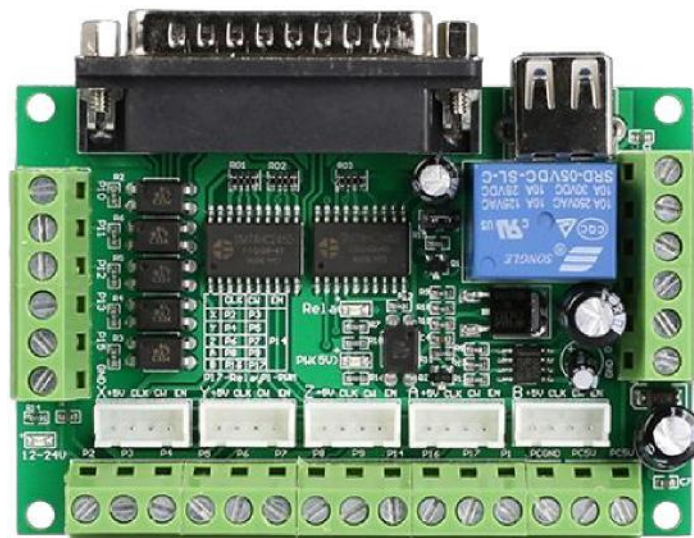


User Manual of 5Axis Breakout Board



5 Axis Breakout Board Interface Adapter

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1 Introduction and Features

1.1 Introduction

The latest upgraded 5 axis breakout board is specially designed for the CNC single axis 2-phase stepper driver controller, such as M542, M542H, MA860H, 2M542, 2M982, DM542(A), DM860(A) etc. single axis stepper driver controller series. With this 5 axis breakout board, any 1-5 single axis stepper driver controllers can be directly controlled by the PC via the MACH3, EMC2, KCAM4, etc.

1.2 Features

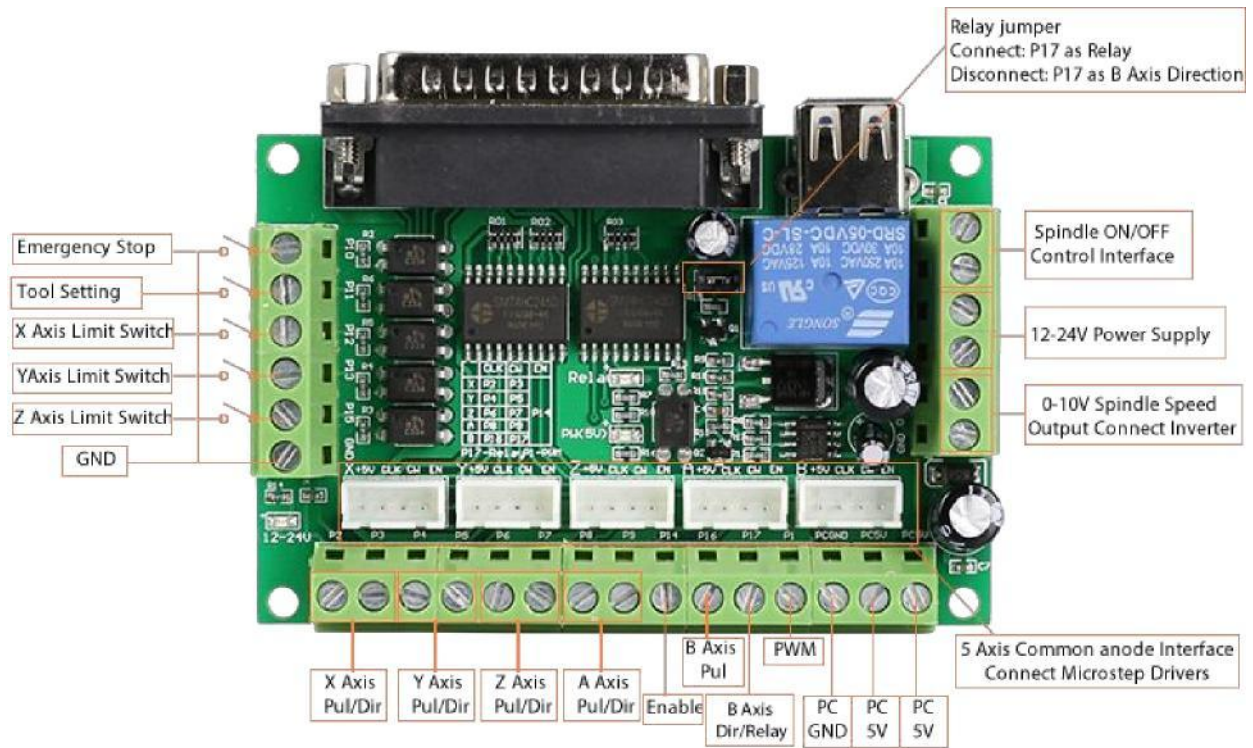
- Maximum support 5-axis stepper motor driver controllers
- Compatible with MACH3, Linux CNC (EMC2) etc. parallel-control CNC software.
- USB power supply and peripherals powered phase are separated to protect computer security.
- All the signals are opto-isolated which can protect your computer security.
- 5-input interface to define the Limit, Emergence-Stop, Cutter alignment, etc.
- Wide input voltage range: 12-24V, and with anti-reverse function.
- One relay output control interface, accessed by the spindle motor or the air pump, water pump, etc.
- Output 0-10V analog voltage for inverter to control the spindle speed.

