

# INSTALLATION GUIDE

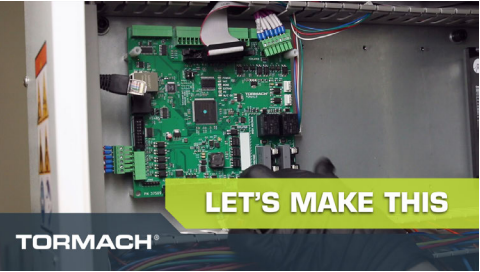
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## ECM1V1.5 UPDATE KIT

# PURPOSE

**? LOOKING FOR A VIDEO?**

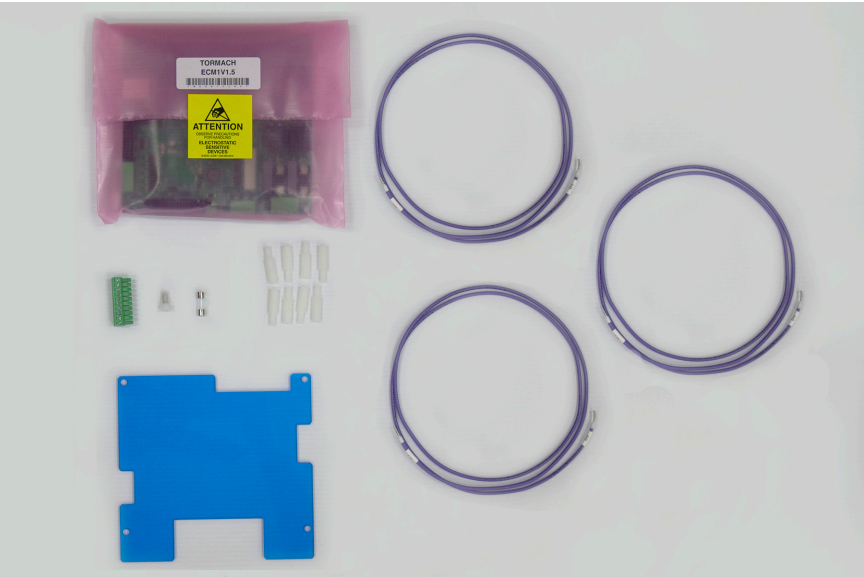
Before you begin, select the image below to watch a walk-through video of this entire installation procedure.



## PURPOSE

This document gives instructions on installing the ECM1v1.5 Update Kit on a mill.

## PRODUCT INFORMATION



**Product:** ECM1v1.5 Update Kit (PN 39257)

Quantity	Description
1	3 A Fuse (PN 31120)
1	10-Pin Terminal Block (PN 32632)
1	Crimp Cap (PN 38453)
1	ECM v1.5 Board (PN 37509)
1	ECM v1.5 Protective Cover (PN 37518)
8	Nylon Standoff (PN 38688)
3	Wires 443-445 (PN 35667)

# REQUIRED TOOLS



**Note:** If any items are missing, we can help. Create a support ticket with Tormach Technical Support at [tormach.atlassian.net/servicedesk](https://tormach.atlassian.net/servicedesk) for guidance on how to proceed.

## REQUIRED TOOLS

This procedure requires the following tools. Collect them before you begin.


- Flat-blade screwdriver
- Flat-blade screwdriver, small
- Phillips screwdriver
- Wire crimper (or similar)

REPLACE THE ECM BOARD

Complete the following steps in the order listed:

Remove the ECM v1.4 Board.....	4
Install the ECM v1.5 Board.....	6

Remove the ECM v1.4 Board

 **WARNING!** Electrical Shock Hazard: You must power off the machine before making any electrical connections. If you don't, there's a risk of electrocution or shock.

- 1. Power off the machine and the PathPilot controller.
  - a. Push in the machine's red Emergency Stop button, which removes power to motion control.
  - b. From the PathPilot interface, select **Exit**.
  - c. Turn the Main Disconnect switch to **OFF** on the side of the electrical cabinet.
  - d. Remove the power plug(s) from the wall outlet. If your system is hardwired, isolate the machine by opening its circuit breaker(s).
  - e. Follow correct lockout/tagout procedures.
- 2. Remove the wire trough covers shown in the following image.

