V supply and the UI + 15V supply.</p>	Same as Binary IN $n$
<b>CONFIGURABLE (Outputs)</b>	<b>OUT <math>n</math></b>	<p>Analog Output - Voltage Mode(0–10 VDC)</p> <p>10 VDC maximum output voltage 10 mA maximum output current</p> <p>Required an external load of 1,000 ohm or more.</p>	See Guideline A in <a href="#">Table 1</a> .
		<p>Binary Output - 24 VAC Triac (External Power Source only)</p> <p>Connects OUT<math>n</math> to OCOM<math>n</math> when activated</p>	See Guideline C in <a href="#">Table 1</a> .

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
		<p>External Power Source Requirements:</p> <p>30 VAC maximum output voltage</p> <p>0.5 A maximum output current</p>	
	<b>OCOM <i>n</i></b>	<p>Analog Output Signal CommonAll Configurable Outputs (COs) defined as Analog Outputs (AOs) share one common.</p> <p>Binary Output Signal CommonAll Configurable Outputs (COs) defined as Binary Outputs are isolated from all other commons, including other CO commons.</p>	Same as (Configurable) Out <i>n</i> .
<b>BINARY - RELAY (Outputs) (SPST)</b>	<b>OUT <i>n</i> NO</b>	<p>Normal Open Contact</p> <p>Connects OCOM to OUT NO when activated.</p> <p>UL 916</p> <p>240 VAC 5A Resistive, 1.9 FLA/11/4 LRA, D300 Pilot Duty, + 70°C (158°F), 30 K cycles</p>	<p>The RELAY output terminals can accommodate the following maximum wire sizes:</p> <p>Two wires per terminal: 1.5 mm<sup>2</sup>(16 AWG) maximum</p> <p>or</p>

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
		EN 60730  240 VAC 3A Resistive, 3A Inductive, Cos(phi) = 0.6, -20° to 70°C(-4 to 158°F), 100K cycles	One wire per terminal: 2.5 mm <sup>2</sup> maximum (12 AWG or 2–16 AWG)  <b>Note:</b> You must determine the required wire size for the high-voltage (>30 V) terminals according to relay ratings, the applied load, and the local, national, or regional electrical codes.  Maximum loads stated require 12 AWG or 2–16 AWG wires.
<b>BINARY - Triacs (Outputs)</b>	<b>OUT <i>n</i> -A</b> <b>OUT <i>n</i> -B</b>	Binary Output - 24 VAC or 240VAC Triac (External Power Source Only)  Connects OUTn-A and OUTn-B when activated.  External Power Source Requirements:  30 VAC or 240 VAC maximum output voltage	

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
		<p>0.5 A maximum output current</p> <p>Reference all triac commons to the same pole of the supply circuit.</p>	
<p><b>BINARY - RELAY (Outputs) (SPDT)</b></p>	<p><b>OUT <i>n</i> NO</b> <b>OUT <i>n</i> NC</b></p>	<p>Normal Open and Normal Closed Contact</p> <p>Connects OCOM to OUT NO when activated and disconnects OCOM to OUT_NC</p> <p>UL 916</p> <p>240 VAC 5A resistive, 1.9 FLA/11/4 LRA, D300 pilot duty, +70°C (158°F), 30K cycles</p> <p>EN 60730</p> <p>240 VAC 3A resistive, 3A inductive, Cos(phi) = 0.6, -20° to 70°C(-4 to 158°F), 100K cycles</p>	<p>The RELAY output terminals can accommodate the following maximum wire sizes:</p> <p>Two wires per terminal: 1.5 mm<sup>2</sup>(16 AWG) maximum</p> <p>or</p> <p>One wire per terminal: 2.5 mm<sup>2</sup> maximum (12 AWG or 2–16 AWG)</p> <p><b>Note:</b> You must determine the required wire size for the high-voltage (&gt;30 V) terminals according to relay ratings, the applied load, and the local, national, or</p>

Terminal Block Label	Terminal Label	Function, Ratings, Requirements	Determine Wire Size and Maximum Cable Length
			regional electrical codes.
	<b>OCOM <i>n</i></b>	Relay Common  Isolated from all other terminal commons, including other Relay Commons.  <p style="text-align: center;"><b>Note:</b> Reference all relay commons to the same pole of the supply circuit.</p>	
<b>PWM Output</b>	<b>OUT5 PWM</b>	PWM Output  User selectable PWM output voltage (5V, 12V default and 15V), 10 mA continuous current, 100 Hz maximum frequency	See Guideline A in <a href="#">Table 1</a> .
	<b>PWM COM</b>	PWM Common  PWM return for the single PWM channel on the controller.	See Guideline A in <a href="#">Table 1</a> .