2 Specifications

Electrical properties(ambient temperature Tj = 25 C)	
Input Power	USB port to directly get power from PC and 12-24V power supply(optional)
Compatible Stepper Motor Driver	Max 5 2-phase Microstep controllers
Driver type	Pulse and Direction signal control
Net/Total Weight	Approx 75g
Dimensions	90 * 70 * 20mm (L*W*H)

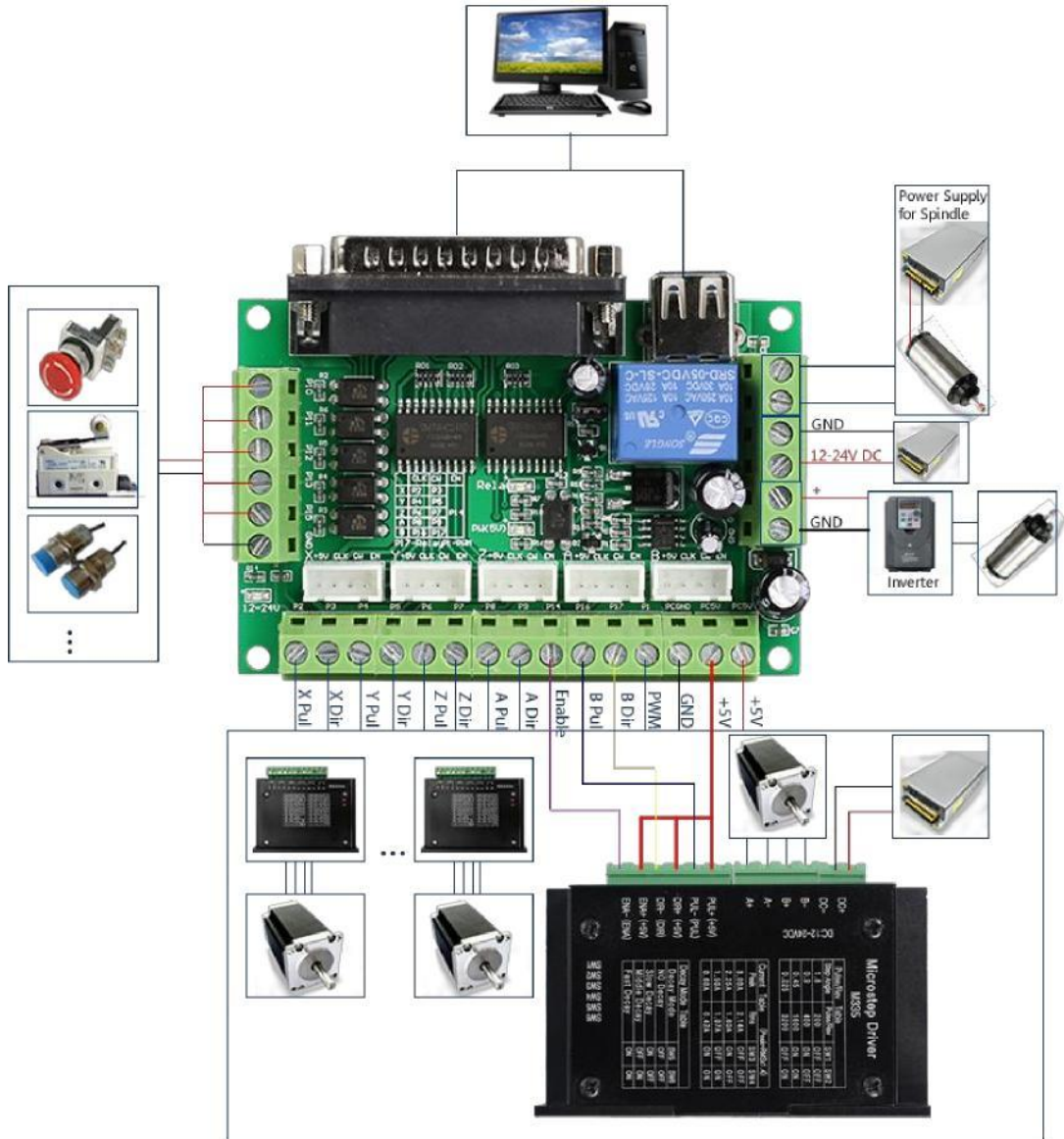
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3 Interfaces



