



# CAN-5901 Expansion I/O Module

## Installation Guide

Complete the following steps to install a Conquest™ CAN-5901 Expansion Module that will be connected to a Conquest BAC-5900 Series Controller.

Refer to the [Conquest CAN-5900 Series I/O Expansion Modules data sheet](#) for module specific information at [kmccontrols.com](http://kmccontrols.com).

### INSTALL MODULE

**NOTE:** Complete steps 1–2 to install the expansion module with screws. Complete steps 3–7 to install the expansion module on a 35 mm DIN rail.

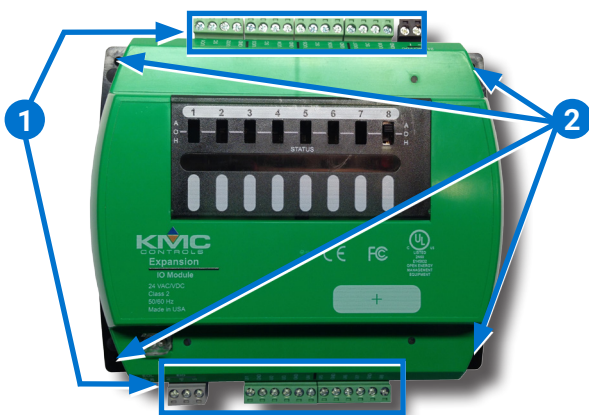
**NOTE:** Install the expansion module in a metal enclosure.

1. Position the expansion module so the color coded **terminal blocks** **1** are easy to access for wiring.

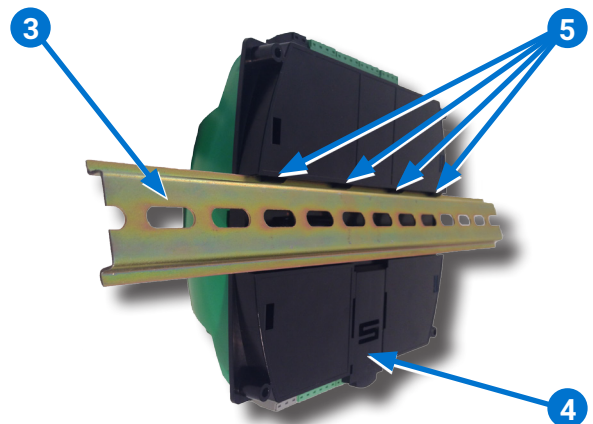
**NOTE:** The black terminals are for power. The green terminals are for inputs and outputs. The gray terminals are for communication.

2. Screw a #6 sheet metal screw through each corner of the **expansion module** **2**.

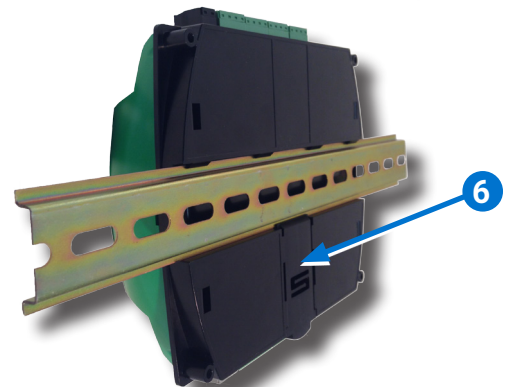
**NOTE:** Complete steps 3–7 to install the expansion module on a 35 mm DIN rail.



3. Position the **DIN rail** **3** so that when the expansion module is installed the color coded terminal blocks are easy to access for wiring.
4. Pull out the **DIN Latch** **4** until it clicks once.
5. Position the expansion module so the top **four tabs** **5** of the back channel rest on the DIN rail.
6. Lower the expansion module against the DIN rail.
7. Push in the **DIN Latch** **6** to engage the DIN rail.



