

System 450™ Series Expansion Modules with Relay Outputs

Installation Instructions

C450SBN-1
C450SCN-1

Part No. 24-7664-2683, Rev. D
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Application

IMPORTANT: Use this System 450 Series Expansion Module with Relay Output only as an operating control. Where failure or malfunction of the System 450 expansion module 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 System 450 expansion module.

System 450 is a family of electronic control, expansion, and power modules that are easily assembled and set up to provide reliable digital temperature, pressure, and humidity control for a wide variety of Heating, Ventilation, Air Conditioning, and Refrigeration (HVACR), and commercial/industrial process applications.

C450SxN-1 models are Single-Pole, Double-Throw (SPDT) relay expansion modules: C450SBN-1 models provide one SPDT relay, C450SCN-1 models provide two SPDT relays.

Refer to the *System 450 Series Technical Bulletin (LIT-12011459)* for detailed information on designing, installing, setting up, and troubleshooting System 450 Series control applications.

Installation

Location Considerations

Observe the following System 450 location guidelines:

- Ensure that the mounting surface can support the module assembly, mounting hardware, and any (user-supplied) panel or enclosure.
- Mount the modules horizontal, in an upright orientation wherever possible. DIN rail mount is recommended.
- Mount modules on flat even surfaces.
- Mount the modules in locations free of corrosive vapors and observe the operating conditions in the [Technical Specifications](#).

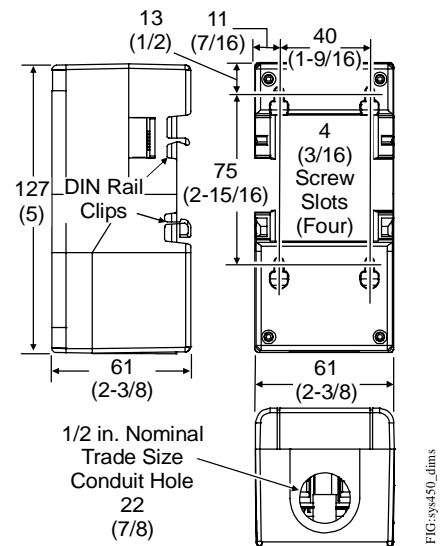


Figure 1: System 450 Module Dimensions

- Allow sufficient space for wires and connections.
- Do not mount the modules on surfaces that are prone to vibration or in locations where radio frequency or electromagnetic emissions may cause interference.
- Do not install the modules in airtight enclosures.
- Do not install heat-generating devices in an enclosure with the modules that may cause the temperature to exceed the ambient operating conditions.

Mounting

Mount System 450 modules on 35 mm DIN rail (recommended) or directly to an even wall surface. To mount the modules on DIN rail:

1. Provide a section of 35 mm DIN rail that is longer than the module assembly width, and mount the DIN rail horizontally in a suitable location using appropriate mounting hardware/fasteners.
2. Clip the control module on the rail, position the upper DIN rail clips on the top rail, and gently snap the lower clips on to the rail.

- Clip the remaining modules to the right of the control module on to the DIN rail and plug together.

To direct mount modules to wall surfaces:

- Plug the modules together, remove the module covers, place the assembly against wall surface horizontally in a suitable location, and mark the mount hole locations on the surface.
- Install appropriate screw fasteners, leaving screw heads approximately one to two turns away from flush to the surface.
- Place the assembly over screw heads and on the mounting slots, and carefully tighten mount screws.

Note: If you mount the modules on an uneven surface, do not damage the housings when tightening mounting screws. Use shims/washers to mount module assembly evenly on the surface.

Refer to the control sensor installation instructions for information on locating and mounting control sensors.

Wiring



WARNING: Risk of Electric Shock.

Disconnect each of multiple power supplies before making electrical connections. More than one disconnect 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.

IMPORTANT: Use copper conductors only. Make all wiring in accordance with local, national, and regional regulations.

IMPORTANT: Do not exceed the System 450 module electrical ratings. Exceeding module electrical ratings can result in permanent damage to the modules and void any warranty.

IMPORTANT: Do not connect 24 VAC supply power to the System 450 modules before finishing wiring and checking all wiring connections. Short circuits or improperly connected wires can result in damage to the modules and void any warranty.

See Figure 2 and Table 1 for electrical termination locations, wiring information, and electrical ratings.