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4 Wiring Diagram for Reference

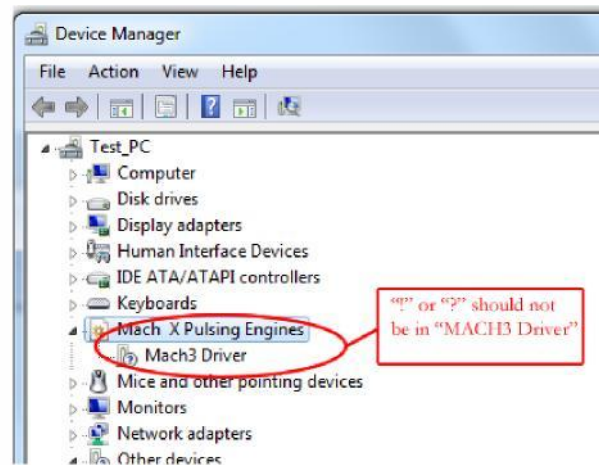


5 MACH3 Software Settings

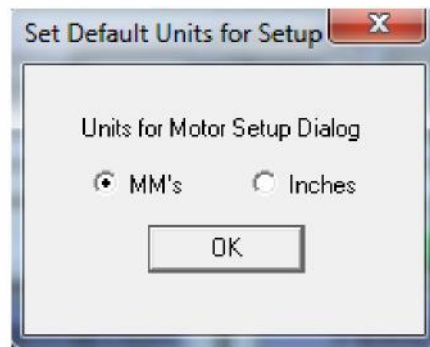
Note: The settings on MACH3 below is in condition that breakout board and stepper drivers are connected in common anode.

1. Check whether the MACH3 driver is installed correctly.

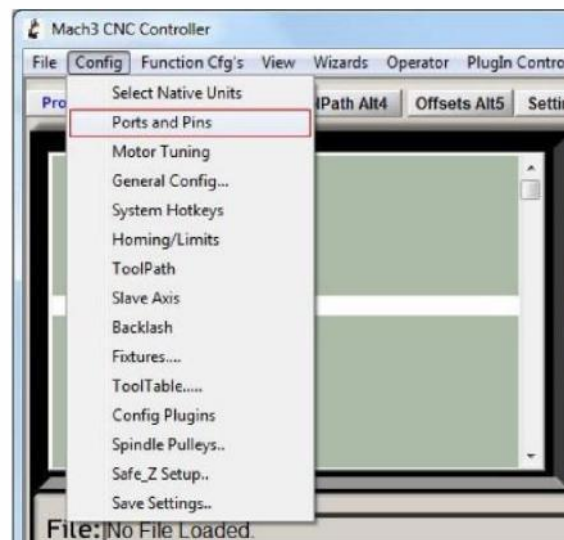
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2. Setup Units: Choose 300 s^T in **Config->Set Default Units for Setup**

