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INTRODUCTION

Complete the following steps to install a KMC Conquest™ CAN-5900 Series Expansion Module that will be connected to a Conquest BAC-5900 Series Controller or KMD-5290 LAN Controller.

The **CAN-5901** has **8** inputs and **8** outputs. The **CAN-5902** has **16** inputs and no outputs.

NOTE: A CAN-5902 requires a BAC-5900 series controller with firmware version R1.2.0.9 or later or KMD-5290 with firmware version **RXXX** or later.

For expansion module specifications, see the **data sheet** at kmccontrols.com. For additional information, see the **KMC Conquest Controller Application Guide**.

MOUNT THE MODULE

NOTE: Install the module in a metal enclosure for RF shielding and physical protection.

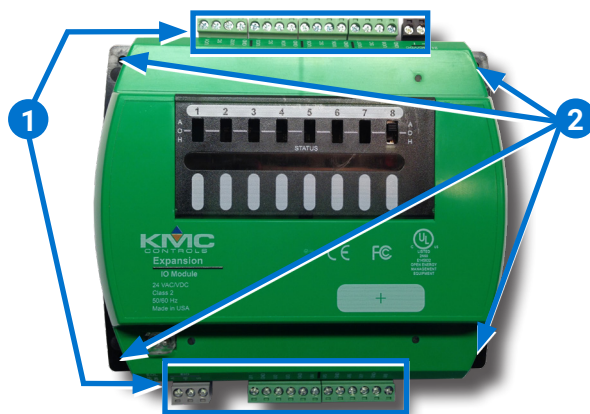
NOTE: To mount the module with **screws** on a flat surface, complete the steps in **On a Flat Surface on page 1**. Or to mount the module on a 35 mm **DIN rail** (such as integrated in an **HCO-1103** enclosure), complete the steps in **On a DIN Rail on page 1**.

On a Flat Surface

1. Position the module so that 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.

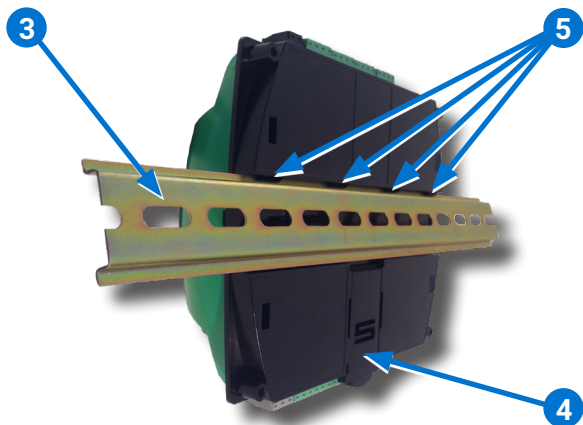
2. Screw a #6 sheet metal screw through each **corner 2** of the module.



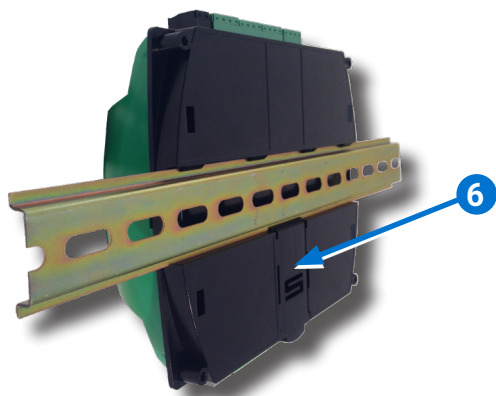
On a DIN Rail

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

5. Push in the **DIN Latch** 6 to engage the DIN rail.



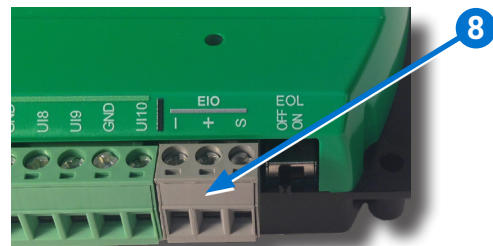
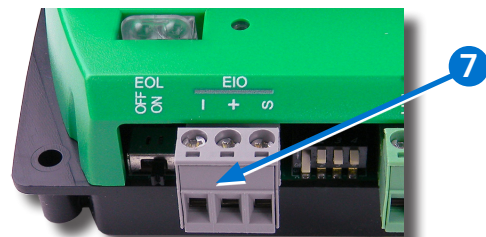
NOTE: To remove the module, pull the DIN Latch out until it clicks once and lift the module off the DIN rail.



