

LN-Display

Installation Instructions

LN-DSWSC1-0, LN-DSWSC2-0

Code No. LIT-1201904

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Applications

The LN-Display controller has multifunction LCD display. The controller can operate with LN Series controllers or other multi-vendor open and interoperable LONWORKS® controllers, and can display up to 250 network variables.

The controller is based on LONWORKS technology for peer-to-peer communication between controllers. The Display is available in two casings: surface and flush mount.

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

Canada

This Class (A) digital apparatus meets all 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.

Installation

Dimensions

Figure 1 shows the LN-Display surface mount casing dimensions.

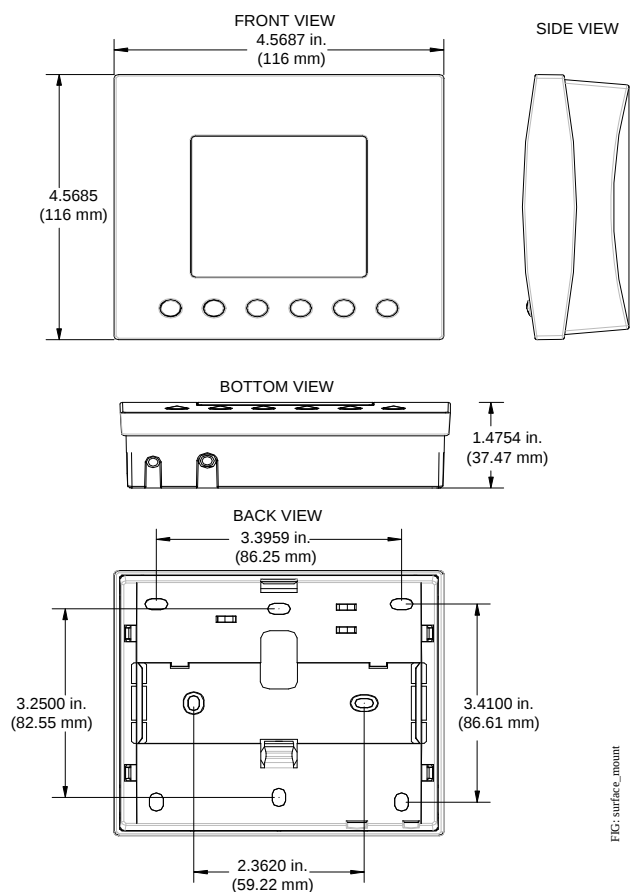


Figure 1: Surface Mount Casing Dimensions, in. (mm)

Figure 2 shows the flush mount casing dimensions.

