
I/O Zone 8112 Installation Guide





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Important changes are listed in **Document revision history** at the end of this document.

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Contents

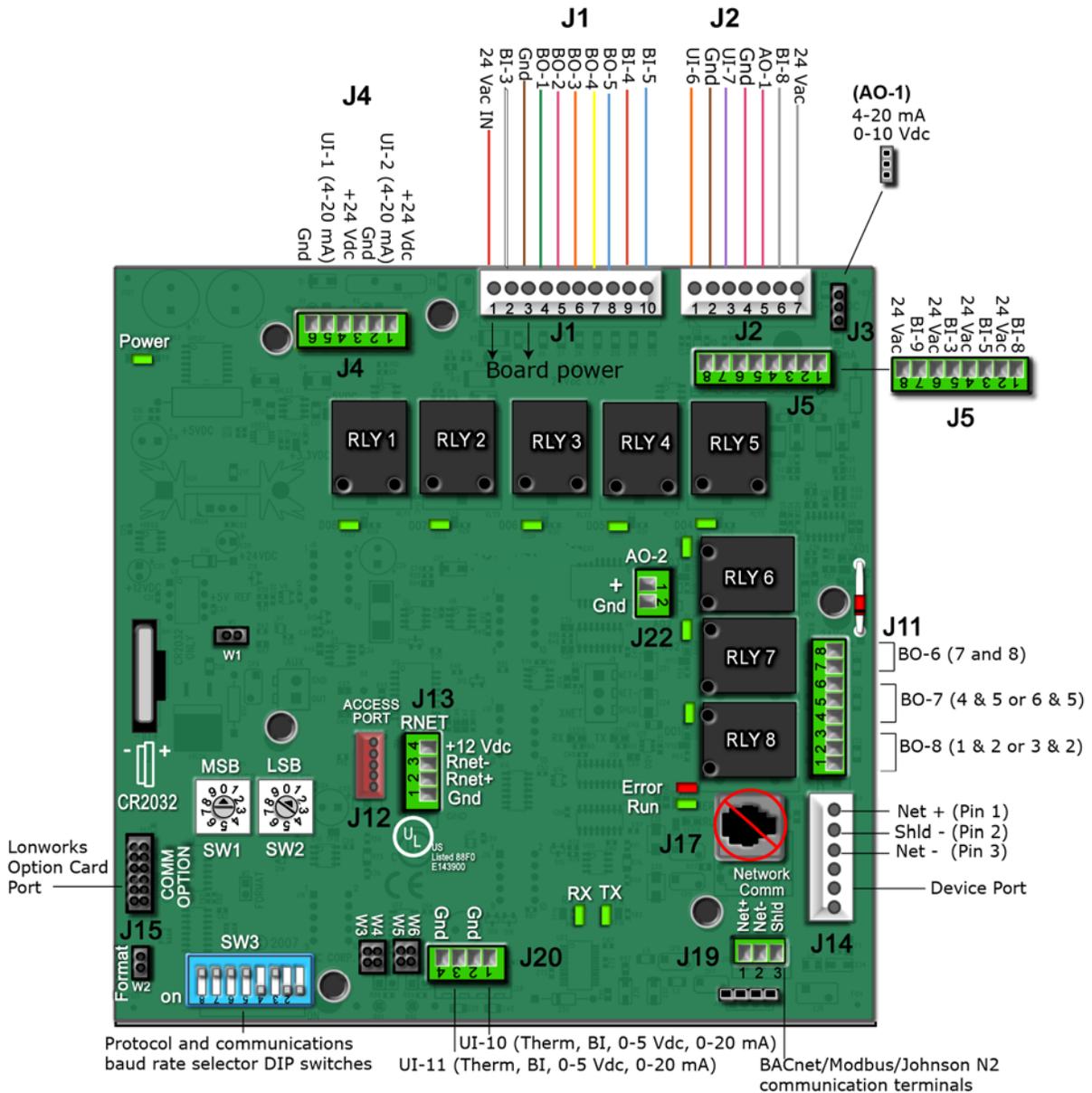
Introduction	1
What is the I/O Zone 8112 controller?	1
Specifications	2
Safety considerations.....	4
To mount the I/O Zone 8112	5
To wire the I/O Zone 8112 for power	6
Using an auxiliary control power transformer	6
Wiring the I/O Zone 8112's inputs and outputs	8
Input wiring specifications	9
Inputs	9
Binary outputs	10
Analog outputs	10
To wire inputs and outputs.....	10
Local Access	13
To communicate through the local access port.....	13
Wiring zone sensors to the I/O Zone 8112	14
Specifications for ZS sensors.....	14
Specifications for RS sensors	16
To wire and mount an RS or ZS sensor	16
What is the Equipment Touch?	18
Specifications	19
Wiring and mounting the Equipment Touch	20
Wiring specifications.....	22
To wire and mount the Equipment Touch.....	23
What is the BACview@6 device?	25
Specifications for mounting the BACview@6 device	25
To wire the BACview@ device	25
To mount the BACview@6 device.....	26
Troubleshooting	28
Communication LED's.....	28
Recovering from a power outage.....	29
To replace the I/O Zone 8112's battery.....	30
Serial number.....	31
Compliance	32
FCC Compliance	32
CE Compliance	32
BACnet Compliance.....	32
Document revision history	33



Introduction

What is the I/O Zone 8112 controller?

The I/O Zone 8112 is a general purpose controller. It provides the communications circuitry, non-volatile memory, and removable screw terminals for I/O connections.

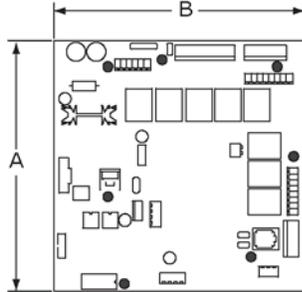


Specifications

Driver	drv_iozone8112
Maximum number of control programs*	10
Maximum number of BACnet objects*	1000
Power	24 Vac \pm 10%, 50–60 Hz 20 VA power consumption (26 VA with BACview® device attached) 26 Vdc (25 V min, 30 V max) Single Class 2 source only, 100 VA or less
Network Comm port	For communication with the controller network using BACnet MS/TP, Johnson Controls N2, or Modbus
Local Access port J12	To connect a BACview® ⁶ Handheld device or an Equipment Touch
Rnet port J13	<p>You can connect zone sensors, the BACview® device, or an Equipment Touch to the Rnet port, as follows:</p> <p>RS sensors</p> <ul style="list-style-type: none"> • 1 RS Plus, RS Pro, or RS Pro-F • 1 – 4 RS Standards • 1 – 4 RS Standards, and 1 RS Plus, RS Pro, or RS Pro-F <p>Connect any of the above combinations to the Rnet port, plus up to 2 BACview® devices, but no more than 6 RS and BACview® devices total. You cannot have an Equipment Touch on the Rnet with an RS Sensor.</p> <p>ZS sensors</p> <ul style="list-style-type: none"> • 1-15 ZS Sensors • NOTE You cannot have more than 5 sensors per control program • Up to 15 ZS sensors and 2 BACview® devices • Up to 15 ZS sensors and 1 Equipment Touch device <p> CAUTIONS</p> <ul style="list-style-type: none"> • You cannot have RS sensors and ZS sensors on the same Rnet. • You cannot have an Equipment Touch and a BACview® device on the same Rnet. • Power requirements differ for the various ZS sensor models. See the <i>ZS Sensor Installation Guide</i> for details. • When using a permanent Equipment Touch or BACview®⁶ device, they must be externally powered.
Marquee port	Not supported
Device port J14	Modbus protocol
Comm Option port	For communication with the LonWorks Option Card.

