



**FEDERAL SIGNAL**  
Safety and Security Systems

# One-Way to Two-Way Kit for DCFCB

Upgrade DCFCB from a One-Way to a Two-Way Controller

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***Upgrade Manual***

## Limited Warranty

This product is subject to and covered by a limited warranty, a copy of which may be found at [www.fedsig.com/SSG-Warranty](http://www.fedsig.com/SSG-Warranty). A copy of this limited warranty may also be obtained by written request to Federal Signal Corporation, 2645 Federal Signal Drive, University Park, IL 60484; by email to [info@fedsig.com](mailto:info@fedsig.com), or by calling +1 708 534-3400.

This limited warranty is in lieu of all other warranties, express or implied, contractual or statutory, including, but not limited to the warranty of merchantability, warranty of fitness for a particular purpose and any warranty against failure of its essential purpose.



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## Safety Messages

### **⚠ WARNING**

Read and understand these procedures before installation. All work should be performed by a properly trained Technician or Electrician that is qualified to do electrical work. You must follow electrical and ESD precautions. If any of the electronics are handled without static protection, the electronics may be damaged.

Listed below are important safety instructions and precautions you should follow:

#### **Important Notice**

Federal Signal reserves the right to make changes to devices and specifications detailed in the manual at any time in order to improve reliability, function or design. The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for any inaccuracies.

#### **Installation and Service**

- Electrocutation or severe personal injury can occur when performing various installation and service functions such as making electrical connections, drilling holes, or lifting equipment. Therefore, only experienced electricians should install this product in accordance with national, state and any other electrical codes having jurisdiction. Perform all work under the direction of the installation or service crew safety foreman.
- The sound output of sirens is capable of causing permanent hearing damage. To prevent excessive exposure, carefully plan siren placement, post warnings and restrict access to areas near the sirens. Sirens may be operated from remote control points. Whenever possible, disconnect all siren power including batteries before working near the siren.
- After installation or service, test the siren system to confirm that it is operating properly. Test the system regularly to confirm that it will be operational in an emergency.
- If future service personnel do not have these warnings and all other instructions shipped with the equipment to refer to, the siren system may not provide the intended audible warning and service personnel may be exposed to death, permanent hearing loss, or other bodily injury. File these instructions in a safe place and refer to them periodically. Give a copy of these instructions to new recruits and trainees. Also, give a copy to anyone who is going to service or repair the sirens.

#### **Operation**

Failure to understand the capabilities and limitations of your siren system could result in permanent hearing loss, other serious injuries or death to persons too close to the sirens when you activate them or to those you need to warn. Carefully read and thoroughly understand all safety notices in this manual and all operations-related-items in all instruction manuals shipped with equipment. Thoroughly discuss all contingency plans with those responsible for warning people in your community, company, or jurisdiction.

***Read and understand the information contained in this manual before attempting to install or service the siren.***

Pay careful attention to notices located on the equipment.

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## General Description

### Introduction

This manual describes how to upgrade your DCFCB from a one-way siren controller to a two-way siren controller.

DCFCBs are one-way controllers for mechanical sirens or similar devices. The DCFCBs receive commands through a radio or other communications, but do not provide any status back toward the activation point. DCFCTBs are two-way control and status monitoring controllers. These units interface to two-way radio systems, which provide two-way control and monitoring capabilities. Federal Signal has a pre configured kit for upgrading DCFCB cabinets to DCFCTB cabinets. For VHF upgrades order Q-DCFC1-2H; and for UHF upgrades, order Q-DCFC1-2U.

**NOTE:** Antenna is not included. You must order antenna separately.

### Qualifications

You must be a properly trained Technician or Electrician in order to install this product. You must be an Engineer or Technician with radio equipment capable of deviation adjustment and VSWR test. Typically, a radio shop has this capability.

### Required Equipment

You need the following:

- Standard Technician's Tool Kit.
- Bucket Truck and Ladder may be needed to access the site. Access for antenna installation is required.
- The One-Way to Two-Way Kit for DCFCB.
- VHF part number: Q-DCFC1-2H
- UHF part number: Q-DCFC1-2U

**NOTE:** For pricing and availability, call Customer Care at 800-548-7229.

- Some installer parts are required.

**NOTE:** These are not part of the One-Way to Two-Way Kit for DCFCB.

For installation instructions on the Yagi and Omni Antennas go to the Federal Signal's website. Typically, additional antenna mounting parts are needed. The required parts are listed in the manual and may change according to local code.

The following are some of the typical parts required. Typically, these are supplied by the electrician.

- Two AWG ground wire for or grounding antenna to ground rod.  
**NOTE:** Treat ground wire connections with anti-oxidant compound.
- Ground rod and tools required to install the ground rod.
- Four 3/8-inch by 4-inch lag bolts
- Four 3/8-inch washers

## Introduction

- Four 3/8-inch lock washers to mount antenna bracket to pole.
- Compression C-tap #2AWG
- Twenty-five clips, coax nail for nailing down the antenna cable
- Ten UV-resistant tie wraps for tie wrapping the cable to the bracket
- Tape, mocap, silicone insulated for sealing the antenna connectors.  
**NOTE:** Seal all connections.
- Disposal bag or box to put the old parts into that will be removed.
- Radio service monitor and VSWR tester required for the radio system. Typically, radio shop supplied.

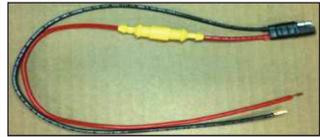
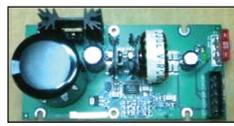
## Recommended Cables

When equipped with radio from the NX-5000 Series in your two-way RTUs, Federal Signal recommends purchasing the following cables for computer programming:

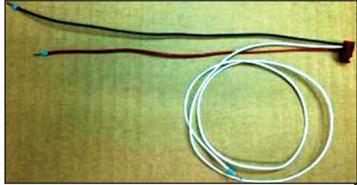
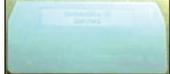
- RIB FIF-12A USB interface cable
- CT-104A interface cable

Use the RIB FIF-12A USB cable to connect to your computer. Use the CT-104A cable to connect from the RIB FIF-12A USB cable to the radio.

**Table 1 Kit Contents**

Item No.	Qty	Part Number	Description	Notes	Picture
1	1	2562640	One-Way to Two-Way Manual for DCFCB	Installation Manual	
2	1	1751587B-01	Cable, radio, to FCT	Cable between the radio and controller board.	
3	1	17500880	Cord, pwr. Supply, radio	Radio power cable	
4	1	175902A-24	Cable, ant, UHF/N, 12 inches	Antenna cable, internal	
5	1	169182A-01	Plate assembly, DC to DC convert	DC converter plate	
6	1	2005173E	PCBA, DC to DC converter	DC converter board	

Item No.	Qty	Part Number	Description	Notes	Picture
7	6	7000A427-04	Screw, mach, pan Phillips 6-32	Screw, Phillips 6-32, 1/4-inch long to mount DC converter to plate	
8	4	7011A041-06	Screw, thd frm, pan, phil, type	Self-tapping screw to mount DC converter plate to backplane	
9	1	1461327A	Wire lead assembly, 5-pos	DC converter wire assembly	
10	2	122378A	Switch, momentary	Intrusion switch	
11	2	8600118B	Bracket, intr. Switch cntl. box al	Intrusion switch bracket	
12	1	7002A009-16	Bolt, hex HD SS 3/8-16	Bolt, 3/8-16 for the lower intrusion bracket	
13	1	7074A046	Lkwash, split SS 3/8 scr	Lock washer, 3/8 for the lower intrusion bracket	
14	1	7059A063	Nut hex 3/8-16	Nut, 3/8-16 for the lower intrusion bracket.	
15	1	T300218-05-065	Wire lead, 44 inches (1/4nt:1/4nt)	Intrusion sensor wire	
16	1	288B229A-06	Snap track. 4 inches	Snap track is for mounting the current and rotator sensors.	
17	2	7011A069-08	Screw thd frm pan hd phil #8	#8-1/2-inch Phillips, self-tapping to mount the snap track to the backplane	
18	1	2005221B	Current sensor pcba	Rotator current sensor	

Item No.	Qty	Part Number	Description	Notes	Picture
19	1	2001062B	Pcba, curr. sens, adj.	Chopper current sensor	
20	1	1461319A	Wire lead assembly, chopper sensor, 4-pos	Chopper sensor wire assembly	
21	1	1461320A	Wire lead assembly, rotator sensor, 4-pos	Rotator sensor wire assembly	
22	1	288691A-03	RF, lhtg pro, 125-1000 MHz	Antenna lightning protection	
23	1	1461404A	Wire lead assembly, current sensor	Rotator sensor wire assembly	
24	5	7058A047	Nut, mach scr hex Keps 10/32 SS	<p>Keps nut, 10/32</p> <p>Two for Antenna lightning protection.</p> <p>Two for the upper intrusion bracket.</p> <p>Two for the radio bracket.</p>	
25	2	229288A	Block, term, ground, 3-pos, branch	Ground block	
26	3	229282A	Term.block, 3 pos, branch	Terminal block	
27	2	229283A	Cap, end, term blk, 1 p.	Terminal block cap	
28	2	229218A	Bracket, t block, end, din mt.	End stop	

Item No.	Qty	Part Number	Description	Notes	Picture
29	3	8568044A	Marker, terminal, block 1-10	Number marker for terminal strip	
30	1	288782A	Jumper, term. Block	2 position jumper for terminal strip TB3	
31	2	7000444A-05	Screw, mach, phil, pan hd, 4-40 SS	Screw, 4-40 to mount radio interface cable to controller board.	
32	2	7075A072	Lkwash, int tooth, ss, #10	Lock washer, #10 for radio to radio mounting plate.	
33	1	7000A070-06	Screw, mach, round, phil, 10-32	Screw, 10-32, 3/8-inch-long, Phillips for radio to radio mounting plate. One comes with the radio	
34	2	7075080A	Lkwasher, int. tooth #4 ss	Lock washer, #4 to mount radio interface cable to controller board.	
35	10	150A109	Clamp, cable tie wrap	Wire tie	
36	2	150A130A	Tie, cable, mount	Wire tie sticky	
37	1	C300218-02-146	Wire, 18 AWG red, 27"	12 V sense wire	
38	1	C300218-10-041	Jumper wire, Blk, 3 inches	FCM+ board jumper JP5: 3 & 5 (GND jumper)	
39	1	1992163A-01 (VHF) 1990263A-03 (UHF)	Radio, NX-5000 Series	Radio is dependent upon frequency required.	

**Introduction**

Item No.	Qty	Part Number	Description	Notes	Picture
40	1	Radio bracket	Radio mounting bracket	Radio mounting bracket comes with the radio	
41	1	288941A-01	Antenna mounting bracket	Used to mount the antenna	
42	1*	OMNI-XX Ordered Separately	Antenna-Omni type Requires either Omni or Yagi Antenna	Antenna type is dependent upon frequency and distance required.	
43	1*	YAGI-XX Ordered Separately	Antenna-Yagi type	Antenna type is dependent upon frequency and distance required.	
44	1*	LMR400 cable	Antenna cable	Antenna cable comes with the antenna. 35 ft length, N type.	
45	1*	FM2 mount	FM2 mount	FM2 mount comes with the antenna	
46	1	8549A178A	Accessory kit, desiccant	Moisture and rust inhibitor.  <b>NOTE:</b> Instruction is in the bag.	