**Note:** See [Table 1](#) to determine wire size and cable lengths for cables other than the recommended cables.

## Cable and wire length guidelines

[Table 1](#) defines cable length guidelines for the various wire sizes that may be used for wiring low-voltage (<30 V) input and output wiring.

**Table 1. Cable Length Guidelines for Recommended Wire Sizes for Low-Voltage (<30 V) Inputs and Outputs**

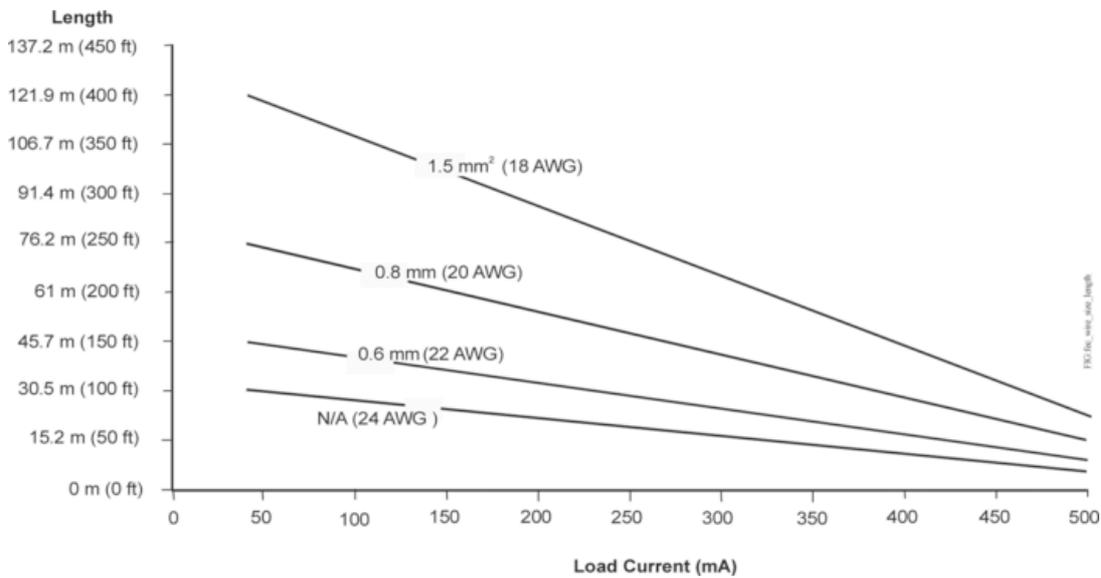
Guidelines	Wire Size/Gauge and Type	Maximum Cable Length and Type	Assumptions
<b>A</b>	1.5 mm <sup>2</sup> (32 AWG) stranded copper	457 m (1,500 ft) twisted wire	100 mV maximum voltage drop  Depending on cable and the connected input or output device, you may have to define an offset in the setup software for the input or output point.
	0.8 mm <sup>2</sup> (20 AWG) stranded copper	297 m (975 ft) twisted wire	
	0.6 mm <sup>2</sup> (22 AWG) stranded copper	323 m (1060 ft) twisted wire	
	N/A (24 AWG) stranded copper	107 m (350 ft) twisted wire	
<b>B</b>	1.5 mm <sup>2</sup> (32 AWG) stranded copper	229 m (750 ft) twisted wire	100 mV maximum voltage drop  Depending on cable and the connected input or output device, you may have to define an offset in the setup software for the input or output point.
	0.8 mm <sup>2</sup> (20 AWG) stranded copper	137 m (450 ft) twisted wire	
	0.6 mm <sup>2</sup> (22 AWG) stranded copper	91 m (300 ft) twisted wire	
	N/A (24 AWG) stranded copper	61 m (200 ft) twisted wire	
<b>C</b>	See <a href="#">Figure 1</a> to select wire size/gauge. Use stranded copper wire.	See <a href="#">Figure 1</a> to determine cable length. Use twisted wire cable.	N/A

## Maximum cable length versus load current

Use [Figure 1](#) to estimate the maximum cable length relative to the wire size and the load current (in mA) when wiring inputs and outputs.

