Application Note: Trenton Systems FSC1401 Fan Speed Controller Installation

Date: August 3, 2016

Note to Technician: Always observe precautions for handling electrostatic sensitive devices when performing maintenance on a Trenton Systems product. Heel straps, wrist straps, and electrostatically controlled environments are required when handling Trenton Systems board products. System damage, malfunction or data loss may result if proper precautions are not observed. Refer to this Trenton Support video for a demonstration of proper electrostatic sensitive device precautions: https:/www.youtube.com/watch?v=MClSGt4K7Cw

Caution: High voltages are present inside the chassis of Trenton Systems products. The technician is required to exercise care to not induce electrical short circuits while performing this or any procedure on Trenton Systems products. Injury, death or system damage may result from electrical short circuits.

Caution: Spinning fans may result in injury. Ensure no implements or body parts are in the path of spinning cooling fans inside the system. Bodily injury or system damage may result from contact with spinning fans.

The Trenton Systems FSC1401 is an intelligent fan speed control circuit that installs in place of the standard Trenton Systems fan board. The FSC1401 utilizes temperature probes located along the rear I/O fence of the chassis to intelligently adjust fan speeds on-the-fly in order to reduce noise while maintaining adequate system airflow. The following procedure will detail how a field technician can retrofit the FSC1401 into an existing Trenton Systems 5U, quad-segment HDEC chassis.

Overview of Procedures:

In general, this process involves putting the system into a serviceable position, i.e., removing the system from any rackmount enclosure and gaining access to the internal componentry. Removing the System Host Boards from the enclosure and removing the fan bar in order to retrofit the FSC1401 which involves replacement of the previous fan speed circuitry and installation of temperature sensors. The technician will then reinstall the previously removed parts in order to return the system to operational status.

Note: Ensure mains power has been completely removed from the system before performing this procedure. Standby voltages are used on Trenton Systems products in order to enable certain system functions and may present a shock risk if not properly removed from the system before maintenance is performed.

Required Materials:
This procedure requires the *FSC1401 Retrofit Kit,* (194500001010-00) available from Trenton Systems. **Note: Do not attempt this procedure without the proper parts validated by Trenton Systems. System damage may result if improper parts are used.**
Contact Trenton for parts availability.

This kit consists of
- 1 – FSC1401 Board
- 4 – 12v Power to Fan Speed Control Wire
- 4 – Air Temp Probes 38"
- 4 – 6-32 x1/4" Screws for FSC1401
- 12 – 1/8" Cable Clamps
- 16 – 6-32 x 3/8" Screws for Backplane Clamps and Temperature Probes
- 4 – 1/4" Cable Clamps for Temperature probes

Detailed Procedures:
First, remove the system retaining screws that secure the chassis to the rackmount cabinet, if applicable. See the figure below, area highlighted in red, already removed.