Inputs	<p>11 inputs:</p> <ul style="list-style-type: none"> • UI 1 and 2: mA or Binary • BI 3, 4, 5, 8, and 9: Binary 24 Vac • UI 6 and 7: Thermistor or Binary • UI 10 and 11: 0–5 Vdc, 0-20 mA, Thermistor or Binary
Binary outputs	<p>8 binary outputs, relay contacts rated at 3 A max @ 24 Vac</p> <p>Relays 1 - 6 are configured normally open. Relays 7 - 8 can be configured normally closed.</p>
Analog outputs	<p>AO-1: 0–10 Vdc or 0–20 mA (Configure on jumper J3)</p> <p>AO-2: 0–10 Vdc or 2-10 Vdc</p>
Output resolution	10 bit D/A
Microprocessor	High speed 16-bit microprocessor with ARCNET communication co-processor
Memory	1 MB non-volatile battery-backed RAM, 4 MB Flash memory, 16-bit memory bus
Real-time clock	Battery-backed real-time clock keeps track of time in event of power failure
Battery	<p>10-year Lithium CR2032 battery ensures the following data is retained for a maximum of 10,000 hours during power outages:</p> <ul style="list-style-type: none"> • Time • Graphics • Control programs • Editable properties • Schedules • Trends <p>A low battery is indicated by a low battery alarm in the WebCTRL® for OEMs application, Equipment Touch, BACview® device, and Field Assistant.</p>
Data Archive	<p>Control programs, graphics, touchscreen, or BACview® files, editable properties, and schedules are archived to non-volatile Flash memory after every download or manual archive.</p> <p>If memory is corrupt or a power outage occurs and the battery backup fails or is turned off, the data is automatically restored from this archive, or you can manually restore from archived memory.</p>
Protection	<p>Incoming power and network connections are protected by non-replaceable internal solid-state polyswitches that reset themselves when the condition that causes a fault returns to normal.</p> <p>The power, network, and output connections are also protected against transient excess voltage/surge events lasting no more than 10 msec.</p>
Status indicators	LED's indicate status of communications, running, errors, power, and binary outputs
Electrostatic Discharge (ESD) Protection	<ul style="list-style-type: none"> • Level: 2 • Contact Discharge (kV): ±4 • Air-Gap Discharge (kV): ±4

Environmental operating range	-40 to 158°F (-40 to 70°C), 10–95% relative humidity, non-condensing NOTE Controllers should be mounted in a protective enclosure.
	Vibration during operation: all planes/directions, 1.5G @ 20–300 Hz Shock during operation: all planes/directions, 5G peak, 11 ms Shock during storage: all planes/directions, 100G peak, 11 ms



Overall dimensions	A: 6-1/2 in. (16.5 cm) B: 6-1/2 in. (16.5 cm)
Mounting dimensions	7 mounting holes in various positions
Depth	1-11/16 in. (4.3 cm)
Weight	11.2 oz (0.32 kg)
BACnet support	Conforms to the BACnet Advanced Application Controller (B-AAC) Standard Device Profile as defined in ANSI/ASHRAE Standard 135-2012 (BACnet) Annex L, Protocol Revision 9
Listed by	UL-873, FCC Part 15-Subpart B-Class A, CE EN50082-1997

*Depends on available memory.

Safety considerations

⚠ WARNING Disconnect electrical power to the I/O Zone 8112 before wiring it. Failure to follow this warning could cause electrical shock, personal injury, or damage to the controller.

To mount the I/O Zone 8112

⚠ WARNING

When you handle the I/O Zone 8112:

- Do not contaminate the printed circuit board with fingerprints, moisture, or any foreign material.
- Do not touch components or leads.
- Handle the board by its edges.
- Isolate from high voltage or electrostatic discharge.
- Ensure that you are properly grounded.

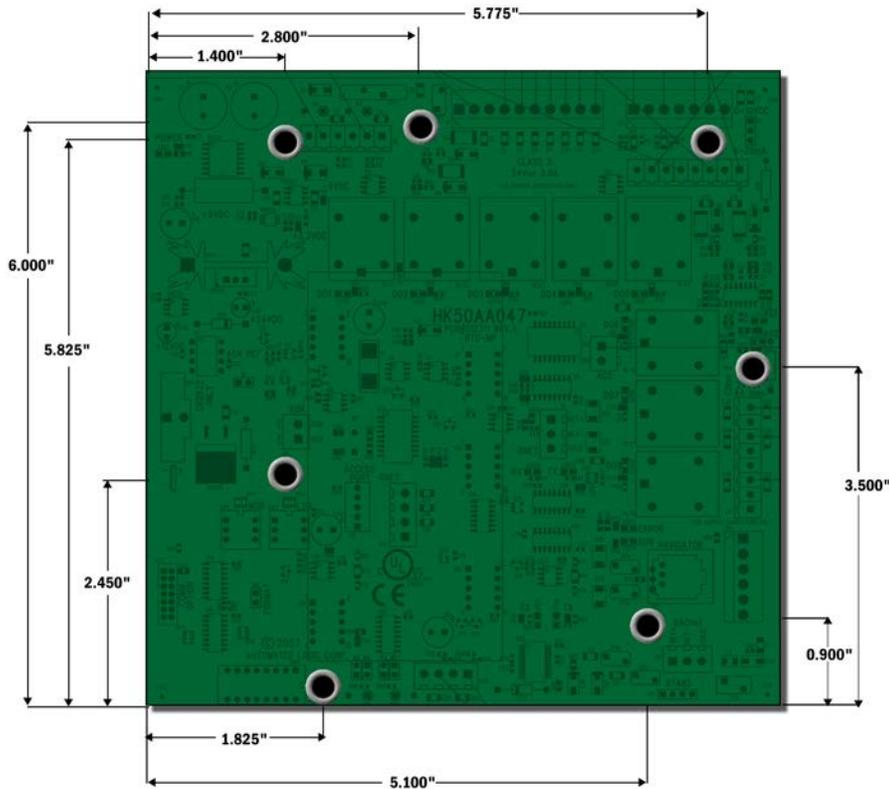
⚠ WARNING!

When you mount the I/O Zone 8112:

- Do not locate in an area that is exposed to moisture, vibration, dust, or foreign material.
- Follow NEC and local electrical codes.
- Do not obstruct access for unit maintenance.
- Protect from impact or contact during unit maintenance.

We highly recommend that you mount the I/O Zone 8112 in the unit control panel!

Screw the I/O Zone 8112 into an enclosed panel using the mounting slots on the cover plate. Leave about 2 in. (5 cm) on each side of the controller for wiring.



To wire the I/O Zone 8112 for power



CAUTIONS

- The I/O Zone 8112 is powered by a Class 2 power source. Take appropriate isolation measures when mounting it in a control panel where non-Class 2 circuits are present.
- Do not power pilot relays from the same transformer that powers the I/O Zone 8112.
- OEMCtrl® controllers can share a power supply as long as you:
 - Maintain the same polarity
 - Use the power supply only for OEMCtrl® controllers
- The I/O Zone 8112 has an operating range of 21.6 Vac to 26.4 Vac. If voltage measured at the I/O Zone 8112's input terminals is outside this range, the I/O Zone 8112 may not work properly.
- Avoid running communication wires or sensor input wires next to AC power wires or the controller's relay output wires. The resulting noise can affect signal quality. Common sources of noise are:
 - Spark igniters
 - Radio transmitters
 - Variable speed drives
 - Electric motors (> 1hp)
 - Generators
 - Relays
 - Transformers
 - Induction heaters
 - Large contactors (i.e., motor starters)
 - Video display devices
 - Lamp dimmers
 - Fluorescent lights
- In most cases, the I/O Zone 8112 will be powered from the control power transformer provided with the rooftop equipment. If you must use a separate control power transformer, additional precautions must be taken to ensure that the auxiliary transformer is in-phase with the rooftop equipment's control power transformer. See *To use an auxiliary control power transformer* (page 6).
- When using a permanent Equipment Touch or BACview® device, they must be externally powered.