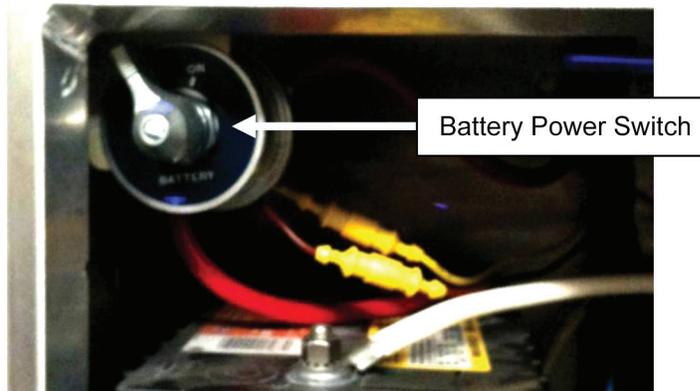
\* Antenna is not included. You must order the antenna separately.

## Removing One-Way Radio Parts

To remove the one-way radio parts:

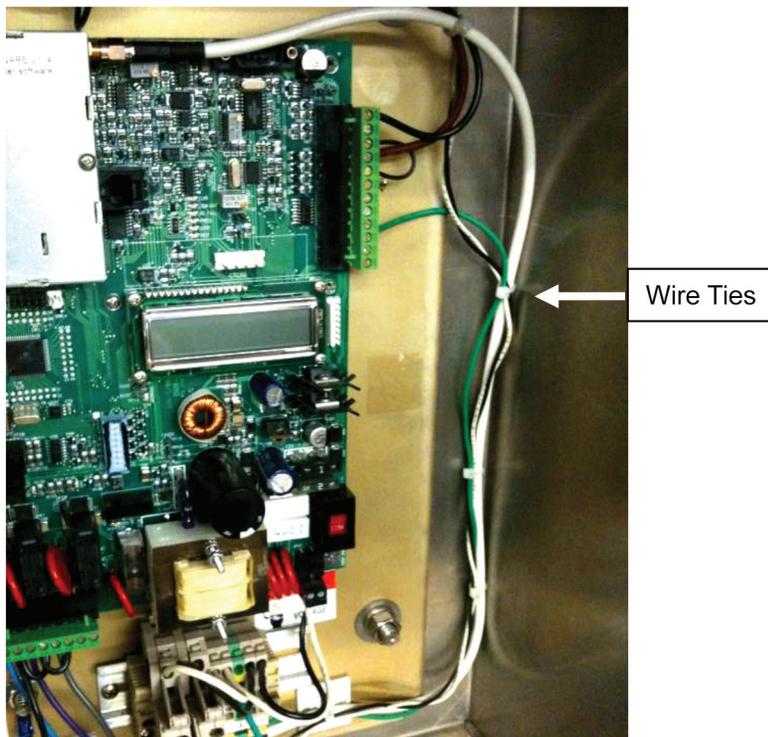
1. Turn off the AC power to the siren at the AC disconnect switch. There is typically an external AC disconnect box.
2. Open the battery cabinet.
3. Turn off the battery power at the battery power switch.

**Figure 1 Battery Power Switch**



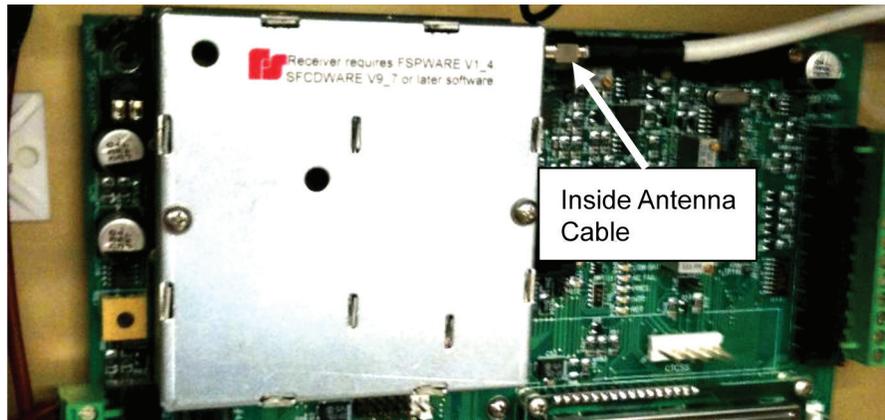
4. Close the battery cabinet.
5. Cut the wire ties as needed so that wires can be removed.

**Figure 2 Wire Ties**



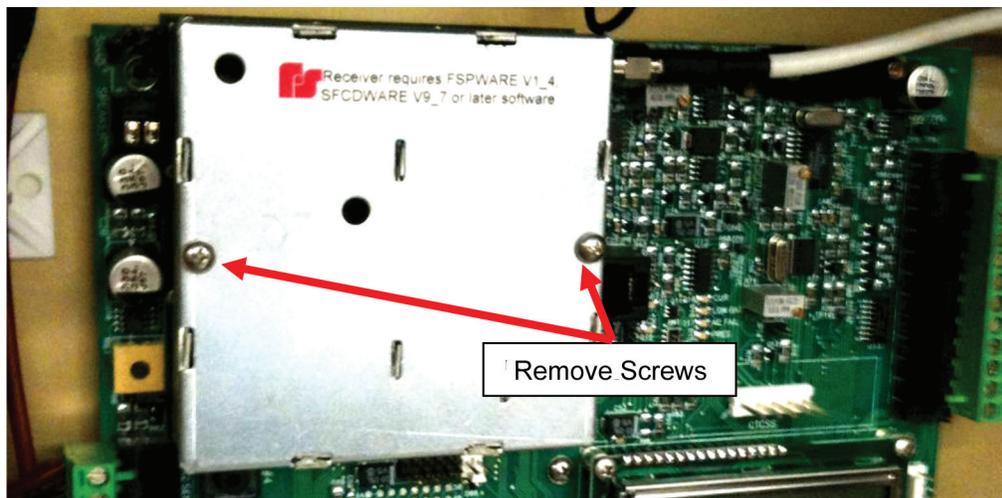
6. Remove the inside antenna cable connector from the radio.

**Figure 3 Inside Antenna Cable**



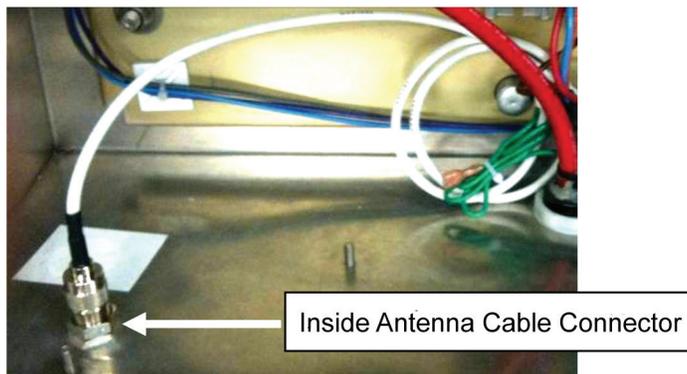
7. After removing the two screws, remove the radio by pulling the radio away from the board.

**Figure 4 Remove Screws**



8. Remove the inside antenna cable connector from bulkhead adapter.

**Figure 5 Inside antenna cable connector**



9. Remove the inside antenna cable.

10. Remove the outside antenna connector from the bulkhead adapter.
11. Remove the bulkhead adapter.
12. Remove the outside antenna cable and old antenna.

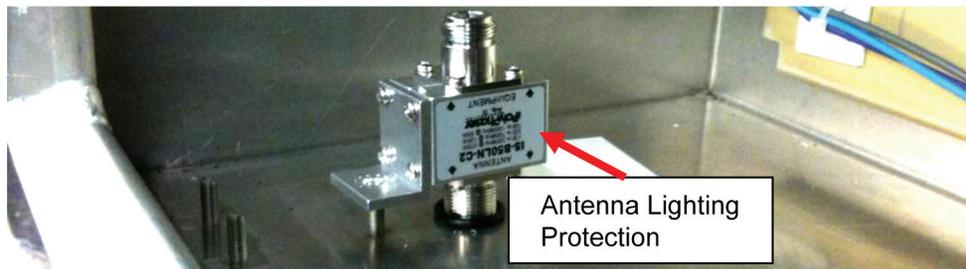
**NOTE:** You may need a bucket truck and ladder to access the site. For installation instructions on the Yagi and Omni Antennas, go to the Federal Signal’s website.

## Installing the Kit

To install the one-way to two-way kit:

1. Install the antenna by using the installation instructions on the Yagi and Omni Antennas found on the Federal Signal’s website. (items 41-45).
2. Install antenna lightning protection (item 22).

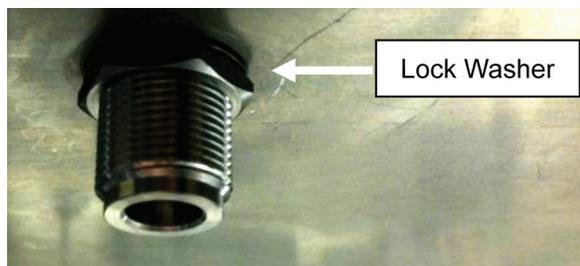
**Figure 6 Antenna lightning protection**



The Rubber ring gasket goes on the inside of the cabinet. The marked text “Antenna” points down and “Equipment” points up.

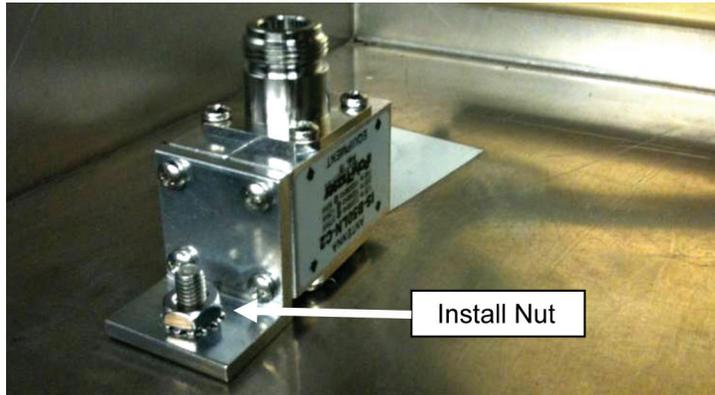
3. Secure lock washer and nut to the outside.

**Figure 7 Lock washer**



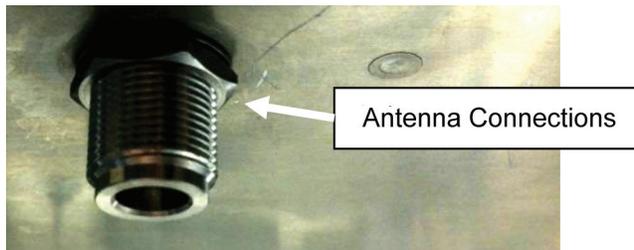
4. Install nut 3/8 inch on the screw stud (item 24).