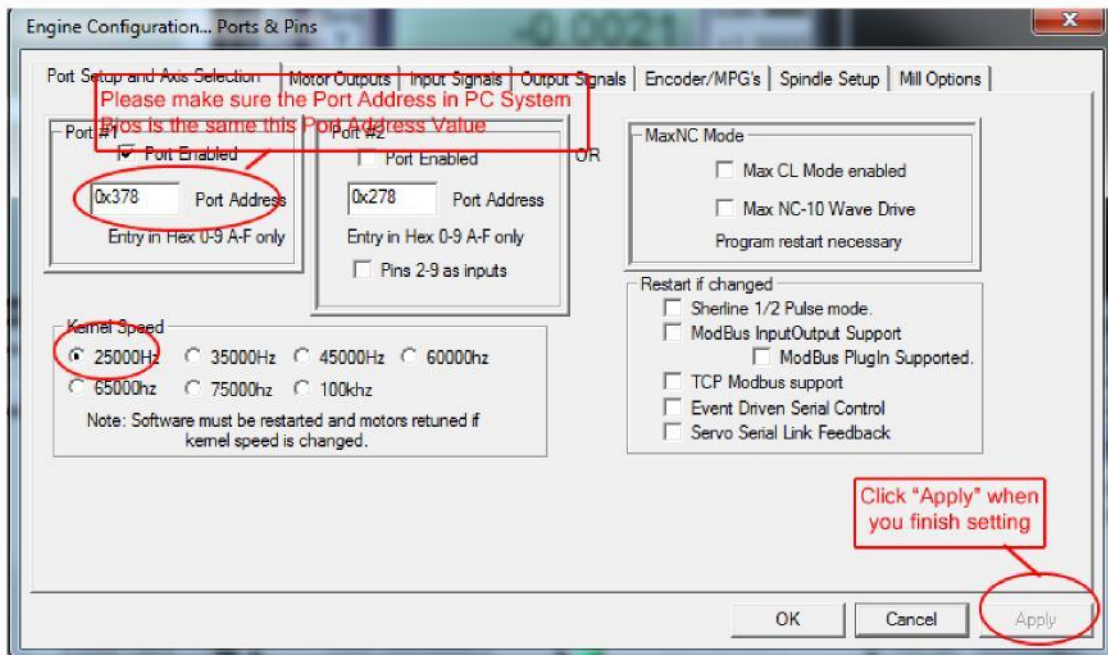


3. Click "Config"->"Ports and Pins" on Main Interface.

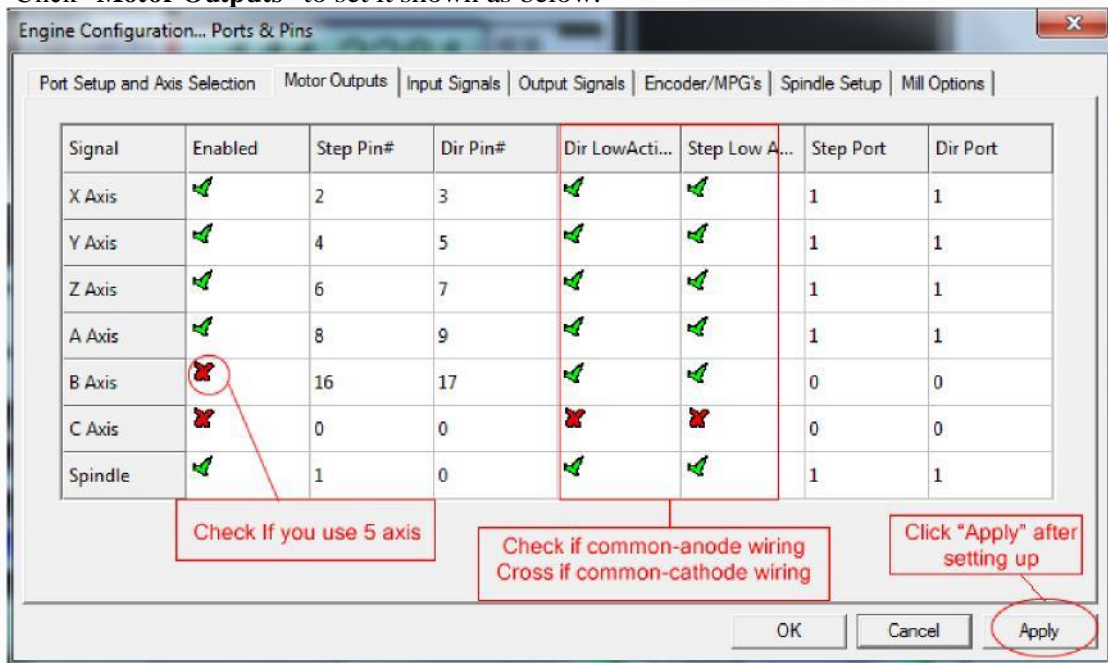


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4. Enter in “**Port Setup and Axis Selection**” to set “**Port#1**” and “**Kernel Speed**” shown as below.