Using an auxiliary control power transformer

If you use a separate control power transformer, it is essential that the auxiliary transformer and the rooftop transformer are in-phase. You **must** verify this prior to connecting the auxiliary transformer to the I/O Zone 8112.

Follow these steps:

- 1 Verify the available primary voltage at the rooftop equipment.

- 2 Remove power from the rooftop equipment and install the appropriate auxiliary transformer. Follow the manufacturer's installation instructions.
- 3 Ground one leg of the auxiliary transformer's secondary wiring.
- 4 Apply power to the rooftop equipment. Measure the potential between the rooftop equipment control power and auxiliary transformer's secondary hot (non-grounded) legs. If the voltage measured is less than 5 volts, the transformers are in-phase; proceed to step 7. If you measure a voltage greater than 24 Vac, then the phases are reversed.
- 5 Correct the phase reversal by either of the following methods:
 - o Remove the ground from the secondary at the auxiliary transformer and connect it to the other secondary
 - o Reverse the primary wiring at the auxiliary transformer
- 6 Repeat step 4 to rewire.
- 7 Remove connector assembly from I/O Zone 8112's **J1** connector.
- 8 Connect the auxiliary transformer wires to **J1** wires **1** (24 Vac) and **3** (Gnd).
- 9 Apply power to the transformer.
- 10 Measure the voltage at the <ACProduct01>'s **J1 - 1** and **3** to verify that the voltage is within the operating range of 21.6–26.4 Vac.
- 11 Attach harness to I/O Zone 8112's connector **J1**. See illustration below.

NOTE The harness connectors are keyed and must be oriented properly for correct installation.
- 12 Verify that the **Power** LED is on and the **Run** LED is blinking.

Wiring the I/O Zone 8112's inputs and outputs

Channel Number	Type	Signal	Wire/Terminal Numbers	Alternate Terminals
UI 1	AI/BI	4-20 mA or BI	J4 - 5 & 6 (mA) J4 - 4 & 5 (BI)	N/A
UI 2	AI/BI	4-20 mA or BI	J4 - 2 & 3 (mA) J4 - 1 & 2 (BI)	N/A
BI 3	BI	24 Vac	J1 - 2	J5 - 5 & 6 ***
BI 4	BI	24 Vac	J1 - 9	N/A
BI 5	BI	24 Vac	J1 - 10	J5 - 3 & 4 ***
UI 6	AI/BI	10K Thermistor or BI	J2 - 1 & 2	N/A
UI 7	AI/BI	10K Thermistor or BI	J2 - 3 & 2	N/A
BI 8	BI	24 Vac	J2 - 6 & 7	J5 - 1 & 2 ***
BI 9	BI	24 Vac	J5 - 7 & 8	N/A
UI 10	AI/BI	10K Thermistor, BI, 0-5 Vdc, or 0-20 mA	J20 - 1 & 2	N/A
UI 11	AI/BI	10K Thermistor, BI, 0-5 Vdc, or 0-20 mA	J20 - 3 & 4	N/A
Rnet	AI		J13 - 1, 2, 3, 4	N/A
AO - 1	AO	2-10 Vdc or 4-20 mA	J2 - 5 & 4	N/A
AO - 2	AO	0-10 Vdc or 2-10 Vdc	J22 - 1 & 2	
BO - 1	BO	N/A - Relay	J1 - 4	N/A
BO - 2	BO	N/A - Relay	J1 - 5	N/A
BO - 3	BO	N/A - Relay	J1 - 6	N/A
BO - 4	BO	N/A - Relay	J1 - 7	N/A
BO - 5	BO	N/A - Relay	J1 - 8	N/A
BO - 6	BO	N/A - Relay	J11 - 7 & 8 (NO)	
BO - 7	BO	N/A - Relay	J11 - 4 & 5 (NC) 6 & 5 (NO)	N/A
BO - 8	BO	N/A - Relay	J11 - 1 & 2 (NC) 3 & 2 (NO)	N/A
<p>Legend</p> <p>AI - Analog Input AO - Analog Output BI - Binary Input BO - Binary Output</p> <p>*** Parallel screw terminal at J5 (J5 - 1 = J2 - 6, J5 - 3 = J1 - 10, J5 - 5 = J1 - 2) may be used in place of the associated flying leads at the harness. See <i>To wire inputs and outputs</i> (page 10) for additional information.</p>				

Input wiring specifications

Input	Maximum length	Minimum gauge	Shielding
0-5 Vdc	1000 feet (305 meters)	24 AWG	Shielded
Thermistor	1000 feet (305 meters)	22 AWG	Unshielded
4-20 mA	3000 feet (914 meters)	22 AWG	Unshielded
Binary input	1000 feet (305 meters)	22 AWG	Unshielded
Rnet	500 feet (152 meters)	18 AWG 4 conductor	Unshielded

Inputs

These I/O Zone 8112 inputs accept the following signal types:

These inputs...	Support this signal type...	Description
1, 2	4-20 mA	The input resistance on the positive (+) terminal is 250 Ohms. The Aux Power Out terminal is capable of supplying 24 Vdc to a 4-20 mA transducer, but the total current demanded must not exceed 40 mA. If the voltage measured from the Aux Power Out terminal to Gnd is less than 18 Vdc, you need to use an external power supply.
3, 5, 8, 9	Binary (24 Vac)	24 Vac voltage, resulting in a 25 mA maximum sense current when the contacts are closed
6, 7	Thermistor or BI	10 kOhm at 77° F
10, 11	Thermistor, BI, Vdc, or mA	

Binary outputs

The I/O Zone 8112 has 8 binary outputs. You can connect each output to a maximum of 24 Vac/Vdc. Each output is a dry contact rated at 3 A, 24 V maximum, and is normally open.

To size output wiring, consider the following:

- Total loop distance from the power supply to the controller, and then to the controlled device
NOTE Include the total distance of actual wire. For 2-conductor wires, this is twice the cable length.
- Acceptable voltage drop in the wire from the controller to the controlled device
- Resistance (Ohms) of the chosen wire gauge
- Maximum current (Amps) the controlled device requires to operate

Analog outputs

The I/O Zone 8112 has 2 analog outputs that support voltage or current devices.

AO-1 - 2-10 Vdc or 4-20 mA (Configure on jumper J3)

AO-2 - 0-10 Vdc or 2-10 Vdc

NOTE The controlled device must share the same ground as the controller and have input impedance of 500 Ohms maximum for the 4-20 mA mode on AO1.

To wire inputs and outputs

- 1 Turn **off** the I/O Zone 8112's power.
- 2 Connect the input wiring to the I/O Zone 8112.
- 3 Turn **on** the I/O Zone 8112's power.
- 4 Set the appropriate jumpers on the I/O Zone 8112.