**Figure 8 Install nut**



5. Connect the external antenna cable to the antenna lightning protection. The antenna was installed earlier.

**Figure 9 Antenna connections**



6. Ensure that all the antenna connections are sealed. If this is not sealed properly, moisture and weather may cause damage.

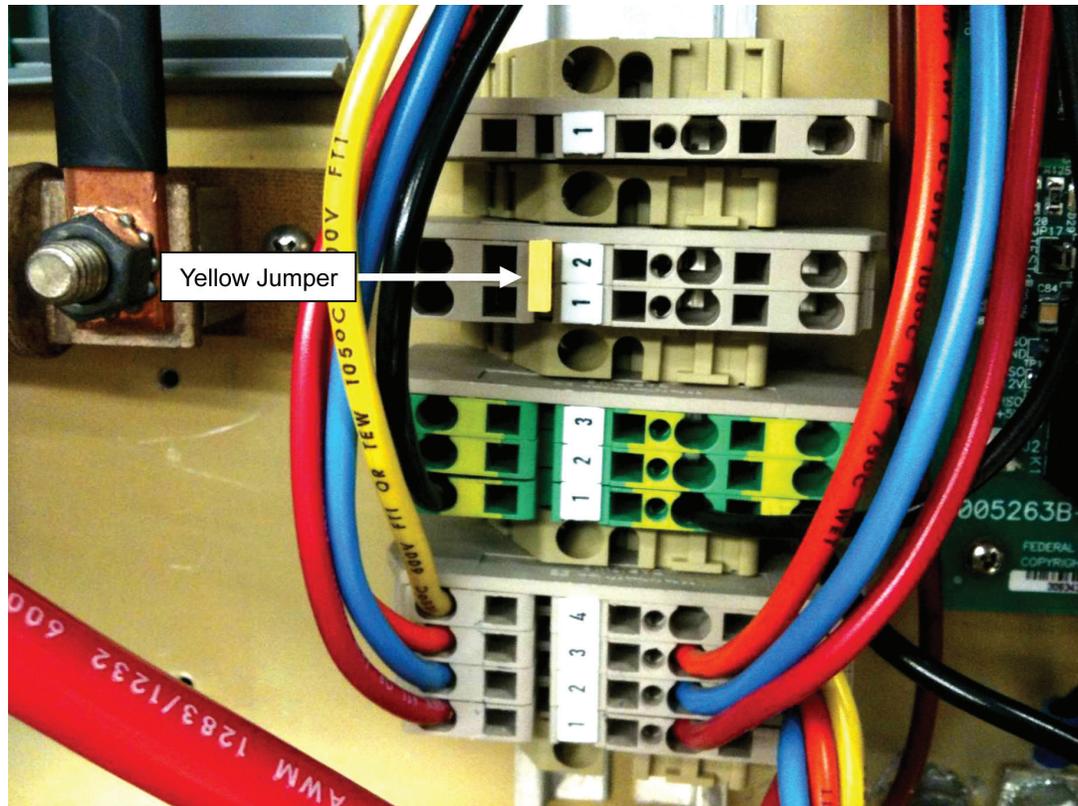
For installation instructions on the Yagi and Omni Antennas, go to the Federal Signal website.

7. Ensure that the antenna cable is properly secured. A loose antenna cable flapping in the wind may cause damage.

Refer to the Yagi and Omni Antennas Installation Manual and ensure that the antenna and antenna cable are correctly installed.

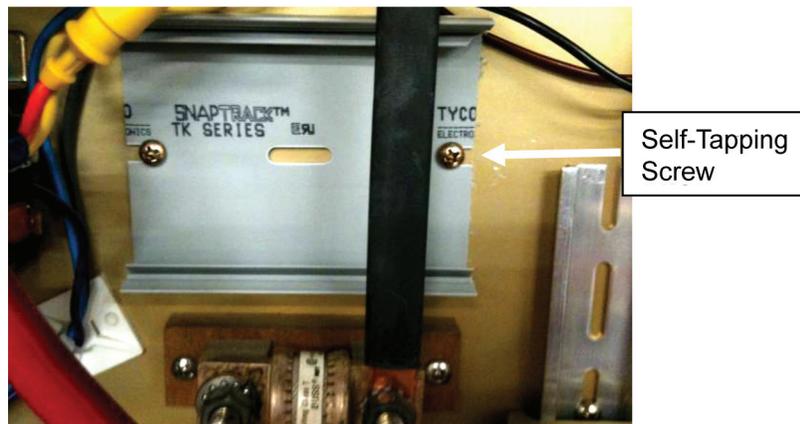
8. Install DIN rail terminals according to the manual (items 25-30).
  - Refer to the schematic section of the DCB, DCFCB and DCFCTB Models Manual. Use the schematic for the DCFCTB.
  - Pay particular attention to the yellow jumper that is inserted at TB3 (item 30).
  - Ensure that the screws in the end stops are tight. If there is any confusion, refer to schematic DCB, DCFCB and DCFCTB Models Manual.

Figure 10 DIN rail terminals



9. Install the snap track (item 16) using self-tapping screws (item 17).

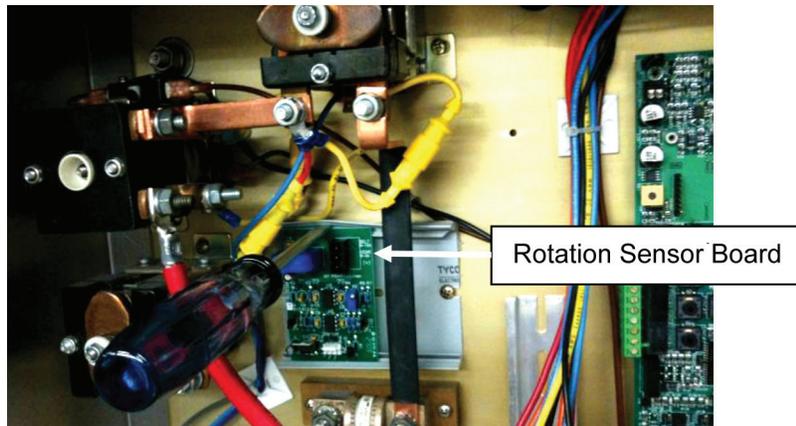
Figure 11 Self tapping screws



10. Install rotation sensor board (item 18).

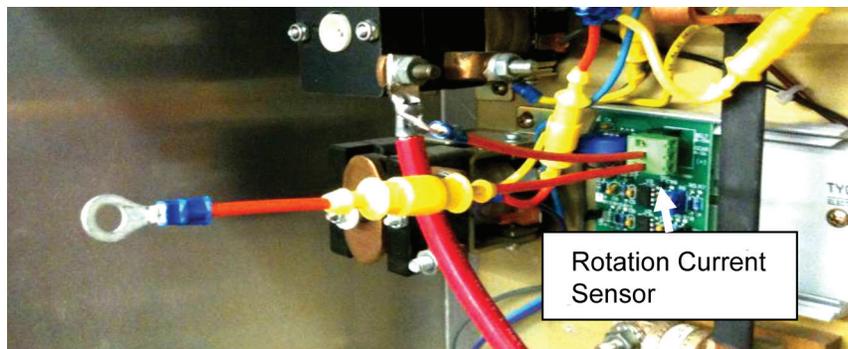
**NOTE:** Use a flathead screwdriver to make this task easier.

**Figure 12 Rotation sensor board**



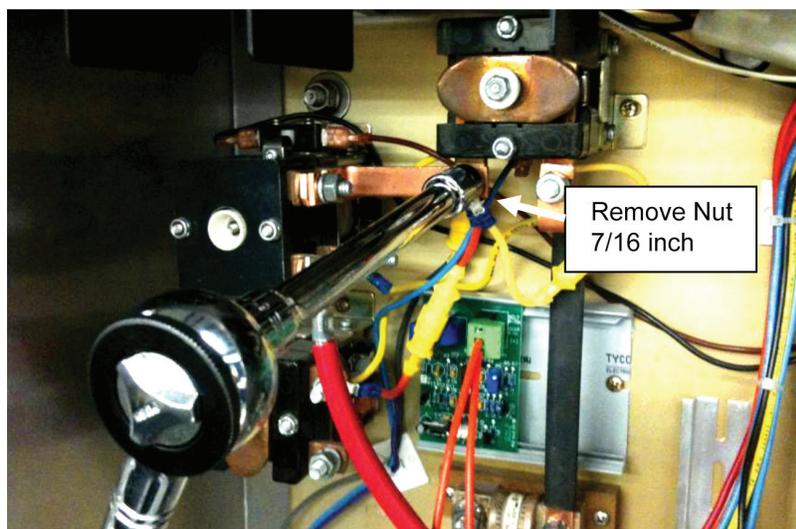
11. Plug the wire assembly (item 23) into the rotation current sensor.

**Figure 13 Rotation current sensor**



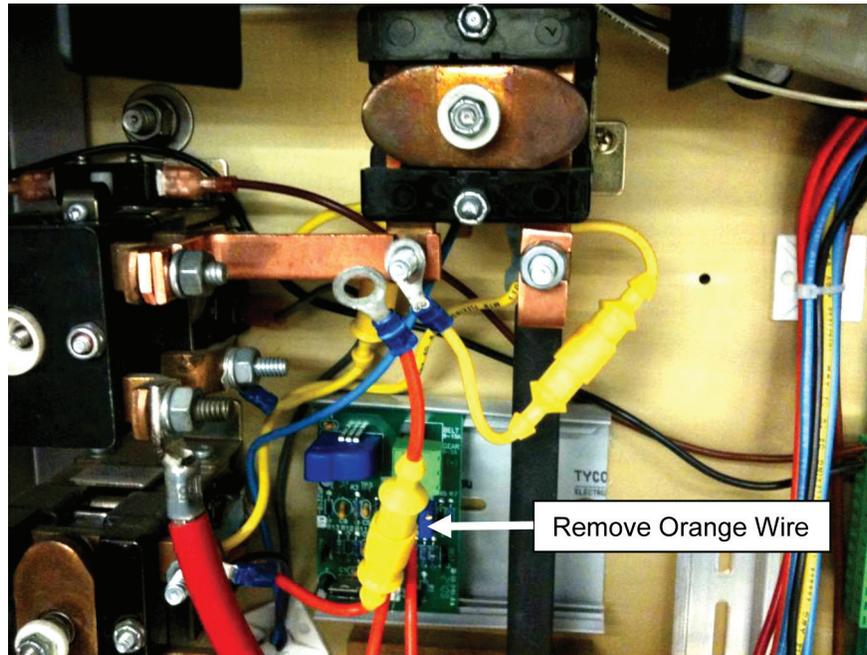
12. Remove the nut 7/16 inch.

