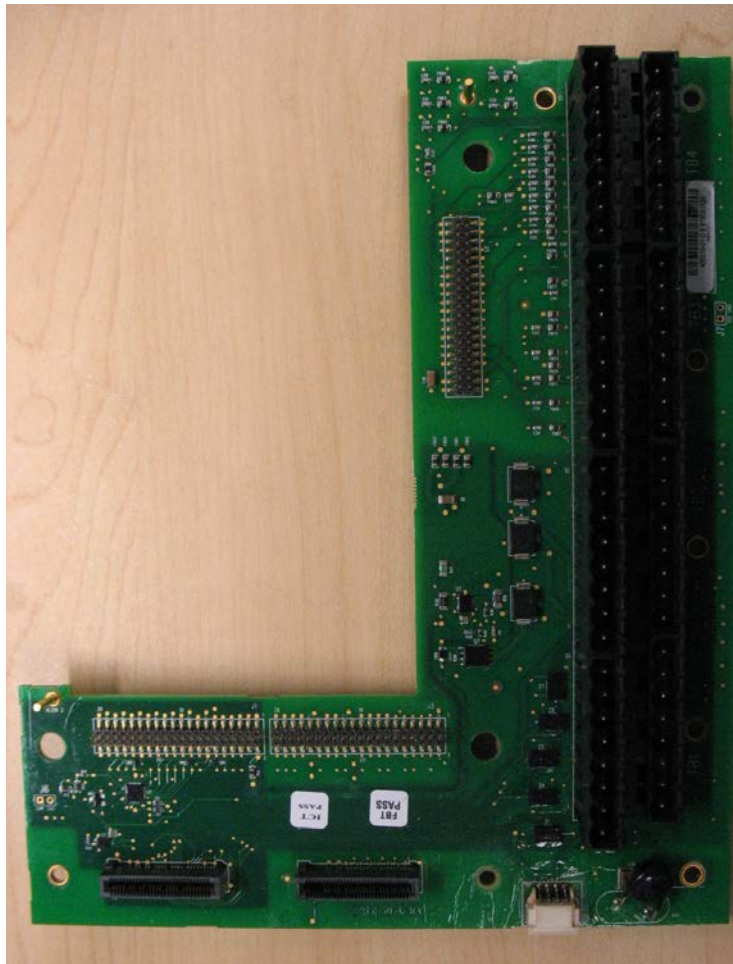


# FB2100/FB2200 Flow Computer I/O Terminal Board Field Replacement Guide



For Part Numbers (Kits):

- 400210010-KIT: I/O Termination Board
- 395807010-KIT: Terminal Blocks

## Device Safety Considerations

- **Reading these Instructions**

Before operating the device, read these instructions carefully and understand their safety implications. In some situations, improperly using this device may result in damage or injury. Keep this manual in a convenient location for future reference. Note that these instructions may not cover all details or variations in equipment or cover every possible situation regarding installation, operation, or maintenance. Should problems arise that are not covered sufficiently in the text, immediately contact Customer Support for further information.

- **Protecting Operating Processes**

A failure of this device – for whatever reason -- may leave an operating process without appropriate protection and could result in possible damage to property or injury to persons. To protect against this, you should review the need for additional backup equipment or provide alternate means of protection (such as alarm devices, output limiting, fail-safe valves, relief valves, emergency shutoffs, emergency switches, etc.). Contact Remote Automation Solutions for additional information.

- **Returning Equipment**

If you need to return any equipment to Remote Automation Solutions, it is your responsibility to ensure that the equipment has been cleaned to safe levels, as defined and/or determined by applicable federal, state and/or local law regulations or codes. You also agree to indemnify Remote Automation Solutions and hold Remote Automation Solutions harmless from any liability or damage which Remote Automation Solutions may incur or suffer due to your failure to ensure device cleanliness.

- **Grounding Equipment**

Ground metal enclosures and exposed metal parts of electrical instruments in accordance with OSHA rules and regulations as specified in *Design Safety Standards for Electrical Systems*, 29 CFR, Part 1910, Subpart S, dated: April 16, 1981 (OSHA rulings are in agreement with the National Electrical Code). You must also ground mechanical or pneumatic instruments that include electrically operated devices such as lights, switches, relays, alarms, or chart drives.