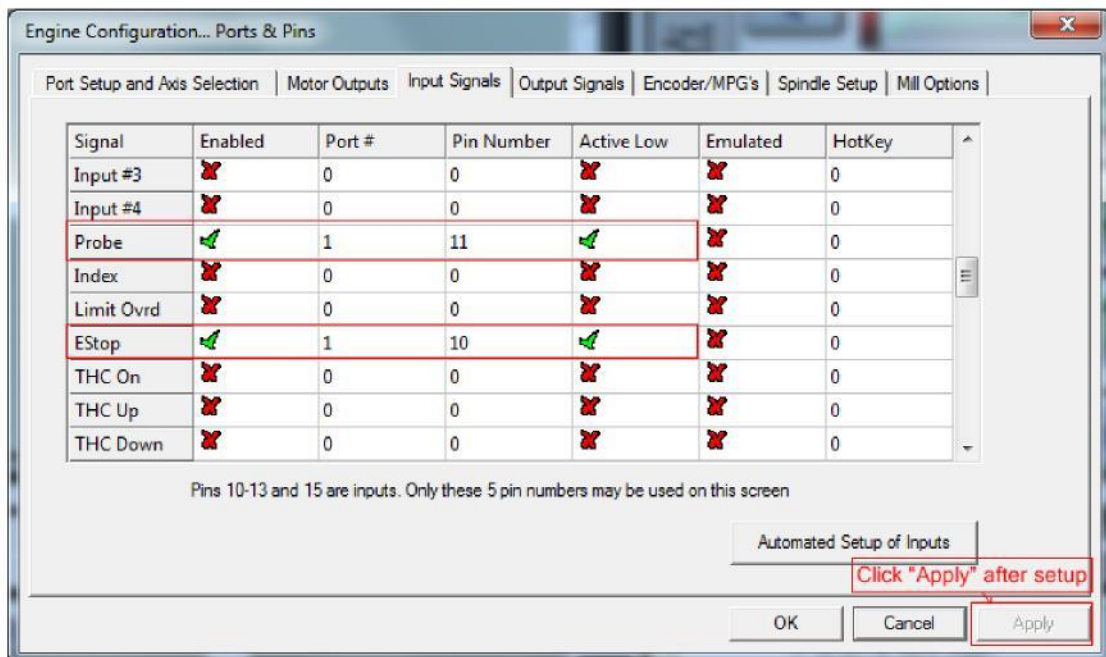
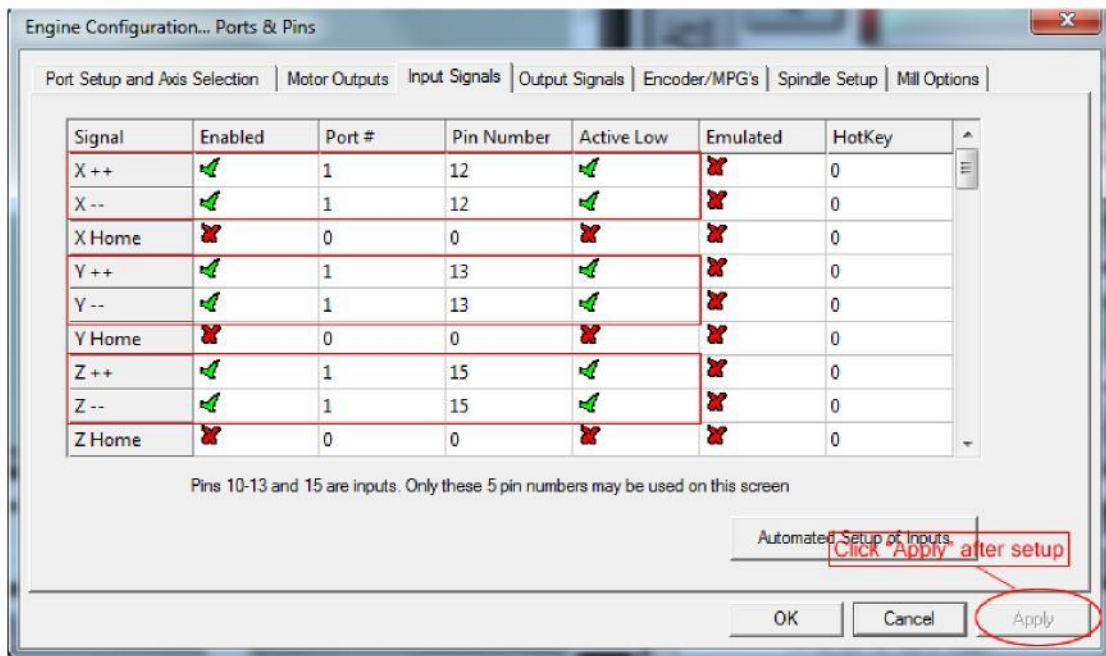


