

FLASHCUT CNC

CONTROL MADE SIMPLE

Torchmate Retrofit Installation Guide



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Getting Started

About This Manual

CNC is a unique application involving hardware and software. We recommend that you read all of these instructions before using the product.



Since automated machining is potentially dangerous, please take the time to completely read through this manual and the software User's Guide to understand the operation of the electronics, software and machine before cutting a part.

Turning Off the Controller



Always turn off the CNC Controller when it is not in use.

Safety and Usage Guidelines



When running an automated machine tool, safety is of the utmost importance. For proper and safe use of the CNC program and your CNC machine, the following safety guidelines must be followed:

- 1. Never let the machine tool run unattended.**
- 2. Require any person in the same room as a running machine tool to wear safety goggles and to stay a safe distance from the machine.**
- 3. Allow only trained operators to run the machine tool. Any operator must have:**
 - Knowledge of machine tool operation.**
 - Knowledge of personal computer operation.**
 - Knowledge of Microsoft Windows.**
 - Good common sense.**
- 4. Place safety guards around the machine to prevent injury from flying objects. It is highly recommended that you build a safety shield around the entire tool envelope.**
- 5. Never place any part of your body within the tool envelope while the machine is online, since unexpected machine movement can occur at any time.**
- 6. Always keep the tool envelope tidy and free of any loose objects.**
- 7. Be on alert for computer crashes at all times.**

WPI, Inc. is not responsible for the safe installation and use of this product. You and only you are responsible for the safety of yourself and others during the operation of your CNC machine tool. We supply this product but have no control over how it is installed or used. Always be careful!

WPI, Inc. or its affiliates are not responsible for damage to any equipment or workpiece resulting from use of this product.

If you do not understand and agree with all of the above safety guidelines, do not use this product.

Torchmate Retrofit Installation

Add a 4th Axis Drive

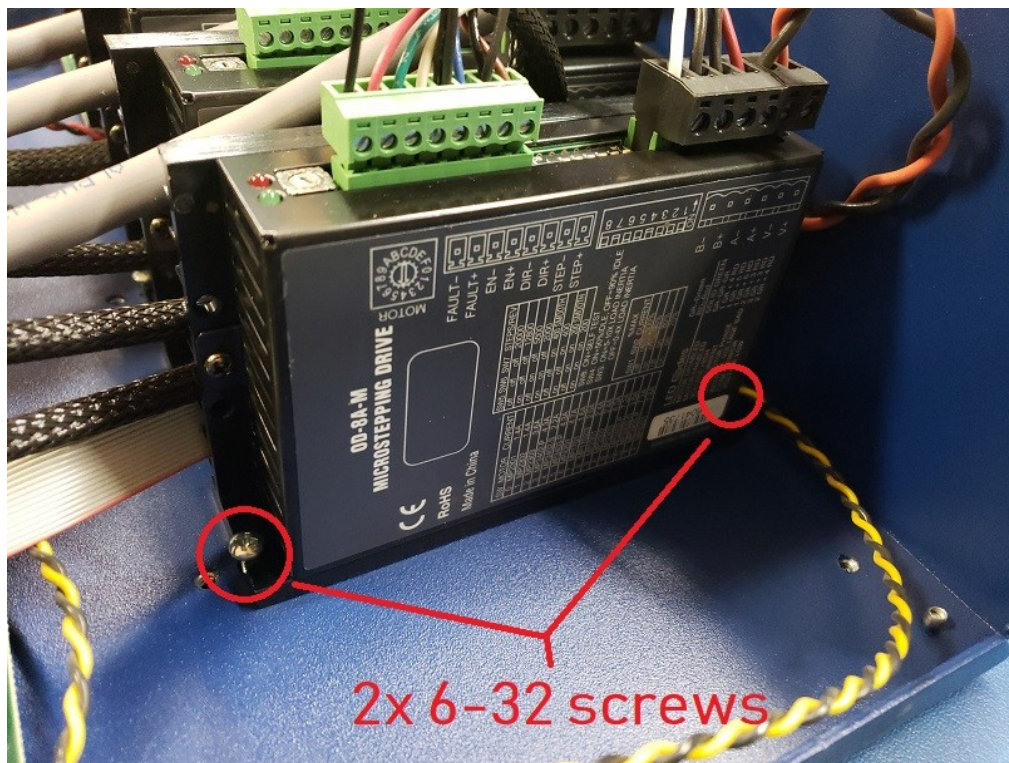
This step can be skipped if your controller is already equipped with four motor drives.