Refer to the reference information for your rackmount slide rail solution, if applicable, for information on sliding the unit forward into the maintenance position.
There will be a set of chassis lid securing screws on the chassis. On our example chassis, there are 2 screws on the rear, 3 on each side and 3 along the top. Remove these screws using an appropriate driver and place them in a secure location as they will be replaced when the operation is complete. Pictures detailing these screw locations are below:
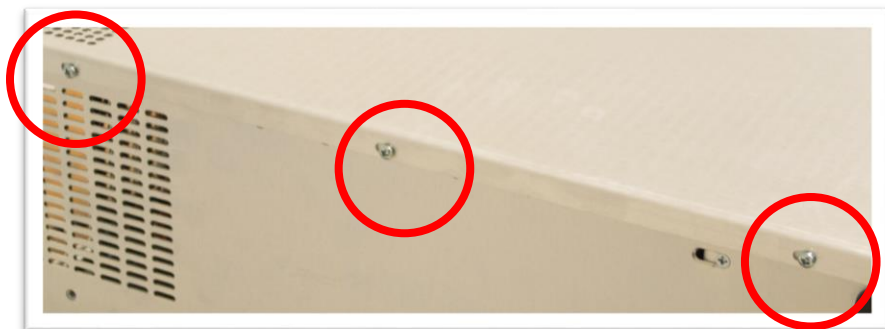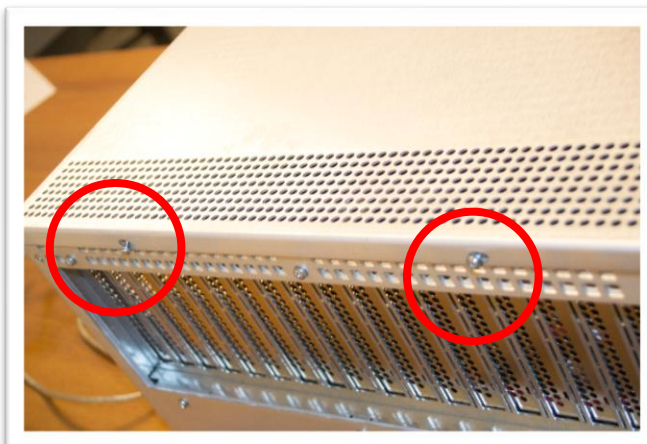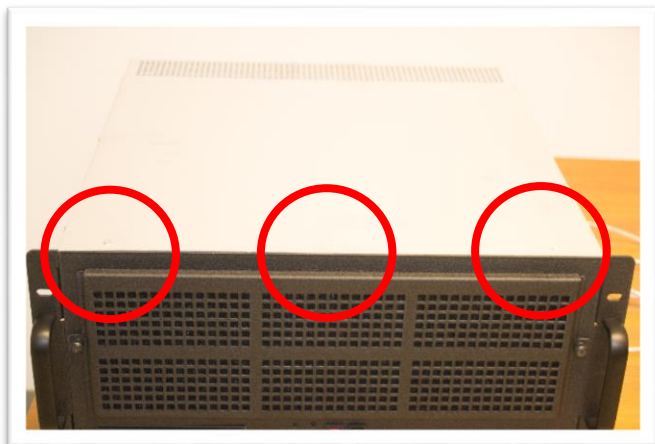
With the unit open, remove the chassis card hold-down bracket located over the SHBs and secured with 4 screws, 2 each on either side of the unit and remove from the system.

Remove all SHB(s) and Option Card(s) from the system and place in a safe area out of the way.

Remove the fan bar by removing the 4 screws, 2 on each side towards the front of the unit. Unplug the 4 fans from the backplane. Remove the fan bar and place in an accessible work area.