**Figure 14 Remove nut 7/16 inch**



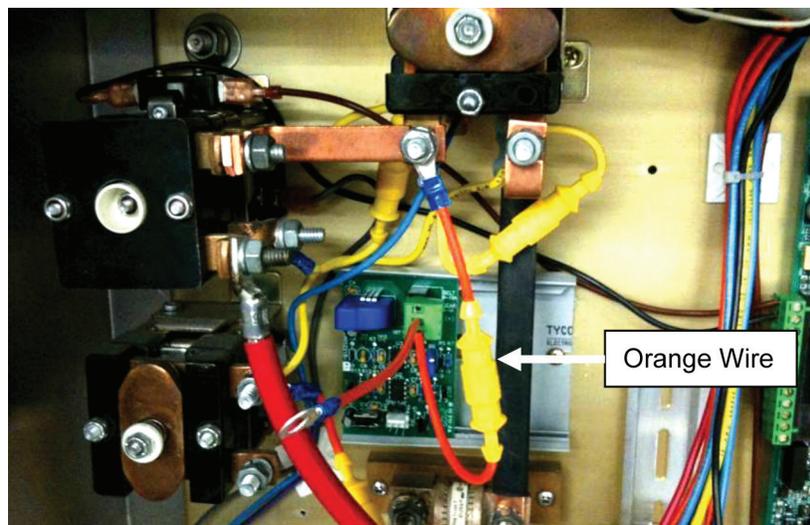
13. Remove the orange wire.

**Figure 15 Orange wire**



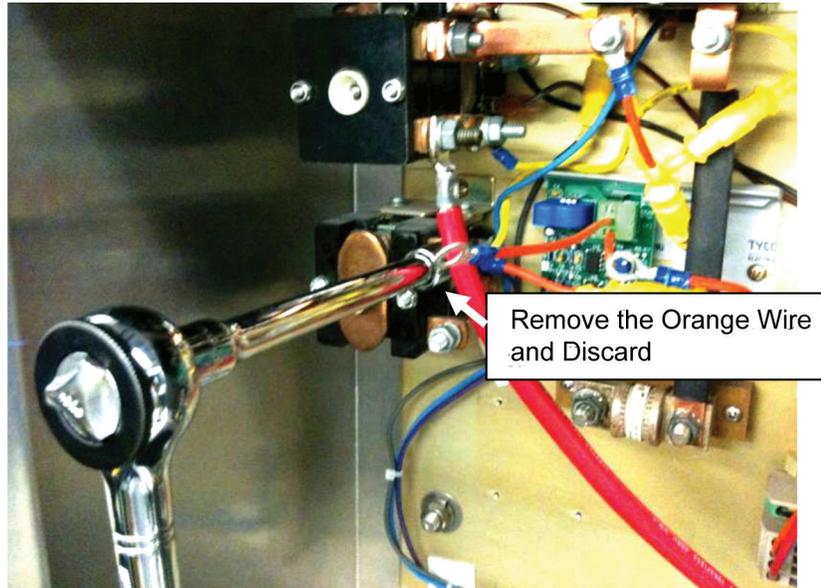
14. Connect the orange wire from the rotation current sensor. Make sure it is the one with the fuse. Reapply and tighten the nut.

**Figure 16 Orange wire**



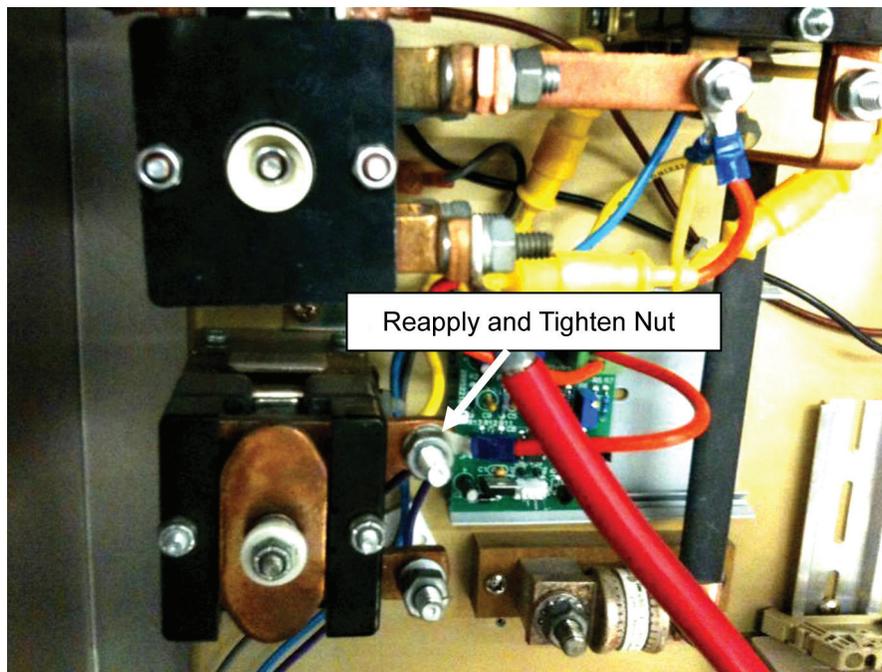
15. Remove the nut 7/16 inch. Remove and discard the orange wire.

**Figure 17 Remove the orange wire**



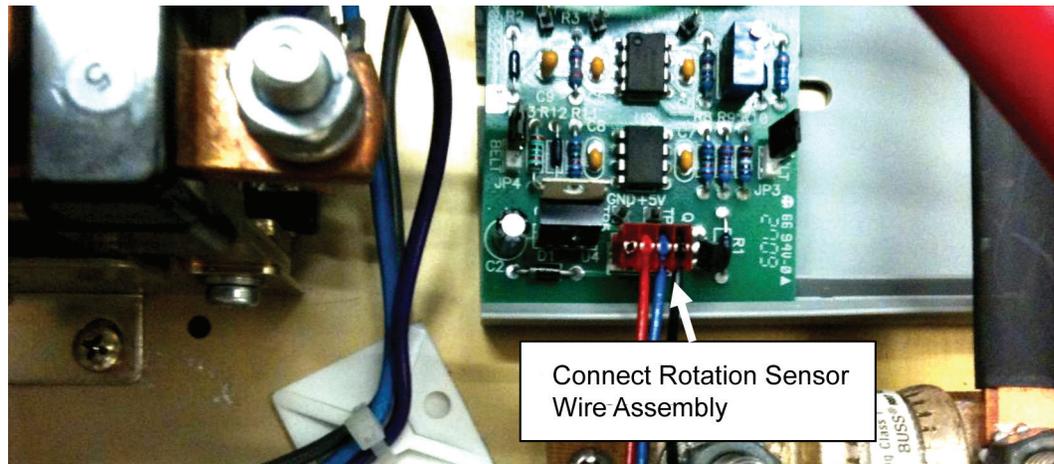
16. Connect the orange wire from the rotation current sensor. Make sure it is the wire without the fuse. Reapply and tighten the nut.

**Figure 18 Reapply and tighten nut**



17. Connect the rotation sensor wire assembly (item 21) to the rotation sensor.

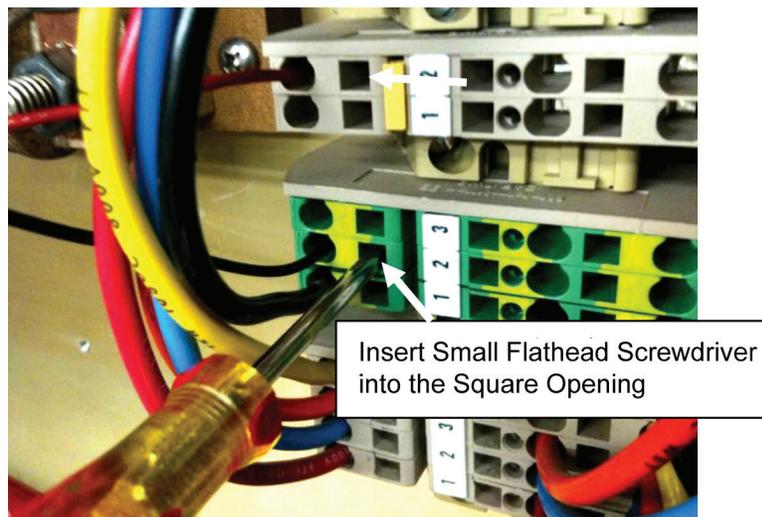
**Figure 19 Connect rotation sensor wire assembly**



18. Connect the rotation sensor wires (item 21) to the DIN rail terminals.

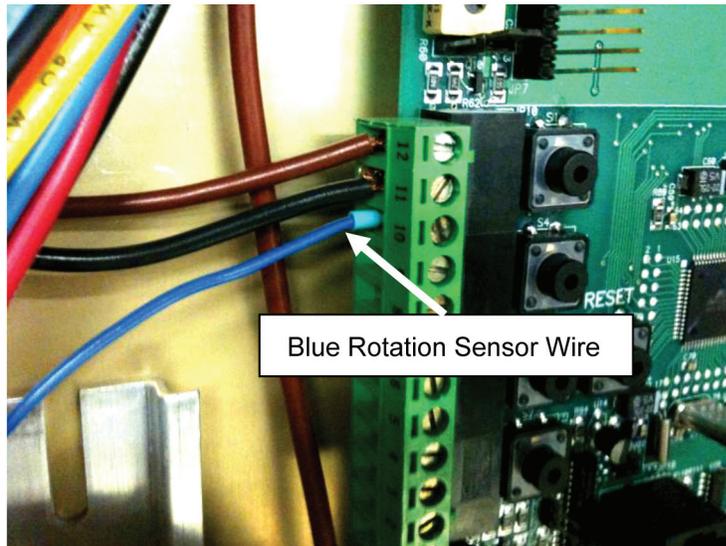
- Refer to the schematic section in the DCB, DCFCB and DCFCTB Models Manual. Use the schematic for the DCFCTB.
- Insert a small, flathead screwdriver into the square opening. This allows the wire to be inserted into the round opening.
- Black goes to TB2-2.
- Red goes to TB3-2.

**Figure 20 DIN rail terminals**



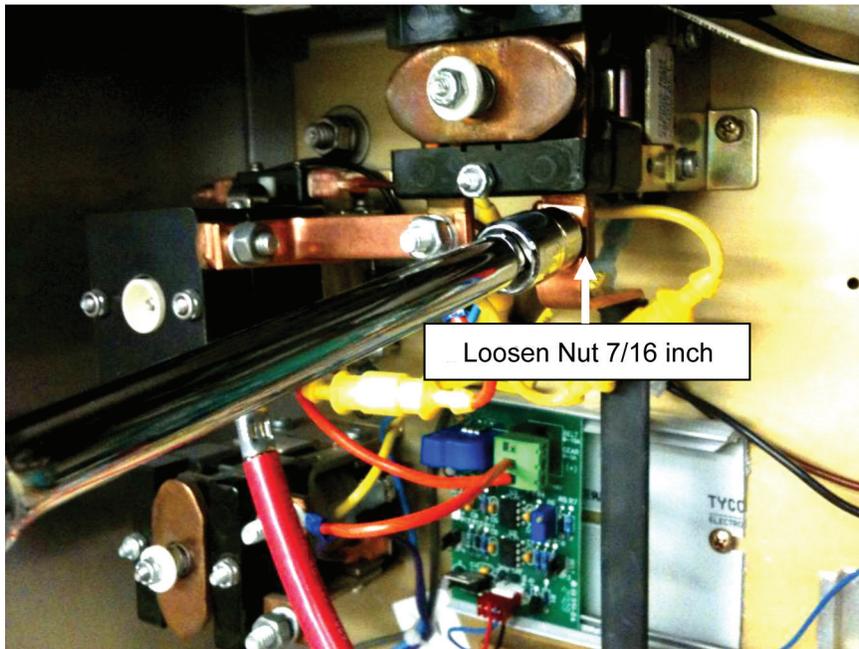
19. Connect the blue rotation sensor wire (item 21) to the controller board. Refer to the schematic in the DCB, DCFCB and DCFCTB Models Manual.