**Important:** Complying with the codes and regulations of authorities having jurisdiction is essential to ensuring personnel safety. The guidelines and recommendations in this manual are intended to meet or exceed applicable codes and regulations. If differences occur between this manual and the codes and regulations of authorities having jurisdiction, those codes and regulations must take precedence.

- **Protecting from Electrostatic Discharge (ESD)**

This device contains sensitive electronic components which be damaged by exposure to an ESD voltage. Depending on the magnitude and duration of the ESD, it can result in erratic operation or complete failure of the equipment. Ensure that you correctly care for and handle ESD-sensitive components.

## System Training

A well-trained workforce is critical to the success of your operation. Knowing how to correctly install, configure, program, calibrate, and trouble-shoot your Emerson equipment provides your engineers and technicians with the skills and confidence to optimize your investment. Remote Automation Solutions offers a variety of ways for your personnel to acquire essential system expertise. Our full-time professional instructors can conduct classroom training at several of our corporate offices, at your site, or even at your regional Emerson office. You can also receive the same quality training via our live, interactive Emerson Virtual Classroom and save on travel costs. For our complete schedule and further information, contact the Remote Automation Solutions Training Department at 800-338-8158 or email us at [education@emerson.com](mailto:education@emerson.com).

## Ethernet Connectivity

This automation device is intended to be used in an Ethernet network which **does not** have public access. The inclusion of this device in a publicly accessible Ethernet-based network is **not recommended**.

# Replacing the I/O Termination Board

UL Field Installed Accessory Kit for Use in Class I, Division 2, Groups A, B, C, and D

You can replace the I/O termination board in the field provided that the replacement has the exact same part and version.

## Restrictions

Hazardous area approvals request that any part replaced in the field be the exact same part ("like-for-like"). Upgrading or substituting different parts violates hazardous area certification.

Refer to the table below for the correct field replacement part number.

Item	Field Replacement Kit Part Number
Flow Computer I/O Termination Board Field Installed Accessory Kit for use with UL Listed Model Series FB2100 and FB220	400210010-KIT

## Required Tools

- #2 Phillips-head screwdriver
- 3/32-inch flat head screwdriver (For 3.81 mm pitch terminal block connections and disconnecting the internal connector to the sensor)
- Hexagonal torque wrenches with 3mm, #1, and #2 Phillips-head bits. Ranges must include 1 to 2 in-lbs (0.1 to 0.2 N-m), 4 to 6 in-lbs (0.5 to 0.7 N-m), and 10 to 12 in-lbs (.1 to 1.4 N-m).

## Electrical Ratings

- **Input Voltage:** 10.5 Vdc to 30 Vdc external supply (Max power at 10 watts)

## Ambient Temperature Ranges:

May be used up to a *maximum* ambient temperature of 80°C and a *minimum* ambient temperature of -40°C; refer to the data plate attached to the device for ambient temperature.

## WARNING

EXPLOSION HAZARD – Substitution of any components may impair suitability for Class I, Division 2.

## WARNING

EXPLOSION HAZARD – Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

## DANGER

EXPLOSION HAZARD: Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.

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### Tip

Because some of these procedures involve removing small parts such as screws, we recommend you provide a container for holding small parts.

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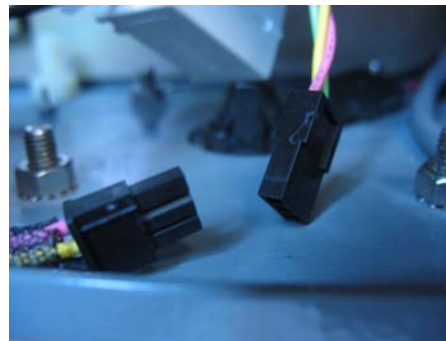
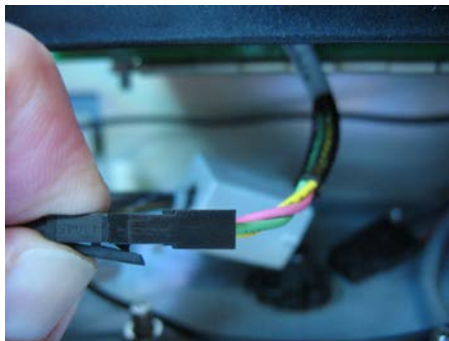
1. Open the enclosure door. The I/O termination board resides underneath the CPU enclosure. The easiest way to proceed is to remove both the HMI module and CPU enclosure together as a single assembly. Follow steps 2 through 4 to do this:



2. Remove power by unplugging terminal block TB2 (pins 1,3,5,7).



3. Disconnect the intermediate cable between the CPU enclosure and the sensor module. To do this, press down on the outer edge of the connection tab, then pull the connectors apart.



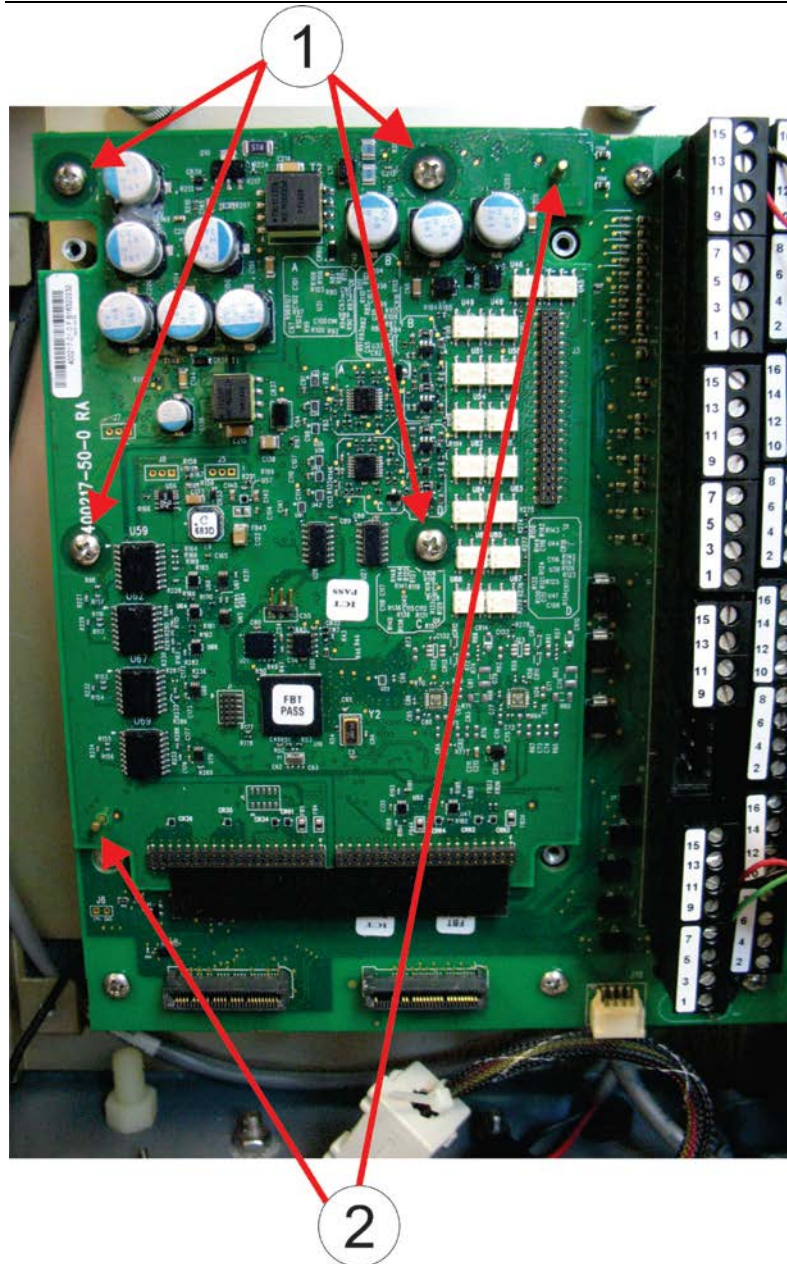
4. Use a #2 Phillips-head screwdriver to loosen the four captive fastening screws that hold the CPU enclosure and gently pull the assembly (including the HMI module) out and set it aside.





- 1 CPU Enclosure
  - 2 HMI Module
  - 3 Captive Fastening Screws (4)
- 

5. The 8-channel expansion I/O board is an option on the FB2200 Flow Computer only; it is not available on the FB2100 Flow Computer. If the optional 8-channel expansion I/O board is present, use a #2 Phillips-head screwdriver to remove the four screws that attach the 8-channel expansion I/O board to the L-shaped I/O termination board. (Keep the screws in a safe place because you will need them in a later step.) Carefully lift the 8-channel expansion I/O board off its posts and set it aside.



- 1 Screws
- 2 Posts

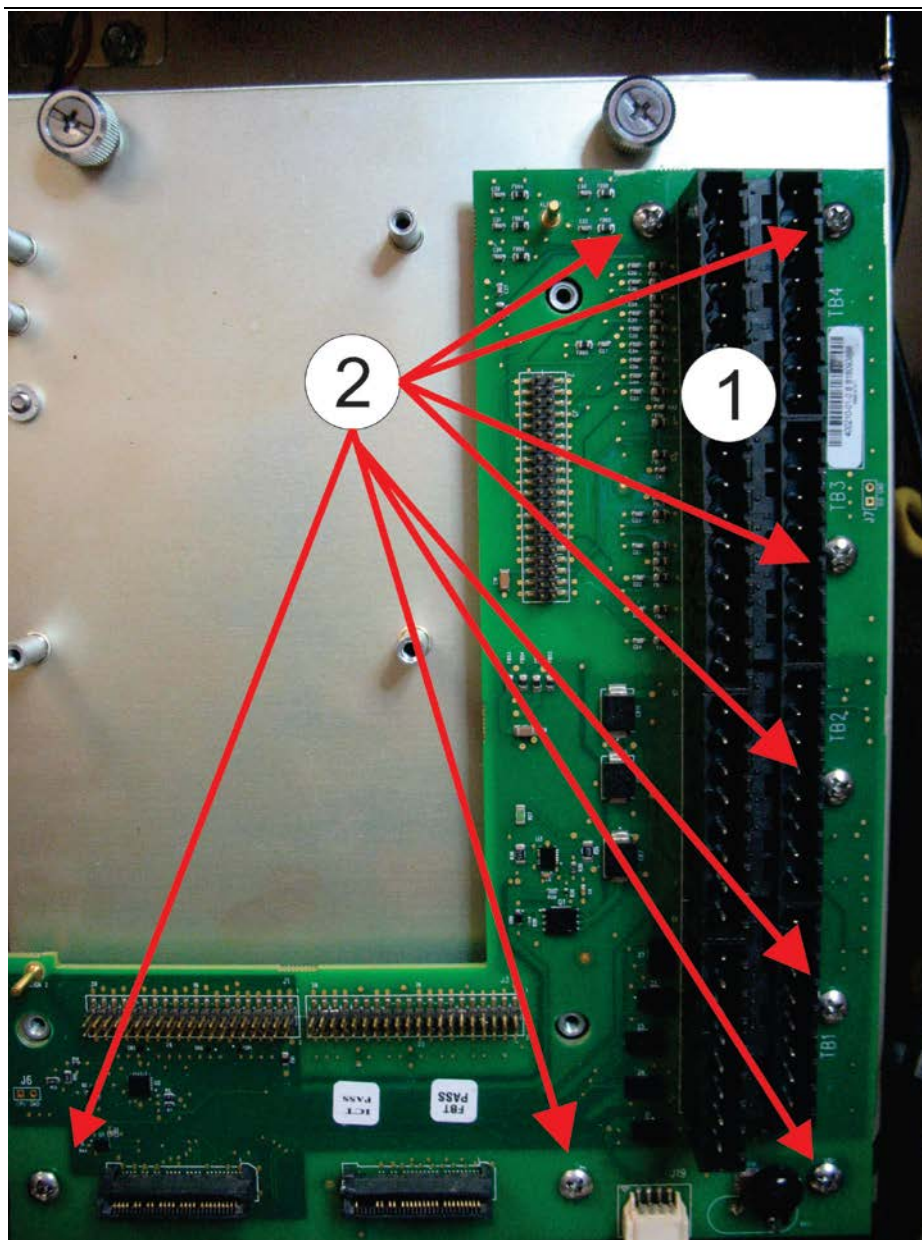
6. Disconnect the remaining terminal blocks on the I/O termination board.
7. Unscrew the eight (8) screws that attach the I/O termination board to the enclosure and remove the board. Save the screws because you will need them in the next step.

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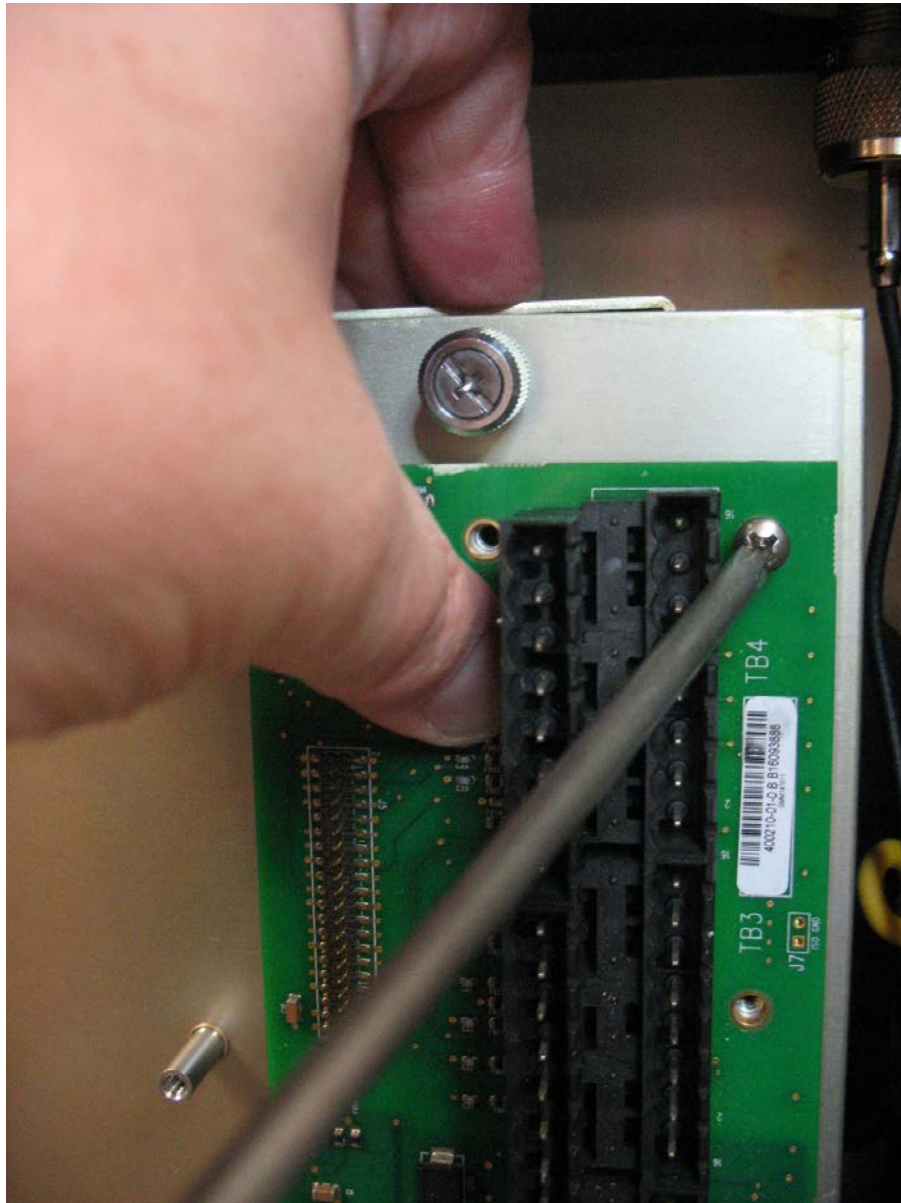
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- 1 L-shaped I/O termination board (all terminal blocks removed)
  - 2 Screws
-



8. Line up the new replacement I/O termination board with the screw holes and reattach it using the eight screws. Torque screws to 4 to 6 in-lbs. (0.5 to 0.7 N m).