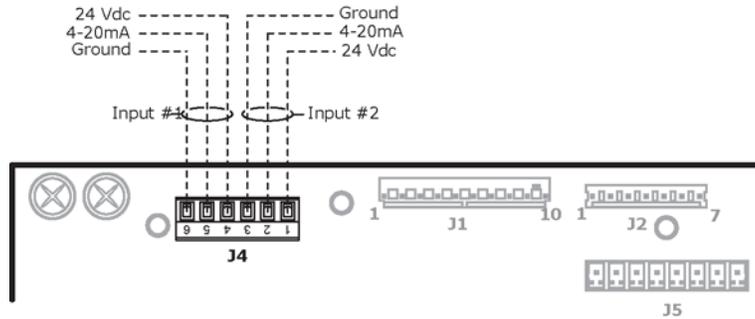
J3	AO - 1	0 - 10 Vdc/4-20 mA
W1	Battery Jumper	In (Do not remove)
W2	Format Jumper*	
W3	Input 11 Jumper	0-20 mA
W4	Input 11 Jumper	Thermistor BI (default)
W3 and W4	Input 11 - No Jumper	0-5 Vdc
W5	Input 10 Jumper	0-20 mA
W6	Input 10 Jumper	Thermistor BI (default)
W5 and W6	Input 10 - No Jumper	0-5 Vdc

*Formatting the controller restores memory. See *Recovering from a power outage* (page 29).

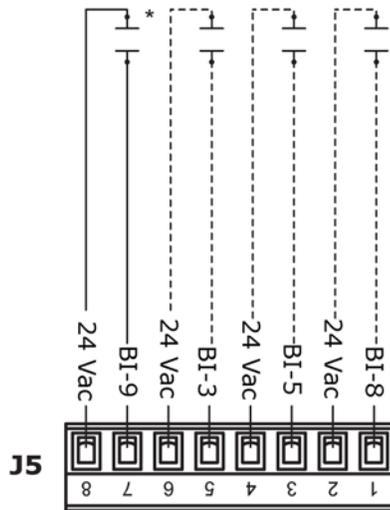
J4 Inputs

- 1 Turn **off** the I/O Zone 8112's power.
- 2 Connect the input and output wiring to the screw terminals on the I/O Zone 8112.

NOTE When utilizing the controller's 24 Vdc auxiliary power out, the total current demand for these two input channels must not exceed 40 mA (100mA per channel).



J5 Inputs

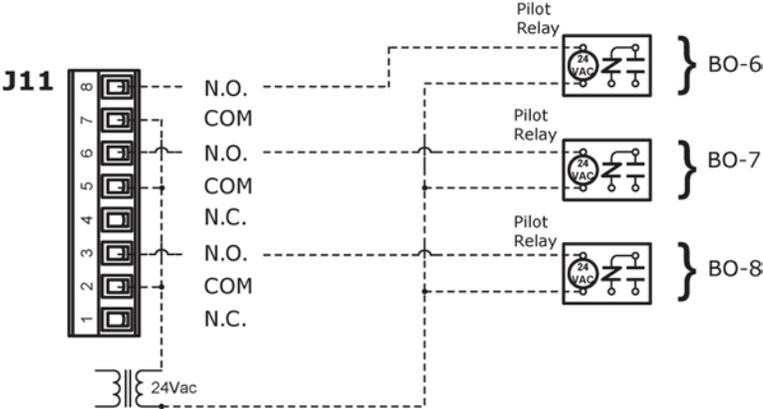


The terminals for Inputs 3, 5, and 8 are available for use in place of the flying wire leads at Molex connectors J1 and J2 identified below:

NOTE J5 binary inputs 3, 5, and 8 are the same input channels as:

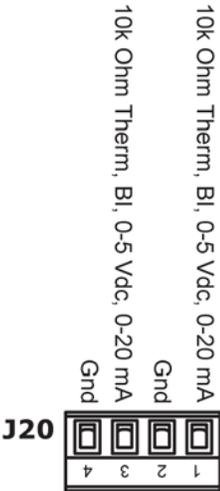
- J1 wire 2, J5 - 5 Input - 3
- J1 wire 10, J5 - 3 Input - 5
- J2 wire 6, J5 - 1 Input - 8

J11 Outputs



NOTE Output relay contacts rated at 3A, 24V maximum. Install pilot relays required by application.

J20 Inputs



Local Access

To communicate through the local access port

Using a computer and a USB Link Kit, you can communicate locally with the I/O Zone 8112 to download or to troubleshoot.

PREREQUISITES

- A computer with a USB port
- A USB Link Kit

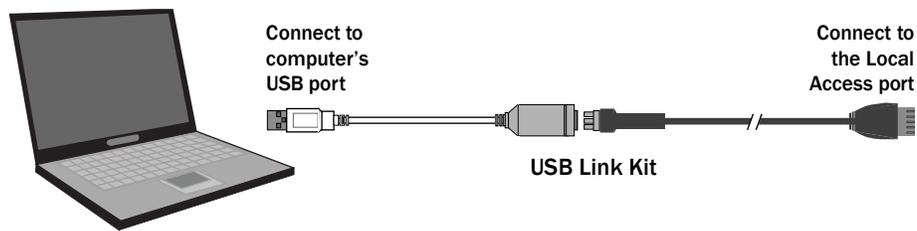


CAUTION If multiple controllers share power but polarity was not maintained when they were wired, the difference between the controller's ground and the computer's AC power ground could damage the USB Link Kit and the controller. If you are not sure of the wiring polarity, use a USB isolator between the computer and the USB Link Kit. Purchase a USB isolator online from a third-party manufacturer.

- 1 If your computer does not already have the USB Link Kit driver installed, install it before you connect the USB Link to your computer.

NOTE The driver is installed with WebCTRL® for OEMs v5 or later system. But if needed, you can get the latest driver from <http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>.

- 2 Connect the USB Link Kit to the computer and to the controller's Local Access port.



NOTE If using a USB isolator, plug the isolator into your computer's USB port, and then plug the USB Link Kit cable into the isolator.

Wiring zone sensors to the I/O Zone 8112

You can connect zone sensors, the BACview[®] device, or an Equipment Touch to the Rnet port, as follows:

RS sensors

- 1 RS Plus, RS Pro, or RS Pro-F
- 1 – 4 RS Standards
- 1 – 4 RS Standards, and 1 RS Plus, RS Pro, or RS Pro-F

Connect any of the above combinations to the Rnet port, plus up to 2 BACview[®] devices, but no more than 6 RS and BACview[®] devices total. You cannot have an Equipment Touch on the Rnet with an RS Sensor.

ZS sensors

- 1 -15 ZS Sensors
- **NOTE** You cannot have more than 5 sensors per control program
- Up to 15 ZS sensors and 2 BACview[®] devices
- Up to 15 ZS sensors and 1 Equipment Touch device



CAUTIONS

- You cannot have RS sensors and ZS sensors on the same Rnet.
- You cannot have an Equipment Touch and a BACview[®] device on the same Rnet.
- Power requirements differ for the various ZS sensor models. See the *ZS Sensor Installation Guide* for details.
- The RS Pro is a thermistor-based temperature sensor

Specifications for ZS sensors

Sensing element range and accuracy	Temperature only	
	Range:	32 to 122 °F (0 to 50 °C)
	Accuracy:	±0.35 °F (0.2 °C)
	Temperature if humidity is included	
	Range:	50 to 104 °F (10 to 40 °C)
	Accuracy:	0.5 °F (0.3 °C)
	Options:	
	Humidity	
	Range:	10 to 90%
	Accuracy:	2% typical
	CO ₂	
	Range:	0 to 2000 PPM
	Accuracy:	±75 PPM typical
	VOC	
	Range:	0 to 2000 ppm
	Accuracy:	1 PPM