CONNECT THE BAC-5900 CONTROLLER OR KMD-5290 LAN CONTROLLER

NOTE: Four expansion modules can be connected in series (daisy chained) to a BAC-5900 series controller or KMD-5290 LAN Controller to add additional inputs and outputs.

1. Wire the **gray EIO (Expansion Input Output) terminal block** 7 of the module to the **gray EIO terminal block** 8 of the BAC-5900 series controller or KMD-5290 LAN Controller. See [Sample Module Wiring on page 9](#).



NOTE: The module can be installed up to 200 feet (61 meters) away from the BAC-5900 controller or KMD-5290 LAN Controller. Up to four modules can be used.

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).

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

ADDRESS THE MODULES

The **address switches 9** are used to identify the module's inputs and outputs.



NOTE: When only one module is used, the address 1 (factory default) does not need to be changed. See the table below.

INPUT/OUTPUT ADDRESSES (CAN-5901)			
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

INPUT ADDRESSES (CAN-5902)			
Module	Inputs	Outputs	Address
Controller	3–10	NA	0
EIO_1	43–58		1 (default)
EIO_2	59–74		2
EIO_3	75–90		3
EIO_4	91–106		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		Address 2	
Address 3		Address 4	

NOTE: Input and output numbers must correspond with the appropriate module number set by the address switches. For example, if Inputs 19–26 and Outputs 17–24 are desired for a module, use the Address 2 switch positions.

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

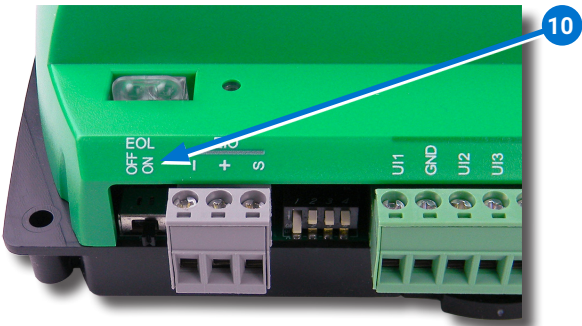
NOTE: One or more CAN-5901s can be mixed with one or more CAN-5902s. The addressing allows existing CAN-5901 input objects to remain the same if a CAN-5902 module is added later or even if a CAN-5902 replaces a CAN-5901.

MIXED MODULE EXAMPLE			
Module	Inputs	Outputs	Address
Controller	3–10	1–8	0
EIO_1 (CAN-5902)	43–58		1
EIO_2 (CAN-5901)	19–26	17–24	2
EIO_3 (CAN-5902)	75–90		3
EIO_4 (CAN-5901)	35–42	33–40	4

SET END OF LINE (EOL) SWITCH

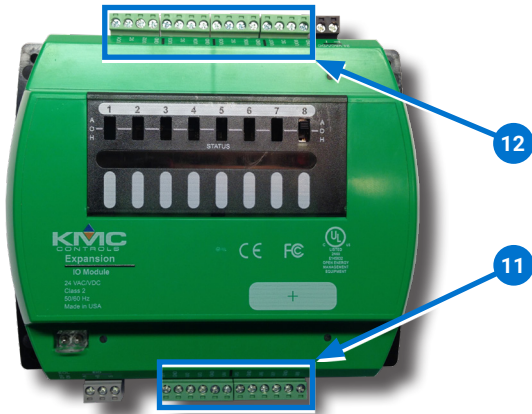
NOTE: The EOL switch is shipped from KMC in the OFF position.

- 1. If the module or controller is at either end of the EIO network (only one wire under the terminals), turn the **EOL switch 10** to **ON**.



CONNECT EQUIPMENT

1. Verify the module is not connected to power.
2. Connect sensors to the **green (input) terminals 11**. See **Sample Module Wiring on page 9**.



NOTE: Wire sizes 12–24 AWG can be clamped in each terminal.

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

3. Connect equipment (such as fans, heaters, and valves) to the **green (output) terminals 12** (on CAN-5901 only).

NOTE: A CAN-5902 has eight additional input terminals instead of output terminals.

⚠ CAUTION

Do NOT connect 24 VAC to any output without first installing an HPO-6701, HPO-6703, or HPO-6705 output override board!