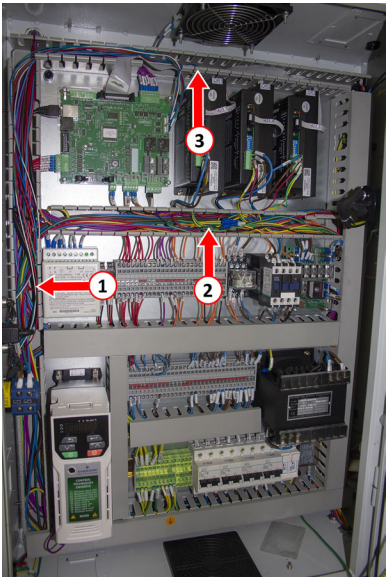


Figure 1: Wire troughs removed from the electrical cabinet.



# REPLACE THE ECM BOARD

3. Use a Phillips screwdriver to remove the four Phillips head screws that secure the ECM board shield to the ECM board. Then, set aside the screws for later use, and discard the shield.

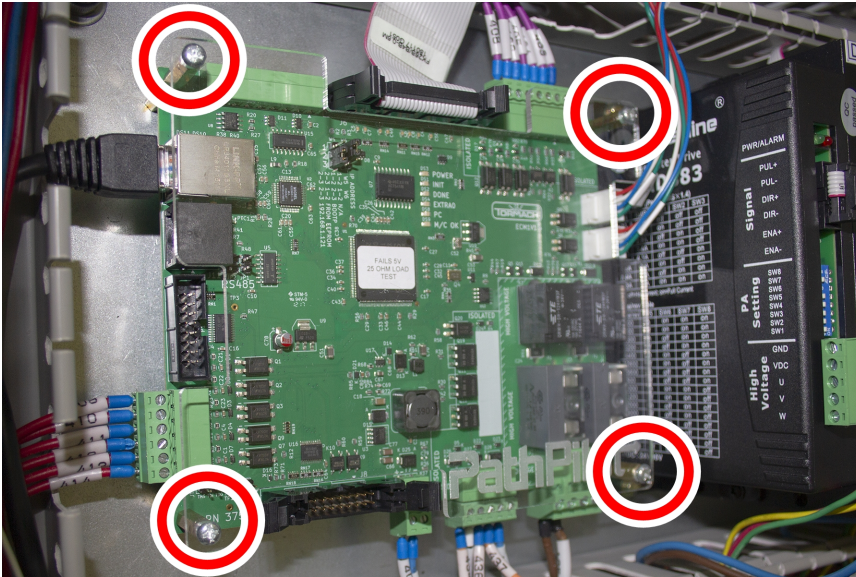


Figure 2: Four Phillips head screws securing the shield to the ECM board.

4. Identify the Accessory 1 input connector and the Accessory 2 input connector on the ECM board (both white). To correctly reinstall them later in this procedure, put a mark on the top connector (Accessory 1) with a marker.

**NOTICE!** If the accessory input connectors are put back incorrectly, it could damage any (optional) accessory probes.

5. Disconnect each connector from the ECM board.
6. Use your fingers to loosen and remove the four brass standoffs that secure the ECM board to the electrical panel.

