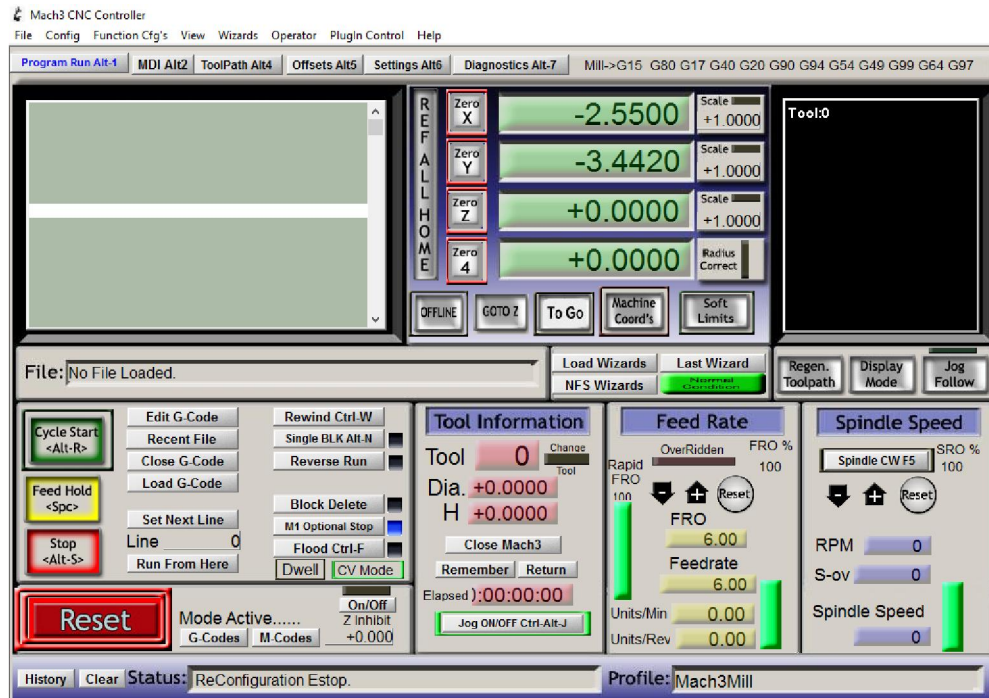


# MACH3 CNC BASIC SET UP

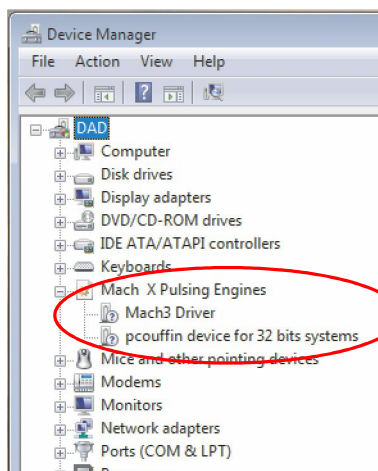


This setup is used for most generic type of Break Out Boards (BOB).

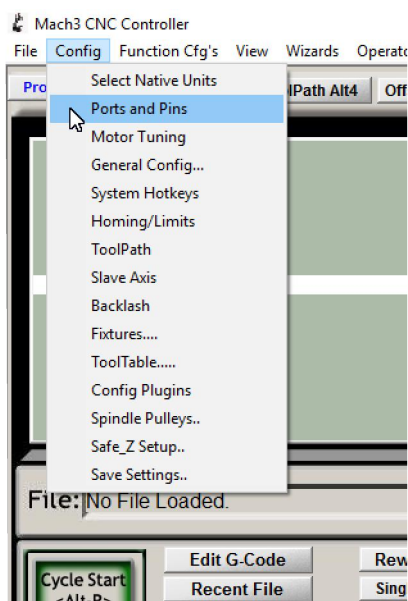
### Please Note:

The settings presented in this manual are for generic break-out boards. These are the most common settings used for CNC setup. However, your break-out board and/or the way you wire and connect your board may not work with these exact settings.

This manual is designed as a starting point. To help guide and understand the basic setup of Mach3. This is just the beginning of a long list of settings you may have to perform to set your machine up properly. Please refer to the Mach3 user manual or online help to fine tune your set up.



1. Under the "Device Manager" under "Settings" on Windows operating system. Make sure Mach3 Pulsing Engine is installed and running correctly. There should not be any "!" or "?" .



2. Click "Config" > "Ports and Pins" on main page of Mach3

## Mach III Set Up

- Enter in "Port Setup and Axis Selection" to set "Port#1 and Kernel speed" as show below.

Be sure that this Port Address is correct. Make sure it is the same as the port address on your PC.

Start your Kernel Speed at 25000Hz and increase as you fine tune you system.

