



Plug and Play Spindle / VFD Retrofit Guide

v2022Q1.1

i Info

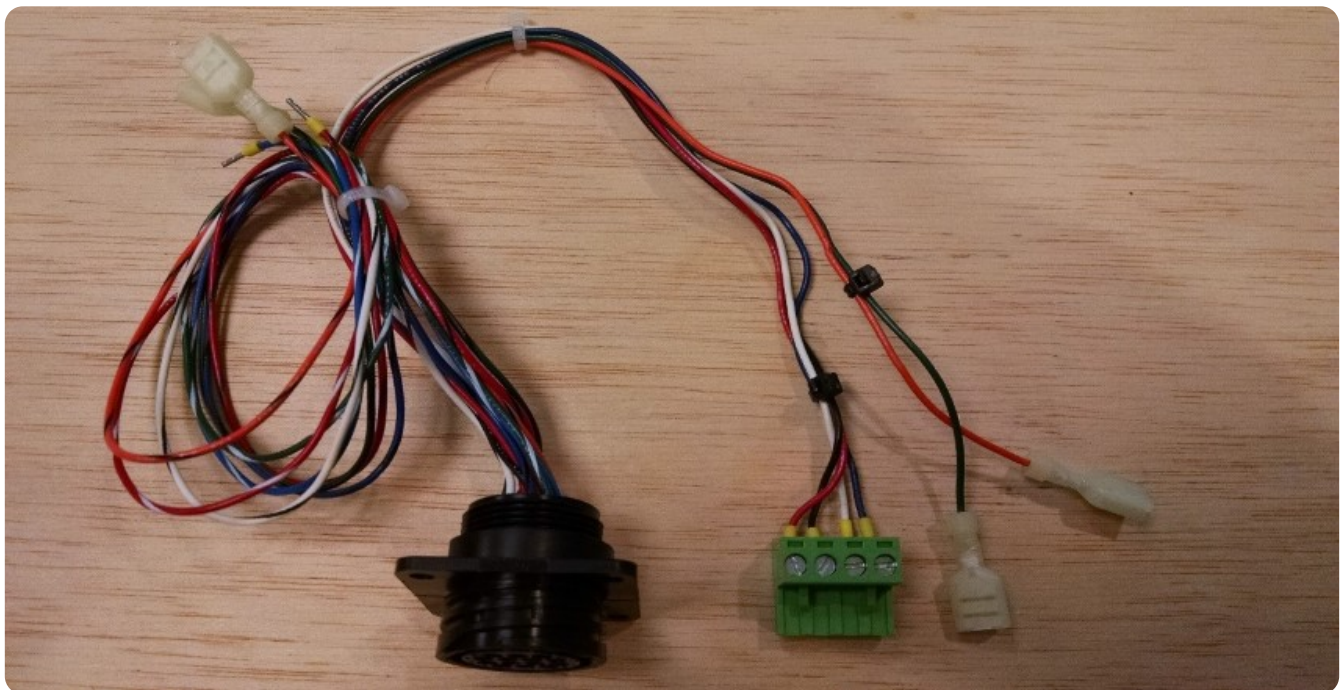
Plug and Play NEMA 23 and NEMA 34 CNC Control Systems purchased prior to Nov 2015 did not include the "SP/THC" connector by default. Please Contact Us and we will provide this connector at no cost.