9. If present, place the optional 8-channel expansion I/O board on the posts, and carefully line it up to avoid bending pins. Gently press the expansion I/O board down onto the I/O termination board. Reattach the 8-channel expansion I/O board to the I/O termination board using the four screws you removed in step 5. Torque screws to 1 to 2 in-lbs (0.1 to 0.2 N m).
10. Take the CPU enclosure (with the HMI module attached) and line up the CPU enclosure's captive fastening screws with their matching holes on the I/O assembly. Press the enclosure screws onto the holes and hold it there while tightening each of the captive fastening screws. Torque screws to 7 to 9 in-lbs. (0.8 to 1.0 N m).
11. Connect the intermediate cable to the sensor module and make sure it has clearance.

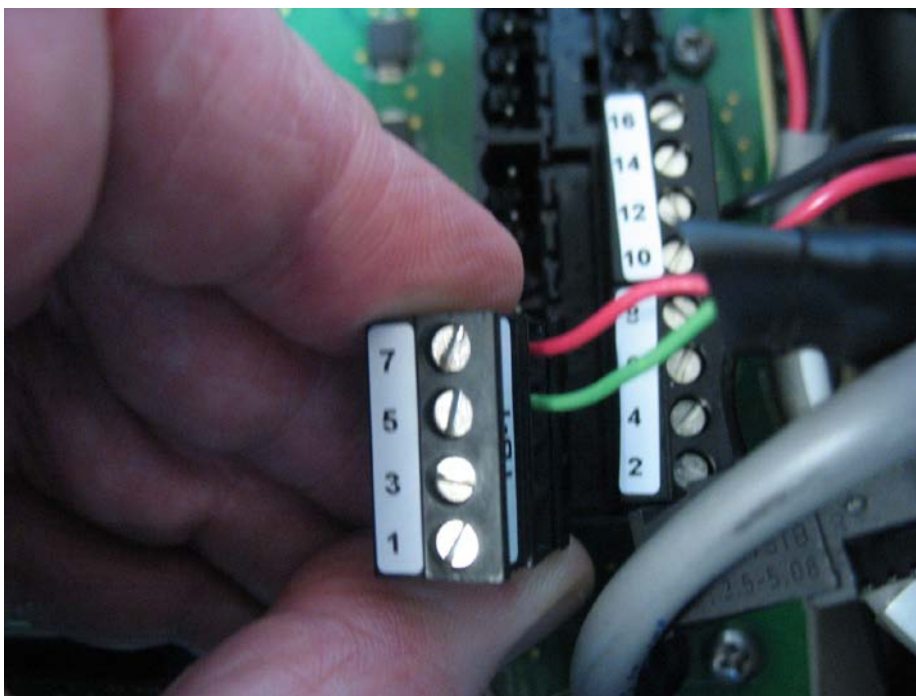
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12. You can now plug the terminal blocks into the I/O termination board. Plug in TB2 (pins 1, 3, 5, 7) last to restore power. Be careful to plug the terminal block into its correct socket on the termination board.




13. Close the enclosure door.

# Replacing Pluggable Terminal Blocks

## Restrictions

Hazardous area approvals request that any part replaced in the field be the exact same part (“like-for-like”). Upgrading or substituting different parts violates hazardous area certification.

Refer to the table below for the correct field replacement part number.

Item	Field Replacement Kit Part Number
Flow Computer Terminal Block Field Installed Accessory Kit for use with UL Listed Model Series FB2100 and FB2200. 4-way terminal block (in pack of 4): 	395807010-KIT
UL Field Installed Accessory Kit for Use in Class I, Division 2, Groups A, B, C, D	

## Required Tools

- 1/8-inch flat-head screwdriver (for 5.08 mm pitch terminal block connections)

## Ambient Temperature Ranges:

May be used up to a maximum ambient temperature of 80°C and a minimum ambient temperature of -40°C; refer to the data plate attached to the device for ambient temperature.