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Port #1: ☒ Port Enabled, Port Address: 0x378, Entry in Hex 0-9 A-F only

Port #2: ☐ Port Enabled, Port Address: 0x278, Entry in Hex 0-9 A-F only, ☐ Pins 2-9 as inputs

OR

MaxNC Mode: ☐ Max CL Mode enabled, ☐ Max NC-10 Wave Drive, Program restart necessary

Restart if changed: ☐ Sherline 1/2 Pulse mode, ☐ ModBus InputOutput Support, ☐ ModBus PlugIn Supported, ☐ TCP Modbus support, ☐ Event Driven Serial Control, ☐ Servo Serial Link Feedback

Kernel Speed: ☒ 25000Hz, ☐ 35000Hz, ☐ 45000Hz, ☐ 60000Hz, ☐ 65000Hz, ☐ 75000Hz, ☐ 100khz

Note: Software must be restarted and motors returned if kernel speed is changed.

OK Cancel **Apply**

Click "Apply" to allow changes to take effect.

- Click "Motor Outputs" and set as shown below.

Make sure your "Step" and "Dir" Port are set to 1.

Engine Configuration... Ports & Pins

Port Setup and Axis Selection | **Motor Outputs** | Input Signals | Output Signals | Encoder/MPG's | Spindle Setup | Mill Options

Signal	Enabled	Step Pin#	Dir Pin#	Dir LowActi...	Step Low A...	Step Port	Dir Port
X Axis	<input checked="" type="checkbox"/>	2	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	1
Y Axis	<input checked="" type="checkbox"/>	4	5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	1
Z Axis	<input checked="" type="checkbox"/>	6	7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	1
A Axis	<input checked="" type="checkbox"/>	8	9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	1
B Axis	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0	0
C Axis	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0	0
Spindle	<input checked="" type="checkbox"/>	1	0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1	0

OK Cancel **Apply**

Click "Apply" to allow changes to take effect.

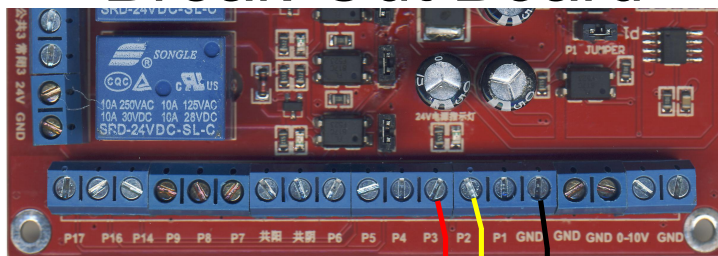
If you have used common-cathode wiring, leave unchecked as shown. If you have used common-anode wiring, make sure to "check". If your stepper motors turn in the wrong direction, check the opposite under "Direction" column.

See the next two pages to find out more information on "common cathode" and "common anode" wiring

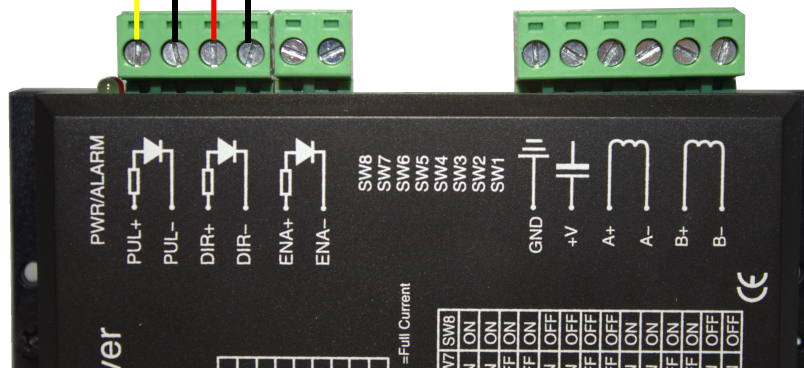
# Mach III Set Up

## Common Cathode Wiring

### Break-Out Board



Notice that the GNDs are shared with the driver.