Compact Series

Open the Compact controller by removing the four screws holding the lid and then remove the lid from the unit. Remove the cover plate on Axis 4 and save the screw. Then, install the new drive card into the open Axis 4 slot, making sure to mate the card properly into the header. Use the removed screw to affix the card to the chassis.

Pro Series

Open the Pro controller by removing the eight screws holding the lid and remove the lid from the unit. Install the new drive module into the next open bay adjacent to the original drive modules using the two provided 6-32 screws.

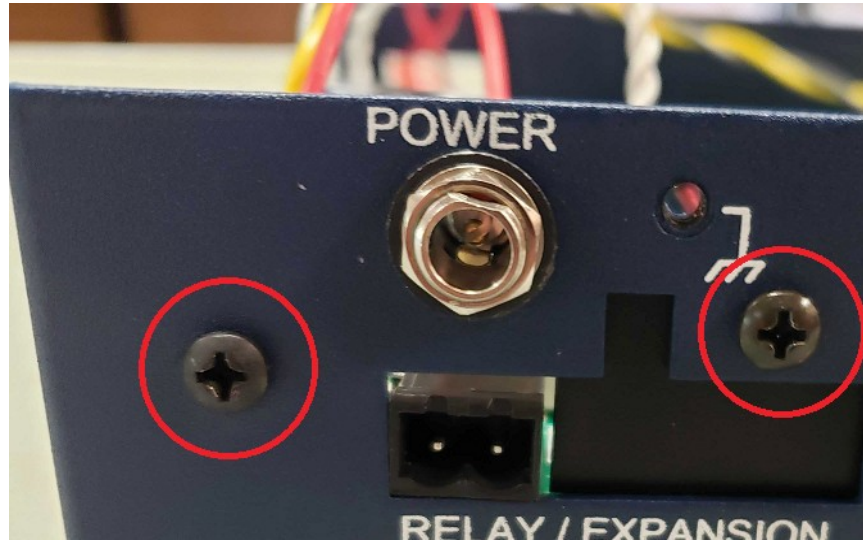


Install the internal power cable to the next available port on the motor power header on the power board—adjacent to the original internal power cable—and plug the connection into the V+/V- port of the drive (closest to the wall of the chassis). Next, install the internal command cable to the Axis 4 header on the signal generator and connect it to the new drive. Use the other axes as a guide for proper orientation. Finally, remove XLR connectors from the original back plate and reinstall them on the new plate. The internal motor cable will replace the cover plate on Axis 4. Plug this connection into the remaining A+/A-/B+/B- port on the drive.