**Note:** [Figure 1](#) applies to low-voltage (<30 V) inputs and outputs only. The required wire size and length for high-voltage (>30 V) Relay Outputs is determined by the load connected to the relay and local electrical codes.

**Figure 1. Maximum wire length for low-voltage (<30 V) inputs and outputs by current and wire size**



## SA/FC bus and supply power wiring guidelines

Table 1 provides information about the functions, ratings, and requirements for the communication bus and supply power terminals; and guidelines for wire sizes, cable types, and cable lengths when wiring the controller's communication buses and supply power.

In addition to the guidelines in Table 1, observe these guidelines when wiring an SA or FC bus and the 24 VAC supply power:

- Run all low-voltage wiring and cables separate from high-voltage wiring.
- All SA and FC bus cables, regardless of wire size, should be twisted, insulated, stranded copper wire.
- Shielded cable is strongly recommended for all SA and FC bus cables.
- Refer to the *MS/TP Communications Bus Technical Bulletin (LIT-12011034)* for detailed information regarding wire size and cable length requirements for the SA and FC buses.
- Refer to the *N2 Communications Bus Technical Bulletin (LIT-636032)* for detailed information regarding wire size and cable length requirements for the N2 bus.

**Table 1. Communication bus and supply power terminal blocks, functions, ratings, requirements, and cables**

Terminal Block/Port Label	Terminal Labels	Function, Electrical Ratings/Requirements	Recommended Cable Type
FC BUS/SA BUS	+	FC Bus Communications	0.6 mm <sup>2</sup> (22 AWG) stranded, 3-wire twisted, shielded cable recommended
	-		

Terminal Block/Port Label	Terminal Labels	Function, Electrical Ratings/Requirements	Recommended Cable Type
<b>FC BUS</b>  <b>(Upper)</b>	<b>COM</b>	Signal Reference (Common) for Bus communications	
	<b>SHD</b>	Isolated terminal (optional shield drain connection)	
<b>SA BUS</b>  <b>(Port)</b>	<b>SA BUS</b>	RJ-12 6-Position Modular Connector provides: SA Bus Communications  SA Bus Signal Reference and 15 VDC Common  15 VDC, 71.5 ohms at 4 W, Power for Bluetooth Commissioning Converter or ZFR3211 Wireless Router	N/A (24 AWG) 3-pair CAT3 cable <30.5 m (100 ft)
<b>FC BUS/SA Bus</b>  <b>SA BUS (Lower)</b>	<b>+</b>	SA Bus Communications	0.6 mm <sup>2</sup> (22 AWG) stranded, 4-wire (2 twisted-pairs), shielded cable recommended.  <b>Note:</b> The + and - wire are one twisted pair, and the COM and SA PWR are the second twisted pair of wires.
	<b>-</b>		
	<b>COM</b>	SA Bus Signal Reference and 15 VDC Common	
	<b>PWR</b>	15 VDC Supply Power for Devices on the SA bus (Maximum total current draw for SA bus is 240 mA.)	
<b>24~ INPUT</b>	<b>HOT</b>	24 VAC Power Supply – Hot  Supplies 20–30 VAC (Nominal 24 VAC)	0.8 mm <sup>2</sup> to 1.5 mm <sup>2</sup> (32 AWG) 2-wire
	<b>COM</b>	24 VAC Power Supply Common (Isolated from all other Common terminals on controller)	

Terminal Block/Port Label	Terminal Labels	Function, Electrical Ratings/Requirements	Recommended Cable Type
		20 VA at 24 VAC nominal	
<b>MODBUS</b>	+	Modbus communications	0.6 mm <sup>2</sup> (22 AWG) stranded, 4-wire(2 twisted pairs), shielded cable recommended
	-		
	<b>COM</b>	Signal Reference (Common) for bus communications	
<b>24~ OUT</b>	<b>24~</b>	24 VAC Utility Supply (for actuators) - 80 mA continuous	0.8 mm <sup>2</sup> to 1.5 mm <sup>2</sup> (18 AWG) 2-wire
	<b>COM</b>	24 VAC Power Supply Common	

## Setup and adjustments

### Setting the device addresses

Use the local display or MAP Gateway to set up device addresses. PEAK field controllers are master devices on MS/TP SA buses. Before operating field controllers on a bus, you **must** set a valid and unique device address for each controller on the bus through the local display or MAP gateway. Device addresses 4 through 127 are the valid addresses for these controllers.