INSTALL (OPT.) OVERRIDE BOARDS

NOTE: Install (optional) 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 CAN-5901 output.

1. Verify the CAN-5901 is **not** connected to power.

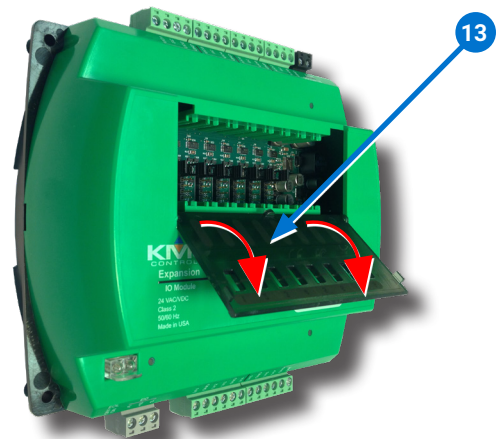
⚠ CAUTION

Connecting 24 VAC to an output before the appropriate override board is installed will damage the CAN-5901.

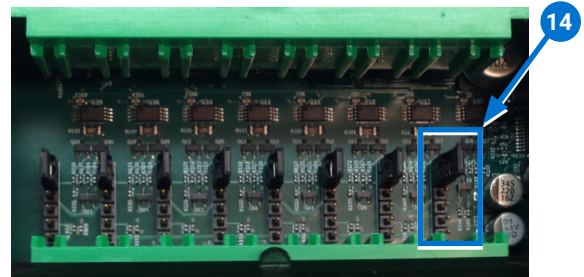
⚠ CAUTION

Connecting signals that exceed the operation specifications of the CAN-5901 may damage it.

2. Open the **plastic cover 13**.

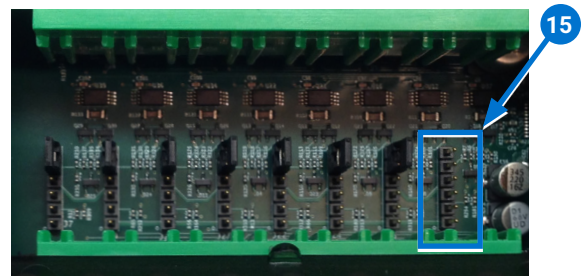


3. Remove the **jumper 14** from the slot where the override board will be installed.

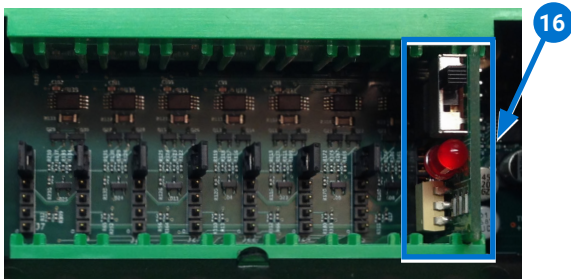


NOTE: Each of the eight override slots ships from KMC with a jumper installed on the two pins closest to the output terminal blocks. Only remove a jumper if an override board will be installed.

4. Install the override board in the slot from which the jumper was removed **15**.



NOTE: Position the board with the **selection switch 16** towards the top of the CAN-5901.



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

CONNECT POWER

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

NOTE: Modules are controlled by the BAC-5900 series controller or KMD-5290 LAN Controller. If they are on separate electrical circuits, the possibility exists that power could fail to the controller but remain on to the modules. Having the transformers for the controller and all modules on the same electrical circuit is recommended.

NOTE: If the **CAN-5901 loses EIO communication** with the BAC-5900 series controller or KMD-5290 LAN Controller, the CAN-5901 **retains the last present value for the outputs** until communication is restored or power is lost. When communication is restored, the outputs will go to whatever state the controller is commanding them to be at that time. (For CAN-5901 modules with firmware 0.0.0.1, about 30 seconds after communications loss, the module turns all of its outputs **off** until communication is restored.)

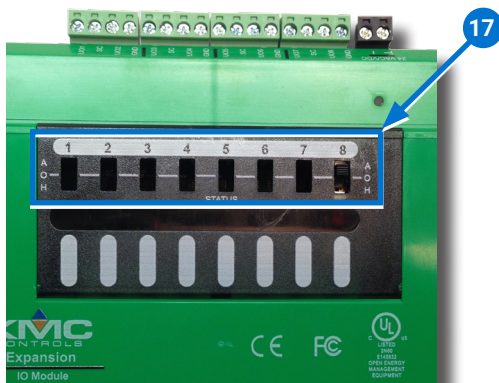
CAUTION

If the CAN-5901 will control a device that has a minimum required “off” time (e.g., a large compressor), for proper operation after a power failure, power the CAN-5901 from the same electrical circuit as the connected BAC-5900 series controller or KMD-5290 LAN Controller. The CAN-5901 should restart at the same time as the controller after a power failure.

NOTE: Follow all local regulations and wiring codes.

5. Close the plastic cover.
6. Move the **A-O-H selection switch 17** on the override board to the appropriate position.

NOTE: A = Automatic
O = Off
H = Hand (Manual On)



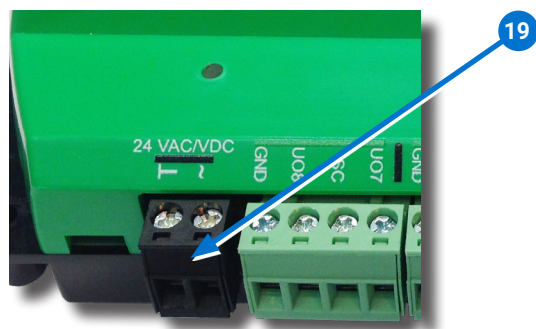
NOTE: For more information about output override boards, see the **HPO-6700 Series**.

7. Wire the output device to the corresponding **green (output) terminal block 18** of the override board.

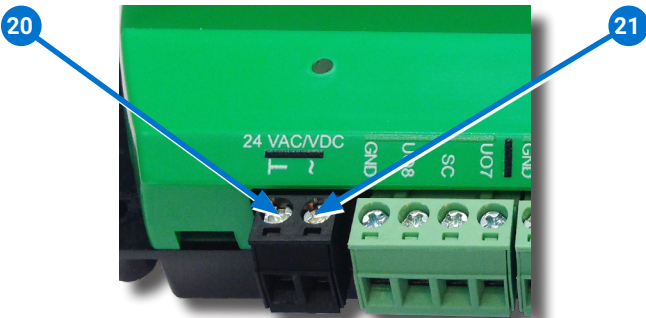


NOTE: Use either shielded connecting cables or enclose all cables in conduit to maintain RF emissions specifications.

8. Connect a 24 VAC, Class-2 transformer to the **black power terminal block 19** of the module. See **Sample Module Wiring on page 9**.



- A. Connect the neutral side of the transformer to the **common terminal L 20**.
- B. Connect the AC phase side of the transformer to the **phase terminal ~ 21**.



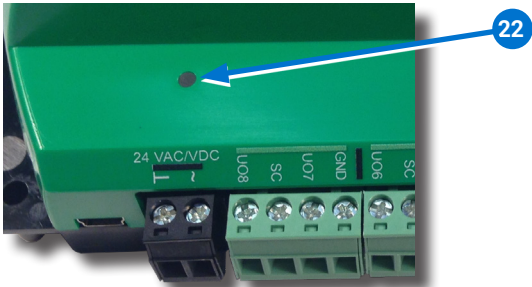
POWER AND COMMUNICATION STATUS

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

NOTE: If both the READY and EIO LEDs remain OFF, check the power and connections to the controller.

READY LED 22

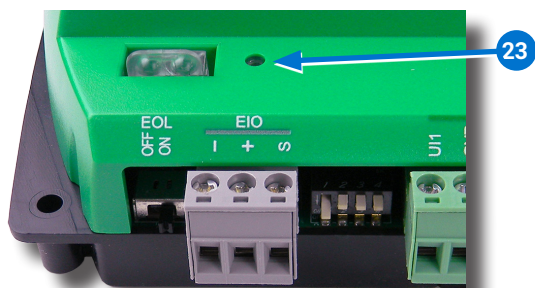
After module power-up or restart is complete, the READY LED flashes steadily about once per second, indicating normal operation.



