

Endurance Laser

Mach 3 PWM set up for AVID CNC/ CNC ROUTERPARTS

And the Ethernet Smooth Stepper (ESS)

This guide is specific to my set up. Your set up may require different setting but this can be used a guide to get you close

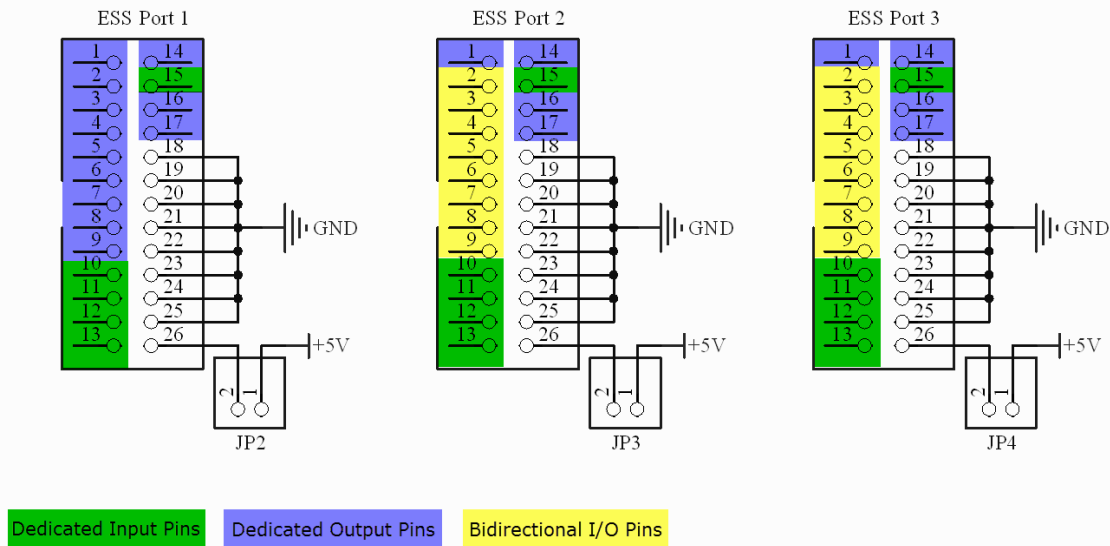
My System

- CNC Routerparts/ Avid Pro CNC 2'x8'
- Nema 23 Stepper motors
- Mach 3 version 3.043.062
- ESS plug in version https://warp9td.com/files/Plugins/ESS/Mach3/ESS_Mach3_2019_11_06__10w2a_10f1.zip
 - This version of the plugin is required to get the THC control screen in the plugin set up tab.

Items needed

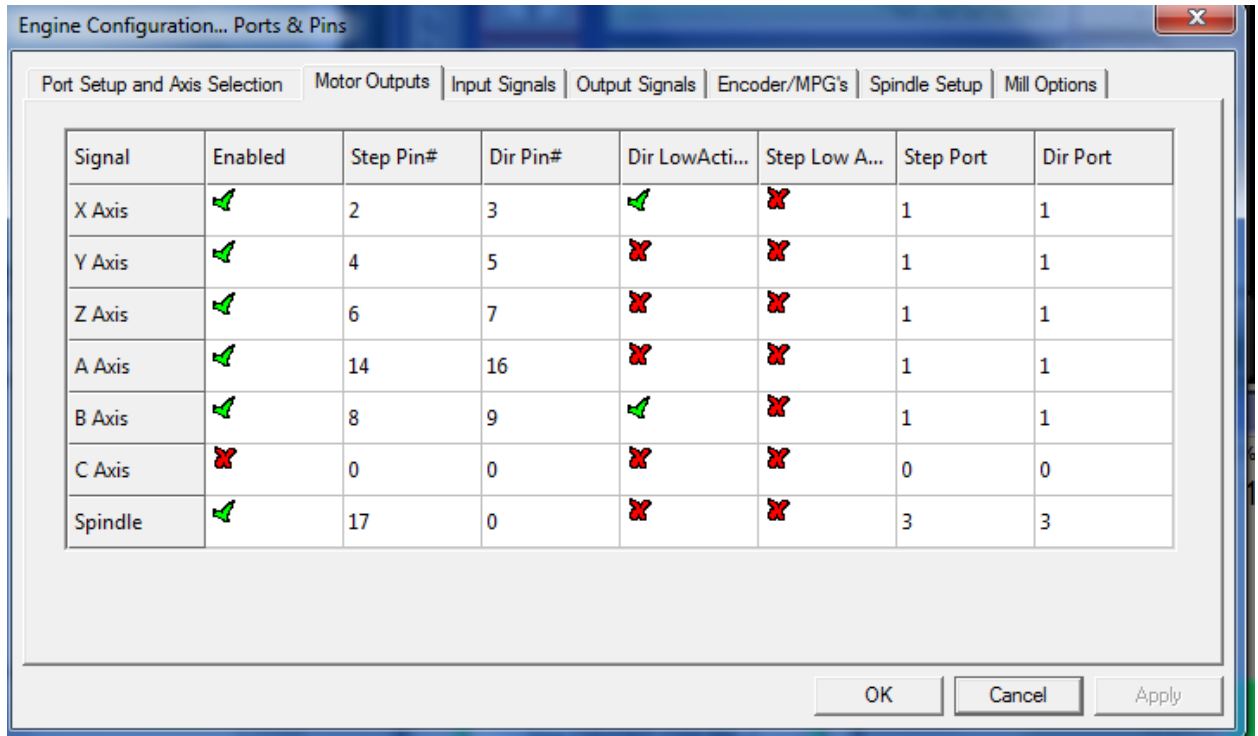
- Break out board. I used a C10D
- 26 pin ribbon cable
- 2 rolls of 20 AWG wire
- Endurance laser