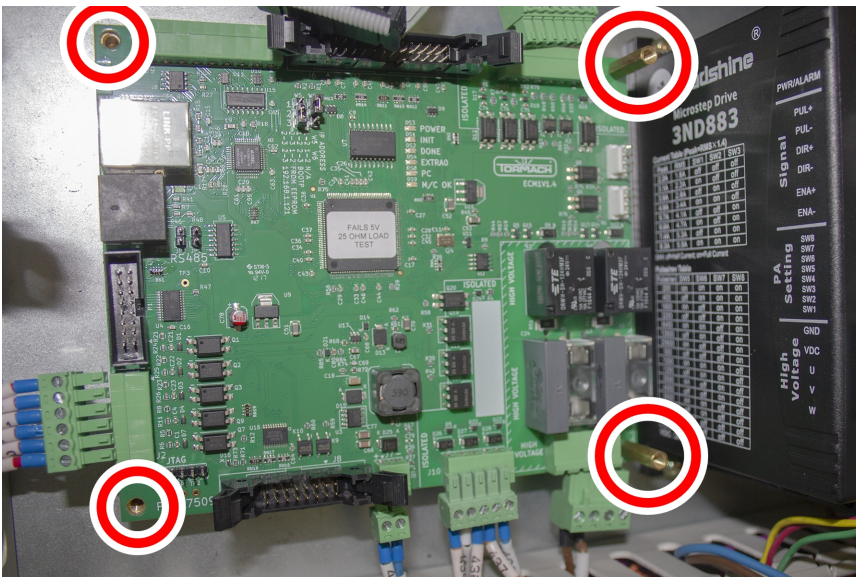


Figure 3: Four standoffs securing the ECM board to the electrical cabinet.

# REPLACE THE ECM BOARD

7. Set aside the ECM v1.4 board.
8. Remove the remaining four brass standoffs from the electrical cabinet. Then, discard all eight brass standoffs that you removed in this procedure.

## Install the ECM v1.5 Board

1. For the ECM v1.5 board to correctly fit in the electrical cabinet, you must first remove two tabs from the top wire trough: bend the tabs back-and-forth until you can remove them from the wire trough, as shown in the following image.



*Figure 4: Two tabs removed from the top wire trough.*

2. Find the eight nylon standoffs provided.

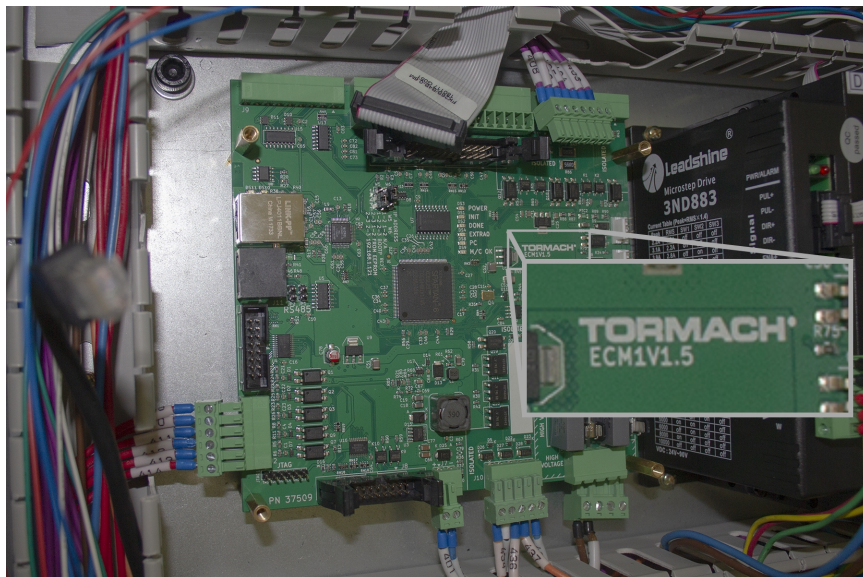
**NOTICE!** To prevent damage to the ECM board from over-tightening, use your fingers to tighten the standoffs.

3. In place of the four brass standoffs that you removed in "Remove the ECM v1.4 Board" (page 4), install four nylon standoffs into the electrical cabinet.
4. Find the ECM v1.5, and remove it from the electrostatic safe bag.