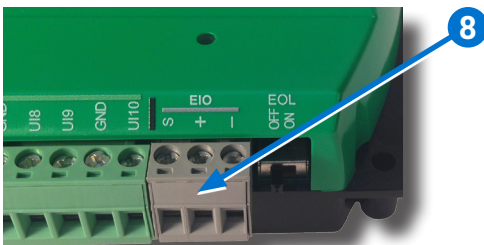
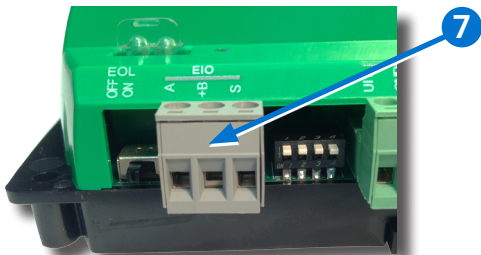
**NOTE:** To remove the expansion module, pull the DIN Latch until it clicks once and lift the expansion module off the DIN rail.



CONNECT BAC-5900 CONTROLLER

**NOTE:** Four CAN-5901 expansion modules can be connected in series (daisy chain) to a BAC-5900 controller to add additional inputs and outputs.

- 8. Wire an expansion module from the **gray EIO (Expansion Input Output) terminal block 7** of the expansion module to the **gray EIO terminal block 8** of the BAC-5900 series controller.



**NOTE:** The expansion module can be installed up to 200 feet (61 meters) away from the BAC-5900 controller.

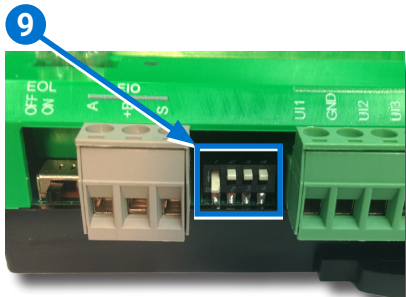
**NOTE:** Use 18 gauge AWG shielded twisted pair cable with maximum capacitance of 51 picofarads per foot (0.3 meters) for all network wiring (Belden cable #82760 or equivalent).

- 9. Connect the -A terminals in parallel with all other -A terminals on the network.
- 10. Connect the +B terminals in parallel with all other +B terminals on the network.
- 11. Connect the shields of the cable together at each device using a wire nut or the S terminal on the controllers or modules.
- 12. Connect the cable shield to a good earth ground at **one end only**.

**NOTE:** For principles and good practices when connecting an MS/TP network, see [Planning BACnet Networks \(Application Note AN0404A\)](#).

ADDRESSING CAN-5900 MODULES



















The **address switches 9** are used to identify the CAN-5900 modules inputs and outputs.



**NOTE:** When only one CAN-5900 module is used, the address EIO\_1 (factory default) does not need to be changed. Refer to the table below.

INPUTS AND OUTPUTS ADDRESSES			
Module	Inputs	Outputs	Address
Controller	3–10	1–8	0
EIO_1	11–18	9–16	1 (default)
EIO_2	19–26	17–24	2
EIO_3	27–34	25–32	3
EIO_4	35–42	33–40	4

**NOTE:** Switch 4 should always be up (Off). Switches 1 through 3 should be configured for the appropriate address as shown in the graphic below.

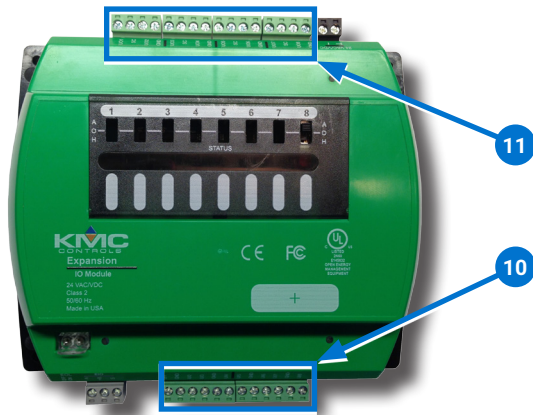
OFF/UP 				ON/DOWN 			
Address 1	    ON			Address 2	    ON		
Address 3	    ON			Address 4	    ON		

**NOTE:** Address the modules in consecutive order if more than one CAN module is used. If the modules are not addressed in consecutive order, gaps will exist between the input and output objects.

## CONNECT AUXILIARY EQUIPMENT

**NOTE:** Auxiliary VAV equipment such as fans, heaters, reheat valves, and discharge air temperature sensors can be connected to the expansion module.