i Info

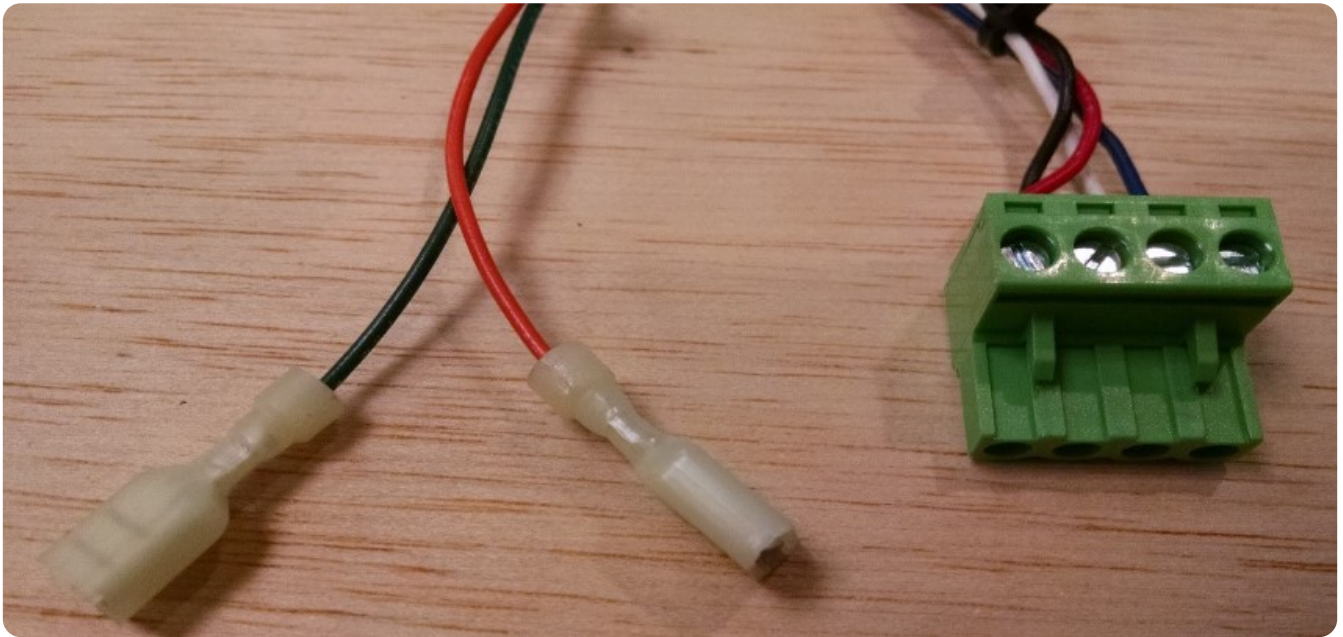
If you are using Mach3 CNC controller software, please refer to our **Mach3 CRP800 VFD Retrofit Guide**.
(https://www.avidcnc.com/dl/cad.2018Q3/CRP800_Retrofit_Guide_v2018Q3_1.pdf)

SP/THC Connector Installation

The first step in setting up your spindle will be to upgrade your current CNC Controller with VFD compatibility. You should have received a 14 pin connector with your Retrofit Kit. (See Below)



This connector will be zip tied to separate out the 4 pins used for speed and fault signaling from the relay wiring. (See Below)



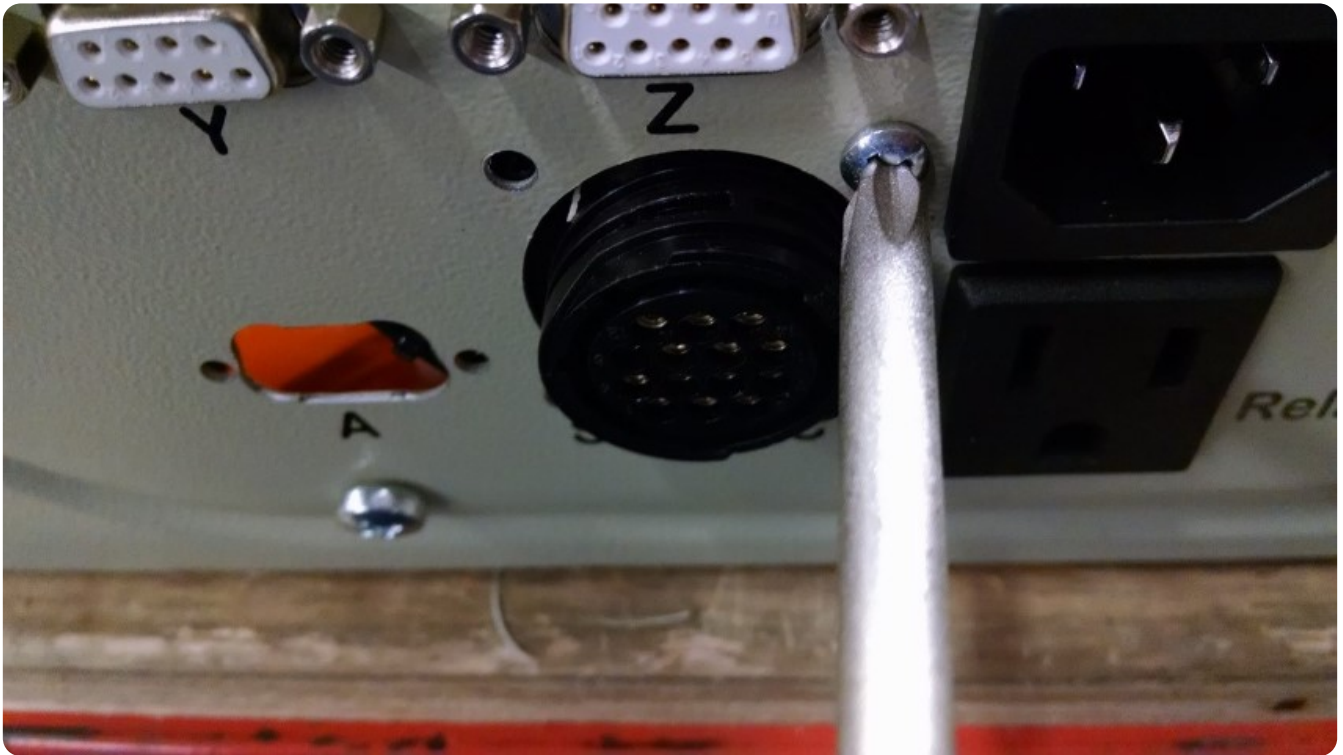
To install this 14 pin connector, first remove the SP/THC port cover on your CNC Controller. (See Below)