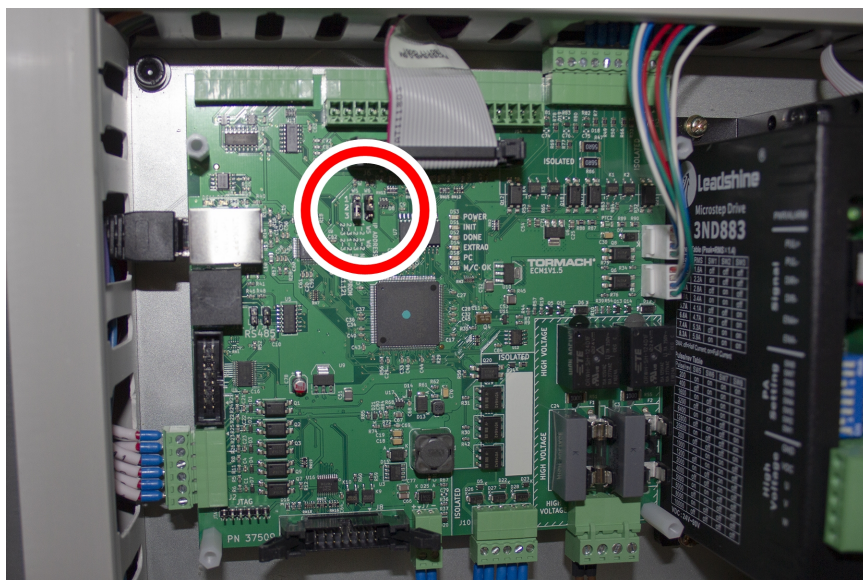
# REPLACE THE ECM BOARD

5. Mount the ECM v1.5 board into the electrical cabinet with the four remaining nylon standoffs. Verify that the logo on the ECM board is upright, as shown in the following image.



*Figure 5: ECM v1.5 board installed in the electrical cabinet.*

6. Identify the jumpers on the ECM v1.5 board, as shown in the following image.



*Figure 6: Jumper on the ECM v1.5 board.*

# REPLACE THE ECM BOARD

7. Verify that the WS5 and WS6 jumpers are in the **FROM EEPROM** position. WS5 connects pins 2 and 3; WS6 connects pins 1 and 2.

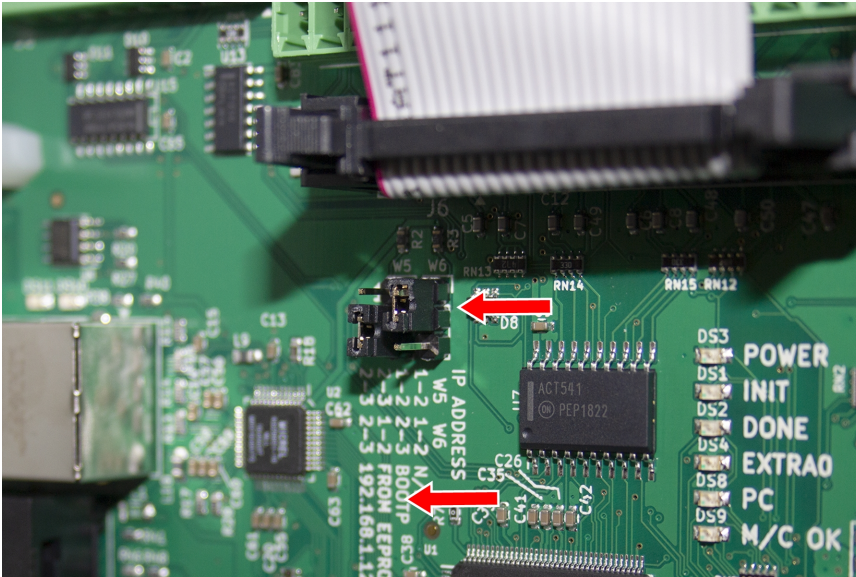


Figure 7: Jumpers on the ECM v1.5 board.



**Note:** The position details are printed on the ECM v1.5 board itself.

8. Make the wire connections on connector J1. From left to right, attach the wires with a small, flat-blade screwdriver as follows:
  - a. Attach wires 445 through 443.
  - b. Transfer wires 402 through 408 from the old connector J1 into the new connector J1.