Using the 4, 6-32 x 3/8" screws, install the FSC1401 on the front of the fan bar. Take the fan power connectors and plug them into the FSC1401, left to right, Fan 1 to P30, Fan 2 to P31, Fan 3 to P32 and Fan 4 to P33.
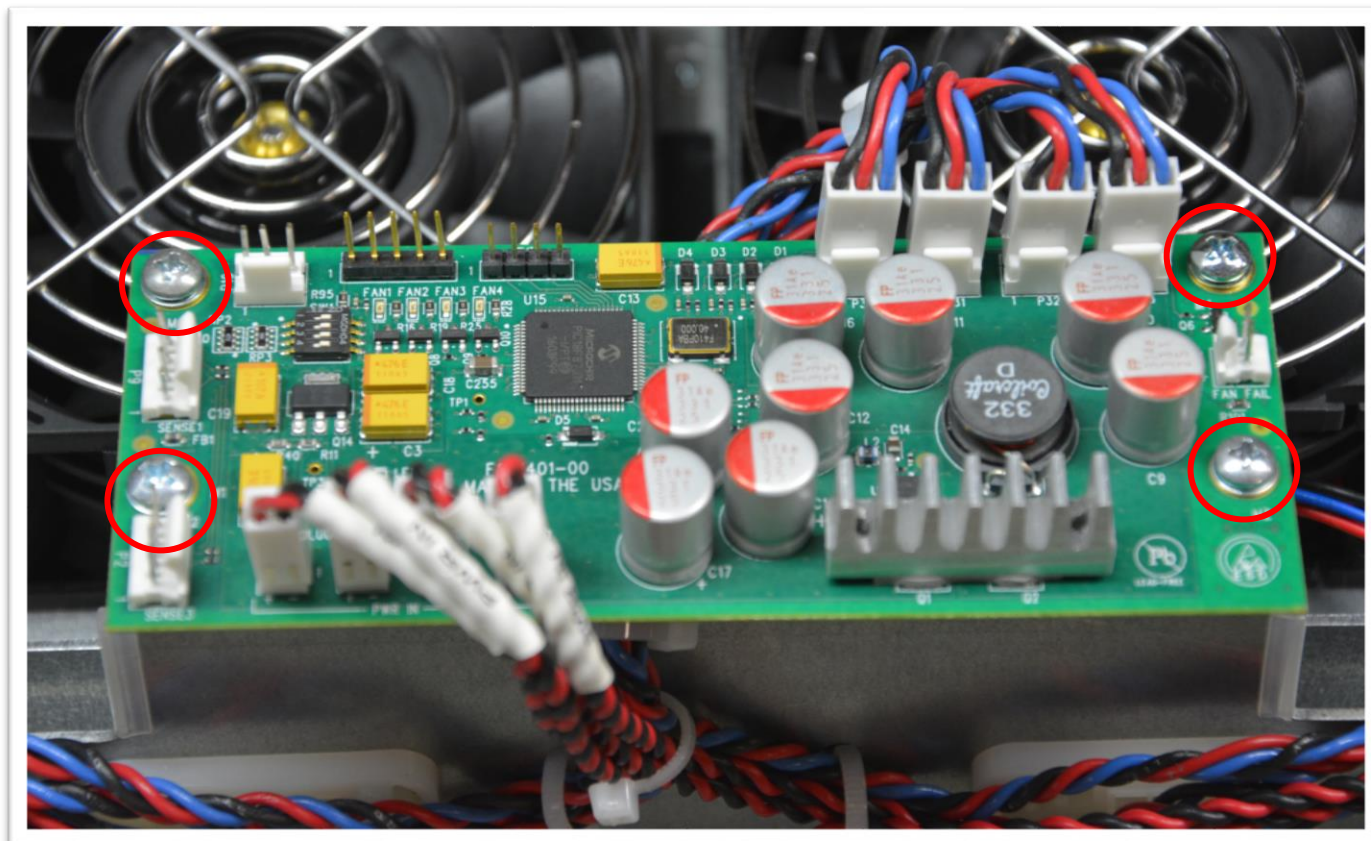
Install and secure, using zip ties or preferred method, the fan power input cables so that they have about 8" of pigtail from the left hand bottom side of each fan, as shown.
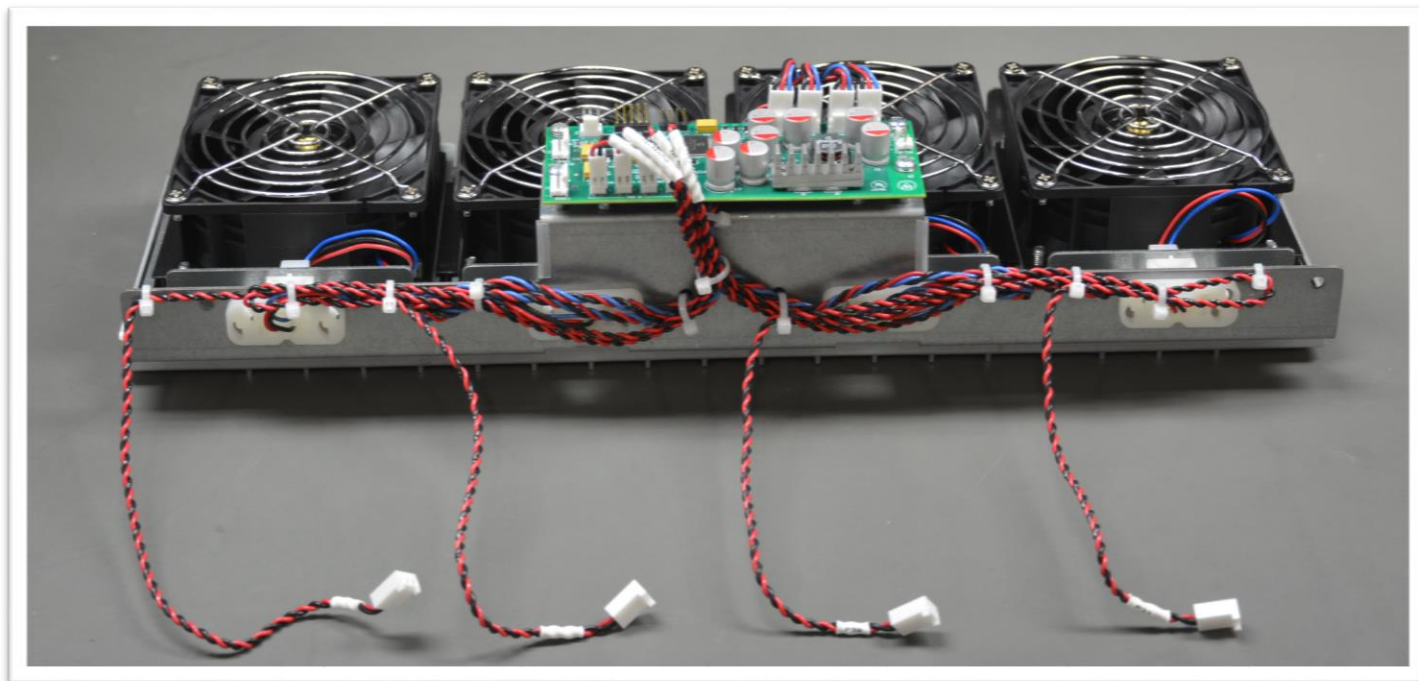