**Figure 21 Blue rotation sensor wire**



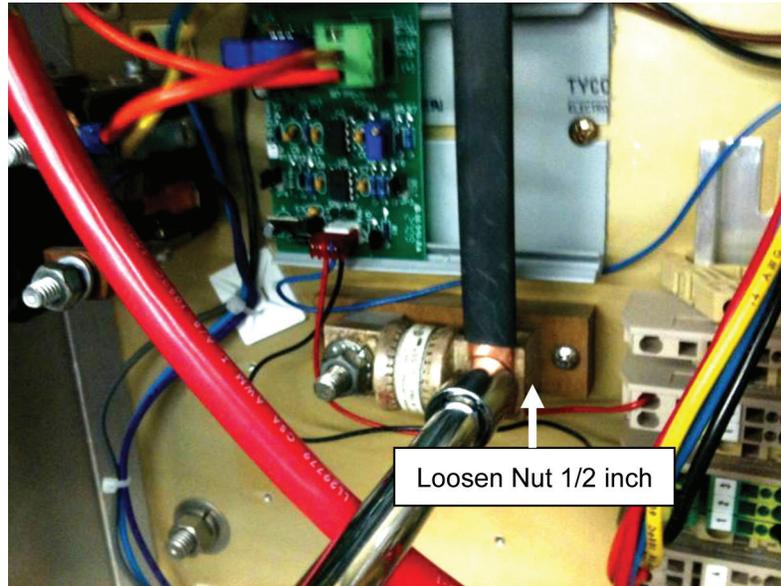
20. Loosen the nut 7/16 inch. DO NOT remove it.

**Figure 22 Loosen nut 7/16 inch**



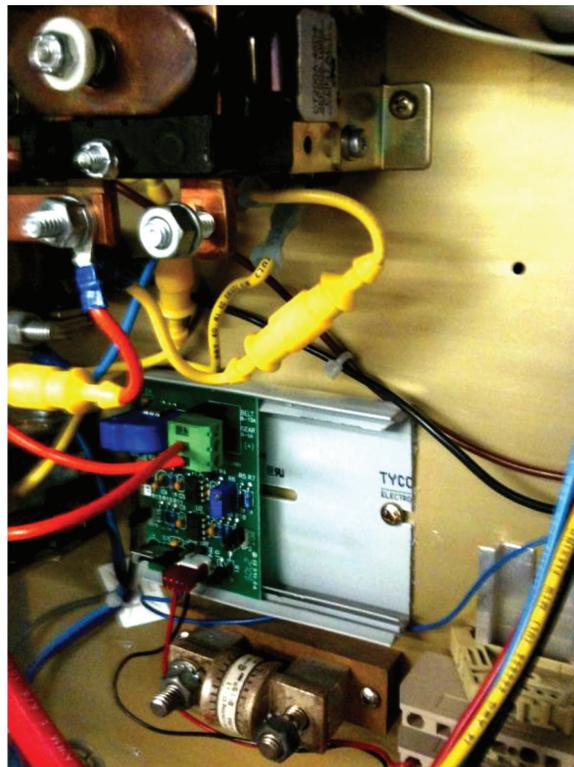
21. Loosen the nut 1/2 inch. DO NOT remove it.

**Figure 23 Loosen nut 1/2 inch**



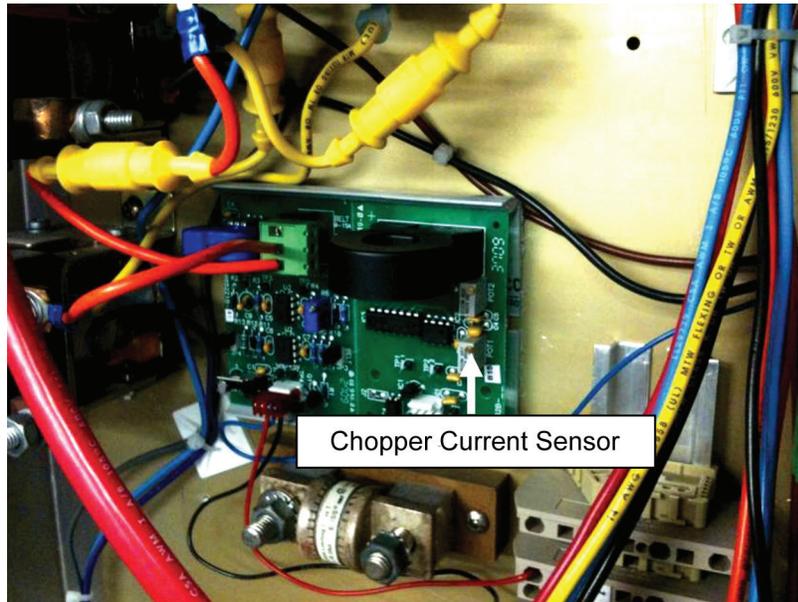
22. Completely remove the copper buss-bar and save it; you will reinstall it soon. The picture below shows it removed.

**Figure 24 Copper buss-bar removed**



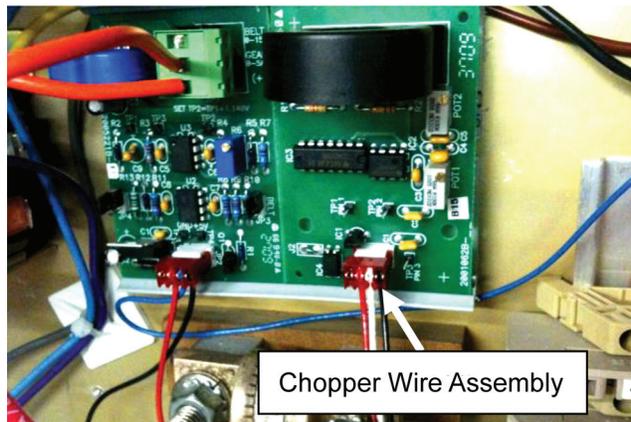
23. Install the chopper current sensor (item 19).

**Figure 25 Chopper current sensor**



24. Connect the chopper wire assembly (item 20) to the chopper current sensor.

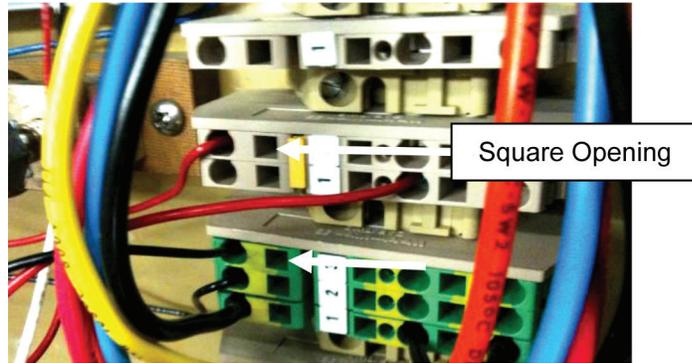
**Figure 26 Chopper Wire Assembly**



25. Connect the chopper sensor wire (item 20) to the DIN rail terminals.

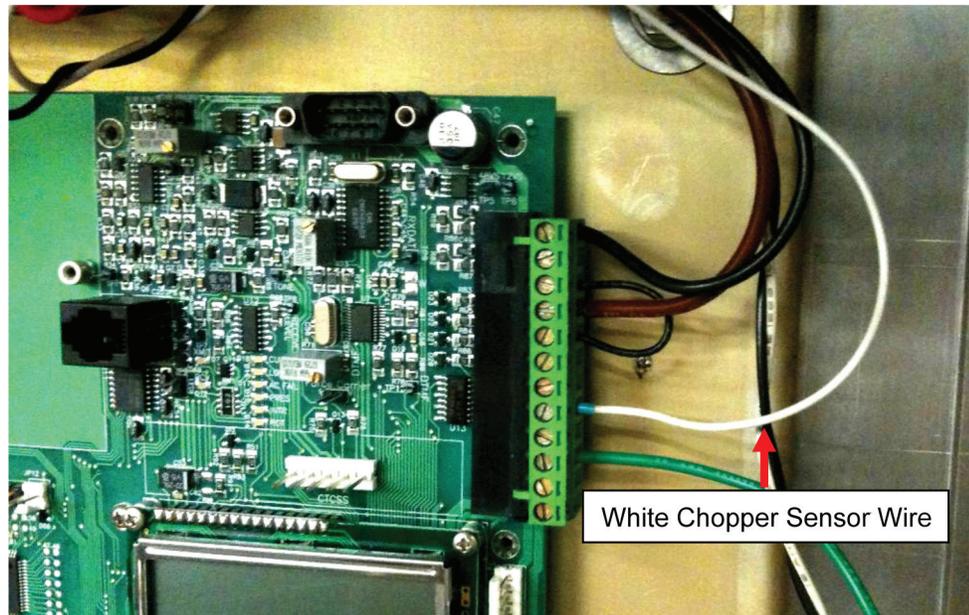
- Refer to the schematic section in the DCB, DCFCB and DCFCTB Models Manual. Use the schematic for the DCFCTB.
- Insert small flathead screwdriver into the square opening. This allows the wire to be inserted into the round opening.
- Black goes to TB2-3.
- Red goes to TB3-2.

Figure 27 DIN rail terminals



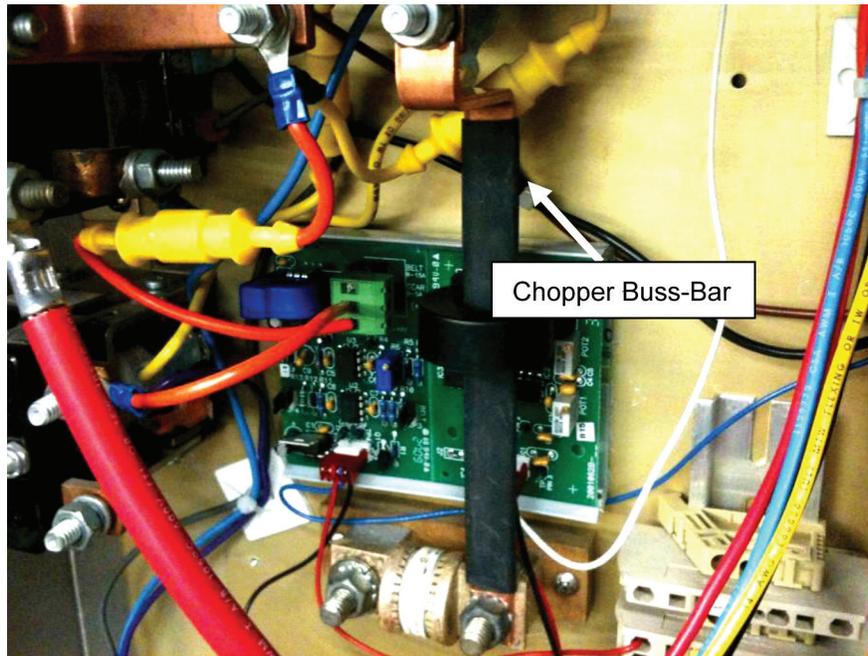
26. Connect the white chopper sensor wire (item 20) to the controller board. Refer to the schematic in the DCB, DCFCB and DCFCTB Models Manual.