### WARNING

EXPLOSION HAZARD: Substitution of any components may impair suitability for Class I, Division 2.

### WARNING

EXPLOSION HAZARD: Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

### DANGER

EXPLOSION HAZARD: Ensure the area in which you perform this operation is non-hazardous. Performing this operation in a hazardous area could result in an explosion.

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1. Open the enclosure door. The terminal blocks plug into the I/O termination board:

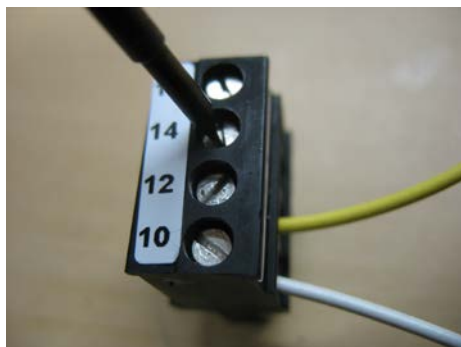




2. Remove power by unplugging terminal block TB2 (pins 1,3,5,7).



3. For the terminal block you want to replace, make sure you note which wire goes to which terminal. If they aren't labeled, you should label them or take a digital photo so you know which wire goes to which connector of the terminal block.
4. Use a flat head screwdriver to loosen the screw for each wire coming into the old terminal block. Slide the same wire into the identical position on the new (replacement) terminal block and tighten the screw to hold it in place. Repeat for each wire.



5. Repeat steps 3 through 4 for each terminal block you want to replace.

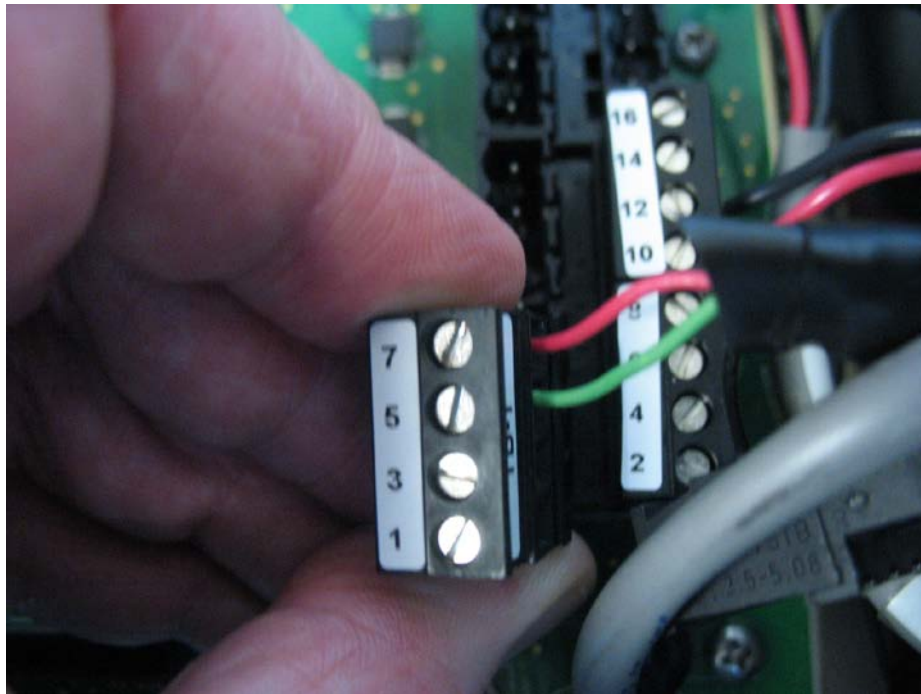
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6. You can now plug the terminal blocks into the I/O termination board. Plug in TB2 (pins 1,3,5,7) last to restore power. Be careful to plug the terminal block into its correct socket on the termination board.



7. Close the enclosure door.



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