Remove the *Fan Fail* connector from the "B" segment of the backplane.
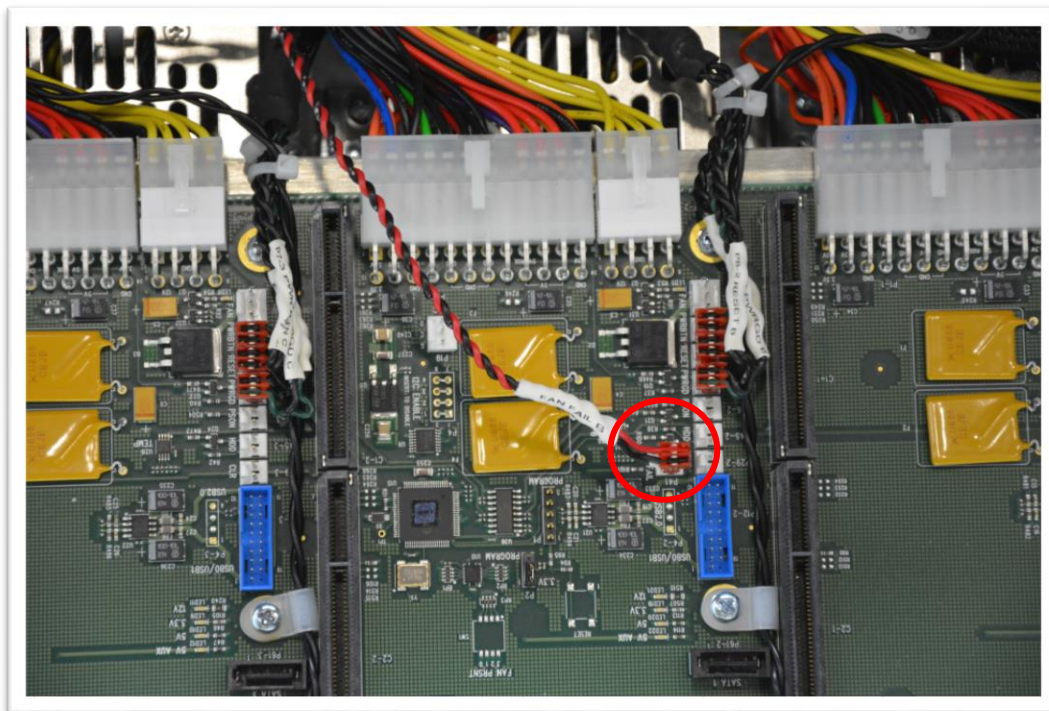
Remove the indicated screws from the backplane. Using the 1/8" cable clamps, run the temperature probe wires through them, one per segment, along the SHB slot and reinstall using 11, 6-32 x 3/8" screws, as indicated. The temperature probes should be run to the I/O fence (rear) of the chassis and the plugs should go to the front of the system.
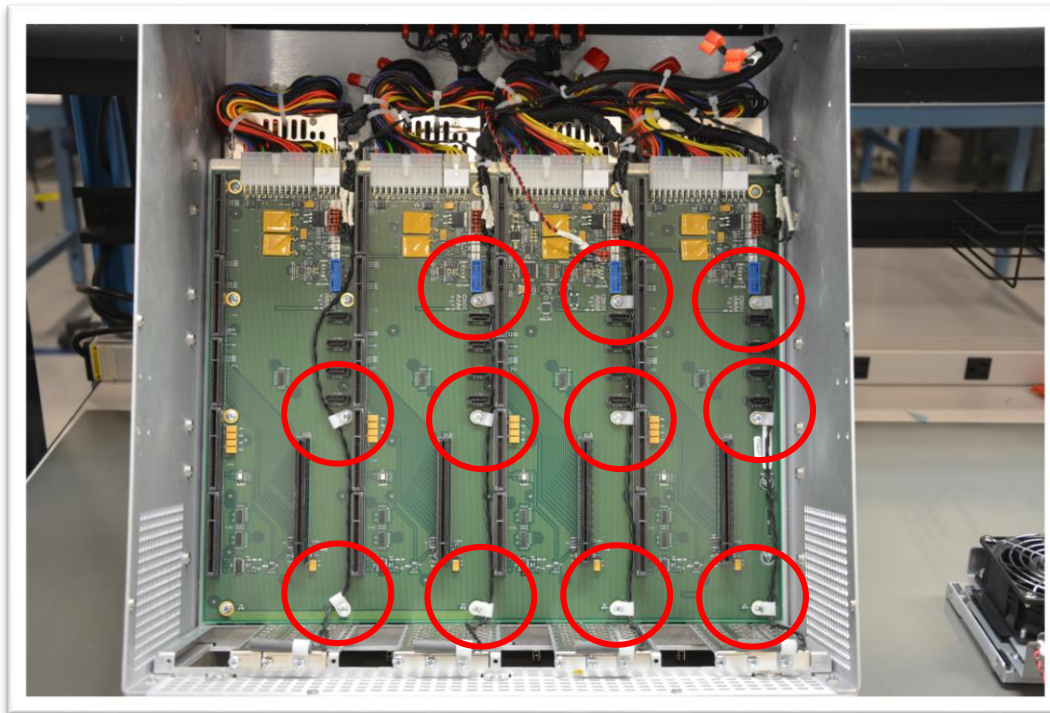

