C18 – SPEED CONTROLLER (Pot Driven) Rev1

Overview

This board comes as a solution to replacing ANY control that works with a real potentiometer. So it can be controller by a PC, PLC or other electronic control. It can take PWM, frequency (0-25khz), or an analog 0-10vdc signal and produce a real turning potentiometer. The board comes with a 1Moms resistor, but the final value can be adjusted (decreased) by placing a parallel resistor in the on-board terminals.

The board has a microcontroller that samples the input signal. It analyzes it and then drives a stepper motor that positions a REAL potentiometer.

This unit can also be used on many AC motor controllers by replacing the potentiometer that controls the speed. This is very useful for routers and other AC speed controllers.

This unit could also be used for controlling directly many DC motors just by varying the DC voltage coming into the motor.

Features

- ***Controls any AC or DC current.***

Since it works with a REAL pot, it can control ANYTHING. The final impedance can be adjusted by placing a parallel resistor in the terminals provided for this purpose. It is also possible to replace the provided pot with your own and double the stepper motor's torque by powering the board with 24vdc. (This modification is under your own risk.)

- ***It is ideal for modifying manual AC speed controllers commonly used for routers.***

This board is ideal for replacing the manual potentiometer found on many manual AC speed controllers. You just have to solder some leads from the current potentiometer and attach those leads to the screw-on terminals on the board. You can continue using the potentiometer that is on the speed controller. It will work in parallel with the on-board pot, so it could be used for manually reducing the current speed. This speed controller can be found at: http://www.harborfreight.com/cpi/ctaf/displayitem.taf?Itemnumber=43060.

- ***Has 3 user selectable operation modes, PWM, frequency (0-25khz), and analog 0-10vdc.***

The board has a jumper that allows the user to select the desired operation mode. Be board also has LEDs that indicate which mode the board is operating at.

- ***Terminals for fitting a parallel resistor adjust final impedance.***

.Comes with a 1Mohms resistor and terminals connected in parallel with it. So the final impedance can be adjusted (reduced) by placing a resistor in these terminals. This gives the user the maximum flexibility, as he can replace virtually ANY potentiometer.

- ***Can be powered with +12 or +24vdc.***

The board requires an external power source, it can be 12 or 24vdc. The board works fine at 12vdc, but if you provide it 24 it will double the torque at which the stepper motor works. This could become useful if you wan to replace the proved pot with your own.

- ***Connect the on-board pot terminals in parallel with the pot you currently have and you can continue using both.***

This gives you added flexibility to your setup since you

- ***RJ45 Connector.***

The board comes with an RJ45 connector. This is to make it compatible with new cnc4pc products that are about to be released. This will provide on-connection point for signals and power.

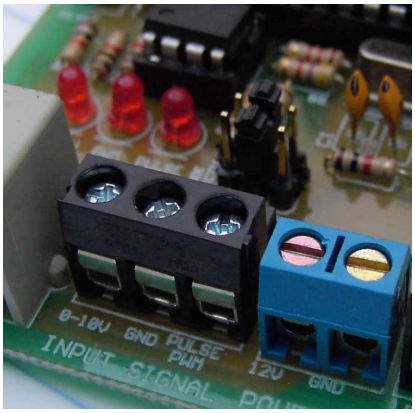
Installation

Requirements:

A power supply with +12 or 24vdc @ 500 milliamps for operation. Cnc4pc offers an electronic switching power supply that is ideal for this board.

Wiring:

Follow the information on the wiring guide found in the web at http://www.cnc4pc.com/Tech_Docs/C18R1WG.pdf, and these steps:



1. Place the jumper in the desired control mode that you are going to use.
2. Connect the pulse signal (PWM or frequency), or connect a line that will carry the analog signal. In both cases the ground will be the same.
3. Connect the board to power. You can use a +12 or +24vdc @ 1 amp power supply. I you feel you need more torque for driving the pot, use a +24vdc power supply.
4. At this time you should configure the control software and make sure the pot turn as instruct it in the control software.
5. Check to see if you need to add a parallel resistor to adjust the required impedance.

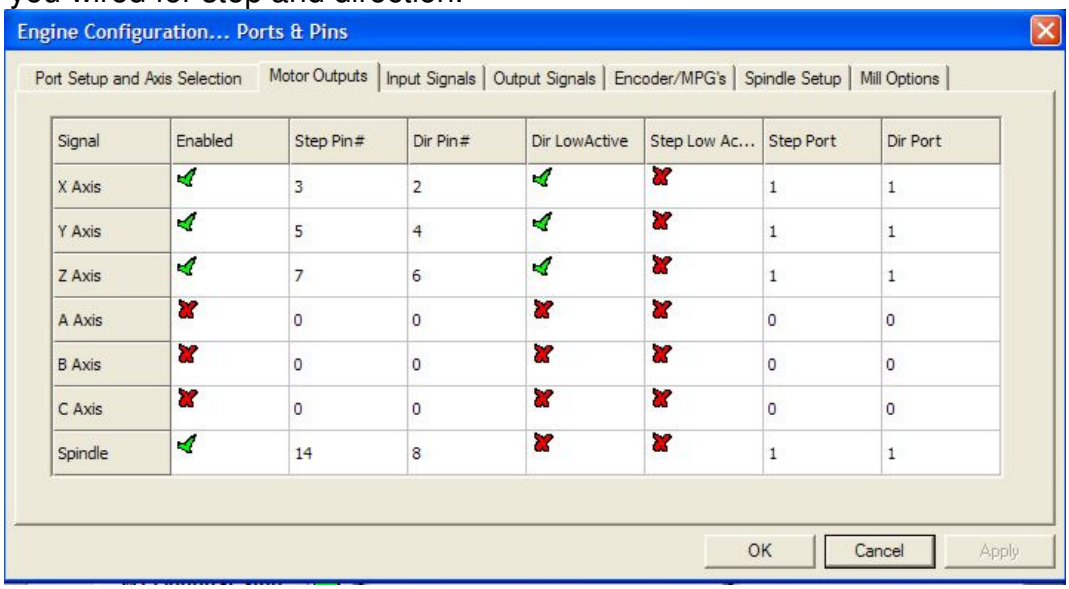
6. Connect the leads from the pot you are trying to replace to the pot terminals on the board.

Configuring the Mach:

CONFIGURING MACH TO CONTROL THE BOARD USING A STEP SIGNAL OR PWM:
It is strongly recommend you read your control software's manual. You need to configure your control software to control the spindle as if it was an angular axis. This card requires a 25 KHz input signal to turn the pot to max. So you have to set the speed of the motor (spindle) at maximum. For acceleration values adjust them to where you feel comfortable.

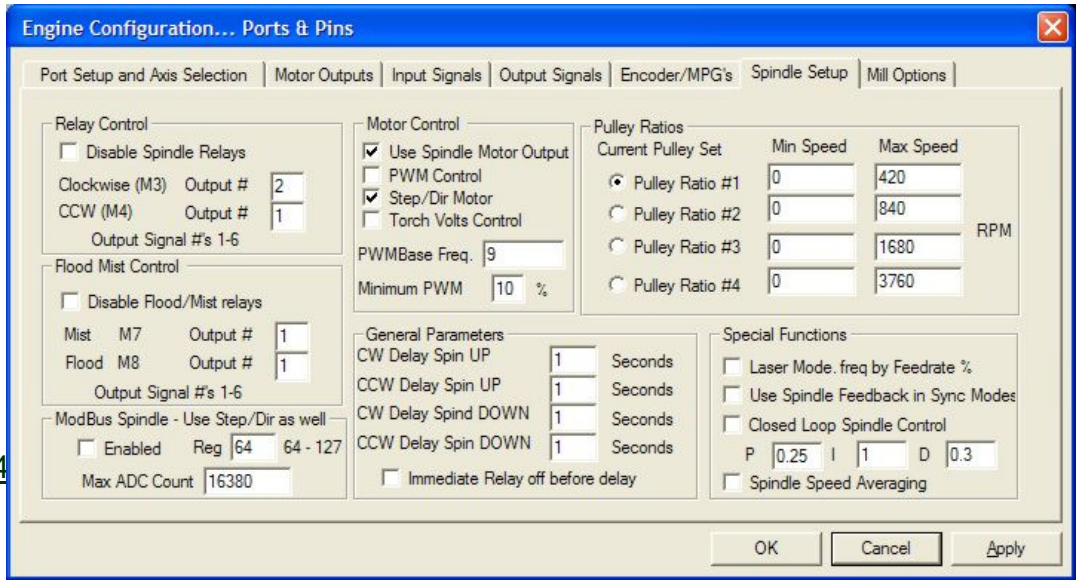
For configuring Mach follow these steps:

1. Go to Config / Ports&Pins / Motor Outputs. Enable the spindle and select the port and pins you wired for step and direction.



Signal	Enabled	Step Pin#	Dir Pin#	Dir LowActive	Step Low Ac...	Step Port	Dir Port
X Axis	✓	3	2	✓	✗	1	1
Y Axis	✓	5	4	✓	✗	1	1
Z Axis	✓	7	6	✓	✗	1	1
A Axis	✗	0	0	✗	✗	0	0
B Axis	✗	0	0	✗	✗	0	0
C Axis	✗	0	0	✗	✗	0	0
Spindle	✓	14	8	✗	✗	1	1

2. Go to Config / Ports&Pins / Spindle Setup. In the motor control box, check Use Spindle Motor Output and Step /Dir Motor if you are going to control it by using a frequency of PWM if you wan to use Pulse Width Modulation. If using PWM select a PWM frequency base above 20hz, since at lower speeds changes might take too long doe to



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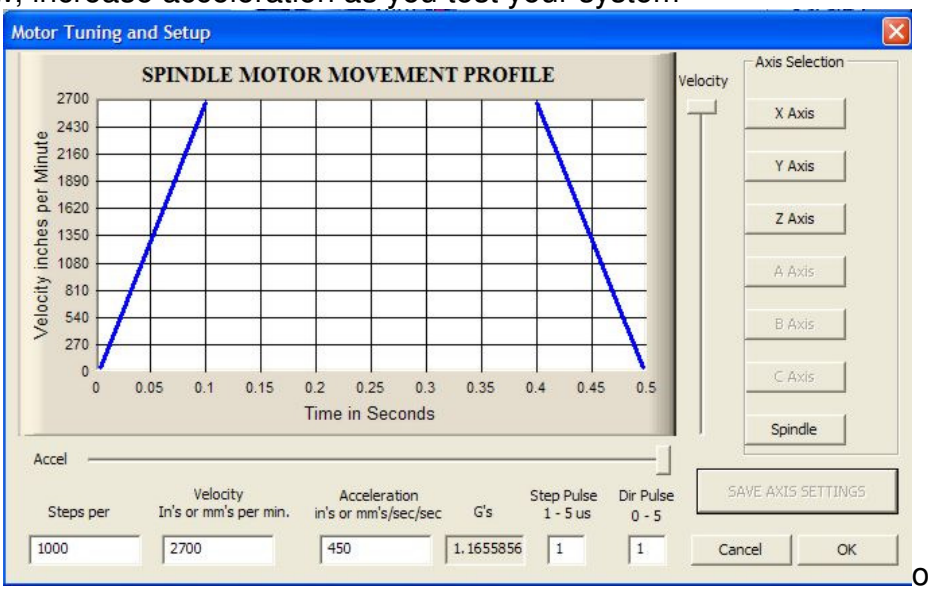
the signal averaging algorithm used. Under Pulley Ratios set the pulley ratios of the machine. Keep in mind most AC speed controllers only reduce the speed to about 50% of the maximum capacity, so you should set that in the min speed.

3. Go to Config / Motor Tuning / Spindle. On Steps per unit put 1,000, set velocity to maximum. For Acceleration, choose the acceleration that you feel comfortable with. Start slow, increase acceleration as you test your system



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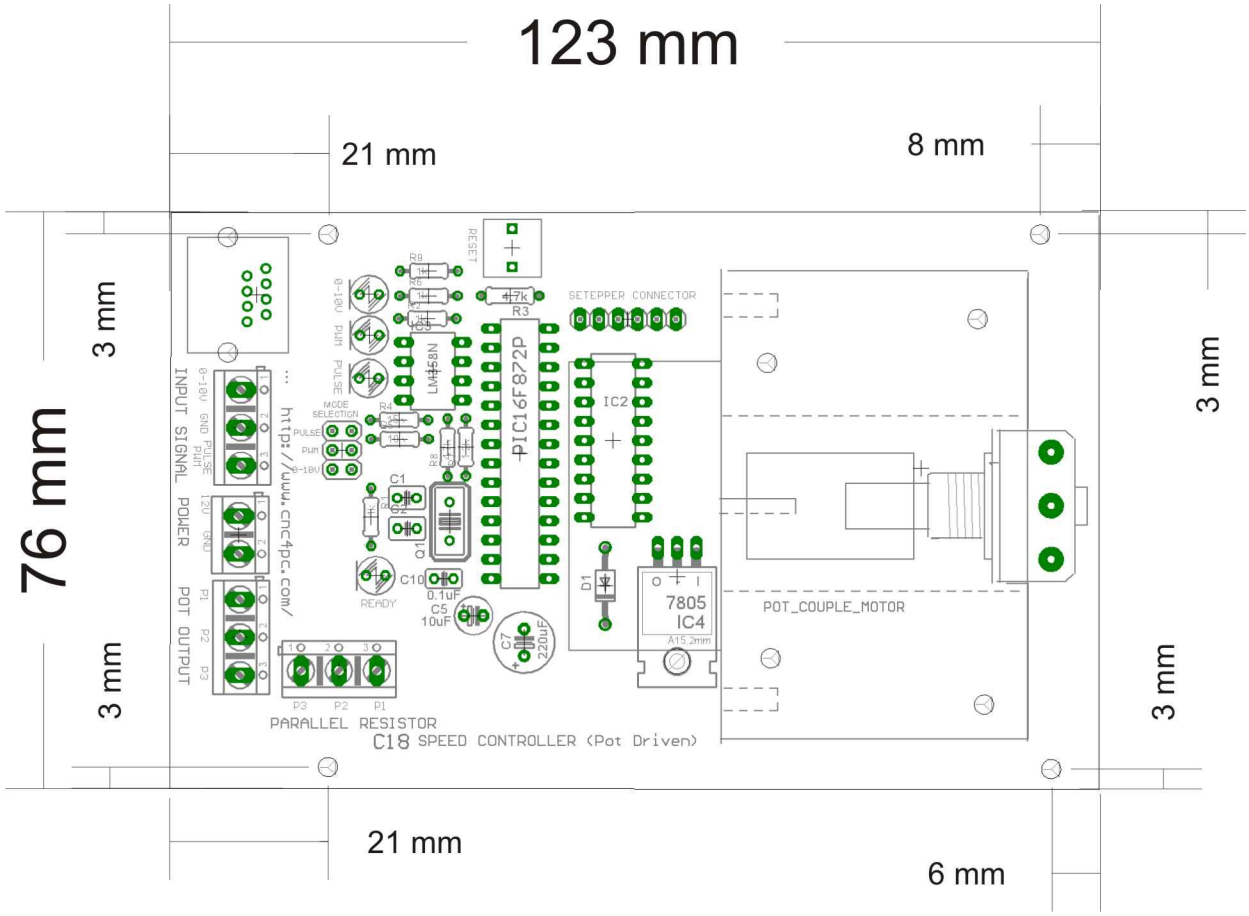
Dimensions:



Disclaimer:

Use caution. CNC machines are dangerous machines. DUNCAN USA, LLC or Arturo Duncan are not liable for any accidents resulting from the improper use of these devices.