13. Verify the expansion module is not connected to power.
14. Connect additional sensors to the **green (input) terminal block 10**.



**NOTE:** Wire sizes 12–24 AWG can be clamped together into each terminal.

**NOTE:** No more than two 16 AWG wires can be joined at a common point.

15. Connect additional equipment to the **green (output) terminals 11**.

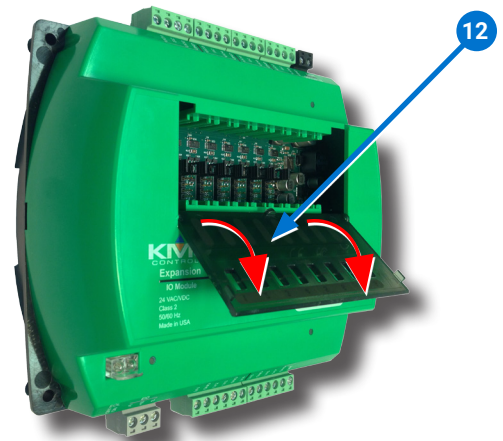
## INSTALL OVERRIDE BOARD

**NOTE:** Install output override boards for enhanced output options, such as manual control, using large relays, or for devices that cannot be powered directly from a standard output.

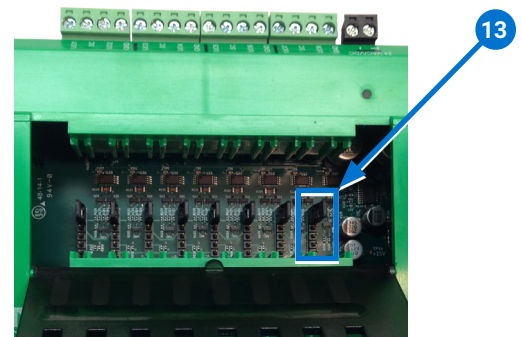
16. Verify the expansion module is not connected to power.

**CAUTION:** Connecting 24 VAC or other signals that exceed the operation specifications of the expansion module before an override board is installed will damage the expansion module.

17. Open the **plastic cover 12**.

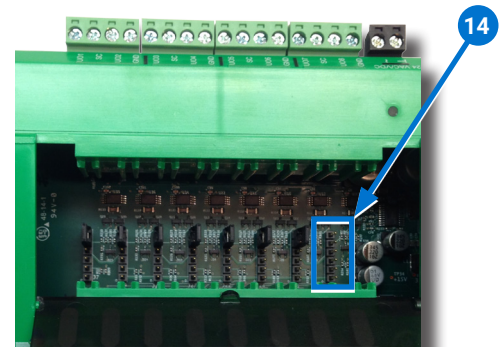


18. Remove the **jumper 13** from the slot where the override board will be installed.



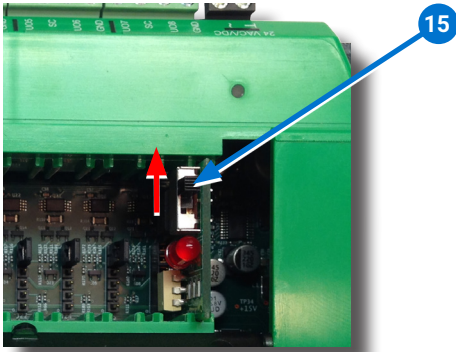
**NOTE:** Each of the eight override slots ships from KMC with a jumper installed on the two pins closest to the output terminal blocks. Only remove a jumper if an override board will be installed.

19. Install the override board in the slot the jumper was removed **14**.





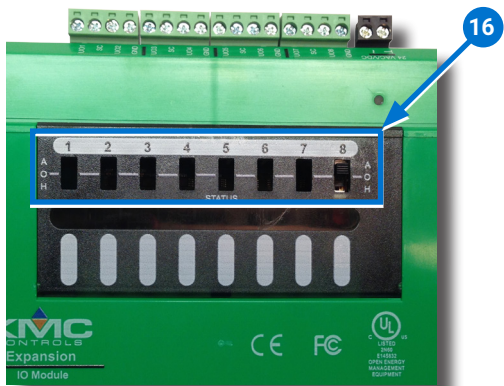
**NOTE:** Position the board with the **selection switch 15** towards the top of the expansion module.