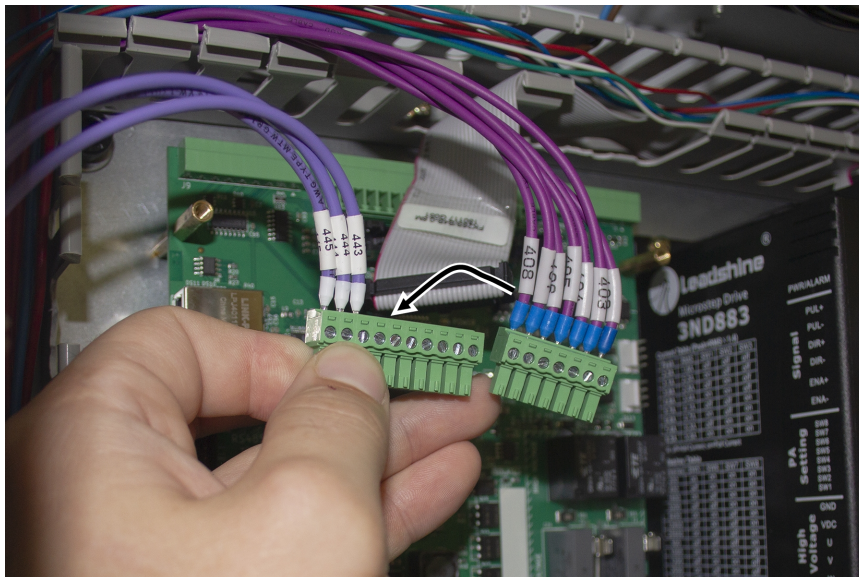
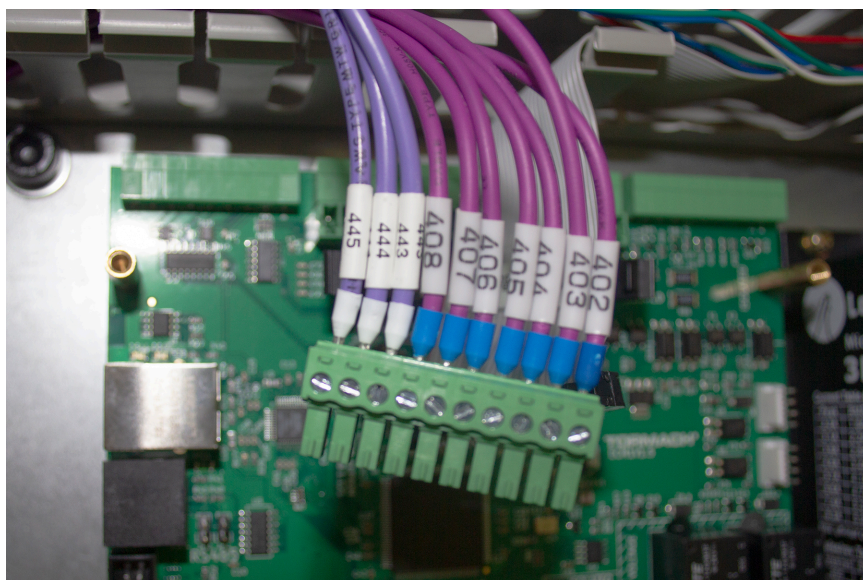


Figure 8: Wires from the old connector J1 and wires from the new connector J1.