1. Connect the break out board with the ribbon cable to port 3 on the ESS.
2. Be sure the jumper is placed over the pins next to EES port 3 to supply power to your BOB if needed. Some breakout boards require 5vdc power. This jumper enables power thru the ribbon cable to the break out board.

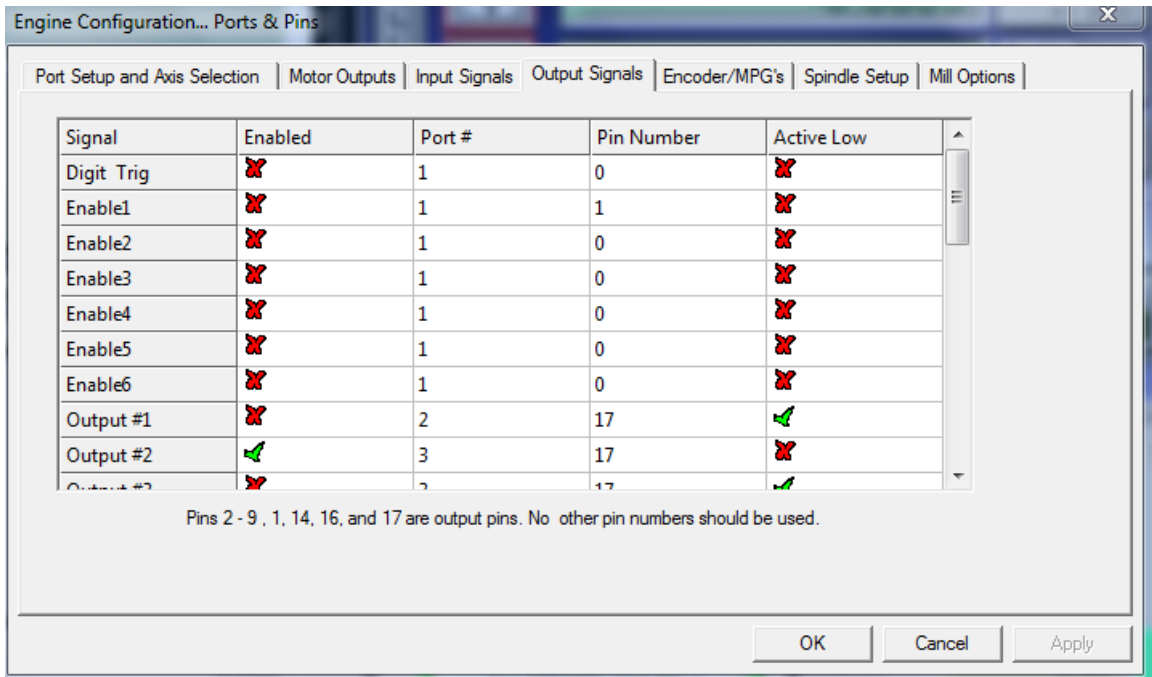


3. Connect the wires from your laser to pins 17 and 18 of the breakout board. Run these wires through your cable chain to your laser box.
4. Open Mach 3
5. Create a new profile by cloning a working profile, name it Laser.
6. Once Mach 3 loads the profile, click config on the menu and select Ports and Pins