Figure 28 White chopper sensor wire



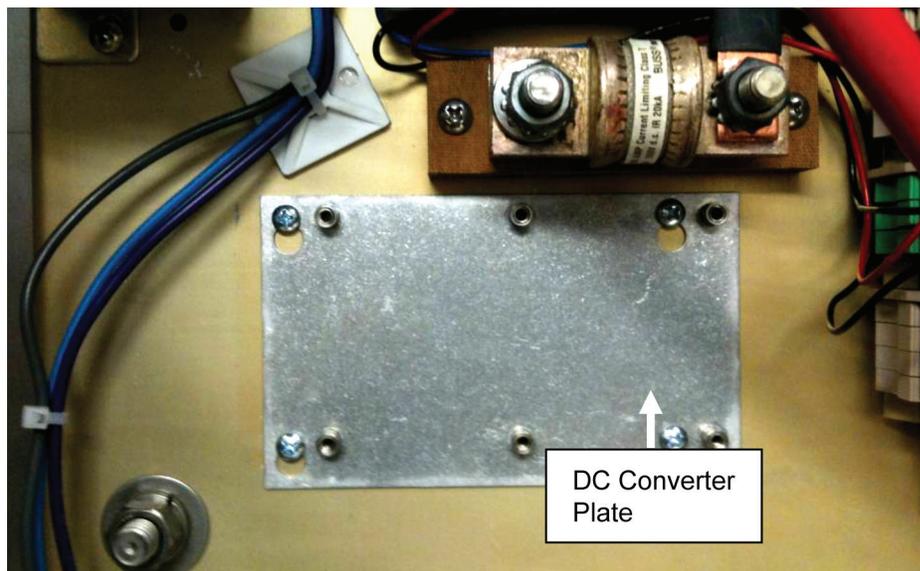
27. Install the chopper buss-bar, which was removed earlier. With finesse, it does fit through the chopper current sensor.

**Figure 29 Chopper buss-bar**



28. Verify that the buss-bar nuts are tight; otherwise, damage may occur.
29. Install the DC converter plate (item 5) using self-tapping screws (item 8).

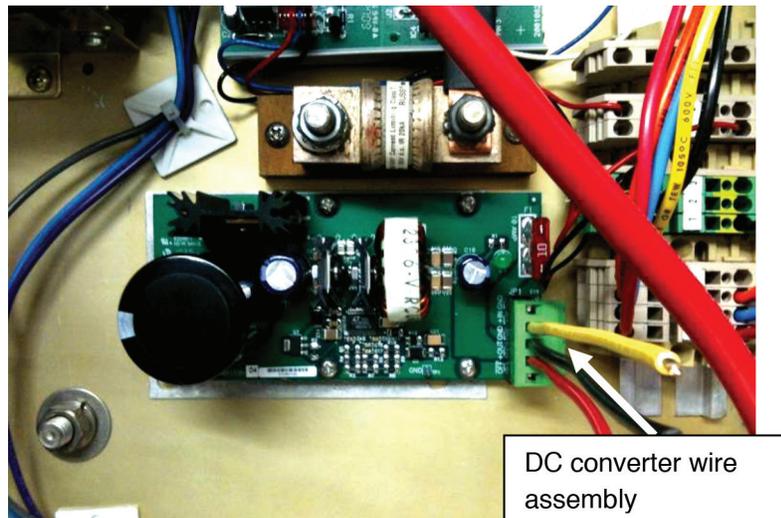
**Figure 30 DC converter plate**



30. Install the DC converter (item 6), using screws (item 7).

31. Connect the DC converter wire assembly (item 9) to the DC converter.

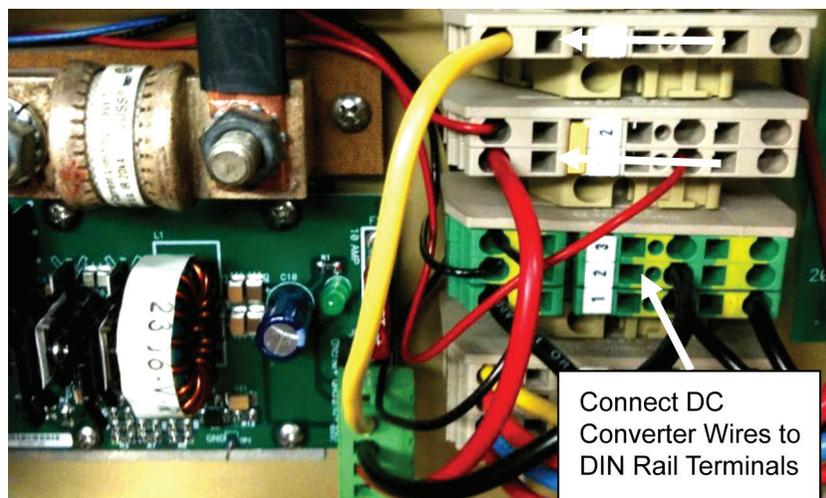
**Figure 31 DC converter wire assembly**



32. Connect the DC converter wires to the DIN rail terminals.

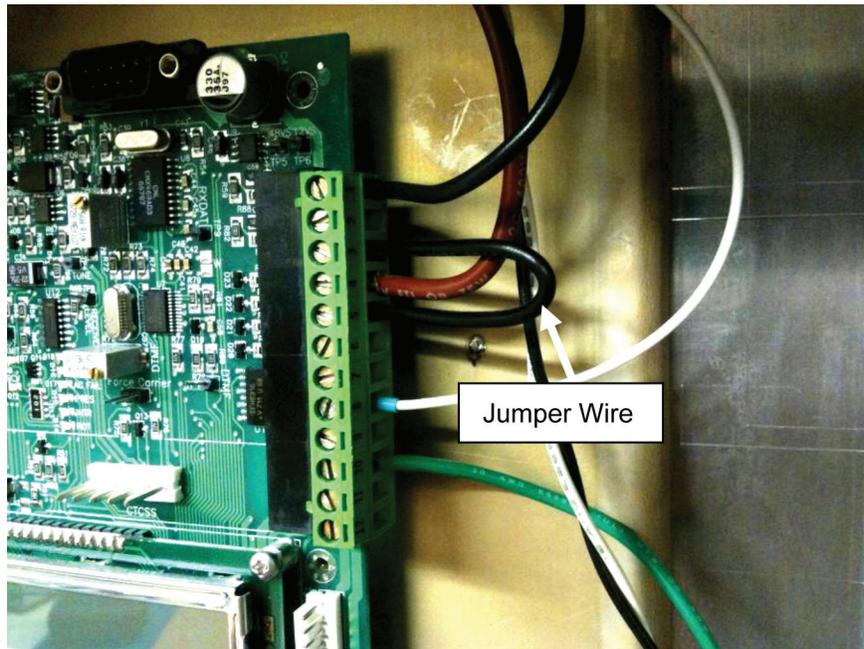
- Refer to the schematic section in the DCB, DCFCB and DCFCBT Models Manual. Use the schematic for the DCFCBT.
- Insert a small, flathead screwdriver into the square opening. This allows the wire to be inserted into the round opening.
- Yellow goes to TB4-1.
- Red goes to TB3-1.
- Black goes to TB2-2.

**Figure 32 DC converter wires**



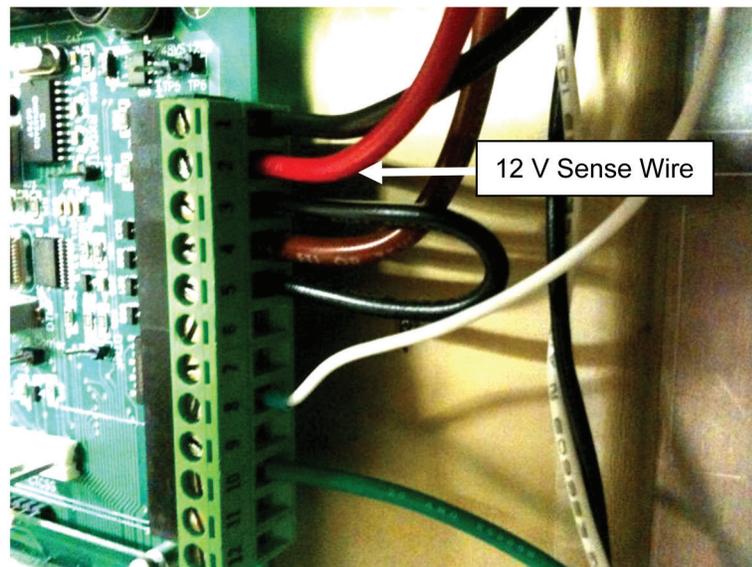
- 33.** Connect the jumper wire (item 38). If there is any confusion, refer to the schematic in the DCB, DCFCB and DCFCB Models Manual.

**Figure 33 Jumper wire**



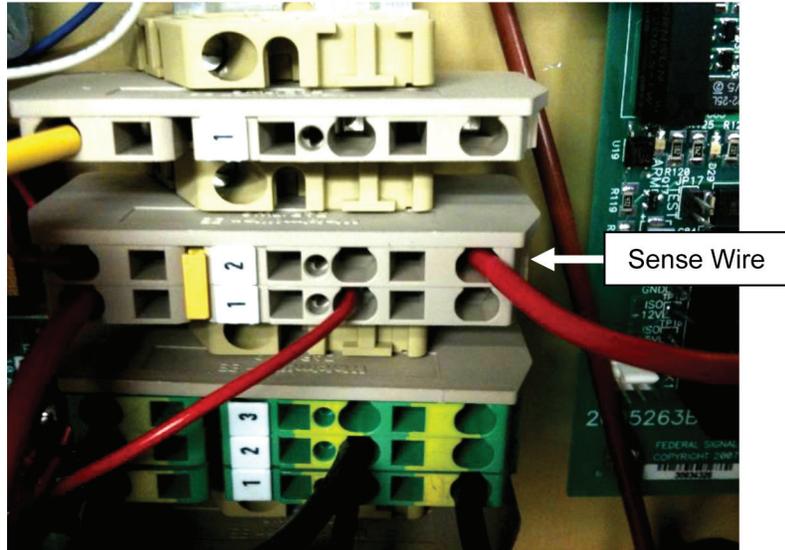
- 34.** Install the 12 V sense wire (item 38) at the controller board. If there is any confusion, refer to schematic in the DCB, DCFCB and DCFCB Models Manual.