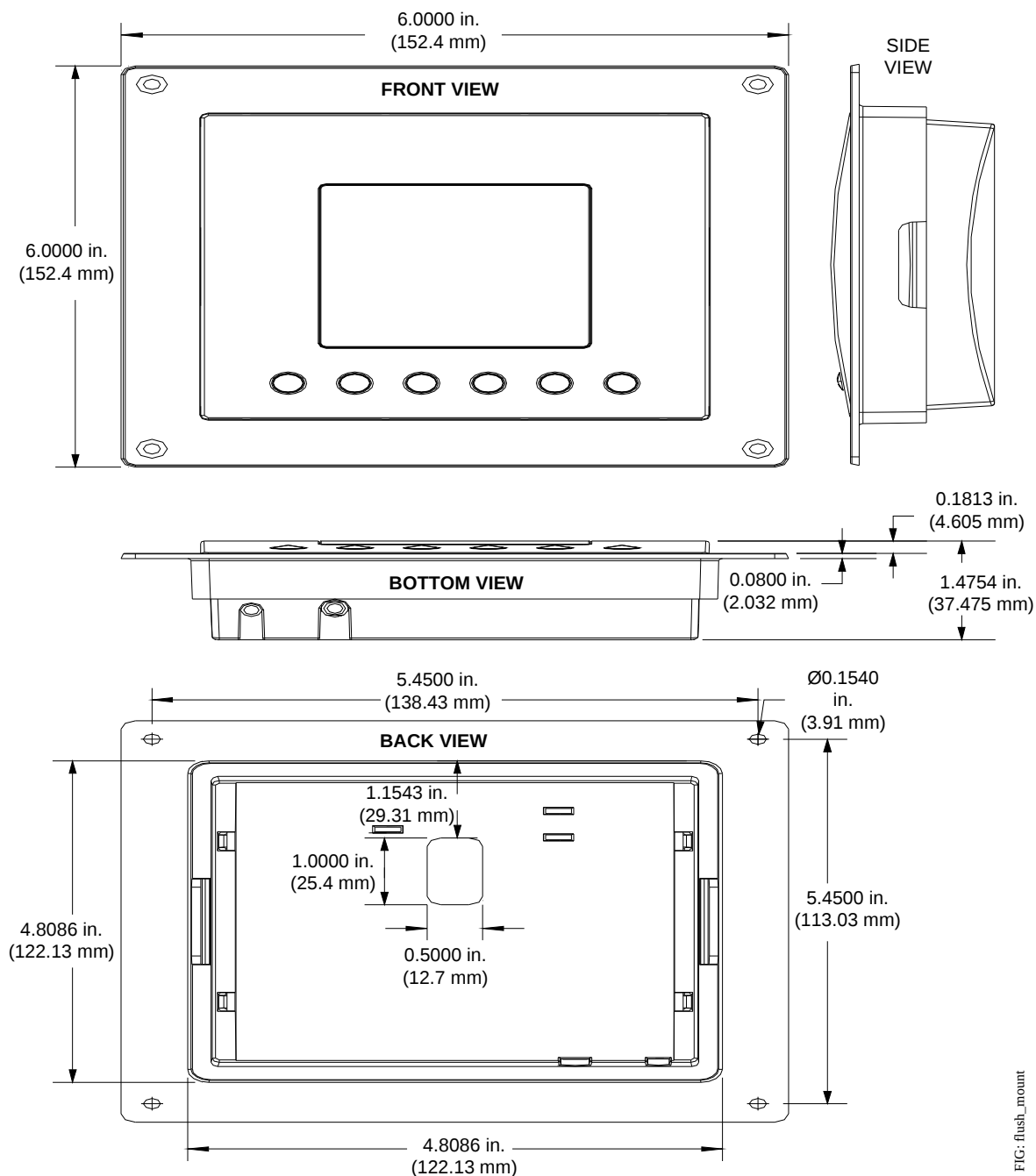


Figure 2: Flush-Mount Casing Dimensions

Mounting

Three mounting scenarios are available for the Display casing: North American Electrical Box, European Electrical Box, and DIN Rail.

North American Electrical Box

To mount the North American Electrical Box:

1. Remove the Display panel from the device by gently pressing on the panel and pulling the front panel outward (Figure 3).

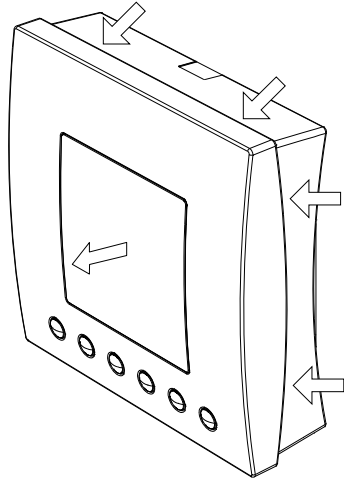


Figure 3: Removing the Surface Mount Casing

2. Select a mounting location.
3. Pull the power and network communication wires until they extend 6 in. (152 mm) from the electrical box.
4. Pull the power and network communication wires through the wire exit hole (Figure 4).