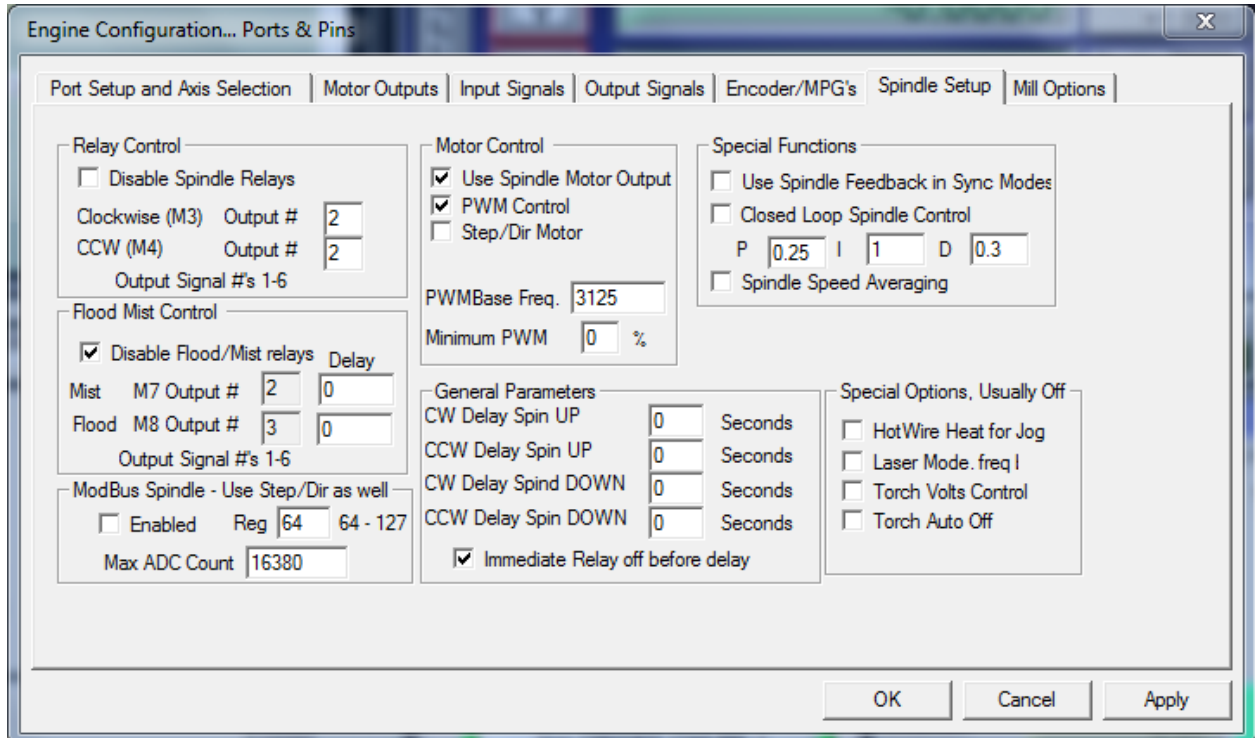
7. Click the Motor Outputs tab. Copy the setting seen below for motor outputs. Enable Spindle. The settings in spindle correspond to Port 3 and Pin 17 where you installed and wired the BOB to trigger your laser to fire. Be sure of place an X on Dir Low active and Step low active. Click apply .



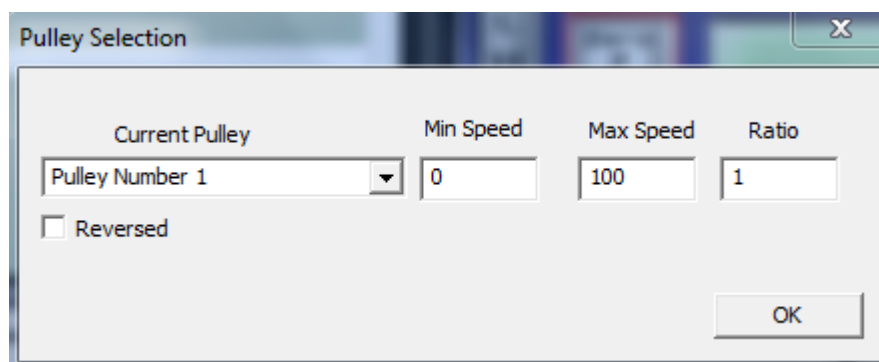
8. Click the Output Signals Tab and copy the settings. Output 2 will become where your laser is triggered. Place an X on active low. This is important in upcoming steps. Click apply



- Click Spindle Set up next. Clear the disable relay box and enter 2 for the outputs. Output 2 is where the relay output 2 on your CNC control box is located. Check Use Spindle Motor Output and PWM Control, set Minimum PWM to 0%. Disable the flood and mist relays. Set all delays to 0 in general parameters. I checked Immediate Relay off before delay but I'm not sure if it has any effect yet. Click apply and OK



- Open Config/Spindle Pulleys. Copy these settings to allow the spindle/laser to be controlled from 0-100% power by commands such as S50 which would equal 50% laser power or S25 which equals 25% power.



11. Plug your laser into Relay 2 output. Run a power cord from Relay 2 In to your outlet.

This should give you PWM power control of your laser with M11 P2 Sx and M10 P2 commands. The Sx command indicates the desired power output of the laser. I.e. M11 P2 S50 would turn the laser on with 50% power. M10 P2 turns the laser off. Of note a single M3 command is required in your g-code header to turn on PWM. M5 in the footer will turn it off.

Useful links

<https://warp9td.com/index.php/gettingstarted/setting-up-the-smoothstepper-and-mach#Laser>

<https://optlasersgrav.com/manuals/Avid-CNC-RP-Laser-Upgrade-G-Code.html>

<https://youtu.be/JYhZAljiaKg>

<https://www.machsupport.com/forum/index.php?PHPSESSID=rc9a8ae0il3tiq6po8l9d6p21u&topic=32442.0>