**Figure 34 Sense wire**



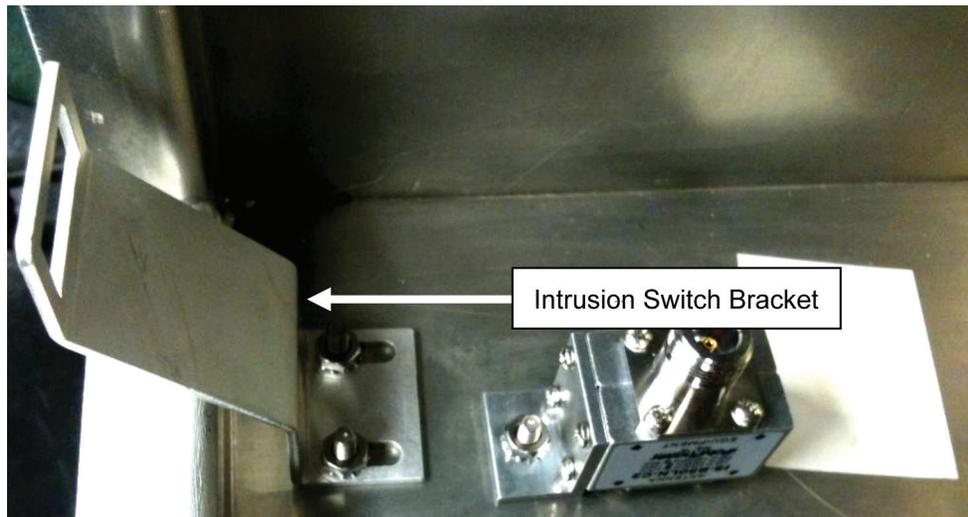
35. Install the 12 V sense wire (item 38) at the DIN rail terminal. If there is any confusion, refer to the schematic in the DCB, DCFCB and DCFCB Models Manual.

**Figure 35 Sense wire (item 38) at din rail terminal**



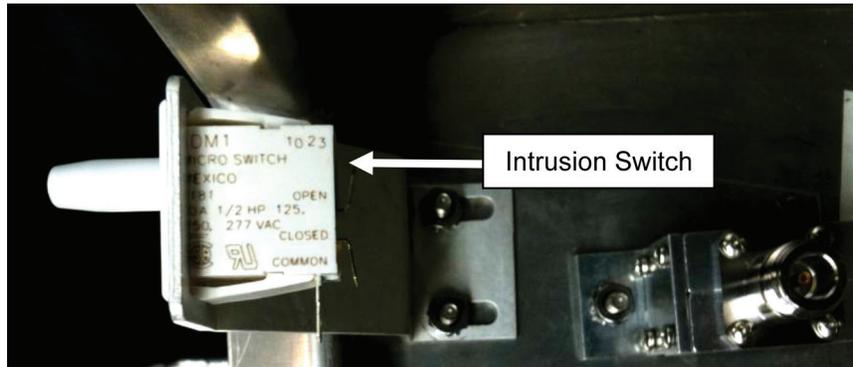
36. Install the intrusion switch bracket (item 11) using 3/8-inch nuts (item 24).

**Figure 36 Intrusion switch bracket**



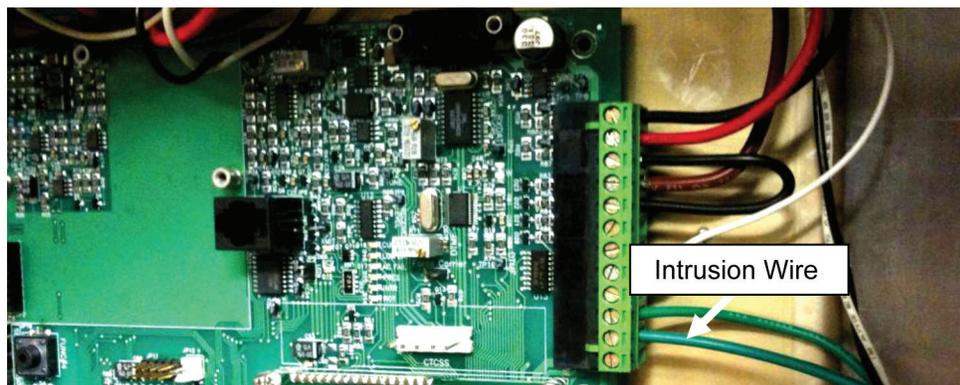
37. Install the intrusion switch (item 10) using a 3/8-inch socket.

**Figure 37 Intrusion switch**



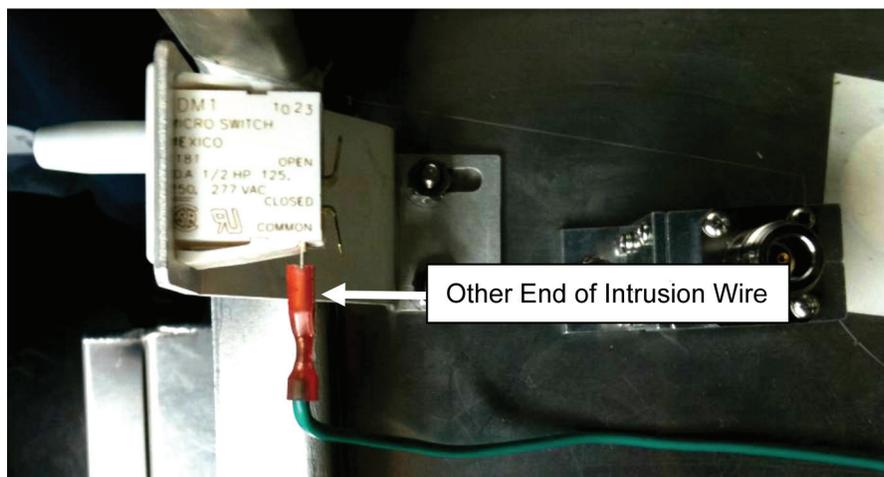
38. Install the intrusion wire (item 15) on the controller board. If there is any confusion, refer to the schematic in the DCB, DCFCB and DCFCB Models Manual.

**Figure 38 Intrusion wire**



39. Install other end of the intrusion wire to the intrusion switch. Connect to COMMON on the switch.

**Figure 39 Other end of intrusion wire**



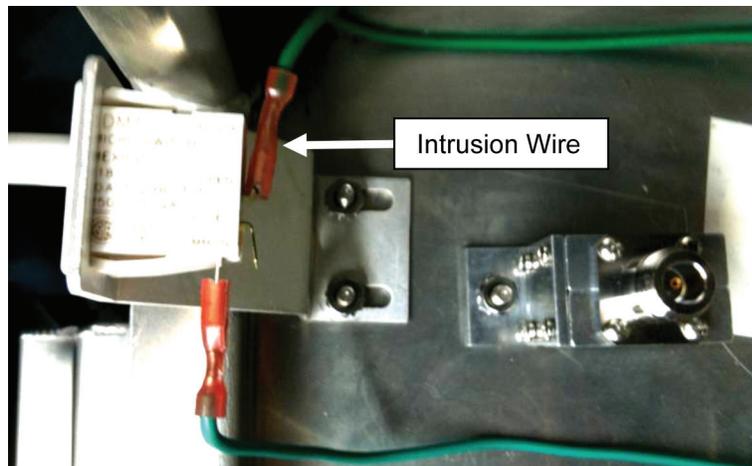
40. Find the pre-existing intrusion wire that goes between the cabinets. Carefully cut the wire tie to release the wire.

**Figure 40 Pre-existing intrusion wire that goes between the cabinets**



41. Install this intrusion wire to the intrusion switch. Connect to OPEN on the switch.

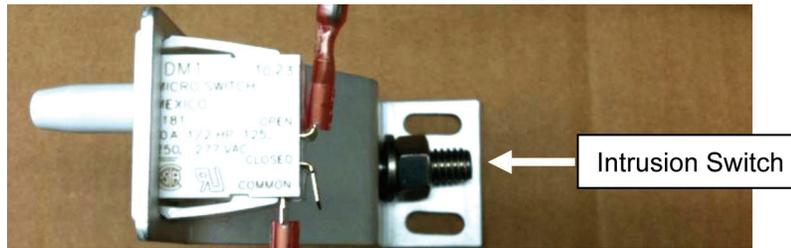
**Figure 41 Intrusion wire**



42. Open the battery cabinet.
  - Take battery safety precautions. Refer to DCB, DCFCB and DCFACTB Models Manual for safety warnings.
  - Take off all jewelry or any metal or cover with electrical insulation.
  - Use electrically insulated tools.

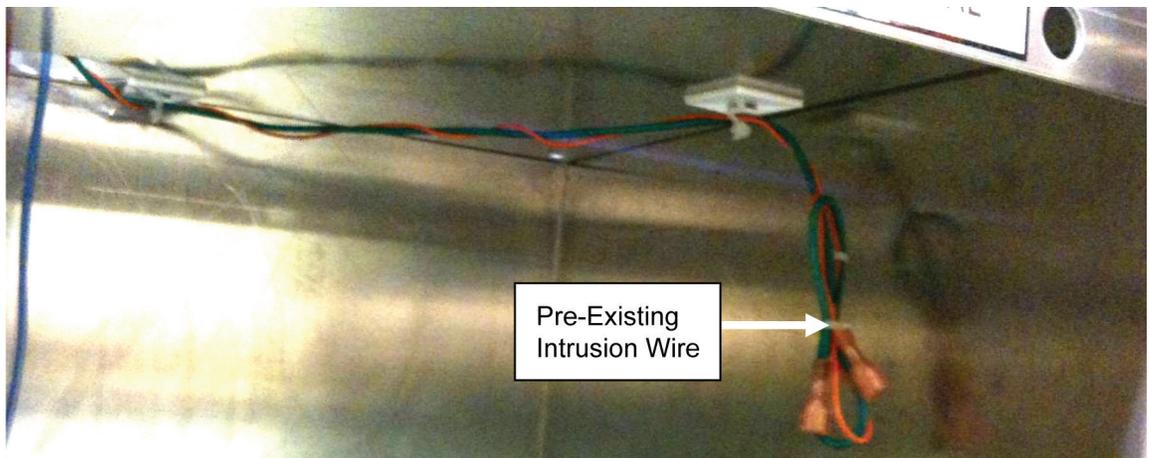
- 43. Install the intrusion switch (item 10) into the bracket (item 11). Do not install the bracket into the cabinet yet.

**Figure 42 Intrusion switch**



- 44. Find the pre-existing intrusion wire that goes between the cabinets. Cut the wire ties as needed to release the wires.

**Figure 43 Pre-existing intrusion wire**

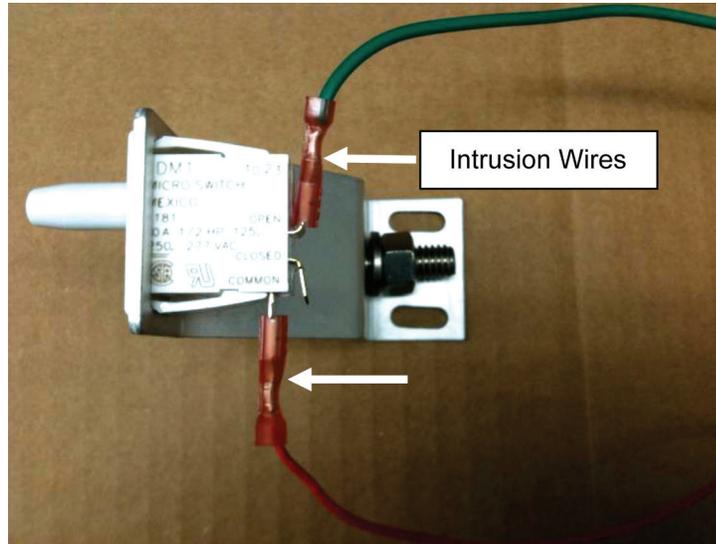


- 45. Install the intrusion wires from the previous step to the intrusion switch (item 10). Do this prior to installing in the cabinet.