5. Click “**Motor Outputs**” to set it shown as below.



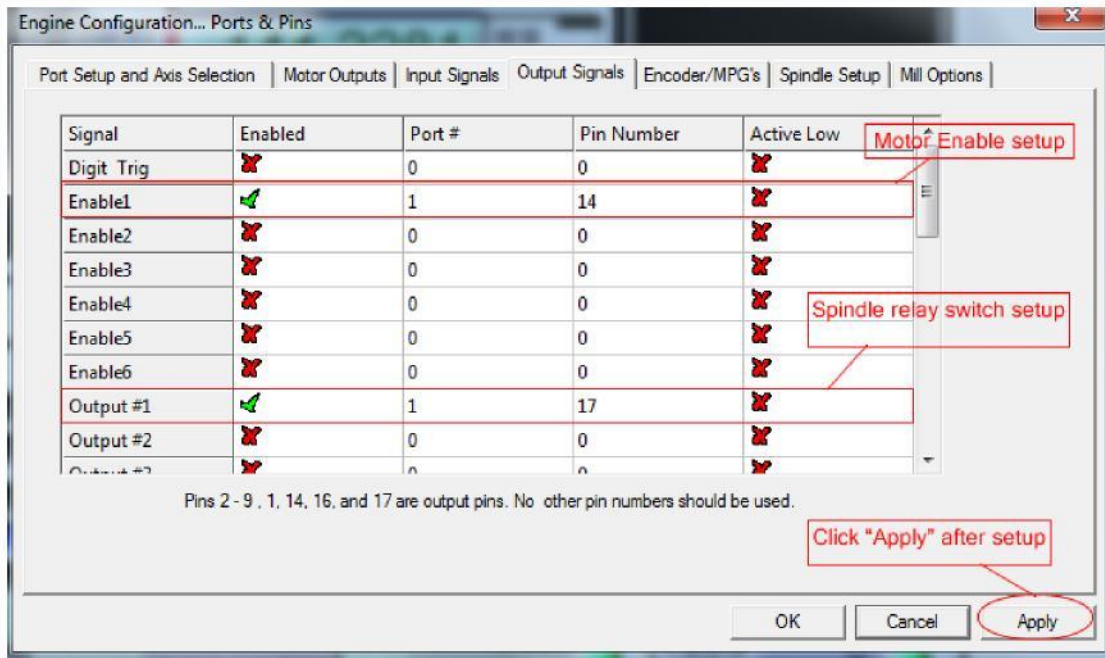
6. Click “**Output Signals**” to set it shown as below