Using four 6-32 ¾" screws, and 1/4" cable clamps, secure the body of the temperature probes to an I/O bracket screw hole, as indicated.
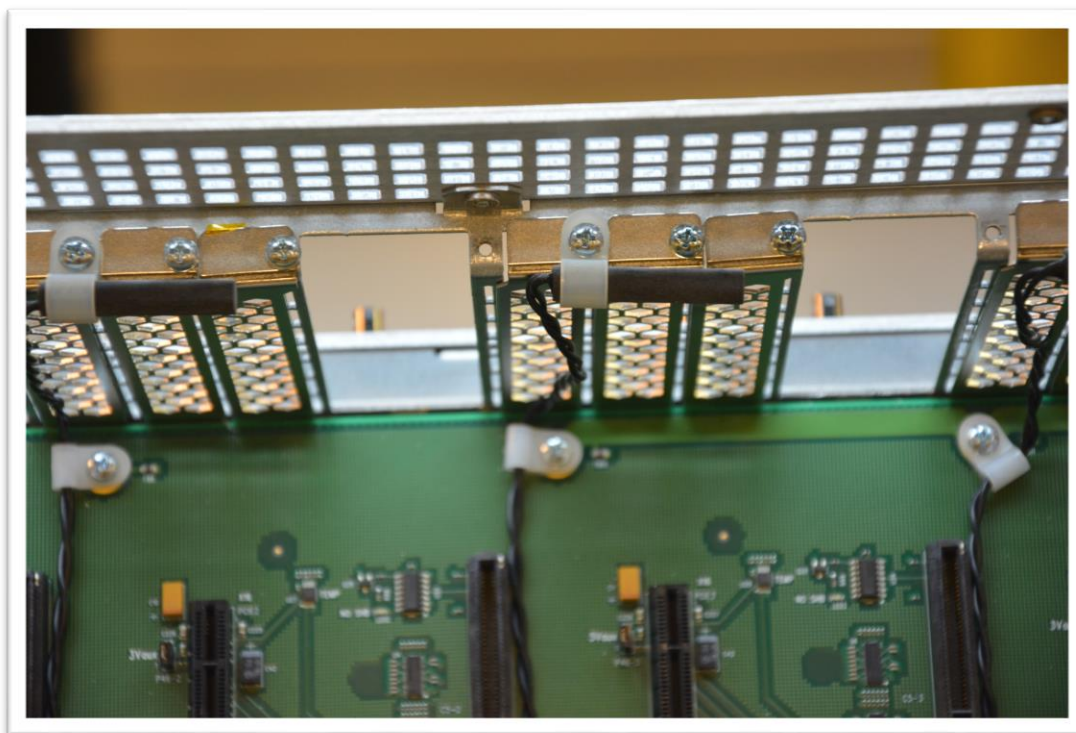
Use zip ties or preferred method to secure the harness at the front of the chassis to the existing chassis wiring.