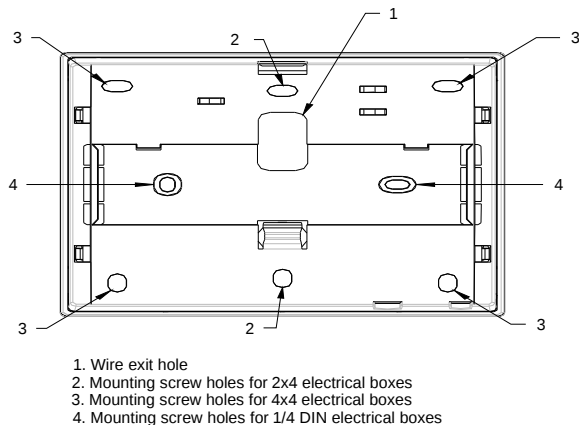


Figure 4: Mounting Screw Holes

5. Position the base plate on the electrical box.
6. Mount the base plate using the screws provided with the electrical box.
7. Connect the power and network communication wires. See the [Wiring](#) section for more information.

8. Reattach the front panel to the base plate by pressing gently on the Display until the panel clicks into place.

European Electrical Box

Follow the steps in the [North American Electrical Box](#) section.

DIN Rail

To mount on a DIN rail:

1. Remove the Display panel from the device by gently pressing on the panel and pulling the front panel outward (Figure 3).
2. Break off the tabs to expose the DIN rail channels in the base plate (Figure 5).

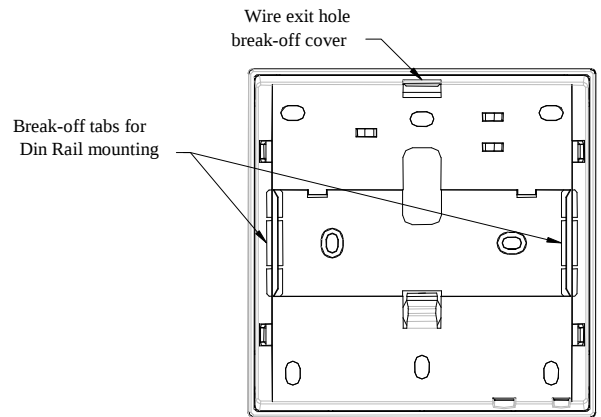


Figure 5: DIN Rail Installation – Break Off

3. Break off the cover from the exit hole (Figure 5).
4. Pull the power and network communication wires through the wire exit hole
5. Slide the back plate onto the DIN rail (Figure 6).

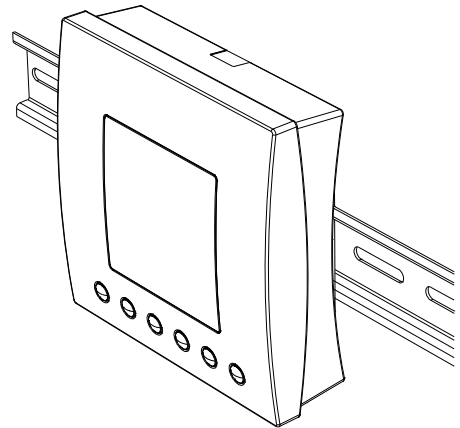


Figure 6: DIN Rail Mounted

6. Connect the power and network communication wires. See the [Wiring](#) section for more information.
7. Reattach the front panel to the base plate by pressing gently on the Display until the panel clicks into place.

Flush Mount Casing

To mount the LN-Display with flush mount casing:

1. Remove the Display panel from the device by gently pressing outwards on the rear openings (Figure 7).

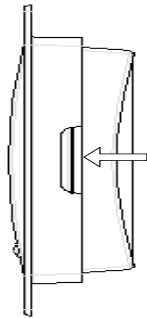


Figure 7: Remove Flush Mount Casing

2. Create a 4 1/2 x 4 1/2 in. (113 x 133 mm) opening in the enclosure cover, if necessary (Figure 8).

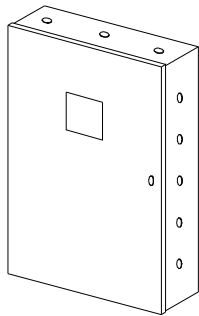


Figure 8: Enclosure

Note: See Figure 2 for the controller dimensions.

