

CNC 6040 Setup for Mach3

2019 © David Parish

23 Feb. 2019

I have the 1500W router spindle with PRT-E1500W VFD. I bought this in Jan 2019, so that is the approximate date of manufacture. Other dates may vary.

Mach 3 wouldn't control the router until I did the following:

Reset VFD to factory settings:

Set D001 to 1
Set D176 to 1
Set for 400 Hz VFD vs 50Hz factory default setting
Set D09=400
Set D00 to 400
Set D002 to 400
Set D000 to 400
Set D003 to 400
Set D009 to 400
Set D021 to 400
Set D093 to 400
Set VFD to receive input frequency from front panel "AVI" terminal (rotary pot)
Set D031 to 1
Set VFD front panel display to show in RPM vs Hz.
Set D039 to 1
Set VFD to operate off of both Manual and PC input Switch
Set D032 to 0

Note: after completing setup sequence, make sure to test manual with rotary switch in Manual, and PC/Mach3 in PC rotary setting. Note if the PC mode shows the numbers increase on front panel display but does not start the spindle, you need to press the ON button on front panel to enable spindle. After that it will remain in PC control of ON/OFF.

Set up Mach3 on PC to control VFD:

Mach3, Config, Ports and Pins, check port 1 and port 2

Note, my machine does not use the parallel port, instead a USB interface to a "sort-of smart card" inside the main enclosure. In order to get the initial settings right and Mach3 code for the machine with configuration data, I opened the enclosure, found the small smart board, read off the manufacturer and model, then google searched for it, and found the USA source for the device. They had a very "minimal" web site that allowed download of the Mach3 program and config, and that was my starting point. My factory CD was corrupted or worthless and didn't work on a Windows 7 machine.

Set Kernel speed for 25000 Hz.

Ports and Pins, Motor Outputs, check X,Y,Z and Spindle. (I left Step and Dir at 0,0 for all except Spindle that was 1,0 and checked active low for Dir and Step. Probably not necessary since it is a PWM interface, but those settings are working.)

Ports and Pins, Input signals, I have checked

- Probe, port 3 pin 3
- Estop, port 3 pin 1
- OEM Trig #1, port 3 pin 5
- OEM Trig #2, Port 3 pin 6
- OEM Trig#3, port 3 pin 7
- OEM Trig#4, port 3, pin 8

Ports and Pins, Output Signals, I have checked

- Enable1, port 1 pin 14
- Output #1 port 1 pin 17

Ports and Pins, Encoder/MPG (I have added a manual pulse generator hand control)

- MPG#1 checked, all 0 settings, counts/U 1, Velocity 100

Ports and Pins, Spindle Set-up

- Uncheck "Disable Spindle Relays (Probably not needed)
- Check "Use Spindle Motor Output"
- Check "PWM Control"
- Uncheck Step/Dir
- Set base PWM Freq to 500
- Set min PWM to 0%
- All other boxes on that page are unchecked

Set Config, Spindle Pulleys, Current pulley Number 4, min speed 0 max speed 24000, ratio 1.
That's it for my machine.

To test:

- Set VFD rotary switch to PC control
- Go to Mach3 main screen, and press Spindle Speed, then spindle CW F5 button.
- Spindle should start. If it does not, look at VFD display and verify it has a number showing like 16000+/-, then press the RUN button it should start.
- Use speed rate override to 160% to get full speed 24000.
- Turn off spindle with same button Spindle CW F5.
- Then go to MDI tab on Mach3.
- On the input line type in M3 to turn on spindle.
- Type input of M5 to turn off spindle.

That's it. I hope yours works. This took a lot of cross referencing other suggestions, then test and debug to find the right settings. Good luck.

Yes it's a nice mechanical machine, and electrical is good, and a good value for what you get, but why can't they provide accurate directions and manuals?! This reminds me of a Dilbert cartoon story line....