Insert the fan bar as indicated and plug the 4, 12V power plugs into the "FAN" ports on the backplane, 1 per segment, with each connector going to a PWR CONNECTOR port on the lower left hand side of the FSC1401.
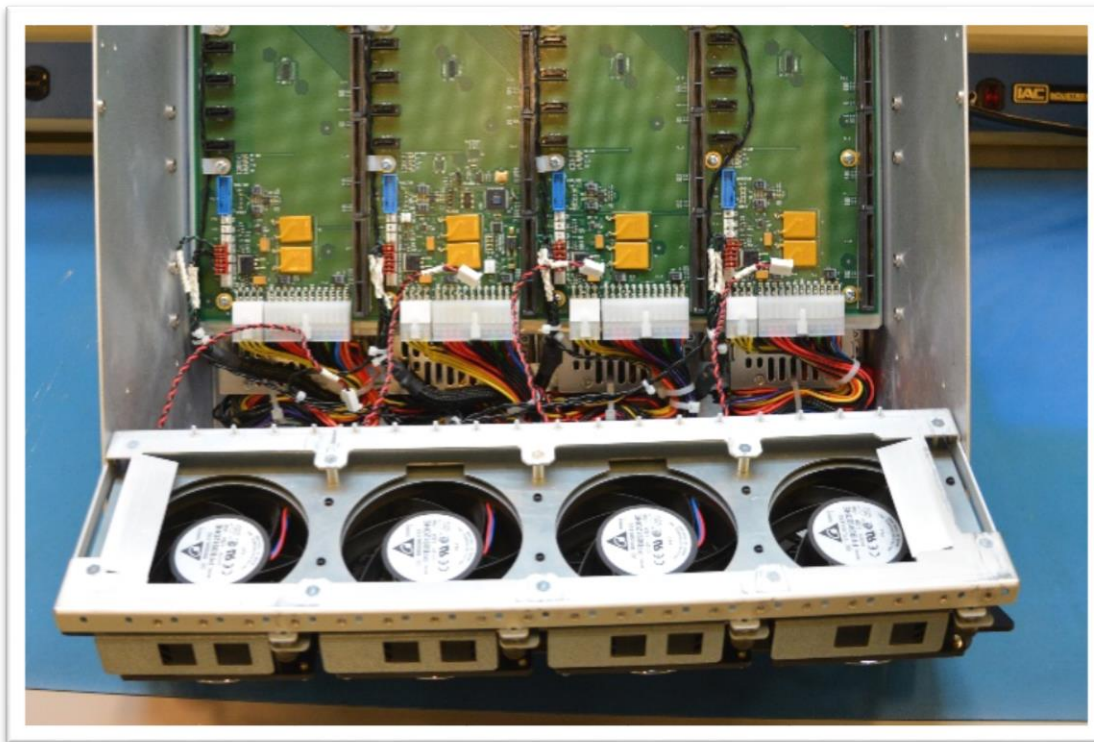