3. Position the Display in the opening of the enclosure cover and then transfer the position of the four mounting holes to the cover (Figure 9).
4. Remove the Display front panel from the enclosure cover and drill the four holes.
5. Fasten the enclosure cover on the panel.
6. Pull the power and network communication wires through the wire exit hole.

7. Connect power and network communication wires.
8. Reattach the front panel to the base plate by pressing gently on the display until the panel clicks into place.

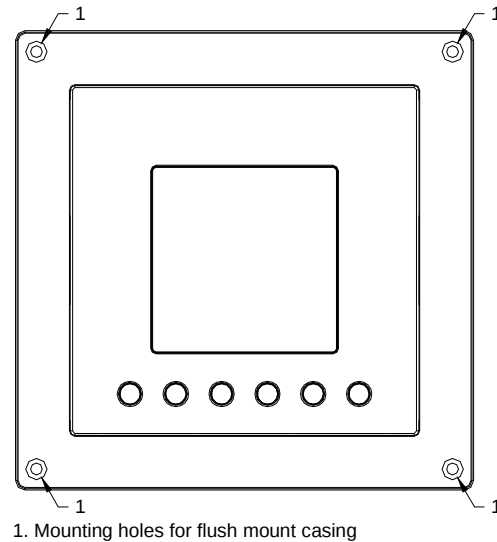


Figure 9: Mounting Holes for Flush Mount Casing

Location Considerations

For proper installation and subsequent operation of the Display controller, follow these recommendations:

- Allow for proper clearance of device casing, wiring terminals, and service pin for easy access, hardware configuration, and maintenance.
- Record the Neuron® ID number located on the inside of the device casing for commissioning the device.
- Install at the following environmental conditions:
Ambient temperature: 32 to 158°F (0 to 70°C)
Relative humidity: 0 to 95%, noncondensing
- Ensure proper ventilation of devices, and avoid area where corroding, deteriorating, or explosive vapors, fumes, or gasses may be present.

Wiring

IMPORTANT: Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the LN-Display's electrical rating.

Power Wiring

LN-Display device power requirements: 24 VAC/VDC, $\pm 15\%$, Class 2. Use transformers of 100 VA or less.

The minimum cable section for power wiring is 18 AWG. We recommended using the heaviest gauge wire based on a maximum of 14 AWG and a minimum of 18 AWG.

If you are applying power to more than one device, use the following method to calculate power requirements of the transformer:

- Add maximum power consumption of all devices and multiply by 1.3.
- If the resulting number is higher than 100 VA, use multiple Class 2 transformers. Do not interconnect the outputs of Class 2 transformers or power sources unless listed for such connections.
- For multiple devices powered from the same transformer, maintain consistent polarity between all controllers. Connect the COM terminals from each controller to the same terminal on the secondary side of the transformer.



CAUTION: Risk of Electric Shock.

Disconnect the power supply before making electrical connections to avoid electric shock.

MISE EN GARDE : Risque de décharge électrique.

Débrancher l'alimentation avant de réaliser tout raccordement électrique afin d'éviter tout risque de décharge électrique.

We recommend using an external fuse on the 24 VAC secondary side of the transformers to protect all devices against power line spikes (Figure 10).

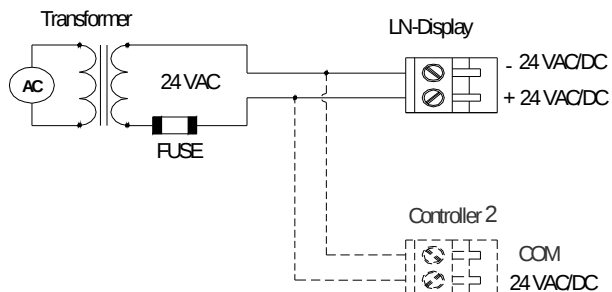


Figure 10: Power Wiring

Communications Wiring

The approved cable type for LON communications is Level IV 22 AWG (0.65 mm) UNSHIELDED. You can use both one-pair and two-pair wires. The LON communication wire is polarity insensitive and can be laid out in either bus, star, loop, or free topology.