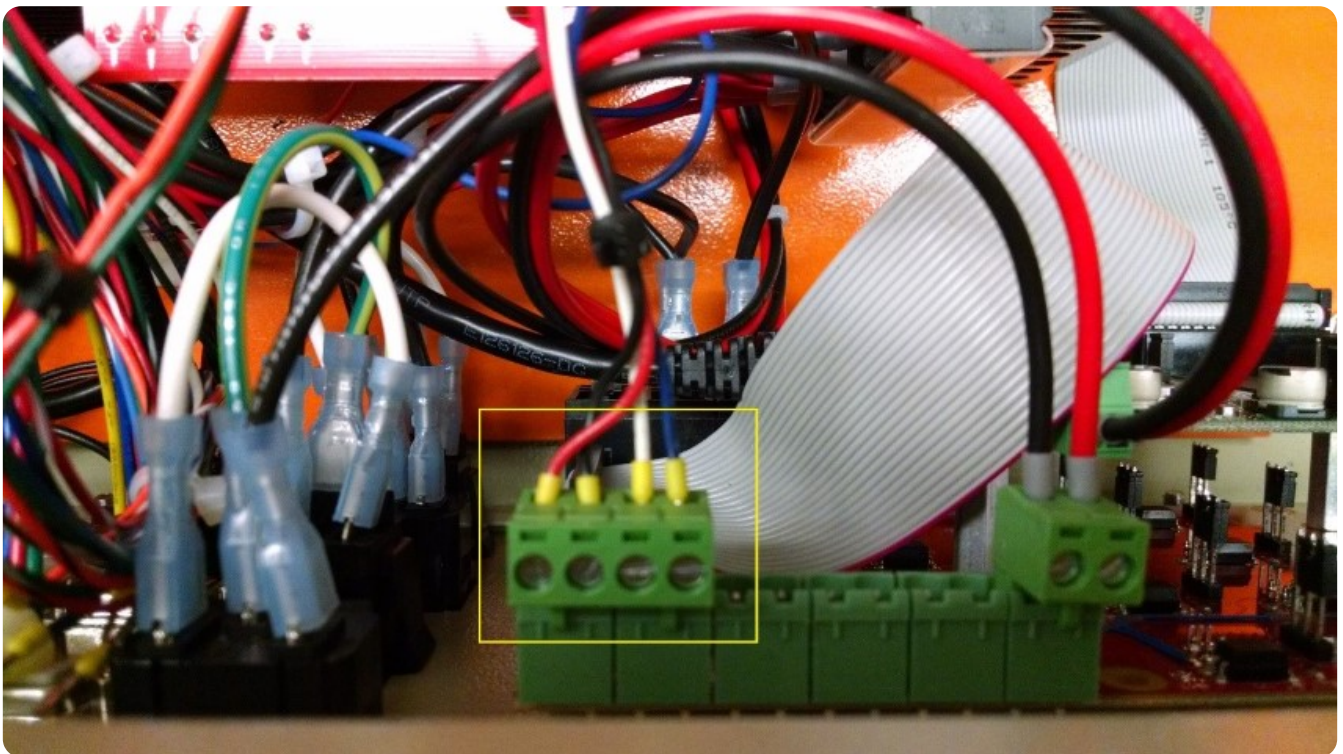
Next install the 14 pin connector from the back side of the gland plate, with the square plastic flange on the inside of the CNC Controller. (See Below)