Power requirements	Temperature only	
	ZS Standard or ZS Plus:	12 Vdc @ 6 mA
	ZS Pro or Pro-F:	12 Vdc @ 7 mA
	Temperature with humidity	
	ZS Standard or ZS Plus:	12 Vdc @ 7 mA
	ZS Pro or Pro-F:	12 Vdc @ 8 mA
	Temperature with humidity and VOC - All models	12 Vdc @ 60 mA
	Temperature with humidity and CO ₂ - All models	12 Vdc @ 15 mA (idle) to 190 mA (CO ₂ measurement cycle)
	Temperature and CO ₂ - All models	12 Vdc @ 14 mA (idle) to 189 mA (CO ₂ measurement cycle)
Power supply	The 4-conductor Rnet cable from a controller supplies +12 Vdc @ 210 mA. For additional power, use an external power supply. Use the above power requirements to calculate the size of the external power supply.	
Communication	115 kbps	
Local access port	For local access to start up and troubleshoot the system	
Environmental operating range	32 to 122° F (0 to 50° C), 10 to 90% relative humidity, non-condensing	
Mounting	Standard 4x2-in. electrical box using the 6-32 x 1/2" mounting screws provided	
Overall dimensions	Temperature sensor or temperature with humidity sensor	Width: 3 in. (7.62 cm) Height: 4-13/16 in. (12.22 cm) Depth: 13/16 in. (2.01 cm)
	Sensor with CO ₂ or VOC	Width: 2-7/8 in. (7.3 cm) Height: 4-13/16 in. (12.22 cm) Depth: 1-1/4 in. (3.18 cm)
Listed by	FCC Part 15-Subpart B-Class A, CE	

See the *ZS Sensor Installation Guide* to configure the control program for the desired user interaction with the sensor.

See the *ZS Sensor Application Guide* to configure the control program for the desired user interaction with the sensor.

See the *ZS Sensor User Guide* to use the sensor.

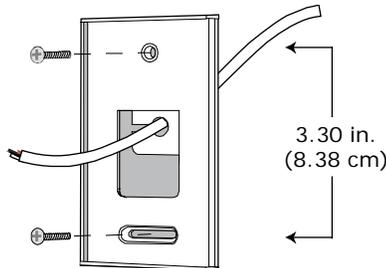
Specifications for RS sensors

Sensor	Thermistor. Accuracy $\pm 0.45^{\circ}\text{F}$ (0.25°C). Less than $\pm 0.18^{\circ}\text{F}$ (0.1°C) drift over a 10 year period.	
Sensor range	50 °F to 95 °F (10 °C to 35 °C)	
Power	Supplied by the 4-conductor cable (+12 Vdc @ 210 mA) from the controller.	
Communication	115 kbps	
Local access port	For local access to start up and troubleshoot system	
Environmental operating range	32–122 °F (0–50 °C), 10–90% relative humidity, non-condensing	
Mounting	Standard 4x2-in. electrical box using provided 6-32 by 1/2 in. mounting screws.	
Overall dimensions:	Width:	2-3/4 in. (6.9 cm)
	Height:	4-3/4 in. (12.1 cm)
	Depth:	5/8 in. (1.6 cm)

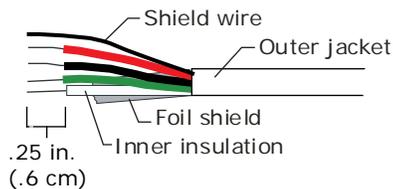
To wire and mount an RS or ZS sensor

PREREQUISITE The Rnet cable is wired to the controller. The shield wire and the ground wire should be inserted into the controller's GND terminal.

- 1 Turn off the controller's power.
- 2 Pull the backplate off the I/O Zone 8112. You may need to turn the setscrew in the bottom of the sensor clockwise until you can remove the backplate.
- 3 Pull the Rnet communication cable through the wire guide in the backplate.

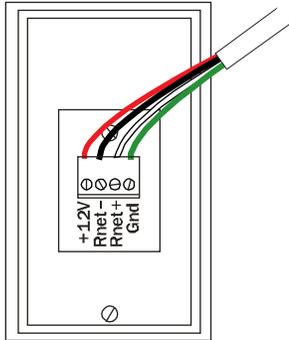


- 4 Use 2 screws to mount the backplate to the wall or outlet box.
Partially cut, then bend and pull off the outer jacket of the Rnet cable(s). Do not nick the inner insulation.



- 5 Strip about .25 inch (.6 cm) of the inner insulation from each wire.
- 6 If wiring 1 cable to the I/O Zone 8112, cut the shield wire off at the outer jacket, then wrap the cable with tape at the outer jacket to cover the end of the shield wire.

If wiring 2 cables in a daisy-chain configuration, twist together the shield wires, then wrap the shield wires with tape.
- 7 Insert the other 4 wires into the I/O Zone 8112's screw terminal connector. If wiring 2 cables, insert like-colored wires into each terminal.

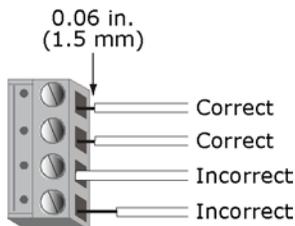


OEMCtrl® recommends that you use the following Rnet wiring scheme:

Connect this wire...	To this terminal...
Red	+12V
Black	Rnet-
White	Rnet+
Green	Gnd



CAUTION Allow no more than 0.06 inch (1.5 mm) bare communication wire to protrude. If bare communication wire contacts the cable's foil shield, shield wire, or a metal surface other than the terminal block, the device may not communicate correctly.



- 8 Attach the sensor's cover and circuit board to the mounted backplate, inserting the top first.
- 9 Turn the setscrew one full turn counterclockwise so that the cover cannot be removed.
- 10 Turn on the controller's power.

NOTE Use the same polarity throughout the Rnet.

What is the Equipment Touch?

The Equipment Touch is a touchscreen device with a 4.3 in. color LCD display that you connect to one of the following controllers to view or change its property values, schedule equipment, view trends and alarms, and more, without having to access the system's server.

- I/O Zone 560, 583, or 8112
- I/O Flex 6126
- I/O Pro 812u
- OEMPrtl Pro
- UPC
- XPC

NOTE Requires controller driver v6-00-082 or later.



You wire the Equipment Touch to the controller's Rnet port. The Rnet can have 1 Equipment Touch device and up to 15 ZS sensors.

NOTE The Equipment Touch Rnet does not support RS Sensors.

You can install and run the Equipment Touch with only its built-in system screens, or you can create a customized touchscreen file in ViewBuilder. This requires that you:

- 1 Create custom screens in ViewBuilder, and then save the touchscreen (.touch) file. See "Working with touchscreens" in ViewBuilder Help.
- 2 Enter the touchscreen file name in the target controller's **Properties** box in SiteBuilder.
- 3 Download **All Content** to the controller. See "Downloading to controllers" in WebCTRL® for OEMs Help.