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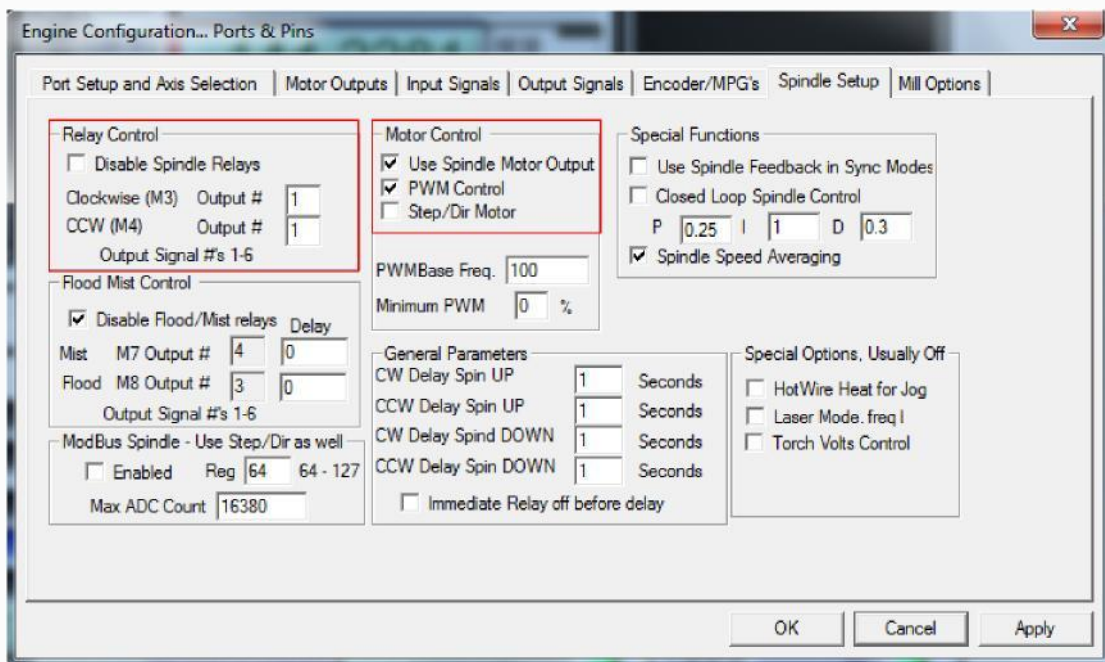


7. Click "Output Signals" to set it shown as below

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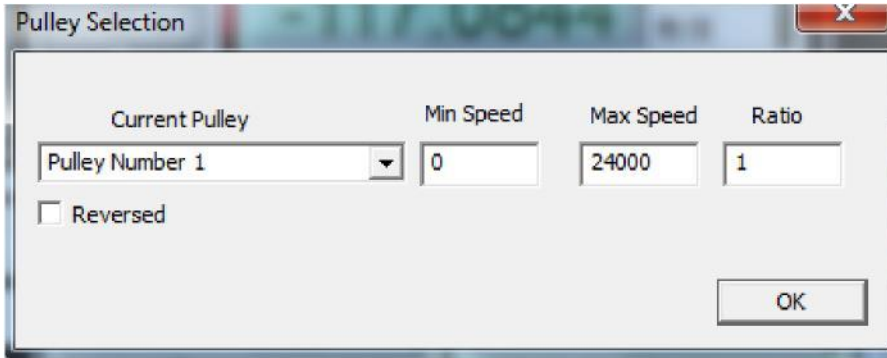


8. Click “Spindle Setup” to set it shown as below



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If you use PWM to control the spindle speed, you have to click **Pulley Selection** to set it shown as below.



9. Motor debugging. Click **Config->Motor Turning and Setup**

The screenshot shows a complex dialog box titled "Motor Tuning and Setup". At the top left is a graph titled "X - AXIS MOTOR MOVEMENT PROFILE". The y-axis is "Velocity mm's per Minute" ranging from 0 to 3281.25. The x-axis is "Time in Seconds" ranging from 0 to 0.5. The graph shows a blue trapezoidal profile. Below the graph are several input fields: "Steps per" (320), "Velocity In's or mm's per min." (200), "Acceleration in's or mm's/sec/sec" (100), "G's" (0.050988), "Step Pulse 1 - 5 us" (5), and "Dir Pulse 0 - 5" (5). To the right is an "Axis Selection" panel with buttons for X Axis, Y Axis, Z Axis, A Axis, B Axis, C Axis, and Spindle. Below this panel is a "SAVE AXIS SETTINGS" button. There are also "Cancel" and "OK" buttons at the bottom right. Several callout boxes provide additional information: one points to the "Steps per" field with the text "Steps per: Steps required to mobile 1 mm. This value must be the same with the 'PulE' in manual control"; another points to the "SAVE AXIS SETTINGS" button with the text "Click this button after you finish each axis setting, or it will not save the data"; and a third at the bottom explains the formula for "Steps per": "This value is calculated in the following formula: Steps per=(360/1.8)*x/l; x:Microstep. l:screw pitch. E.G. Microstep=8, screw pitch = 5mm. then Steps per = 320".

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10. Click **System HotKeys Setup**. Set X, Y, Z axis hotkey shown as below. Then you can manual control the corresponding axis motor turning via hotkeys.