20. Close the plastic cover.

21. Move the **A-O-H selection switch 16** on the override board to the appropriate position.

**NOTE:** A = Automatic  
O = Off  
H = Hand



**NOTE:** For more information about output override boards see the **Output Override Boards HPO-6700 Series Installation Guide**.

## CONNECT OVERRIDE BOARD OUTPUT DEVICE

22. Verify the output device is not connected to power.

23. Wire the output device to the corresponding **green (output) terminal block 17** of the override board.

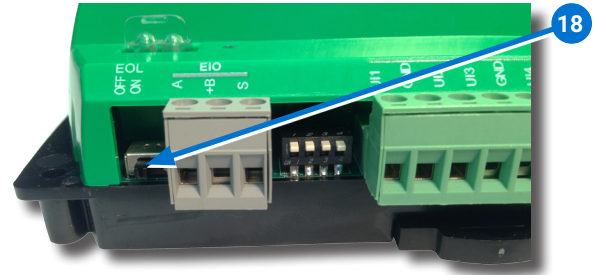


**NOTE:** Wire the HPO-6701 triac and HPO-6703/6705/670 output override boards to the Switched Common **SC** not the Ground Common **GND** terminal.

## SELECT END OF LINE (EOL)

**NOTE:** The EOL switch is shipped from KMC in the OFF position.

24. If the expansion module is at either end of the EIO network, turn the **EOL switch 18** to **ON**.

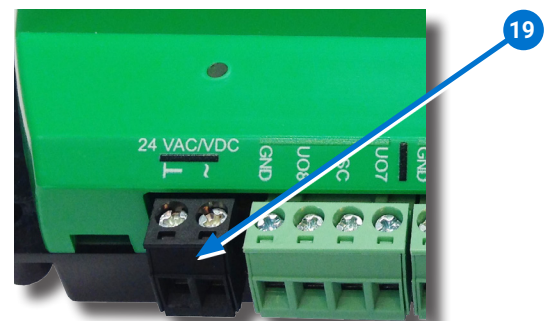


## CONNECT POWER

**NOTE:** Follow all local regulations and wiring codes.

**NOTE:** Use either shielded connecting cables or enclose all cables in conduit to maintain RF emissions specifications.

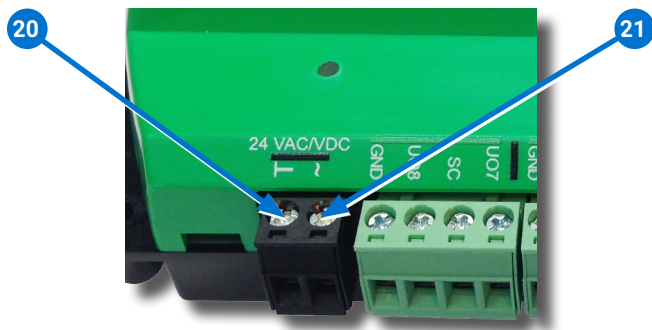
**NOTE:** Connect a 24 VAC, Class-2 transformer to the **black power terminal block 19** of the controller.



**NOTE:** Connect only one expansion module to each 24 VAC, Class-2 transformer with 12–24 AWG copper wire.

**NOTE:** The expansion module should be on the same electrical circuit as the controller.

25. Connect the neutral side of the transformer to the expansion module **common terminal** **⌊** **20**.
26. Connect the AC phase side of the transformer to the **phase terminal** **~** **21** of the expansion module.



## POWER AND COMMUNICATION STATUS

The **status LEDs** indicate power connection and network communication.

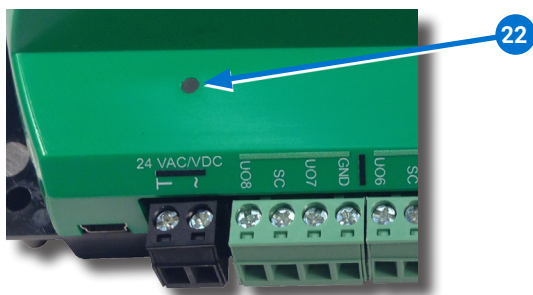
**NOTE:** If neither the green READY LED nor the amber COMM LED is ON, check the transformer fuse, power, and connections to the controller.