Specifications

Power	24 Vac ($\pm 15\%$), 5 VA, 50–60 Hz, Class 2.	
Display	4.3 in. resistive touchscreen color LCD display with backlighting (Wide Quarter VGA, 480x272 pixels)	
Enclosure	ABS plastic with polycarbonate bezel	
Ports	<ul style="list-style-type: none"> • EIA-485 based serial port for Rnet communication • USB host port 	
Microcontroller	32-bit	
Memory	<ul style="list-style-type: none"> • 16 MB Flash memory to store program code and screen file. • 1.5 MB RAM to store variable data and LCD data. • 4 KB Serial EEPROM to store non-volatile configuration data. 	
Real-time clock	A 365-day real time clock/calendar chip. The time and date will be maintained for a minimum of 72 hours after loss of power (at room temperature).	
Audible alarm notification	A piezoelectric sounder	
Temperature sensor	Range:	-4.0°F to 140°F (-20°C to 60°C)
	Accuracy over 30.0°F to 100°F:	$\pm 1.0^\circ\text{F}$ ($\pm 0.55^\circ\text{C}$)
	Accuracy over full range:	$\pm 2.0^\circ\text{F}$ ($\pm 1.1^\circ\text{C}$)
	Resolution:	0.2°F (0.1°C)
Humidity sensor	Range:	0 to 100% RH
	Accuracy over 20 to 80% RH:	$\pm 3.0\%$ RH
	Accuracy over full range:	$\pm 5.0\%$ RH
	Resolution:	0.05% RH
Environmental operating range	-4°F to 140°F (-20°C to 60°C), 10–90% RH, non-condensing	
Mounting	Wall or panel mounting within the building interior.	
Overall dimensions	Width:	5.44 in. (13.82 cm)
	Height:	4.55 in. (11.56 cm)
	Depth:	1.24 in. (3.15 cm)
Backplate dimensions	Width:	4.79 in. (12.2 cm)
	Height:	3.94 in. (10 cm)
Weight	8 oz. (0.23 kg)	

Listed by	UL-916 (PAZX), CE, FCC Part 15-Subpart B-Class A
Device identification	The I/O Zone 8112's box contains a label with the product name and the serial number that begins with EQB . Remove the front of the I/O Zone 8112 and turn it over to see the serial number on a label attached to the control board.

Wiring and mounting the Equipment Touch



CAUTION If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Mounting

The Equipment Touch must be mounted within the building interior. You can mount the Equipment Touch:

- In a panel with the controller or on the panel door
- On a wall up to 500 feet from the controller

Wiring

- The Equipment Touch requires a 24 Vac power supply. It is not powered by the Rnet.



CAUTION The Equipment Touch can share a power supply with the OEMCtrl® controller as long as you:

- Maintain the same polarity.
 - User the power supply only for OEMCtrl® controllers.
- You can also wire an external 10 kOhm, Type II thermistor to the Equipment Touch.

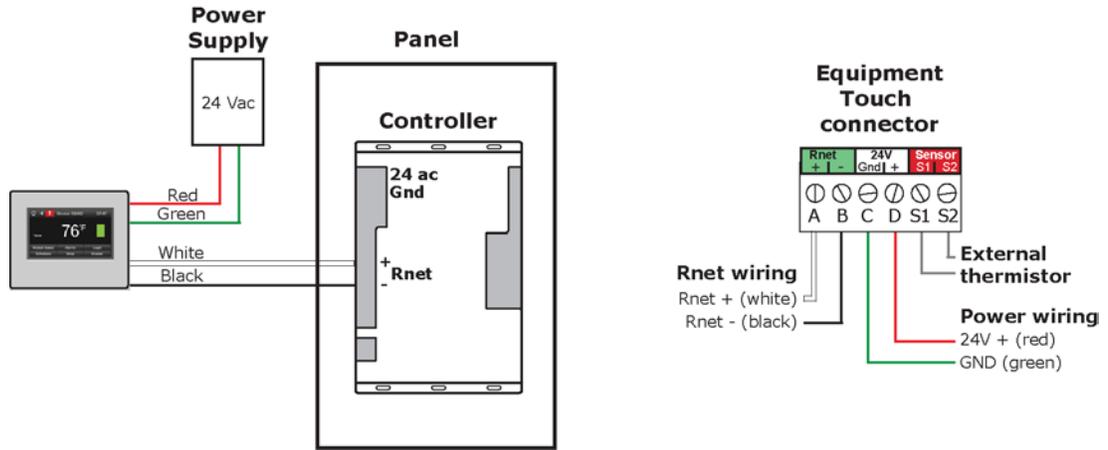
See:

Wiring specifications (page 22)

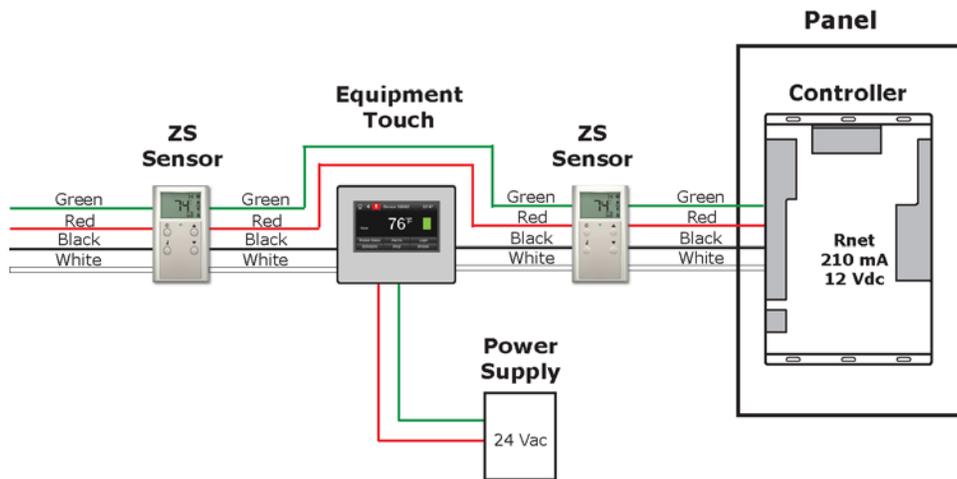
To wire and mount the Equipment Touch (page 23)

Wire the Equipment Touch in one of the following ways:

- Wire the Equipment Touch directly to the controller's Rnet port as shown below.



- Wire the Equipment Touch in a daisy-chain configuration with up to 5 ZS zone sensors as shown below.



NOTE You do not need to set an address for the Equipment Touch.

Wiring specifications

Power wiring

2-conductor wire 18 AWG for distances up to 100 feet. All transformer secondaries must be grounded. Wiring connections must be in accordance with NEC and local codes.

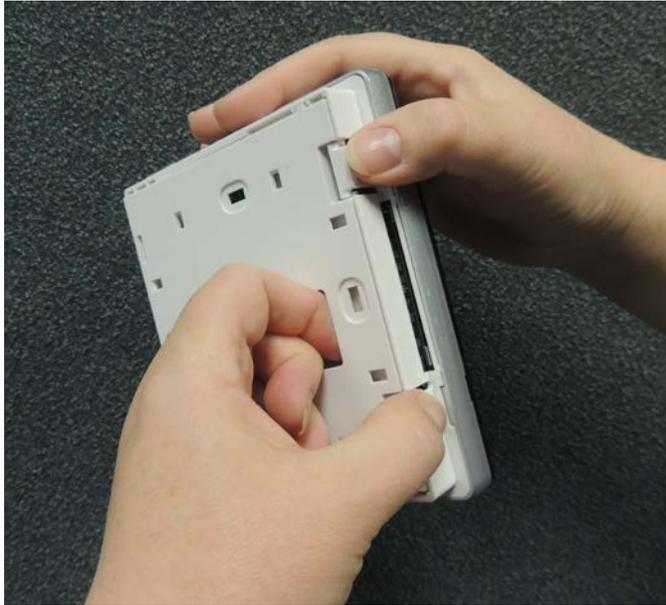
Rnet wiring

NOTE If you wire the Equipment Touch directly to the controller's Rnet port, you can use a 2-conductor cable instead of the standard 4-conductor Rnet cable.