Install the Mini I/O Board

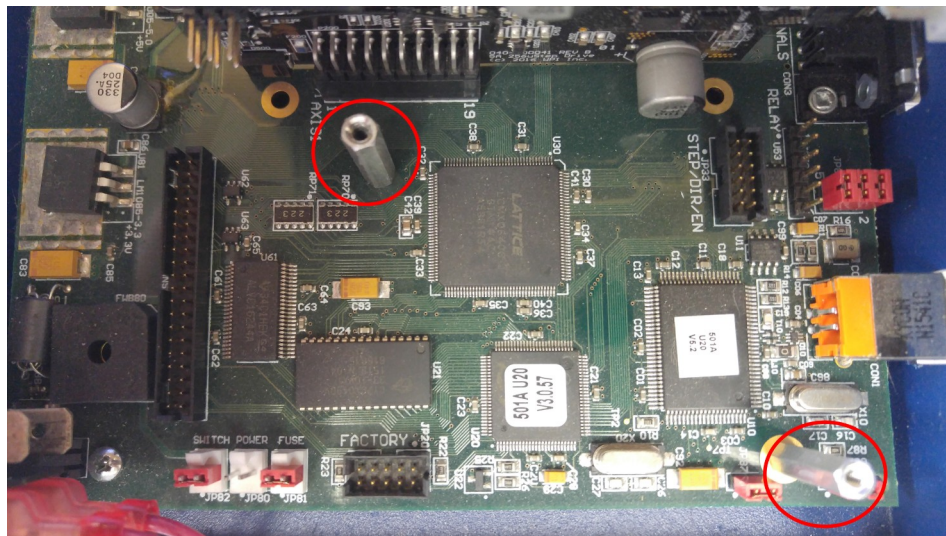
Compact Series

With the Compact controller still open, unplug the connections to and remove the original power supply board. Remove the Relay/Expansion cover plate as well.