### GREEN READY LED **22**

- ◆ During initialization, the green READY LED is ON for 5 to 20 seconds.

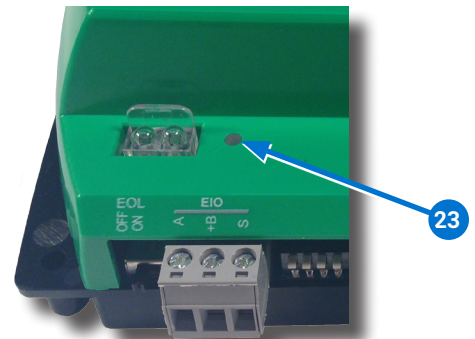
#### THEN

- ◆ The green READY LED flashes once per second, indicating power.



### AMBER CAN COMM LED **23**

The **Computer Area Network (CAN) status LEDs** indicate CAN network communication.



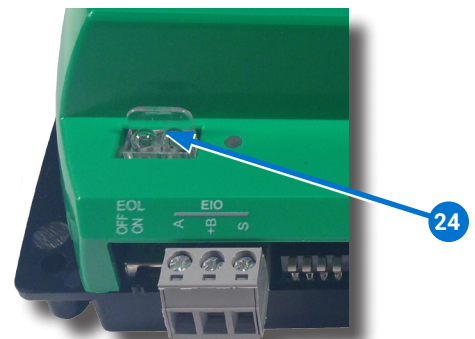
**NOTE:** The amber CAN COMM LED is active when a Conquest CAN-5901 Expansion Module is connected to the controller.

- ◆ The amber CAN COMM LED flickers as it receives and passes the token.

**NOTE:** If the amber CAN COMM LED is OFF, the module is not communicating with the CAN network. Check the power and EIO network connection.

### NETWORK ISOLATION BULBS

The two **network isolation bulbs** **24** serve three functions:



1. Removing the bulb assembly opens the EIO circuit and isolates the expansion module from the network.
  2. If one or both bulbs are lit, it indicates the network is improperly phased.
- ◆ This means the ground potential of the expansion module is not the same as other controllers on the network.

- ◆ If this happens, fix the wiring. (See **CONNECT BAC-5900 CONTROLLER** on page 2.)
- 3. If the voltage or current on the network exceeds safe levels, the lamps blow, opening the circuit.
- ◆ If this happens, fix the problem and replace the bulb assembly.

## REPLACEMENT PARTS

**HPO-0055** Replacement Network Bulb Module for Conquest Controllers, Pack of 5

**HPO-9901** Conquest Hardware Replacement Parts Kit

**NOTE:** HPO-9901 includes the following:

### Terminal Blocks

- (1) Black 2 Position
- (2) Grey 3 Position
- (2) Green 3 Position
- (4) Green 4 Position
- (2) Green 5 Position
- (2) Green 6 Position

### DIN Clips

- (2) Small
- (1) Large

## EXPANSION MODULE SET UP

Refer to the table below to set up the expansion module. See the documents or Help systems for the respective KMC Tool to use.

SET UP PROCESS			KMC TOOL
Config-uration	Programming (Control Basic)	Web Page Graphics*	
			Conquest NetSensor
			KMC Connect Lite app or software**
✓	✓		KMC Connect software
		✓	TotalControl software
		✓	KMC Converge module for Niagara <sup>AX</sup> WorkBench
<p>*Custom graphical user-interface web pages can be hosted on a remote web server, but not in the expansion module.</p> <p>**Requires a Near Field Communication (NFC) enabled Android mobile device or tablet or an Android or Apple mobile device, paired with an NFC-Bluetooth fob, running the KMC Connect Lite app or a PC, paired/connected to an NFC-Bluetooth fob, running the KMC Connect Lite Desktop software.</p>			

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