### Stepper Driver

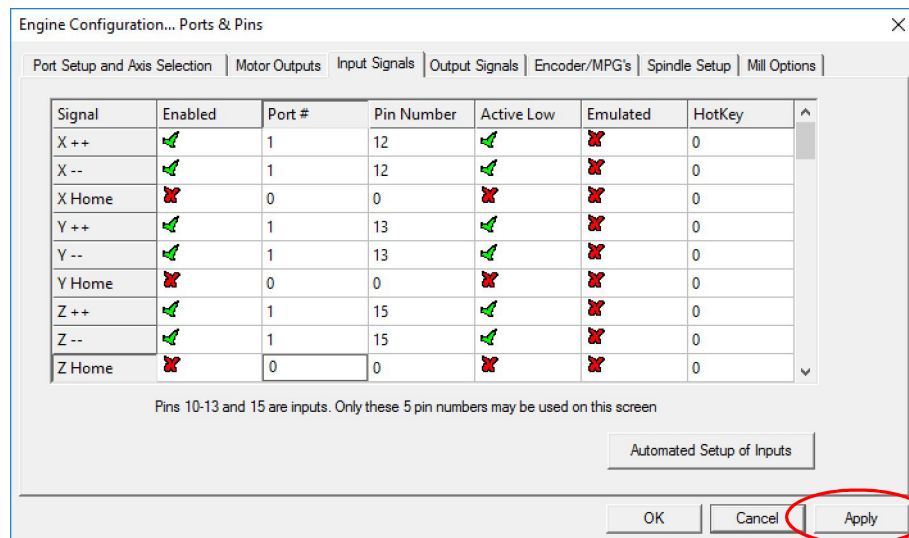
**Mach III Set Up**

# Break-Out Board

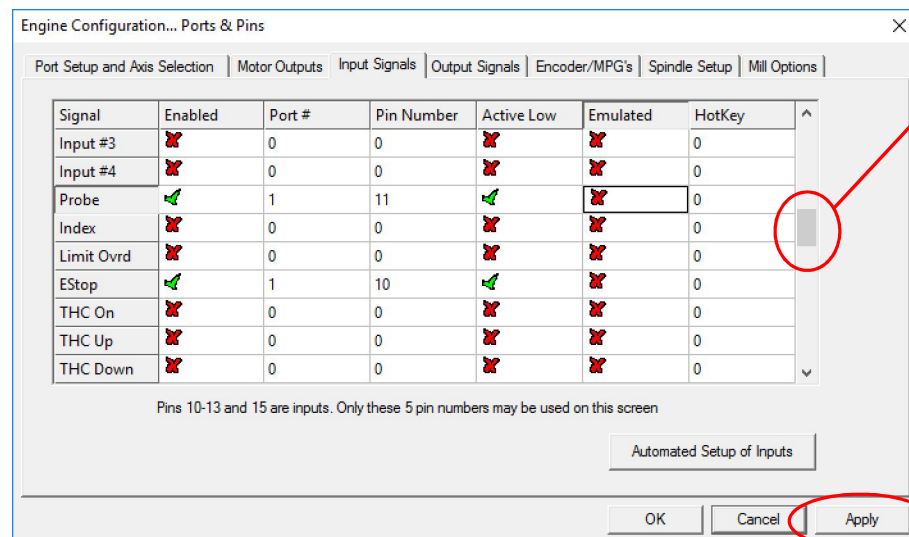


# Mach III Set Up

5. Click "Input Signals" set as shown below.



Click "Apply" to allow changes to take effect.



Be sure to scroll to access other inputs.

Click "Apply" to allow changes to take effect.

**Mach III Set Up**



6. Click "Input Signals" set as shown below.

Signal	Enabled	Port #	Pin Number	Active Low
Digit Trig	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Enable1	<input checked="" type="checkbox"/>	1	14	<input checked="" type="checkbox"/>
Enable2	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Enable3	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Enable4	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Enable5	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Enable6	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #1	<input checked="" type="checkbox"/>	1	17	<input checked="" type="checkbox"/>
Output #2	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
Output #3	<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>

Pins 2 - 9, 1, 14, 16, and 17 are output pins. No other pin numbers should be used.

OK Cancel **Apply**

Motor enable setup.  
Note: If you did not connect your enable input on your driver, leave this unchecked.

Spindle relay switch setup.

Click "Apply" to allow changes to take effect.

7. Click "Spindle Setup" set as shown below.

Relay Control

☐ Disable Spindle Relays

Clockwise (M3) Output #

CCW (M4) Output #

Output Signal #'s 1-6

Flood Mist Control

☒ Disable Flood/Mist relays Delay

Mist M7 Output #

Flood M8 Output #

Output Signal #'s 1-6

ModBus Spindle - Use Step/Dir as well

☐ Enabled Reg  64 - 127

Max ADC Count

Motor Control

☒ Use Spindle Motor Output

☒ PWM Control

☐ Step/Dir Motor

PWMBase Freq.