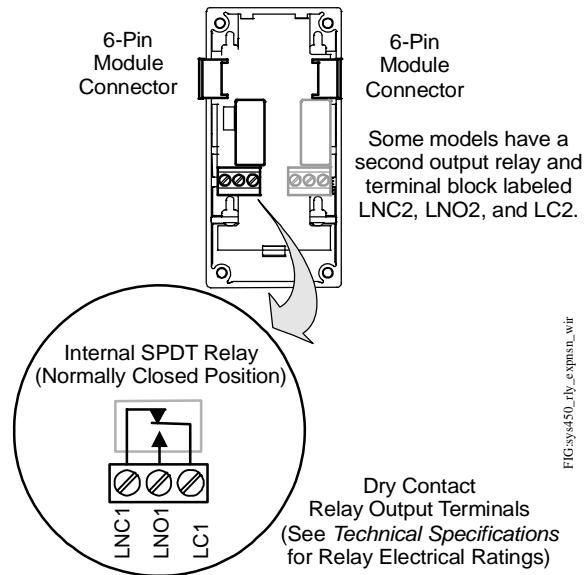


Figure 2: C450SxN-1 Wiring Terminals

Note: The System 450 Output Relay terminals connect to an internal SPDT relay and **do not** supply any power to the control application. See Figure 2.

Table 1: System 450 Terminal Wiring Information

Label	Terminal Function	Wire Sizes
LNC1, LNC2	Connects equipment control circuit to the Normally Close contact on the SPDT output relay.	28 AWG to 14 AWG 0.3 mm ² to 1.5 mm ²
LNO1, LNO2	Connects equipment control circuit to the Normally Open contact on the SPDT output relay.	
LC1, LC2	Connects line (power) to Common (C) on the SPDT relay.	

Technical Specifications

C450SxN-1

Product	C450SBN-1: System 450 Expansion Module with one SPDT output relay C450SCN-1: System 450 Expansion Module with two SPDT output relays									
Supply Power	C450-YNN-1 Power Supply Module or 24 (20-30) VAC Safety Extra-Low Voltage (SELV) (Europe) Class 2 (North America) 50/60 Hz, 10 VA minimum									
Ambient Operating Conditions	Temperature: -40 to 66°C (-40 to 150°F) Humidity: Up to 95% RH non-condensing; Maximum Dew Point 29°C (85°F)									
Ambient Shipping and Storage Conditions	Temperature: -40 to 80°C (-40 to 176°F) Humidity: Up to 95% RH non-condensing; Maximum Dew Point 29°C (85°F)									
Output Relay Contacts	General: 1/2 HP at 120/240 VAC, SPDT Specific: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">AC Motor Ratings</th> <th style="text-align: center;">120 VAC</th> <th style="text-align: center;">208/240 VAC</th> </tr> </thead> <tbody> <tr> <td>AC Full-load amperes:</td> <td style="text-align: center;">9.8 A</td> <td style="text-align: center;">4.9 A</td> </tr> <tr> <td>AC Locked-rotor amperes:</td> <td style="text-align: center;">58.8 A</td> <td style="text-align: center;">29.4 A</td> </tr> </tbody> </table> 10 amperes AC Non-inductive at 24/240 VAC Pilot Duty: 125 VA at 24/240 VAC	AC Motor Ratings	120 VAC	208/240 VAC	AC Full-load amperes:	9.8 A	4.9 A	AC Locked-rotor amperes:	58.8 A	29.4 A
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AC Full-load amperes:	9.8 A	4.9 A								
AC Locked-rotor amperes:	58.8 A	29.4 A								
Control Construction	Independently-mounted control, surface mounted with Lexan® 950 enclosure suitable for DIN rail mounting or direct mounting to a hard, even surface.									
Dimensions (H x W x D)	127 x 61 x 61 mm (5 x 2-3/8 x 2-3/8 in.)									
Weight	C450SBN-1: 172 gm (0.38 lb) C450SCN-1: 186 gm (0.41 lb)									
Compliance	North America: cULus Listed; UL 60730, File E27734, Vol. 1; FCC Compliant to CFR47, Part 15, Subpart B, Class B Industry Canada (IC) Compliant to Canadian ICES-003, Class B limits Europe: Mark: CE Compliant; Low Voltage Directive (2006/95/EC); EMC Directive (2004/108/EC); RoHS Directive (2002/95/EC); WEEE Directive (2002/96/EC) Australia: Mark: C-Tick Compliant (N1813)									

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult Johnson Controls Application Engineering at (414) 524-5535. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

United States Emissions Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canadian Emissions Compliance

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

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



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