Connect both wires to the NET terminals of the controller. If you are inserting multiple wires in the terminals, properly twist wires together prior to inserting them in the terminal connectors (Figure 11).

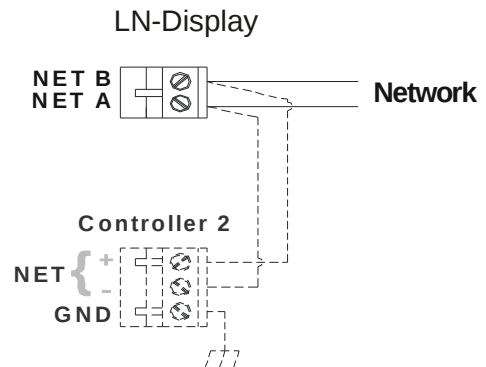


Figure 11: Communications Wiring

Note: For additional information about network topology and wire-length restrictions, refer to the Echelon® *Junction Box and Wiring Guideline for Twisted Pair LONWORKS Networks* (Part No. 005-0023-01).

IMPORTANT: Use proper terminations on the network, according to the type of network topology you are using. Failure to do so might result in communication errors between controllers. Do not use multiple gauges of cable on the same communication bus, as this may also result in communication errors.

The LN-Display controller also has a built-in network jack (1/8 in. [3.5 mm] mono male audio jack) that can be used to connect to the LONWORKS network. This network jack is located on the bottom of the device (Figure 12).

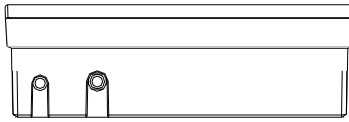


Figure 12: Bottom View



CAUTION: Risk of Property Damage.

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

MISE EN GARDE : Risque de dégâts matériels.

Ne pas mettre le système sous tension avant d'avoir vérifié tous les raccords de câblage. Des fils formant un court-circuit ou connectés de façon incorrecte risquent d'endommager irrémédiablement l'équipement.

Selecting Network Terminators

For information on selecting Network Terminators, refer to the *LONWORKS LN-Series Network Communication and Interface Guide Technical Bulletin (LIT-12011253)*.

Setup and Adjustments

Commissioning

To commission a device and add it to a LONWORKS network, use the device plug-in as well as the .xif and .apb files.

Note: The device commissioning instructions only apply when you are using a LONWORKS Network Services (LNS®) network management tool, such as LN-Builder.

To obtain the necessary files:

1. Run the installation setup to install the device plug-in and the latest version of the .xif and .apb files onto your computer. The .xif and .apb files install in the C:\LonWorks\Import\JCI folder.

2. Register the plug-in on the network database. By doing this, you create the device template that is used to commission the device.
3. Commission the device using the proper device template and .apb file with your network management tool.

Note: If you download an improper .apb file into the device, you may damage the Neuron chip in your controller. The controller may become unusable.

Neuron ID and Service Pin

To commission a device and add it to a LONWORKS network, you need the Neuron ID of the device. There are two methods to obtain the Service Pin number.

To locate the Neuron ID number, perform one of the following procedures:

1. **Manual entry:** The Neuron ID address and bar code are located on either the top panel of the device (surface and DIN rail models), or inside the casing of the device (flush mount models).
2. **Service Pin:** Press the Service Pin on the device to broadcast the Neuron ID on the LONWORKS network. The Service Pin on the Scheduler is located on the bottom right of the device (Figure 12). The Display device may have multiple methods for broadcasting the Neuron ID over the network depending on the revision level of the actual controller. The revision number is located on the printed circuit board, inside the casing.

Information on Revision levels:

- all devices with Revision 5 or later have a Service Pin located on the bottom of the device
- all devices with Revision 4 or earlier have a Reset Pin instead of a Service Pin. (When you press the Reset Pin the controller performs a cold reset and restarts the device.)

Repair Information

If the LN-Display fails to operate within its specifications, replace the unit. For a replacement, contact the nearest Johnson Controls® representative.