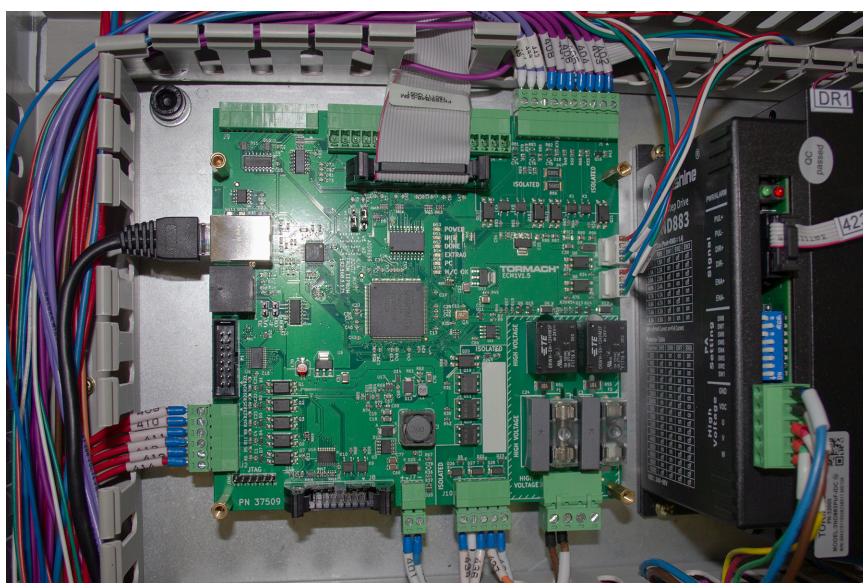
# REPLACE THE ECM BOARD

9. When finished, verify that the wires in connector J1 are configured as shown in the following image.



*Figure 9: Final wire configuration for connector J1.*

10. Put all connectors back on the ECM v1.5 board.

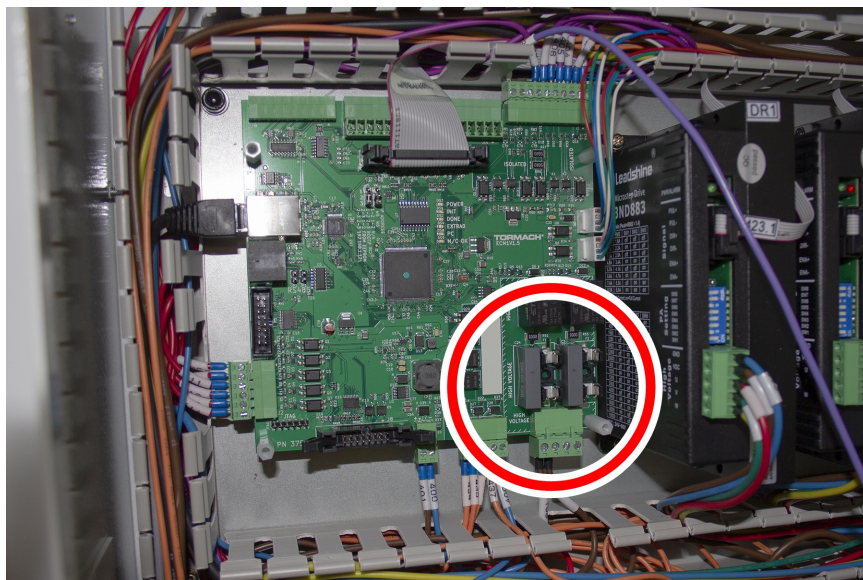


*Figure 10: ECM v1.5 board correctly installed in the electrical cabinet.*

11. Verify that the following connections on the ECM board are correct:
- On connector J3, the white connector has a mark (that you made in "Remove the ECM v1.4 Board" (page 4)).
  - On connector J4, the white connector doesn't have a mark.
12. Find the fuse provided.

# REPLACE THE ECM BOARD

13. Install the fuse in F1, as shown in the following image.



*Figure 11: F1 on the ECM v1.5 board.*

14. Find the ECM v1.5 protective cover provided.
15. Attach the protective cover with a Phillips screwdriver, using the four Phillips head screws that you set aside in "Remove the ECM v1.4 Board" (page 4).



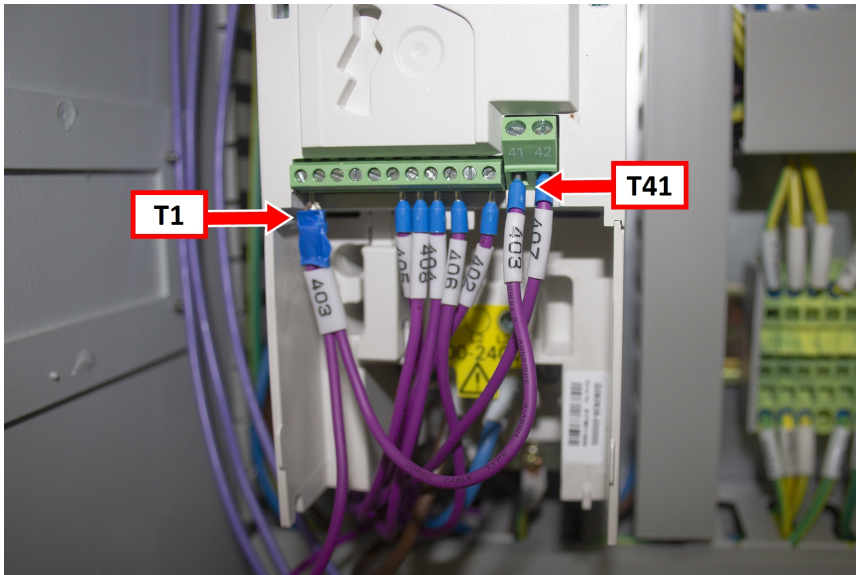
## MAKE VFD CONNECTIONS

1. Turn the latch on the VFD cover with a flat-blade screwdriver. Then, slide down and remove the cover, and set it aside.