Refer to the *MS/TP Communications Bus Technical Bulletin (LIT-12011034)* for more information on field controller device addresses and how to set them on MS/TP buses.

**Table 1. SA bus device address description**

Device Address	Use on Description
<b>0</b> <b>(Switch 128 Off)</b>	Reserved for FC Bus Supervisory Controller (not for use on field controllers).

<b>Device Address</b>	<b>Use on Description</b>
<b>1 to 3</b> <b>(Switch 128 Off)</b>	Reserved for peripheral devices (not for use on field controllers).
<b>4 to 127</b> <b>(Switch 128 Off)</b>	Used for MS/TP master devices (field controllers) that are hardwired to an SA bus or FC bus.
<b>0 to 3</b> <b>(Switch 128 On)</b>	Reserved addresses for wired subordinate devices (not for use on field controllers).
<b>4 to 127</b> <b>(Switch 128 On)</b>	Valid for MS/TP Master field controllers on <b>wireless FC Buses only</b> (future).

## Commissioning the controllers

Commission the PEAK OEM 32 controller with CCT Release 10.3 OEM package. The programming is finalized by the OEM or the Johnson Controls Center of Excellence for application development. You cannot modify this application in the field; changes must be completed by the OEM. All configuration and parameter changes are completed through the local display or MAP Gateway.

## Troubleshooting

Observe the Status LEDs on the front of the controller and see [Table 1](#) to troubleshoot the controller.

**Table 1. Status LEDs and descriptions of LED states**

<b>LED Label</b>	<b>LED Color</b>	<b>Normal LED State</b>	<b>Description of LED States</b>

LED Label	LED Color	Normal LED State	Description of LED States
<b>POWER</b>	Green	On Steady	<p>Off Steady = No Supply Power. Check Output wiring for short circuits and cycle power to the controller.</p> <p>On Steady = Power Connected</p>
<b>FAULT</b>	Red	Off Steady	<p>Off Steady = No Faults</p> <p>On Steady = Device Fault: no application loaded; Main Code download required if controller is in Boot mode, or a firmware mismatch exists between the PEAK controllers and the ZRF3211 Wireless Field Bus Router.</p> <p>Blink - 2 Hz = Download or Startup in progress, not ready for normal operation</p>
<b>SA BUS</b>	Green	Blink - 2 Hz	<p>Blink - 2 Hz = Data Transmission (normal communication)</p> <p>Off Steady = No Data Transmission (Auto baud in progress)</p> <p>On Steady = Communication lost, waiting to join.</p>
<b>FC BUS</b>	Green	Blink - 2 Hz	<p>Blink - 2 Hz = Data Transmission (normal communication)</p> <p>Off Steady = No Data Transmission (Auto baud in progress)</p> <p>On Steady = Communication lost, waiting to join.</p>
<b>MOD BUS</b>	Green	Blink - 2 Hz	<p>Blink - 2 Hz = Data Transmission (normal communication)</p>

LED Label	LED Color	Normal LED State	Description of LED States
			Off Steady = No Data Transmission (Auto baud in progress)  On Steady = Communication lost, waiting to join.

## Accessories ordering information

**Table 1. Accessories information**

Product Code Number	Description
<b>PK-KIT3210-0</b>	PEAK OEM 32 24 Volts removable terminal block kit for all spade connections
<b>MS-BACEOL-0</b>	Terminator module providing EOL termination on FC Bus and N2 segments

## Repair information

If the PEAK OEM Controllers fail to operate within their specifications, replace the controller. For a replacement controller, contact your OEM representative.