Orient as it will be installed in the system and install the Fan Fail Connector to the Fan Fail port on the FSC1401.
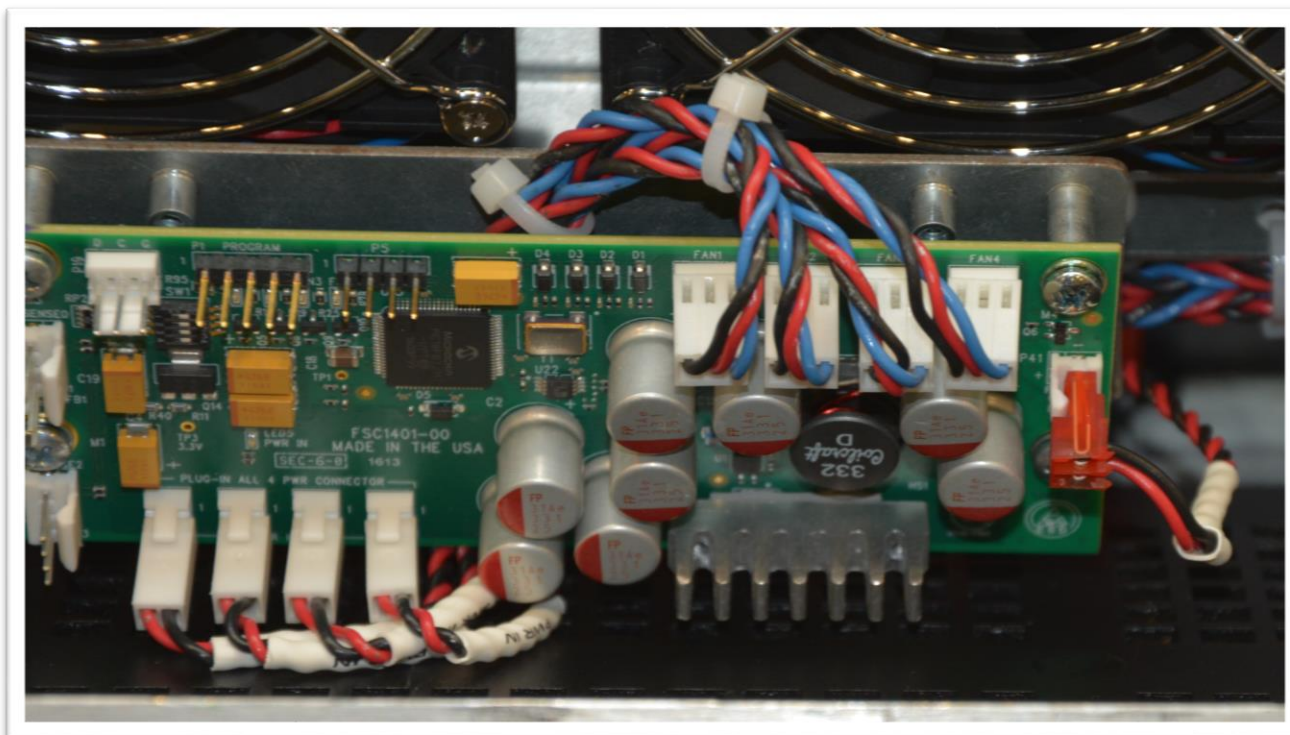
Plug the sensor connectors into the FSC1401, P9 to P9 on the FSC1401, P2 to P2 on the FSC1401.
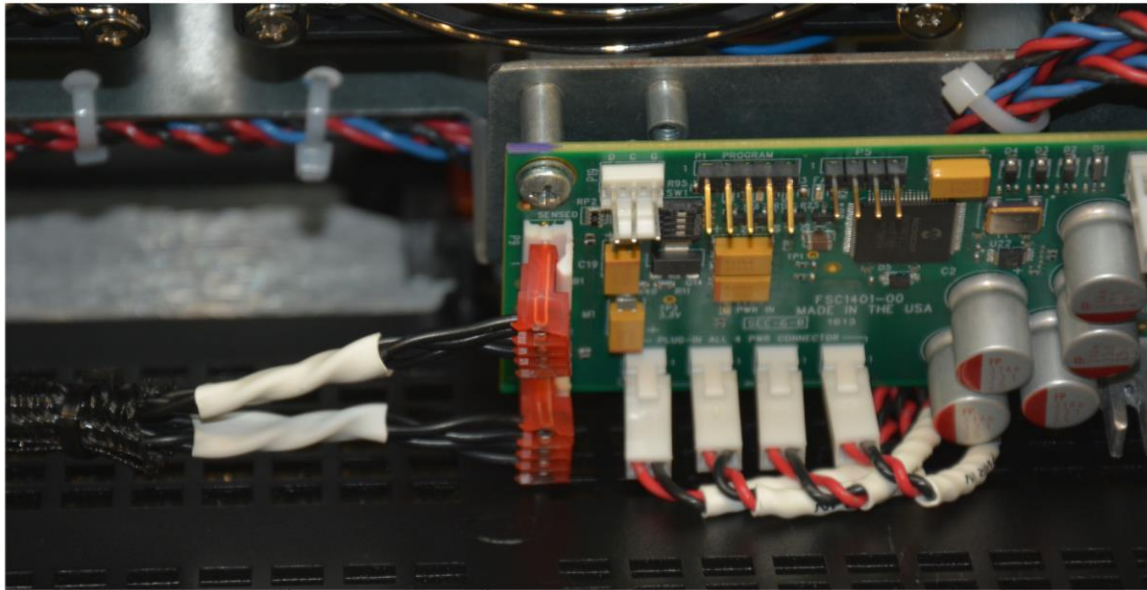
Insert the fan bar into the operational position and confirm that all wires are properly secured.