EIO COMM LED 23

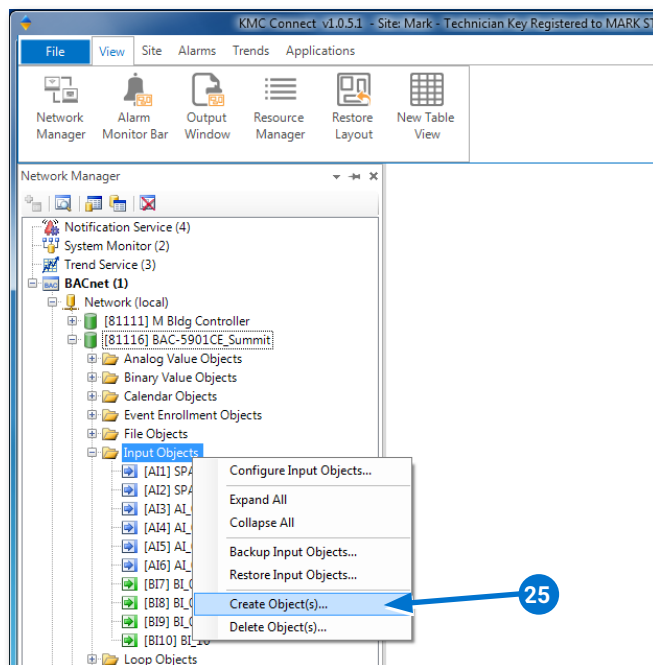
The **EIO communication status LED** next to the network bulb assembly indicates EIO network communication with the BAC-5900 series controller. The LED flickers as it receives and passes the token:

EIO COMM LED ON CAN-590X MODULE		
LED Activity	Typical Status	Action
Flashing rapidly	Connected and communicating with a controller and/or another module	None required
Flashing slowly	Connected but not communicating (silenced in [PRP140-x] EIO_0x proprietary object)	Reset object
Solid on	Not connected with an EIO network or a blown network isolation bulb (the LED might remain on or off, dependent on the timing of the interruption to the LED flashing cycle)	Check wiring and bulb
Off	No power to CAN-5901 if Ready LED is also off	Check power
EIO COMM LED ON BAC-590X CONTROLLER		
LED Activity	Typical Status	Action
Flashing	Communicating properly with expansion module(s)	None required
Off	Not communicating with any modules (possibly because of bad wiring, blown network isolation bulb, or silenced [PRP140-x] EIO_0x proprietary object)	Check wiring, bulb, and object
	No power if controller Ready LED is also off	Check power



MODULE CONFIGURATION

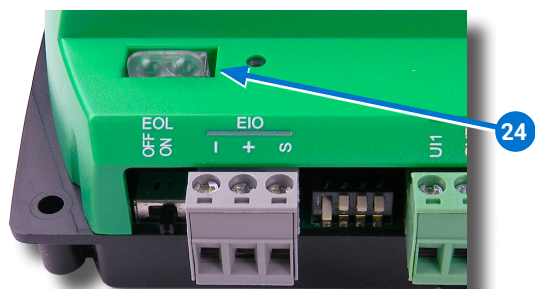
Input and output objects for the CAN-5900 series modules are **not** automatically created in the controller. Use KMC Connect, KMC Converge, or TotalControl to **create** **25** and configure input objects 11 and higher and output objects 9 and higher **26** (as needed) in the **connected BAC-5900 series controller**.



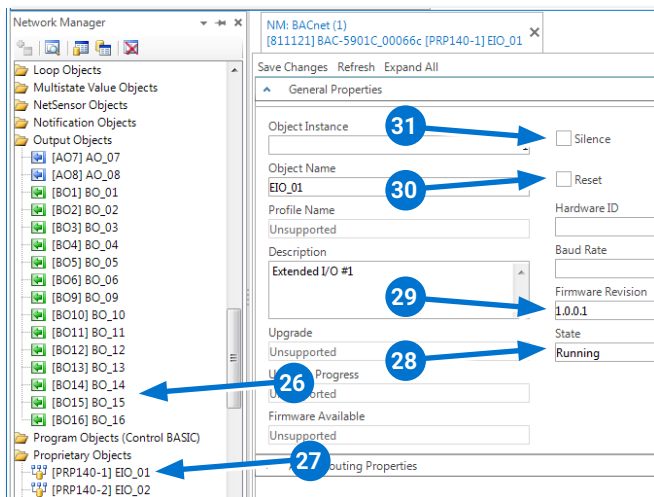
A CAN-5900 series module does not appear in the Network Manager of KMC Connect, KMC Converge, or TotalControl except as a proprietary object in the latest software.

NETWORK ISOLATION BULBS

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



- ◆ Removing the (**HPO-0055**) bulb assembly opens the EIO circuit and isolates the module from the network.
- ◆ If one or both bulbs are ON, the network is improperly phased. This means the ground potential of the module is not the same as other modules or the controller on the network. If this happens, fix the wiring. (See [Connect the BAC-5900 Controller on page 2](#).)
- ◆ If the voltage or current on the network exceeds safe levels, the bulbs blow, opening the circuit. If this happens, fix the problem and replace the bulb assembly.



With module firmware version 1.0.0.1 or later, the relevant **proprietary object 27 [PRP140-x] EIO_0x** (with x being the number of the addressed module) lets you:

- ◆ See the module's current **State 28** (Running, Silent, or Inactive).
- ◆ See the module's installed **Firmware Revision 29**.
- ◆ **Reset 30** the module remotely (rather than cycling power to it).
- ◆ **Silence 31** the module for testing purposes (all inputs and outputs hold their last current value).

For more information, see the documents or help systems for the respective KMC software tool.

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

NOTE: See the **Conquest Selection Guide** for more information about replacement parts and accessories.

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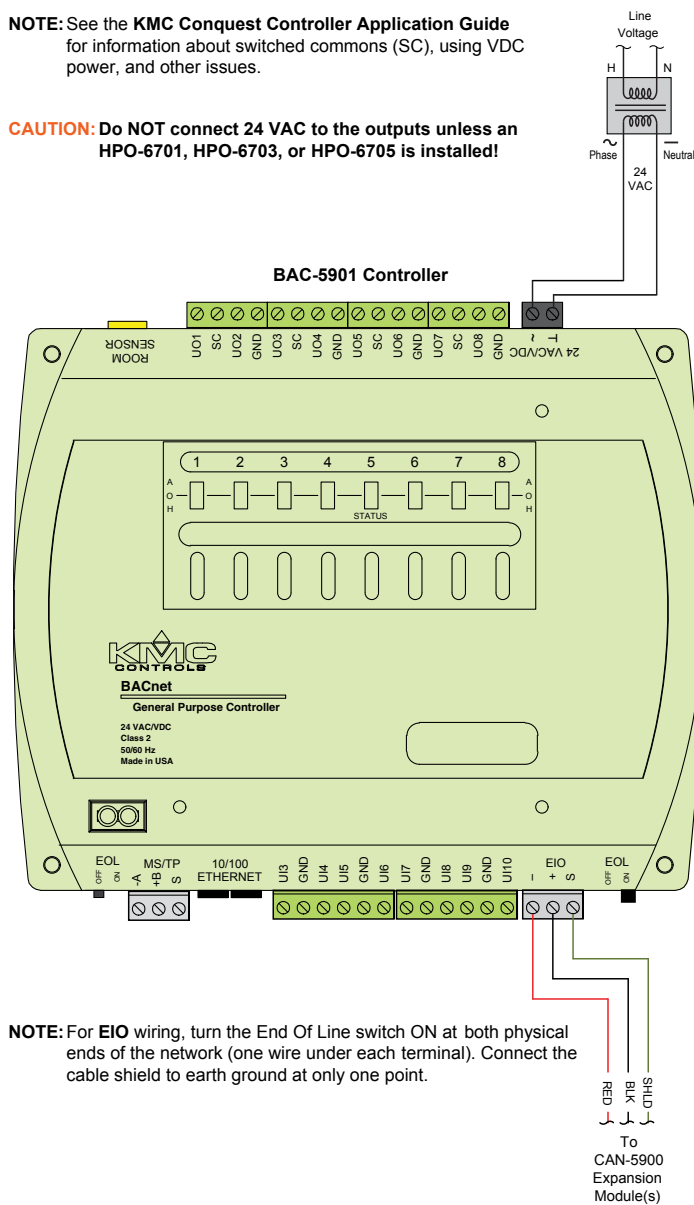
SAMPLE MODULE WIRING

(General Purpose Applications with Input/Output Expansion)

NOTE: For information on BAC-5900 connections, see the information in the installation guide for the BAC-5900 series controllers.

NOTE: See the **KMC Conquest Controller Application Guide** for information about switched commons (SC), using VDC power, and other issues.

CAUTION: Do NOT connect 24 VAC to the outputs unless an HPO-6701, HPO-6703, or HPO-6705 is installed!



NOTE: The CAN-5900 series modules do not have a Room Sensor port (unlike Conquest BAC-59xx/9xxx controllers). CAN-5902 modules have only inputs and no output override board slots.

NOTE: For information about connecting outputs and output override boards, see the information in the installation guide for the BAC-5900 series controllers.