**⚠ WARNING**

- Ensure that the metal bracket does not touch the battery posts, especially while connecting the wires.
- Color or polarity of wires is not important. The important item is the wires need to be on Open and Common.
- If there is any confusion, refer to the schematic in the DCB, DCFCB and DCFCTB Models Manual.

Figure 44 Intrusion wires

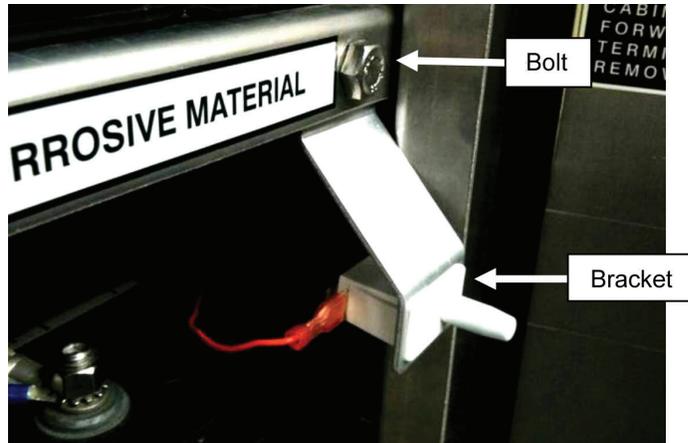


46. Install the intrusion bracket (item 11), using a 9/16-inch nut, 9/16-inch bolt, and lock washer (items 12-14).

**⚠ WARNING**

*Do not touch the battery posts.*

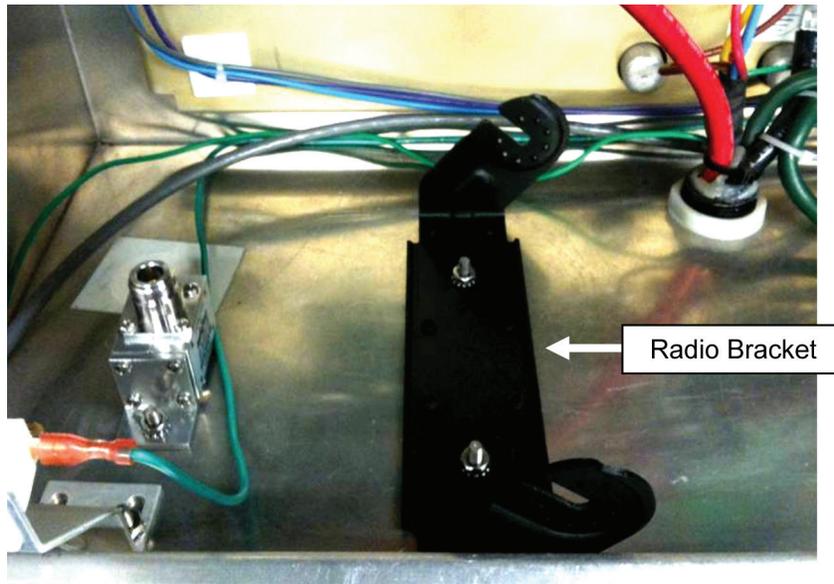
Figure 45 Intrusion bracket



47. Make sure the switch engages when the battery cabinet door is closed. Close the battery cabinet.

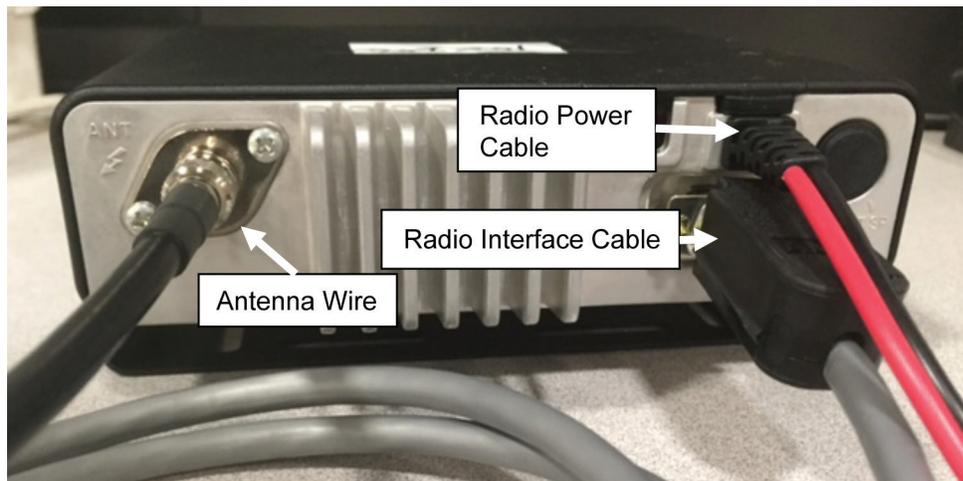
48. Install the radio bracket (item 40) using the 3/8-inch nuts (item 24).

**Figure 46 Radio bracket**



49. Connect the antenna wire (item 4) to the radio. Ensure that it is tight.

**Figure 47 Antenna wire**



50. Connect the radio power cable (item 3) and radio interface cable (item 2) to the radio.

**NOTE:** The radio interface cable plug is centered in the radio socket.

51. Install the radio (item 39) into the radio bracket. To secure the radio in the bracket, use items 32-33, and the pre-existing thumb screw that comes with the radio.

**NOTE:** The screw is used on the door side to allow the door to shut.

52. Connect the antenna cable (item 4) to the antenna lightning protection. Ensure that it is tight.

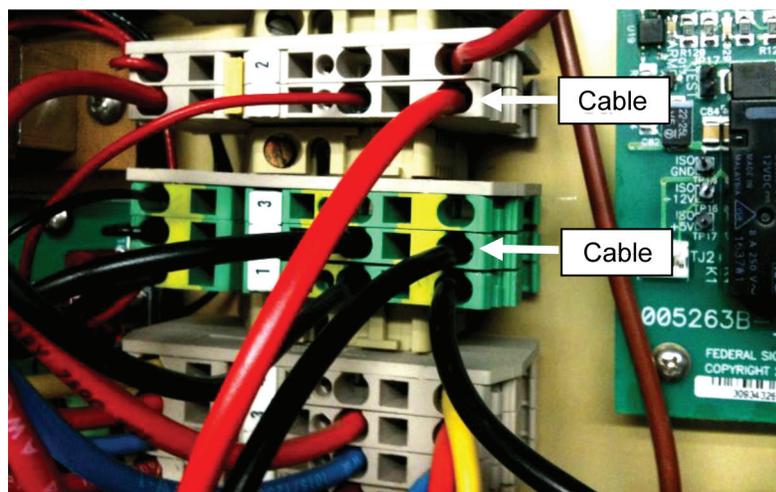
Figure 48 Antenna cable



**53.** Connect the radio power cables to the DIN rail terminal strip. Refer to the schematic section in the DCB, DCFCB and DCFCTB Models Manual. Use the schematic for the DCFCTB.

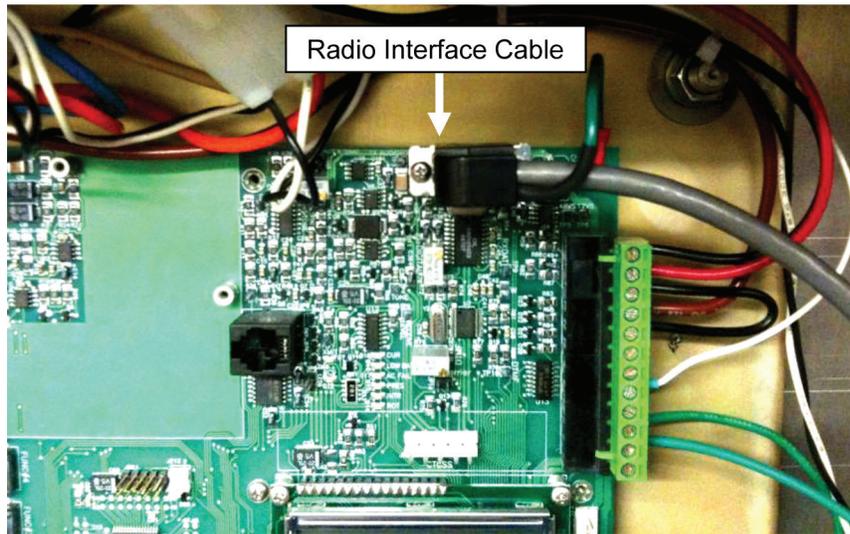
- Red to TB3-1.
- Black to TB2-2.

Figure 49 Radio power cables



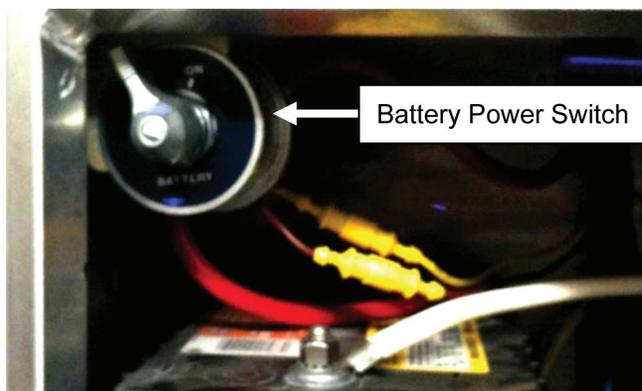
54. Connect the radio interface cable (item 2) to the controller board. Secure with screws (item 31) and lock washer (item 34).

**Figure 50 Radio interface cable**



55. Secure the wires as necessary using the wire-ties and wire sticky (items 35-36).
56. Clean the control cabinet.
57. Install desiccant (item 46) in the control cabinet. The desiccant installation instruction is in the packet.
58. Close the control cabinet door.
59. Open the battery cabinet door.
60. Turn on the battery power at the battery power switch.

**Figure 51 Battery power switch**



61. Close the battery cabinet.
62. Turn on the AC power to the siren at the AC disconnect switch.
63. Clean up the surrounding area. Do not forget tools.

**NOTE:** The siren controller may not have radio communications until the radio adjustment is completed. An Engineer or Technician with radio equipment capable of radio deviation adjustment and VSWR test is required. Typically, a radio shop has this capability.

- 64.** Conduct a radio deviation adjustment and VSWR test.

**NOTE:** Refer to the Transceiver Audio Level Adjustments and VSWR Testing section of the DCB, DCFCB and DCFCTB Models Manual.

## **Getting Service**

If you are experiencing any difficulties, contact Federal Signal Customer Support at 800-548-7229 or 708-534-3400 extension 7511 or Technical Support at 800-524-3021 or 708-534-3400 extension 7329 or through e-mail at [techsupport@fedsig.com](mailto:techsupport@fedsig.com). For instruction manuals and information on related products, visit <http://www.fedsig.com>.



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