Reinstall the fan bar using the screws that secured it previously.
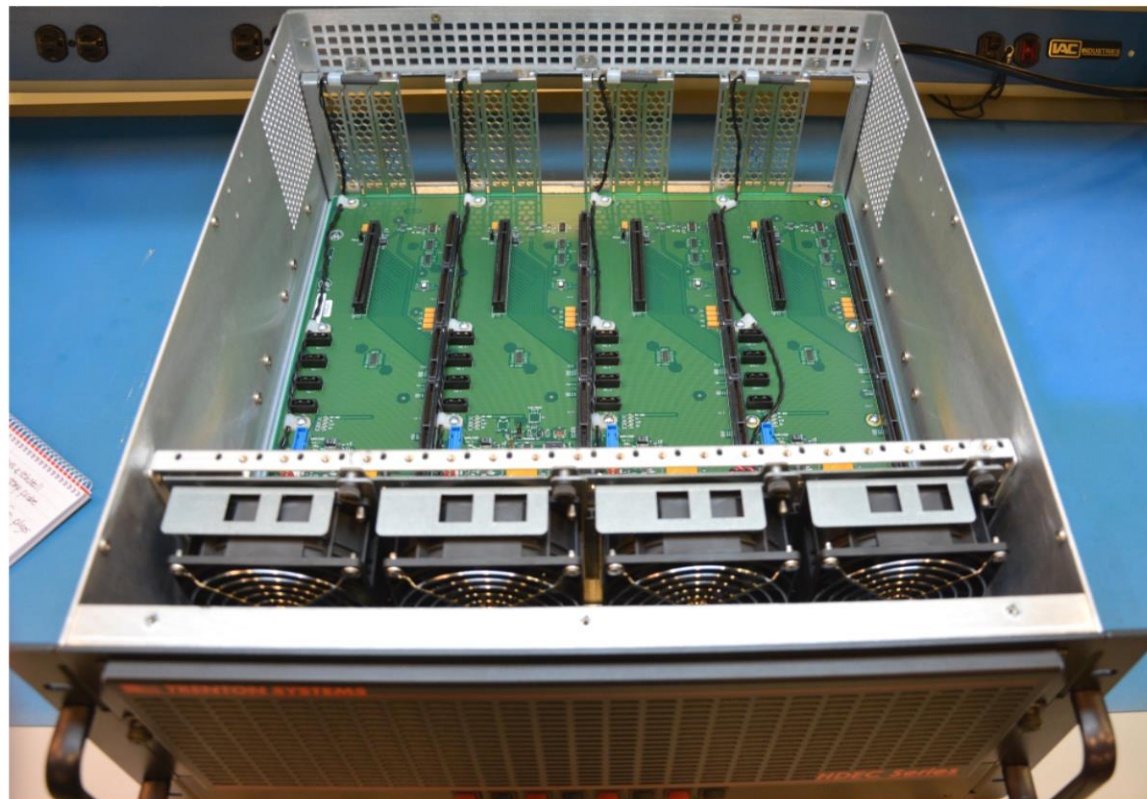
Reinstall the SHB(s) and any Option Card(s) using the screws that secured them previously.

Reinstall the hold-down bar using the screws that secured it previously.

Replace the cover and secure with the screws that secured it previously.

Reverse any other steps taken to remove the system from service.

Hopefully, you find this information helpful in retrofitting the fan control circuitry of your Trenton Systems product. For additional information contact Trenton toll-free in the U.S. at 1-800-875-6031 or worldwide at +1-770-287-3100. Please visit our website at www.TrentonSystems.com or follow us on: