

Unit:

To do this we go to the *Config* menu and click *Select Native Units* and select either inches or mm and click OK. Choose inch here in our system

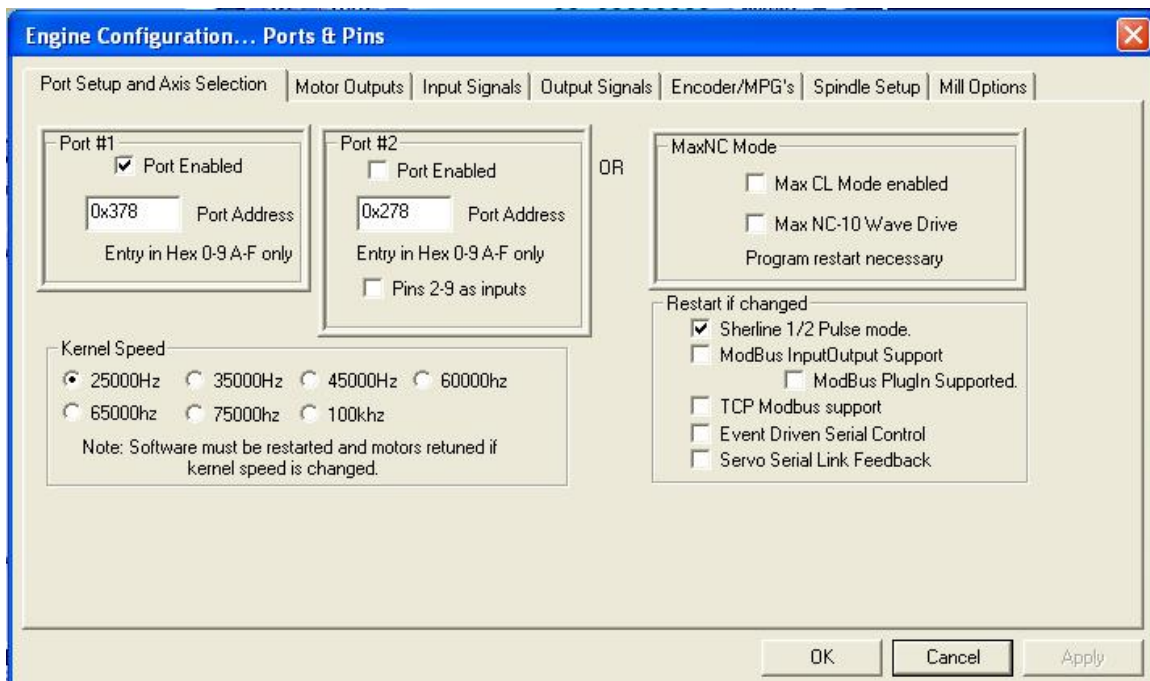


The hardware interface and connections.

Now we need to do is tell Mach3 how many parallel ports and at which addresses they are located. If the port is onboard your computers motherboard the standard address is 0x378. But other addresses are sometimes used as well. We tell Mach3 this information by selecting

Ports and Pins under the *Config* Menu.

Remember to click Sherline 1/2 Pulse mode

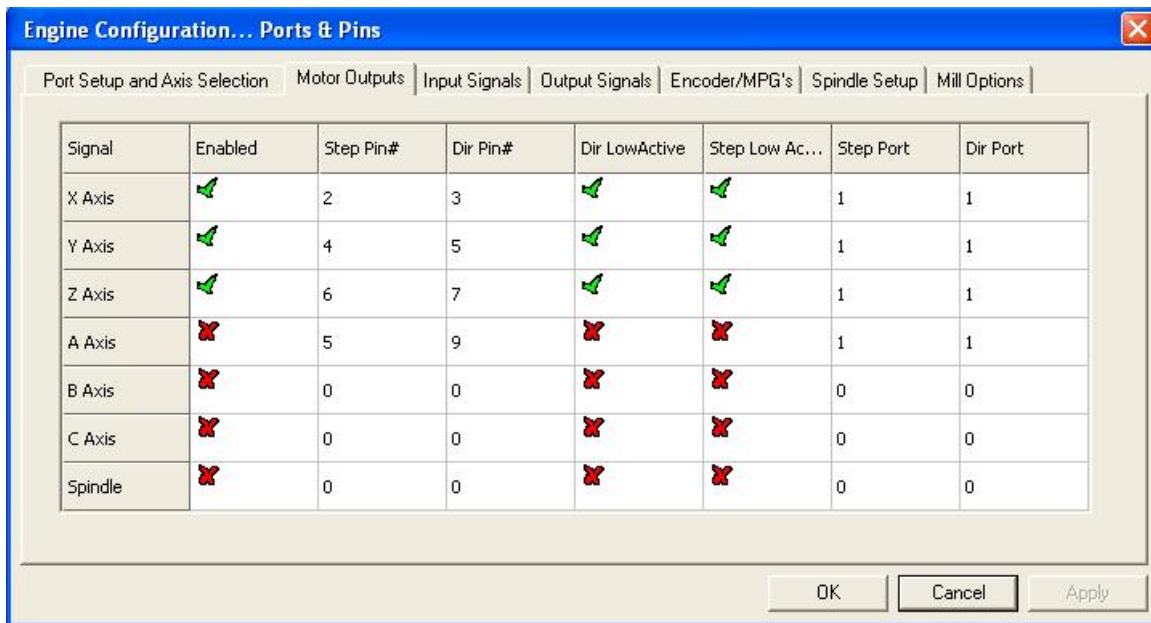


First check that the address of Port#1 corresponds to the actual address of your printer port and that it is enabled. 0x378 is the address most onboard parallel ports use. Since we won't be using a second port here we make sure that Port#2 is disabled. (No checkmark in the *Port Enabled* box under Port#2).

Next thing to do is to select our Kernel speed. This is the frequency at which the Mach3 driver operates and is also the maximum frequency the software will output to your motor drives. We will use 25000Hz here. Also make sure that none of the options on the right side is enabled and then click *Apply*.

Next in line is the *Motor Outputs* tab. This is where we tell Mach3 how many motors we want to control and to which pins in our printer port the each motor driver is connected. In this case it's three axis, X, Y and Z so we enable those three by making sure that there is a green checkmark in the first column of those axis.

The second column sets the pin to which the step input on our motor drive is connected. In this case the X axis drive step input is connected to pin 2, Y to pin 4 and Z to pin 6. The third column is just like the second but for the drives direction inputs, wired to 3, 5 and 7 on this machine. The actual pin out of your machine may be different. If you have wired it yourself you probably know the pin out and if you bought the machine and/or driver box please consult the documentation for that particular machine or check with the hardware manufacturer.

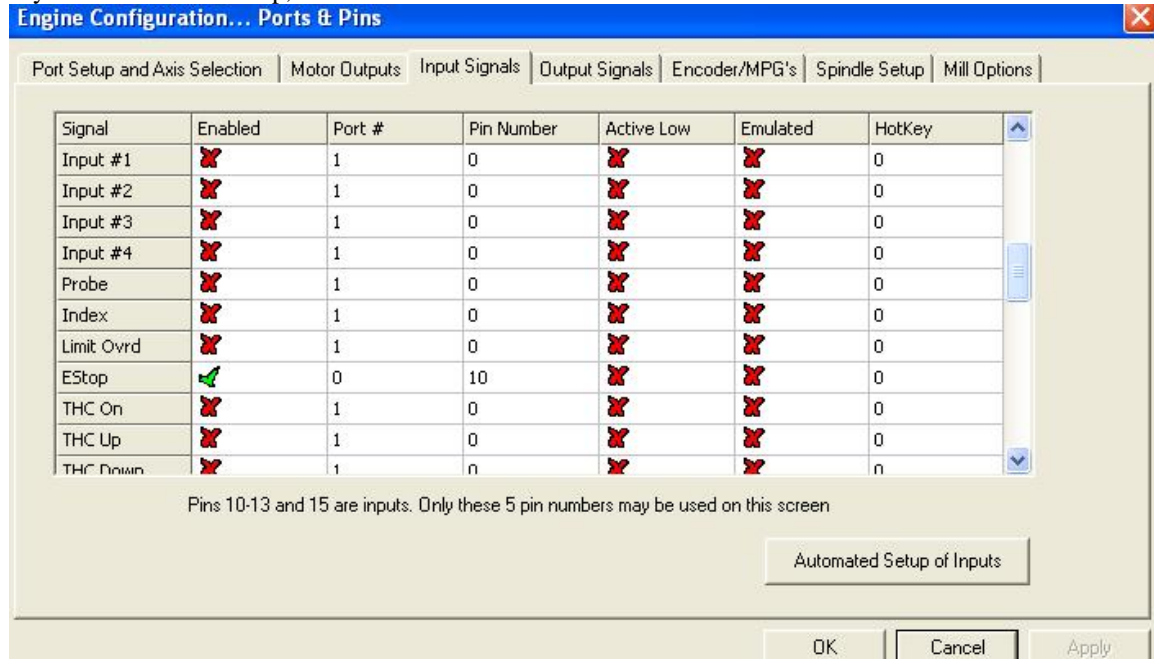


The Emergency Stop button.

Any decent machine tool should have an Emergency Stop button that, in the safest possible way, halts all machine movement and prevents damage to the operator in the first place and/or the machine – so will this one. This tutorial will not go into the actual hardware design of a proper E-stop system but will focus on getting Mach3 to understand that the big red button has been pushed. The various input signals to Mach3 are setup on the *Input Signals* tab under

Ports and Pins in the *Config* menu:

If you do not have E-Stop, set as follow



Motor Tuning:

Finally we'll get to actually spin some motors. The first thing in the tuning process is to calculate how many steps per unit of travel we have. This depends on a few things:

In case of a step motor:

- The amount of steps per revolution, most commonly 200.
- The step resolution of the motor drive, if you set at 8
- And finally, the thread pitch of the screw. (How far the table moves with each rotation of the screw) let say it has a 5TPI pitch.

So Step per should be $200 \times 8 \times 5 = 8000$. See Figure