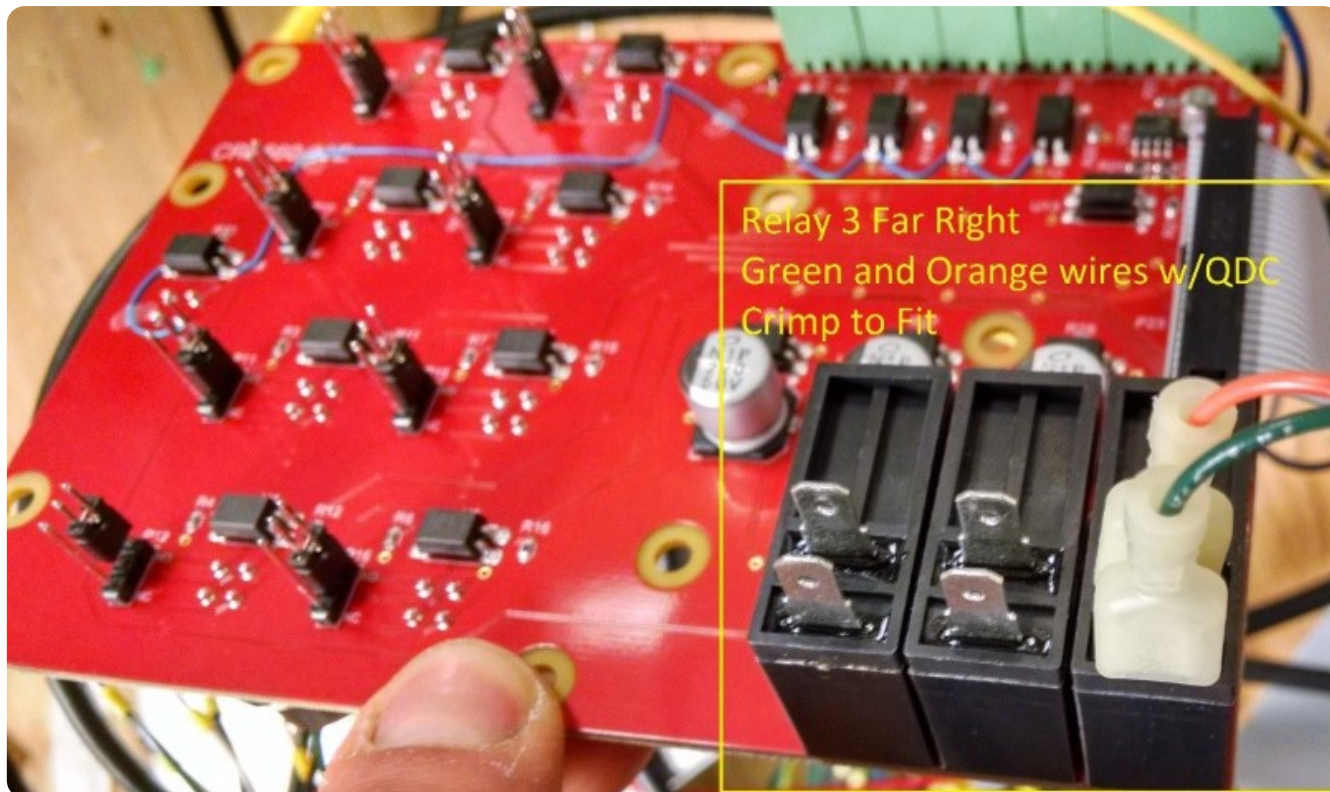
Now using the supplied #6-32 screws and nuts, secure the 14 pin connector to the gland plate. (See Below)



The 14 pin connector must now be wired to the break out board inside of the CNC Controller. Install the four pin SUPU connector onto the break out board in the orientation and position shown.



Then, install the Orange and Green quick disconnects on the 3rd relay of the red break out board mounted to the gland plate (furthest on the left when facing down into the CNC Controller, closest to the relay sockets on the gland plate). Note, you may have to crimp down on the QDC's to create a solid connection.



Your CNC Controller is now ready to connect to the Spindle Controller via the 14-pin SP/THC cable included with your Plug and Play Spindle / VFD System.

Spindle Controller Connections

14-Pin SP/THC Cable



CNC Controller



Spindle Controller

Connect the 14-pin SP/THC cable to your Spindle Controller and CNC Controller.

8.7 HP Plug and Play Spindle / VFD System

If you are upgrading to the 8.7 HP Plug and Play Spindle / VFD System, ensure you use the new 14-pin cable that came with your 8.7 HP system.

Systems produced after mid-February 2022 include a hardwired SP/THC cable that connects directly to the CNC Controller.

M23 Spindle Cable



Connect the male end of your M23 spindle cable to your Spindle Controller, aligning the arrow on the cable connector with the arrow on the panel mount connector.