Description	4-conductor, shielded or unshielded, CMP, plenum rated cable
Conductor	22 AWG (7x0096) bare copper
Maximum length	500 feet (152 meters)
Insulation	Low-smoke PVC (or equivalent)
Color Code	Black, white, green, red
Shielding	If shielded, Aluminum/Mylar shield (100% coverage) with TC drain wire
UL temperature rating	32–167 °F (0–75 °C)
Voltage	300 Vac, power limited
Listing	UL: NEC CL2P, or better

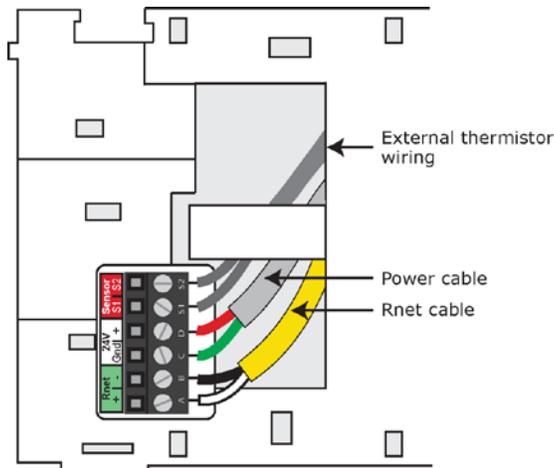
To wire and mount the Equipment Touch

- 1 Remove the backplate from the Equipment Touch:
 - a) Hold the Equipment Touch as shown in the picture below.

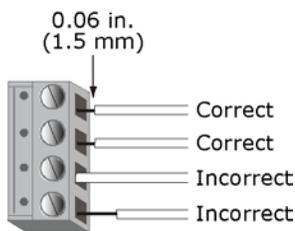


- b) While firmly pressing the 2 tabs on top of the Equipment Touch, pull on the backplate with your index finger until the backplate releases from the Equipment Touch.
- 2 Pull the communication cable, power cable, and external thermistor wiring (if applicable) through the large hole in the center of the backplate. See figure in step 5.
- 3 Partially cut, then bend and pull off the outer jacket of the Rnet cable(s). Do not nick the individual wire insulation.
- 4 If wiring 1 cable to the I/O Zone 8112, cut the shield wire off at the outer jacket, then wrap the cable with tape at the outer jacket to cover the end of the shield wire.
If wiring 2 cables in a daisy-chain configuration, twist together the shield wires, then wrap the shield wires with tape.
- 5 Strip about 0.25 inch (0.6 cm) insulation from the end of each wire.
- 6 Connect wiring to the Equipment Touch as shown below:

What is the Equipment Touch?



CAUTION Allow no more than 0.06 inch (1.5 mm) bare communication wire to protrude. If bare communication wire contacts the cable's foil shield, shield wire, or a metal surface other than the terminal block, the device may not communicate correctly.



- 7 Attach the backplate to the wall or panel. If mounting in or on a panel:
 - a) Drill two 3/16 inch (4.8 mm) pilot holes in the panel.
 - b) Attach backplate using pan head 6-32 x 3/8" to 1/2" long machine screws. Do not overtighten screws to prevent damage to plastic housing.
RECOMMENDATION Use Loctite 220 on screw threads if the Equipment Touch will be subject to vibration.

- 8 Attach the Equipment Touch to the backplate:
 - a) Place the bottom of the Equipment Touch onto the backplate by aligning the 2 slots on the Equipment Touch with the tabs on the backplate.
 - b) Push the Equipment Touch onto the backplate until the tabs at the top of the Equipment Touch snap onto the backplate.

9 Turn off the controller's power.

10 Connect the other end of the Rnet wiring to the controller's **Rnet** port or to a zone sensor.

NOTES

- Insert the shield wire with the ground wire into the controller's **GND** terminal.
- Use the same polarity throughout the Rnet.

11 Connect power wiring to a 24 Vac power supply.

12 Turn on the controller's power.

What is the BACview®6 device?

The BACview®6 device is a keypad/display unit that you connect to the I/O Zone 8112 controller to let you view or edit certain property values and the controller's real time clock.

You connect the BACview®6 device to the I/O Zone 8112's 4-pin Rnet port. The I/O Zone 8112 can share the Rnet with zone sensors. Wire the devices in a daisy-chain or hybrid configuration.

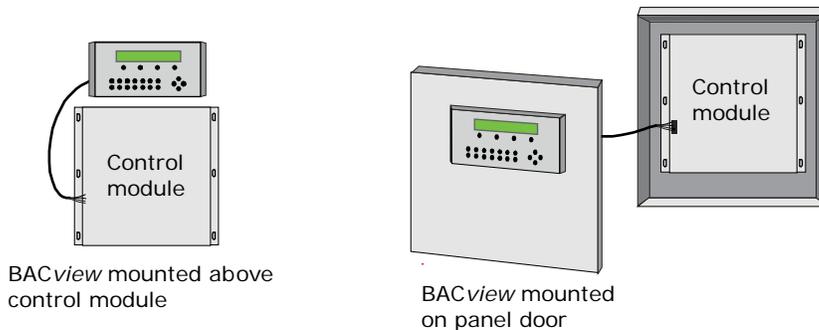
For instructions on using/programming the BACview®6 device, refer to BACview®6 technical documentation.

NOTE When using a permanent Equipment Touch or BACview®6 device, they must be externally powered.

Specifications for mounting the BACview®6 device

You can mount the BACview®6 device:

- In the panel above the controller
- On the panel door
- On a wall up to 500 feet from the controller



To wire the BACview® device

NOTE Use 18 gauge wire for the BACview®6 device to be up to 500 feet from the controller.



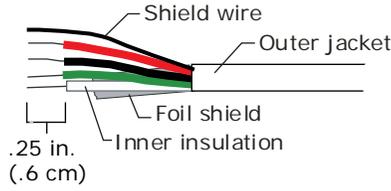
CAUTIONS

- Maintain the same polarity throughout the Rnet.
- Wiring the 12V power incorrectly can damage the components.
- When using a permanent Equipment Touch or BACview®6 device, they must be externally powered.

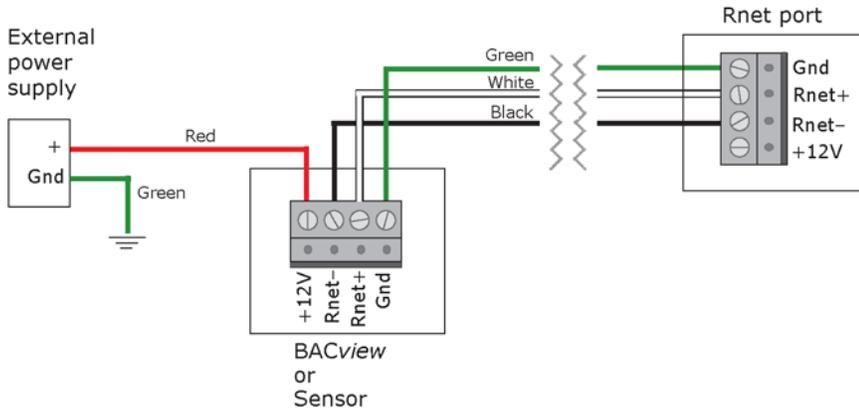
- 1 Pull the screw terminal connector from the controller's power terminals labeled **Gnd** and **Hot**.
- 2 Pull the screw terminal connector from the BACview®6 device.

What is the BACview®6 device?

Partially cut, then bend and pull off the outer jacket of the Rnet cable(s). Do not nick the inner insulation.



- 3 Strip about .25 inch (.6 cm) of the inner insulation from each wire.
- 4 Insert the wires into both of the screw terminal connectors.
- 5 If connecting more than one BACview®6 device, the first one on an Rnet is powered by the controller. You must provide an external power supply for a second BACview®6 device. When wiring two BACview®6 devices together on the same Rnet, set the J1 jumper to the down position on the first BACview®6 device.