Troubleshooting

Table 1 describes possible troubleshooting problems and solutions.

Table 1: Troubleshooting

Problem	Cause	Solution
Device is powered but does not turn on.	Fuse has blown (Auto-reset fuse)	Disconnect the power, the inputs, and the output terminals. Wait a few seconds to allow the auto-reset fuse to cool down. Check the power supply and the input/output wiring. Reconnect the power.
	Power supply polarity	Verify that consistent polarity is maintained between all controllers and the transformer. Ensure the COM terminal of each controller is connected to the same terminal on the secondary side of the transformer (Figure 11).
Device cannot communicate on the FTT network.	Absent or incorrect supply voltage	Check power supply voltage between 24 VAC/DC and COM pins to ensure that it is between acceptable limits. Check for tripped fuse or circuit breaker.
	Overloaded power transformer	Verify the transformer used is powerful enough to supply all controlled devices.
	Network not wired properly	Verify the wire connections are correct.
	Absent or incorrect network termination	Check the terminations.
Device communicates well on short network but does not communicate on large network.	Network length	Check the total wire length to verify it does not exceed the specifications.
	Wire type	Check the wire type to verify it meets the specifications. Ensure you are using unshielded wire.
	Network wiring problem	Verify the wire connections are correct.
	Absent or incorrect network termination	Check the terminations. Incorrect or broken terminations make the communication integrity dependent upon a device's position on the network.
	Extra capacitance	Verify that no extra capacitance is connected to the network other than the standard FTT circuit and a maximum of a 10 ft (3 m) stub (in bus topology).
	Number of devices on network segment exceeded	The number of devices on a channel should never exceed 64. Use a router or a repeater in accordance to the specifications.
	Network traffic	Query node statistics to check errors. Use a LON protocol analyzer to check network traffic.
Status Light Emitting Diode (LED)¹	Off	The device is in normal operation or the device is not powered. If the device is not powered and the LED is Off, press the Service Pin to light up the LED display.
	On	The device has no application. Reload the application file (.apb).
	Slow Blink 1 second On, 1 second Off	The device is not configured. Commission the device.
	Fast Blink 1 second On, 1 second Off	Watchdog time out. The application is corrupted. Call your Johnson Controls representative to report the problem.

1. The Status LED is located on the bottom right of the LCD display. It emits an orange light when the device is ON.

Technical Specifications

LN-Display

Power		Voltage: 24 VAC/DC; $\pm 15\%$, 50/60 Hz, Class 2 Protection: 500 mA auto-reset fuse Consumption: 8 VA
Environmental		Operating Temperature: 32 to 158°F (0 to 70°C) Storage Temperature: -4 to 158°F (-20 to 70°C) Relative Humidity: 0 to 90% noncondensing
General		Processor: Neuron 3150™, 8 bits, 10 MHz Memory: Nonvolatile Flash 64 K (APB application, Nonvolatile Flash 64 K [storage]) Communication: LonTalk® protocol Transceiver: TP/FT-10, 78 Kbps Status Indicator: Green LEDs on outputs Communication Jack Input: 1/8 in. (3.5 mm)
Enclosure		Material: ABS Resin Color: Off White Dimension (FMT): 6 in. x 6 in. x 1.48 in. (151 x 151 x 38 mm) Dimension (SMT): 4.57 in. x 4.57 in. x 1.48 in. (116 x 116 x 38 mm) Shipping Weight (FMT): 0.88 lb (0.40 kg)
Liquid Crystal Display (LCD)		Type: Backlit Definition: 128 x 128 pixels Display Area: 2.1 x 2.1 in. (53 x 53 mm) Screen Saver: Customizable
Compliance	United States	UL Listed, File E107041, CCN PAZX, to UL 916, Energy Management Equipment. FCC Compliant to CFR 47, Part 15, Subpart B, Class B.
	Canada	UL Listed, File E107041, CCN PAZX7, to CAN/CSA C22.2 No. 205, Signal Equipment. Industry Canada, IECES-003.

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, contact the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



Building Efficiency

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