*Figure 12: Removing the cover from the VFD.*

2. Identify wire 403 in terminal T41 and terminal T1. Verify that there are two wires in terminal T1, as shown in the following image.

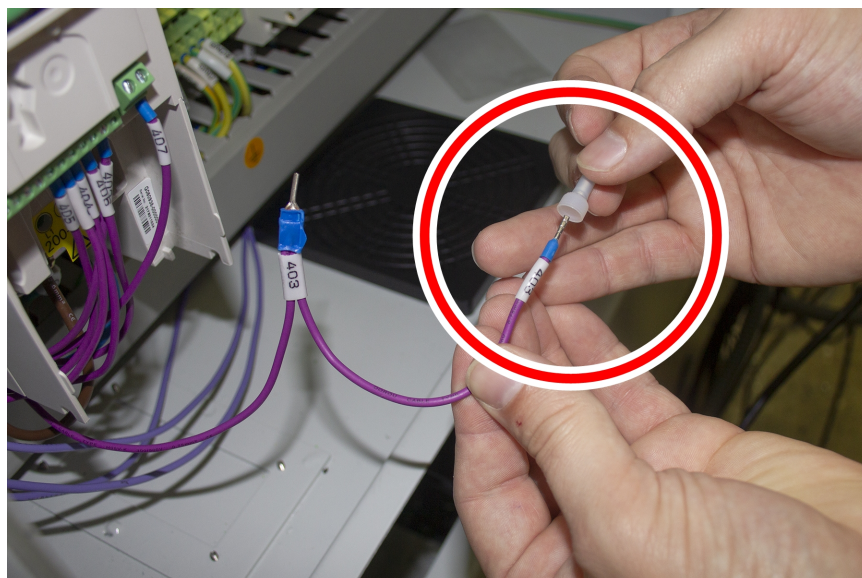


*Figure 13: Wire 403 on the VFD.*

3. Depending on the wire orientation identified in Step 2, do one of the following:
  - **Two Wires in T1** Go to Step 4.
  - **Two Wires in T41** Remove wire 403 from terminal T41 and T1, and install the two-wire end of 403 in terminal T1. Then, go to Step 5.
4. Remove the one-wire end of 403 from terminal T41.

# MAKE VFD CONNECTIONS

5. Find the ferrule cap provided.
6. Secure the ferrule cap onto the one-wire end of wire 403 with a wire crimper.



**Figure 14: Ferrule cap on wire 403.**

7. Use a small, flat-blade screwdriver to connect the following wires from connector J1 to the VFD:

Wire	VFD Connector
443	T5
444	T13
445	T41

8. Replace the VFD cover that you set aside in Step 1.
9. Put all wires into the wire troughs, and then replace the wire trough covers that you removed in "Remove the ECM v1.4 Board" (page 4).
10. Close the electrical cabinet door.



## VERIFY THE INSTALLATION

1. Power on the machine and the PathPilot controller.
  - a. Insert the power plug(s) into the wall outlet. If your system is hardwired, restore power to the circuit breaker(s).
  - b. Turn the Main Disconnect switch to **ON** on the side of the electrical cabinet.
  - c. Twist out the machine's red Emergency Stop button, which enables movement to the machine axes and the spindle.
  - d. Press the Reset button.
2. Do a test of the axes movement: jog the machine in each direction, and confirm that they move as expected.
3. Do a test of the spindle movement: move the spindle in each direction, and confirm that it moves as expected.
4. Depending on the results of Steps 2 through 3, do one of the following:
  - **Correct Movement** You've completed the installation of the ECM Upgrade Kit.
  - **Incorrect Movement** We can help. Create a support ticket with Tormach Technical Support at [tormach.atlassian.net/servicedesk](https://tormach.atlassian.net/servicedesk) for guidance on how to proceed.