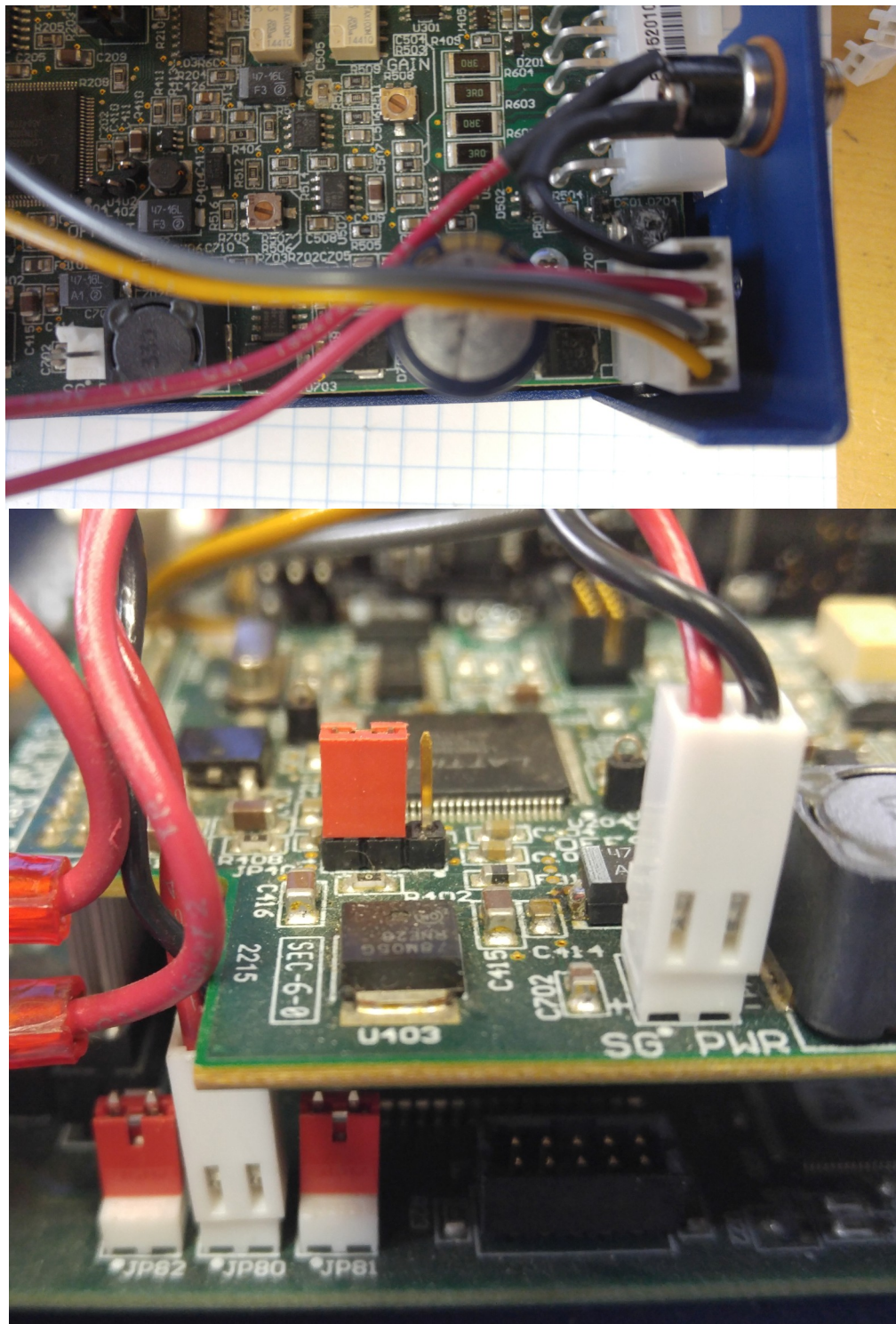


If all four cables use identical connectors, you will also need to uninstall the motor power (to TB80 on the signal generator) and power inlet (to the power switch and rear power inlet) cables and replace them with the new provided cables.

Remove the indicated screw from the signal generator and replace it with one of the provided 4-40 standoffs. Install the other standoff to the position indicated, if threads are present. Then mount the board in the JP32 Bus Expansion slot on the signal generator and affix the card to the standoffs.

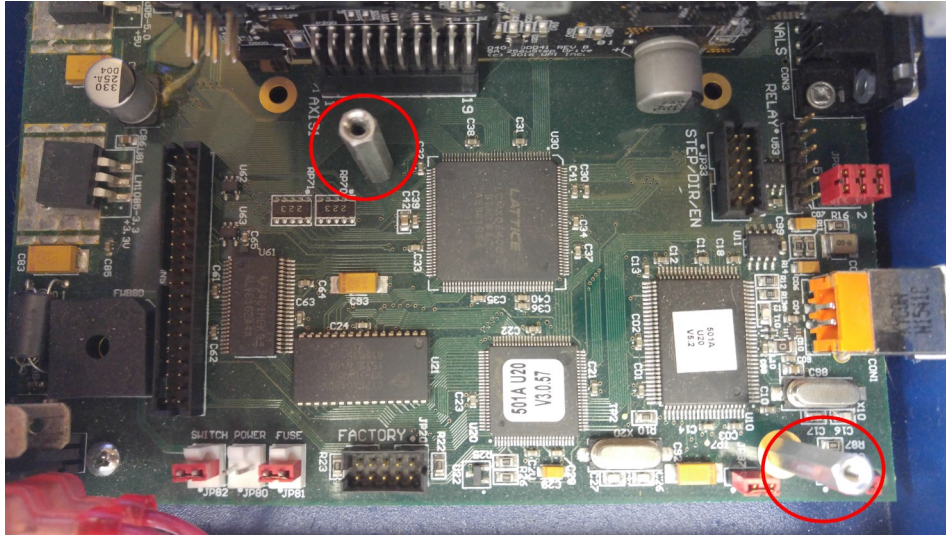


Last, plug the internal cabling into the board as shown below and replace the controller lid. On the latest revision of Mini I/O board, the SG PWR connection can be made at any of the three headers. The remaining cable (2-pin to 6-pin) will not be used.



Pro Series

With the Pro controller still open, install the two standoffs provided with the board. You will have to remove one of the already-present screws. Then, seat the board in the JP32 Bus Expansion slot on the Signal Generator below. Secure the board to the standoffs using the provided screws. No cable connections need to be made to this board.



Mount the Z Axis Motor

Uncouple and dismount the original Z Axis motor from the lifter mechanics. Mount the new NEMA 23 stepper motor in its place and tighten the coupling to the motor shaft. Run the new motor cable through the cable track. Plug this cable in to the Axis 4 port of the controller as well as the new motor.

Configure the Software

Load Original Setup File

After installing and launching the FlashCut CNC software, move the original Torchmate setup file (a .stp file) from the C:\Torchmate Data\Torchmate 4\Setup folder to C:\FlashCut Data\FlashCut {Version#}\Setup. Then, open the Configuration using the double-gear button to the upper right.



Click the 'Load' button in the configuration and open the original setup that was copied here. The system will automatically update this file to be compatible with the new software.

Configure the Z Axis

In the software configuration, go to the "Machine...Axes" page. Assign the Z axis to the 4th motor line and enable the Z axis with the corresponding 'Use Axis' checkbox. If motion is in the incorrect direction after jogging, return to this page and change the 'Direction' selection for the 4th axis.

Motor Line/Axis Mapping						
Line #	Axis	Sub Axis	Offset	Direction		
1	X	N/A	0 in	<input type="radio"/> Positive	<input checked="" type="radio"/> Negative	
2	Y	2	0 in	<input checked="" type="radio"/> Positive	<input type="radio"/> Negative	
3	Y	1	0 in	<input checked="" type="radio"/> Positive	<input type="radio"/> Negative	
4	Z	N/A	0 in	<input checked="" type="radio"/> Positive	<input type="radio"/> Negative	
5	None	N/A	0 in	<input checked="" type="radio"/> Positive	<input type="radio"/> Negative	

Axis Settings						
Axis	Use Axis	Limited travel	Length	Backlash	Direction Change Delay (sec)	Interpolate During Safe Moves
X	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	96 in	0 in	0.01	<input checked="" type="checkbox"/>
Y	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	245 in	0 in	0.01	<input checked="" type="checkbox"/>
Z	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7 in	0 in	0.01	<input type="checkbox"/>
W	<input type="checkbox"/>	<input type="checkbox"/>	10 in	0 in	0.01	<input type="checkbox"/>
V	<input type="checkbox"/>	<input type="checkbox"/>	10 in	0 in	0.01	<input type="checkbox"/>
U	<input type="checkbox"/>	<input type="checkbox"/>	10 in	0 in	0.01	<input type="checkbox"/>

☒ Enable Backlash Compensation

Add the Input Controls

In the software configuration, go to the “I/O...Input Lines” page. Ensure that lines 19 and 20 are set up as shown below.

18		Unused	▼	N/A	▼	N/A	▼	N/A	▼	0.001		N.O.	●	N.C.
19	Ohmic Sensor	Control	▼	N/A	▼	N/A	▼	N/A	▼	0.001		N.O.	●	N.C.
20	Arc Transfer	Control	▼	N/A	▼	N/A	▼	N/A	▼	0.001		N.O.	●	N.C.
21		Unused	▼	N/A	▼	N/A	▼	N/A	▼	0.001		N.O.	●	N.C.

Configure the Plasma

In the software configuration, go to the “Machine...Fabrication Heads” page. Click on the existing Powermax listing in the chart. This will drop down additional settings. If you’re not using a Powermax torch, click the ‘Delete Fab Head’ button, then the ‘New Fab Head’ button, and then select the proper Subtype and Model. If you have a Powermax, simply adjust the Model to the correct torch for your setup.

Select Output 1 for both the ‘Torch On’ and ‘Torch Off’ states.

Torch Control

Torch On: Output Line(s) State:

1 ▼

On

×

+

Turn On Using:

Output Lines ▼

Delay:

0

sec

Torch Off: Output Line(s) State:

1 ▼

Off

×

+

Turn Off Using:

Output Lines ▼

Delay:

0

sec

Enable ‘Torch Height Control’ and leave these parameters at their default values.

Enable ‘Use Program Zero Sensing’ and leave these parameters at their default.

Enable ‘Touch Off At Start (G605)’.

Finally, click ‘Save’ in the configuration to finalize all changes.