## Technical specifications

**Table 1. PK-OEM32x0-0**

Specification	Description
<b>Product Code Numbers</b>	PK-OEM3210-0 PEAK OEM 32 Controller 24 Volts without Display  PK-OEM3220-0 PEAK OEM 32 Controller 24 Volts with Display
<b>Supply Voltage</b>	24 VAC, 20 VAC minimum/30 VAC maximum), 50/60 Hz, power supply Class 2(North America), Safety Extra-Low Voltage (SELV) (Europe)
<b>Power Consumption</b>	<b>20 VA maximum</b>

Specification	Description
	<p><b>Note:</b> VA rating does not include any power supplied to the peripheral devices connected to Binary Outputs (BOs) or Configurable Outputs (COs), which can consume up to 12 VA for each BO or CO; for a possible total consumption of an additional 60 VA (maximum).</p>
<p><b>Ambient Conditions</b></p>	<p><b>Operating:</b> -20 to 70°C (-4 to 158°F); 10 to 95% Relative Humidity (RH) noncondensing; Pollution Degree 2</p> <p><b>Storage:</b> -40 to 85°C (-40 to 185°F); 5 to 95% RH noncondensing</p>
<p><b>Addressing</b></p>	<p><b>BACnet® MS/TP:</b> valid field controller device addresses 4–127 (Device addresses 0–3 and 128–255 are reserved and not valid field controller addresses.)</p> <p><b>N2:</b> Valid field controller device addresses 1 to 255</p>
<p><b>Communications Bus</b></p>	<p><b>BACnet® MS/TP, MODBUS (M/S) and N2 via RS-485:</b></p> <p>3-wire FC Bus between the supervisory controller and field controller addresses).</p> <p>3-wire SA Bus between controller, network sensors and other sensor/actuator devices, includes a lead to source 15 VDC supply power (from controller) to bus devices.</p> <p>3-wire one Modbus communication half-duplex (Master RTU port)</p>
<p><b>Processor</b></p>	<p>RX631 Renesas® 32-bit microcontroller</p>
<p><b>Memory</b></p>	<p>16 MB flash memory and 8 MB RAM</p>
<p><b>Input and Output Capabilities</b></p>	<p><b>Six Universal Inputs:</b> User-Configurable, 3 available modes:</p> <ul style="list-style-type: none"> <li>• Voltage Input: 0 to 10 VDC</li> </ul>

Specification	Description
	<ul style="list-style-type: none"><li>• Current Sense Input: 4 to 20 mA</li> <li>• Resistive Inputs/Dry Contact Inputs</li></ul> <p><b>12 Binary Inputs:</b> Defined as Dry Contact maintained or Pulse Counter/Accumulator Mode</p> <p><b>Four Configurable Outputs:</b> User-Configurable, 2 available modes:</p> <ul style="list-style-type: none"><li>• Analog Output: 0 to 10 VDC, 10 mA</li> <li>• Triac Output: 24 VAC, 0.5 A (Externally sourced powered)</li></ul> <p><b>One Utility Output Power Port (24~ OUT):</b> Ability to deliver 24 VAC</p> <p><b>Four Binary Outputs (Relays):</b> Single-Pole, Single-Throw. Dry Contacts rated 240 VAC.</p>

Specification	Description
	<ul style="list-style-type: none"> <li data-bbox="549 331 1331 479">• UL: 240 VAC 5A Resistive, 1.9 LA/11.1LRA, D300 Pilot Duty, 70°C/158°F (30,000 cycles)</li> <li data-bbox="549 607 1369 754">• IEC: 240 VAC 3A Resistive, 3A Inductive, Cos=0.6, -20 to 70°C (-4 to 158°F) (100,000 cycles)</li> </ul> <p data-bbox="504 981 1337 1055"><b>One Binary Outputs (Relays):</b> Single-Pole, Double-Throw, Dry Contacts rated 240 VAC</p> <ul style="list-style-type: none"> <li data-bbox="549 1218 1331 1366">• UL: 240 VAC 5A Resistive, 1.9 LA/11.1LRA, D300 Pilot Duty, 70°C/158°F (30,000 cycles)</li> <li data-bbox="549 1494 1369 1641">• IEC: 240 VAC 3A Resistive, 3A Inductive, Cos=0.6, -20 to 70°C (-4 to 158°F)(100,000 cycles)</li> </ul> <p data-bbox="504 1865 1385 1939"><b>One PWM Output Port:</b> 5V, 12V, 15V selectable PWM output voltage, 10 mA (maximum) continuous current, 100 Hz</p>