Minimum PWM  %

Special Functions

☐ Use Spindle Feedback in Sync Modes

☐ Closed Loop Spindle Control

P  I  D

☒ Spindle Speed Averaging

General Parameters

CW Delay Spin UP  Seconds

CCW Delay Spin UP  Seconds

CW Delay Spind DOWN  Seconds

CCW Delay Spin DOWN  Seconds

☐ Immediate Relay off before delay

Special Options, Usually Off

☐ HotWire Heat for Jog

☐ Laser Mode, freq I

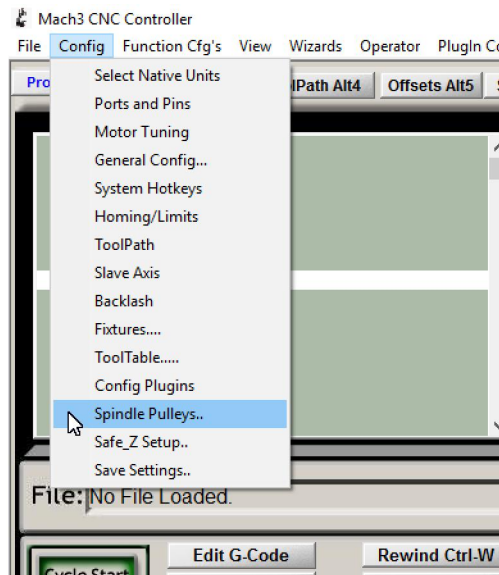
☐ Torch Volts Control

OK Cancel **Apply**

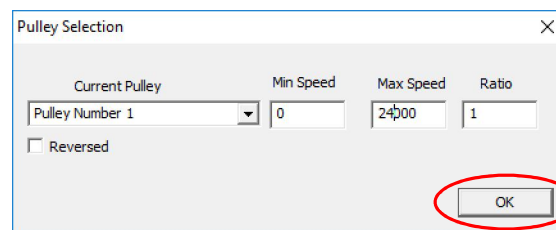
Don't forget !

**Mach III Set Up**

8. Click “Spindle Pulleys..” as shown below.



9. Click “Spindle Setup” set as shown below.

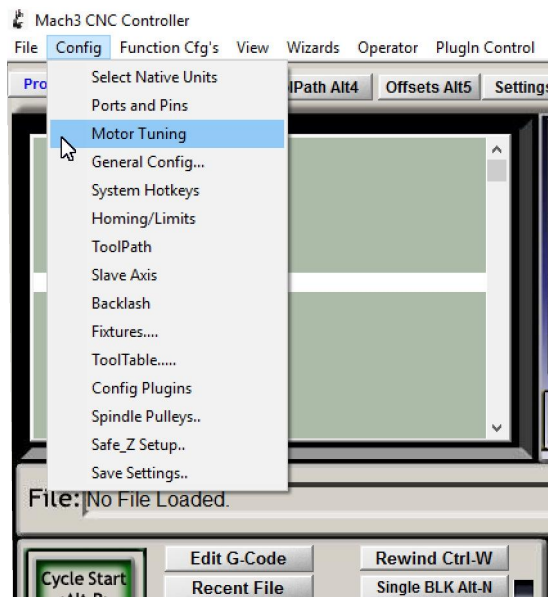


Click “OK”.

**Mach III Set Up**

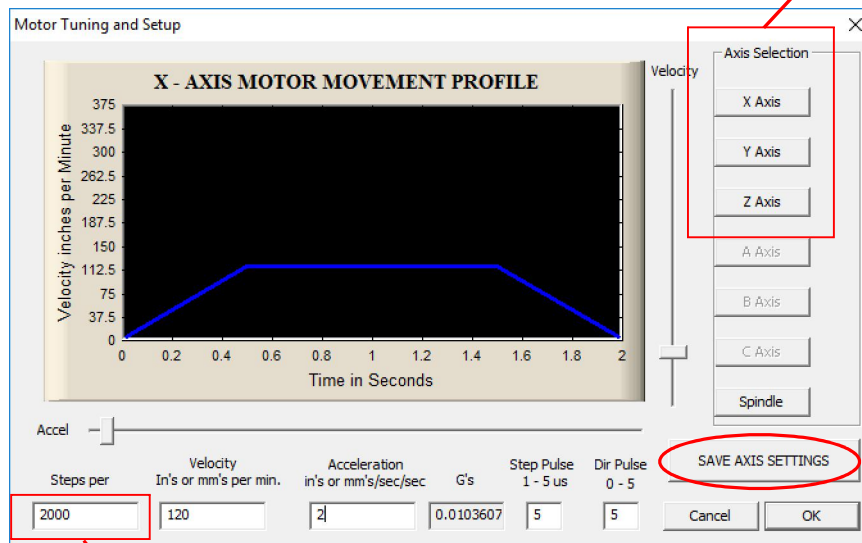


10. Click "Motor Tuning" set as shown below.



Set up X, Y, Z, A Axis Separately.

10. Set up as shown below.



Click this button after you finish each setting. Or it will not take effect. Don't forget !

This is the amount of steps to move one inch. Each machine will have to be adjusted to it's own setting. This is a starting point to adjust from.

END

**Mach III Set Up**