Power Cable

Plug the power cable from the Spindle Controller into an appropriate receptacle, based on your application below.

3 HP and 4 HP Plug and Play Spindle / VFD System

- L6-30 receptacle (200-240VAC single-phase)

8.7 HP Plug and Play Spindle / VFD System

- L21-30 receptacle (200-240VAC three-phase)
- If running on single-phase, refer to **power requirements** for this system.

Spindle Connection

3 Avid HP Spindle



Connect the female end of the M23 spindle cable to the spindle, aligning the arrows as in the previous step.

4 Avid HP Spindle



M23 Cable Seated



M23 Cable Fully Tightened

Connect the female end of the M23 spindle cable to the spindle. Ensure the connector is seated before tightening.

Assembly Note

It may be necessary to rotate the M23 cable to allow it to seat properly. During this process you will feel the connector drop into place when the pins and sockets of the connector align.

8.7 Avid HP Spindle



M23 Cable Seated



M23 Cable Fully Tightened

Connect the female end of the M23 spindle cable to the spindle. Ensure the connector is seated before tightening.

Assembly Note

It may be necessary to rotate the M23 cable to allow it to seat properly. During this process you will feel the connector drop into place when the pins and sockets of the connector align.

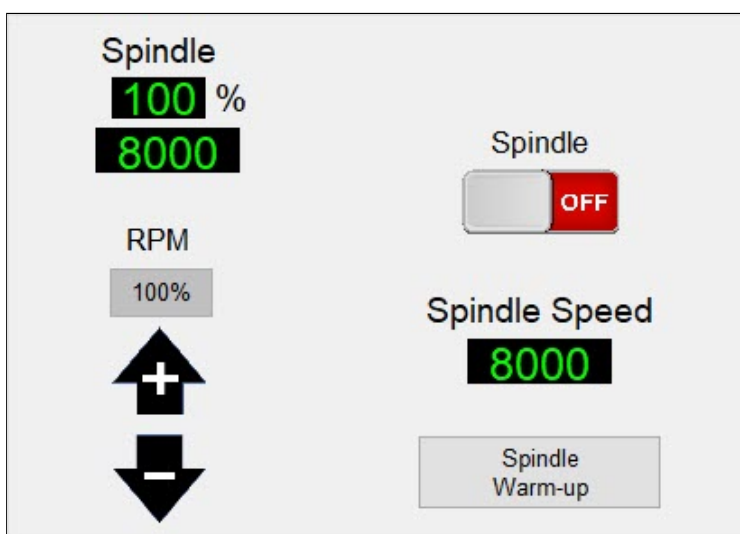
Mach4 Setup

i Mach4 Version

Use of the 4 HP Avid CNC spindle requires version 2.2.2 or newer of Mach4 and use of the 8.7 HP Avid CNC spindle requires version 2.1.0 or newer of Mach4. If you need to update your installation of Mach4, please visit the [Mach4 downloads](#) page and Contact Us with any questions.

After the physical connections are complete, the next step is to configure Mach4 for your spindle. If you have not configured Mach4 for your machine, follow the steps in the [CNC Software Setup Guide](#).

If you are currently using Mach4, you will need to update your Mach4 configuration using the [Avid CNC Mach4 Configuration](#) menu. When selecting a Cutting Tool, choose "Spindle" (or "Spindle / Plasma" for dual-use machines) and the appropriate Spindle Type.



Once you have configured Mach4 with a Spindle cutting tool, you will see the spindle control functions shown above. For more detail about each of the buttons and DROs, refer to the [Mach4 Users Guide](#). Each spindle type has a pre-defined minimum and maximum speed, as shown in the table below.

Spindle Type	Min Speed (RPM)	Max Speed (RPM)
3 HP Avid CNC spindle	8000	24,000
4 HP Avid CNC spindle	6000	24,000
8.7 HP Avid CNC spindle	1000	24,000

To manually adjust the spindle speed, enter a speed within your spindle's range into the Spindle Speed DRO. If you enter a value too low, it will bump up to the minimum, too high and it will bump down to the maximum.

Once you have input a valid spindle speed, click the Spindle toggle button to turn the spindle on and run it at that speed (Mach4 will need to be enabled to turn the spindle on).

Check that you can adjust speed while the spindle is on by entering various speeds (between your spindle's min and max speeds) into Spindle Speed DRO and hit enter.

If the spindle responds to these speed commands, your VFD and Spindle package is ready for use!

If you experience any trouble while following this guide, please feel free to Contact Us.