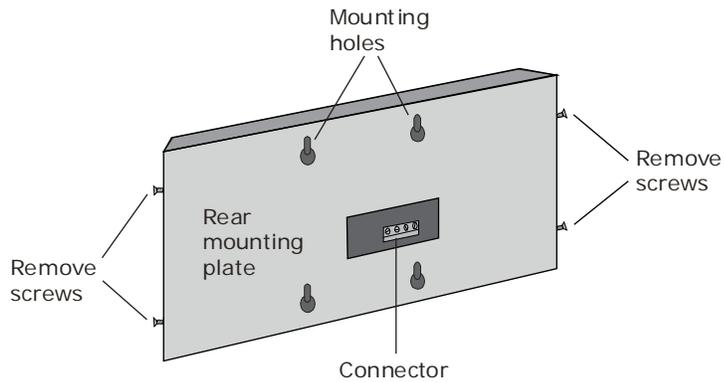


- 6 Insert the screw terminal connector into the BACview®6 device with the screw heads facing out.
- 7 Insert the screw terminal connector into the I/O Zone 8112's power terminals.

To mount the BACview®6 device

CAUTIONS

- The BACview®6 device is powered by a Class 2 power source. Properly isolate the BACview®6 device from non-Class 2 circuits in the same control panel.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



- 1 Remove the 4 screws on the sides of the BACview®6 device to remove the rear mounting plate.
- 2 Using the rear mounting plate as a template, drill 4 holes in the surface that you are mounting the BACview®6 device to, then insert 4 screws in the holes.
- 3 If mounting on a panel door, use the cutout in the rear mounting plate as a template to cut a hole in the panel door for the cable to pass through.
- 4 Reattach the BACview®6 device's rear mounting plate.
- 5 Wire the BACview®6 device to the I/O Zone 8112.
- 6 Hang the BACview®6 device on the 4 mounting screws.

NOTE If mounting above the I/O Zone 8112 or on a wall, pull the cable out to the side of the BACview®6 device without bending or pinching the cable beneath the BACview®6 device.

Troubleshooting

If you have problems mounting, wiring, or addressing the I/O Zone 8112, contact OEMCtrl® Technical Support.

Communication LED's

The LED's on the I/O Zone 8112 show the status of certain functions. Verify the LED patterns by cycling power to the controller and noting the lights and flashes.

If this LED is on...	Status is...
Power	The I/O Zone 8112 has power
Rx	The I/O Zone 8112 is receiving data from the network segment
Tx	The I/O Zone 8112 is transmitting data over the network segment
DO#	The binary output is active

The **Run** and **Error** LED's indicate controller and network status.

If Run LED shows...	And Error LED shows...	Status is..
2 flashes per second	Off	Normal
2 flashes per second	2 flashes, alternating with Run LED	Five minute auto-restart delay after system error
2 flashes per second	3 flashes, then off	The controller has just been formatted
2 flashes per second	On	Exec halted after frequent system errors or control programs halted
5 flashes per second	Off	Firmware transfer in progress, Boot is running
7 flashes per second	7 flashes per second, alternating with Run LED	Ten second recovery period after brownout
14 flashes per second	14 flashes per second, alternating with Run LED	Brownout

If Run LED shows...	And Error LED shows...	Status Is..
On	On	<p>Failure. Try the following solutions:</p> <ul style="list-style-type: none"> • Turn the I/O Zone 8112 off, then on • Restore factory defaults • Download memory to the I/O Zone 8112.* • Replace the I/O Zone 8112.* <p>* Contact the manufacturer or OEM Technical Support.</p>

Recovering from a power outage

The I/O Zone 8112 has a 10-year Lithium CR2032 battery that ensures the following data is retained for a maximum of 10,000 hours during power outages:

- Time
- Graphics
- Control programs
- Editable properties
- Trends
- Schedules

If the above data is lost after power returns, replace the battery and then restore memory from archive. See instructions below.

Archive function

Factoryies - After a memory download, the firmware stores the touchscreen, BACview® files, graphics, control programs, and database settings to flash memory. This archiving can take up to a minute, depending on the size of the files.

Site-specific - You can archive site-specific configurations to the I/O Zone 8112 by using the Equipment Touch, BACview® device, the control program, the WebCTRL® for OEMs application, or Field Assistant. We strongly recommend you archive whenever you change factory settings, such as schedules, devices instances, network addresses, etc.

Restore memory from archive

The I/O Zone 8112 checks the memory configuration during power up and, if it is identified as corrupt, it reconstructs memory from the last archive. In addition, if the battery fails to power the device during a power outage, memory could be lost, but will be reconstructed from the last archive. The device supports factory and site-specific archives, which can be manually restored in the field.

To restore the factory archive

- 1 Turn off the I/O Zone 8112.
- 2 Address the rotary address switches to 0, 0 (zero, zero).
- 3 Put the **Format** jumper on the pins.
- 4 Turn on the I/O Zone 8112.
- 5 **Run** and **Error** LED's cycle 3 times opposite of each other, then returning to normal operation once the process is complete.

NOTE The **Run** LED flashes once per second during normal operation.

To restore the site-specific archive

- 1 Turn off the I/O Zone 8112.
- 2 Address the rotary address switches to any numbers greater than 0, 0 (zero, zero). Example (0, 1).
- 3 Put the **Format** jumper on the pins. For device with a format button, hold it down.
- 4 Turn on the I/O Zone 8112.
- 5 **Run** and **Error** LEDs cycle 3 times opposite of each other, then returning to normal operation once the process is complete..

NOTE The **Run** LED flashes once per second during normal operation.

After restoring from archive

- 1 Run a module status and check the information message history to confirm the archive.
- 2 Set the time and date for schedules to operate properly.

NOTE The restore uses June 12, 2002 @ 10:00 AM as a place holder because the battery failure inhibits the real time clock. Use the Equipment Touch, BACview® local display, the WebCTRL® for OEMs application, or Field Assistant to set the correct time and date. If the device is integrated with a BACnet-speaking BAS, the time and date are set through the communication network.

To replace the I/O Zone 8112's battery

To determine when to replace the battery, remove power and measure the voltage. If the voltage is below 2.9 volts, you need to replace the battery.



CAUTION Power must be **ON** to the I/O Zone 8112 when replacing the battery, or your date, time, and trend data will be lost.

- 1 Remove the battery from the controller, making note of the battery's polarity.
- 2 Insert the new battery, matching the battery's polarity with the polarity indicated on the I/O Zone 8112.

Serial number

If you need the I/O Zone 8112's serial number when troubleshooting, the number is on:

- a sticker on the back of the main controller board
- a Module Status report (modstat) from the WebCTRL® for OEMs application

Compliance

FCC Compliance

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 the 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 is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



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

CE Compliance



WARNING This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

BACnet Compliance

BACnet® is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of listed products to requirements of ASHRAE Standard 135 is the responsibility of BACnet International. BTL® is a registered trademark of BACnet International.

Document revision history

Important changes to this document are listed below. Minor changes such as typographical or formatting errors are not listed.

Date	Topic	Change description	Code*
5/13/15	What is the I/O Zone 8112 controller?	Illustration correction - J14, Pins 2 and 3 description reversed.	O-TS-PK-E
7/24/14	Specifications What is the Equipment Touch?	Changed number of ZS sensors that can be used with an Equipment Touch, from 5 to 15.	X-D
5/14/14	Specifications	Added backplate dimensions.	X-D

* For internal use only



OEMCtrl® · 1025 Cobb Place Blvd, Kennesaw, GA 30144 · 770-429-3060 · www.oemctrl.com
5/13/2015