Specification	Description
	<p data-bbox="504 259 1342 338"><b>Note:</b> Reference all relay commons to the same pole of the supply circuit.</p> <p data-bbox="504 450 1393 528"><b>Four Binary Outputs (Triacs):</b> Output: 24 VAC or 240 VAC, 0.5 A (Externally Powered).</p> <p data-bbox="504 685 1390 763"><b>Note:</b> Reference all triac commons to the same pole of the supply circuit.</p>
<b>Analog Input/Analog Output Resolution and Accuracy</b>	Analog Input: 12-bit resolution Analog Output: 15-bit resolution, +/- 200 mV accuracy in 0 to 10 VDC applications

Specification	Description
<b>Terminations</b>	<p>Input/Output: Fixed Spade terminals</p> <p>SA/FC/Modbus: 4-Wire and 3-Wire Pluggable Screw Terminal Blocks</p> <p>SA Bus Tool Port: RJ-12 6-Pin Modular Jack</p> <p><b>Field Install Option:</b></p> <p>Input/Output: Fixed Solder terminals</p> <p>SA/FC/Modbus: 4-Wire and 3-Wire Pluggable Screw Terminal Blocks</p> <p>SA Bus Tool Port: RJ-12 6-Pin Modular Jack</p> <p>See <a href="#">Table 7</a> for Number of Cycles and Electrical Ratings</p>
<b>Mounting</b>	<p>Horizontal on single 35 mm DIN rail mount (preferred), or screw mount on flat surface with three integral mounting clips on controller.</p> <p>Mount the PEAK controllers on a wall or DIN rail inside an enclosure (rated at least IP20).</p>
<b>Housing</b>	Enclosure material: Polycarbonate LEXAN SABIC EXL9330
<b>Dimensions</b> <b>(H x W x D)</b>	220 x 125 x 58 mm (8.66 x 4.92 x 2.28 in.)
<b>Weight</b>	0.5 kg (1.1 lb)
<b>Compliance</b>	<p><b>United States:</b> UL Listed, File E107041, CCN PAZX, UL 916, Energy Management Equipment</p>

Specification	Description
	FCC Compliant to CRF47, Part 15, Subpart B, Class A
	<b>Canada:</b> UL Listed, File E107041, CNN PAZX7 CAN/CSA C22.2 No.205, Signal Equipment  Industry Canada Compliant, ICES-003
	<b>BACnet International:</b> BACnet Testing Laboratories (BTL) Protocol Revision 12 Listed BACnet Advanced Application Controller (B-AAC)
	<b>Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant</b>
	<b>Europe:</b> Johnson Controls declares that this product is also in compliance with the essential requirements and other relevant provisions of the EMC Directive and Declared as Electronic Independently mounted control, suitable for DIN rain mounting. Intended to mount in remote panel. Type 1.C (Micro-interruption), 330 V rated impulse voltage. 125°C ball pressure test.

## North American emissions compliance

### United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the users will be required to correct the interference at their own expense.

#### Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

### Industry Canada Statement(s)

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie 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, et
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## Product warranty

This product is covered by a limited warranty, details of which can be found at [www.johnsoncontrols.com/buildingswarranty](http://www.johnsoncontrols.com/buildingswarranty).

## Single point of contact

APAC	Europe	NA/SA
JOHNSON CONTROLS  C/O CONTROLS PRODUCT MANAGEMENT	JOHNSON CONTROLS  WESTENDHOF 3  45143 ESSEN	JOHNSON CONTROLS  507 E MICHIGAN ST

<b>APAC</b>	<b>Europe</b>	<b>NA/SA</b>
NO. 32 CHANGJIJANG RD NEW DISTRICT  WUXI JIANGSU PROVINCE 214028  CHINA	GERMANY	MILWAUKEE WI 53202  USA

## Contact information

Contact your local branch office: [www.johnsoncontrols.com/locations](http://www.johnsoncontrols.com/locations)

Contact Johnson Controls: [www.johnsoncontrols.com/contact-us](http://www.johnsoncontrols.com/contact-us)