This document describes the basic functionality and the electrical specifications of StepperOnline's 5 Axis CNC Breakout Board Interface ST-V2.

1. Functions and Features:

- High performance, cost-effective.
- 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.
- Compatible with all the 2 phase microstep drivers in the market.
- Output 0-10V analog voltage for inverter to control the spindle speed.

2. Wiring diagram:
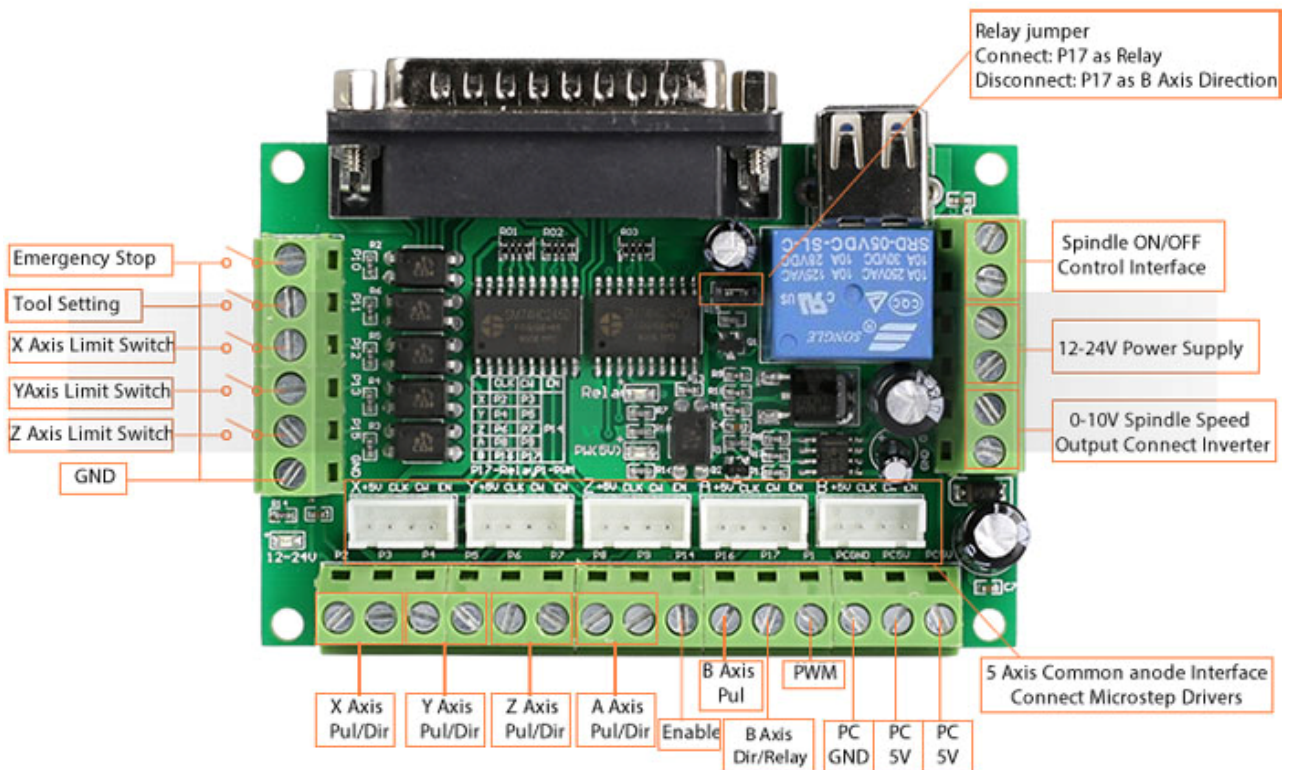
Note: all the seting below is for common anode connection between this interface board and the stepping motor drivers.
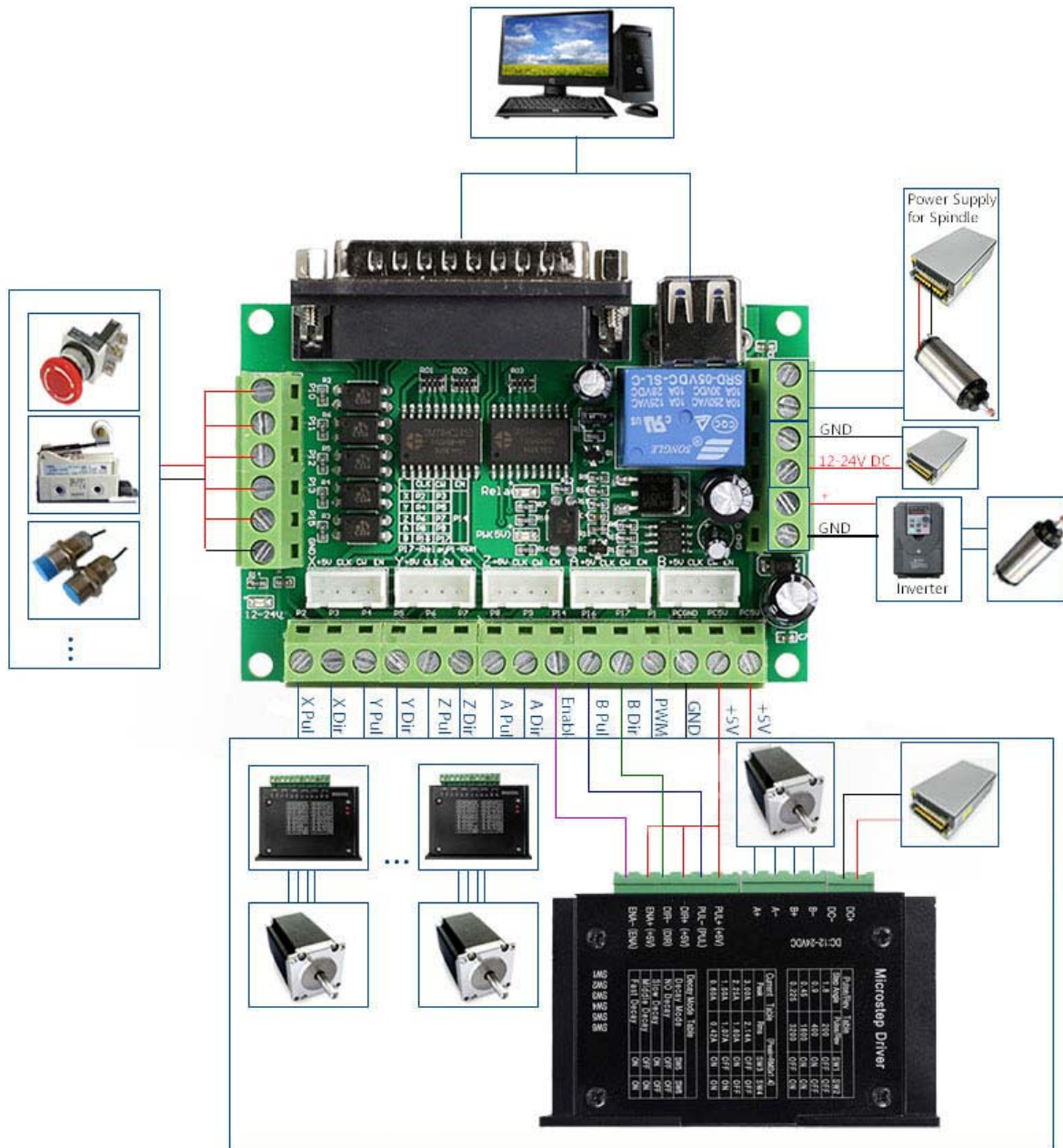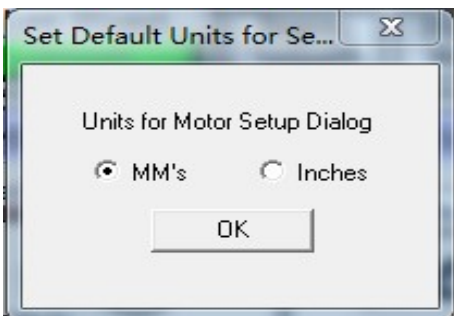
3. MACH3 Software Setting:

a. First check MACH3 driver is install set correct or not:

Note: "Mach3 Driver" can showing neither "!" nor "?".
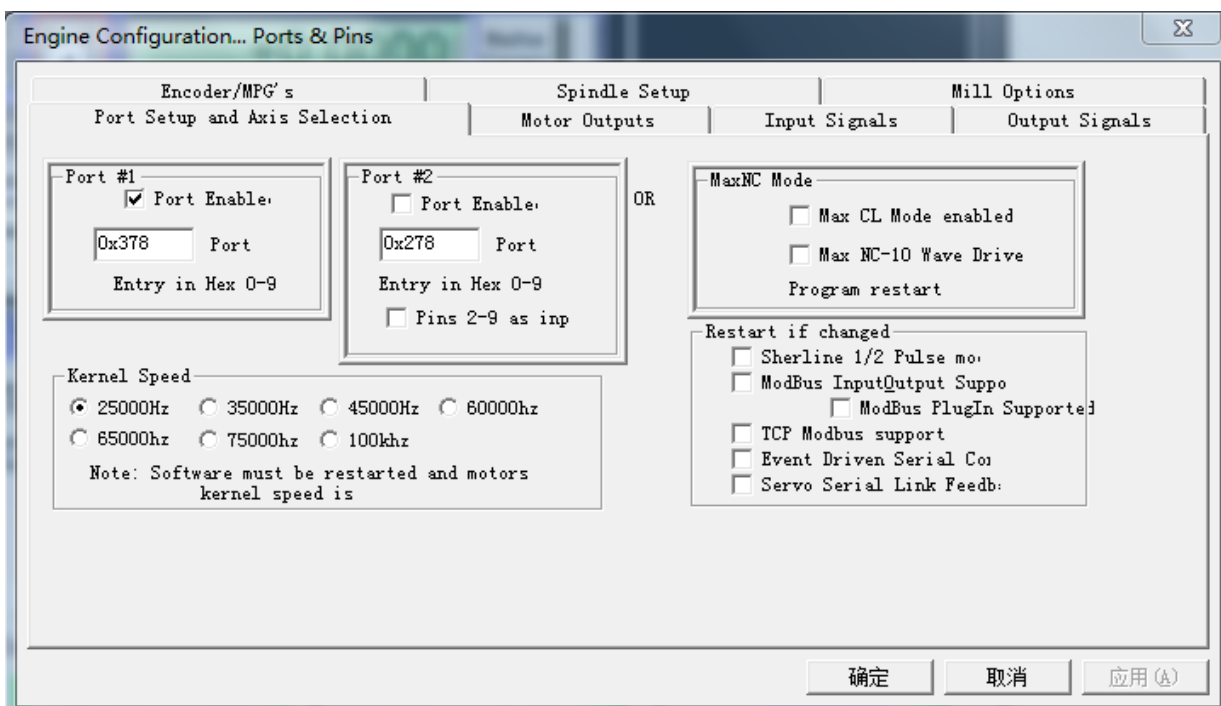
b. Software setting:

1. Unit select. Select unit: on menu "config" ---- select native units ---- mm.
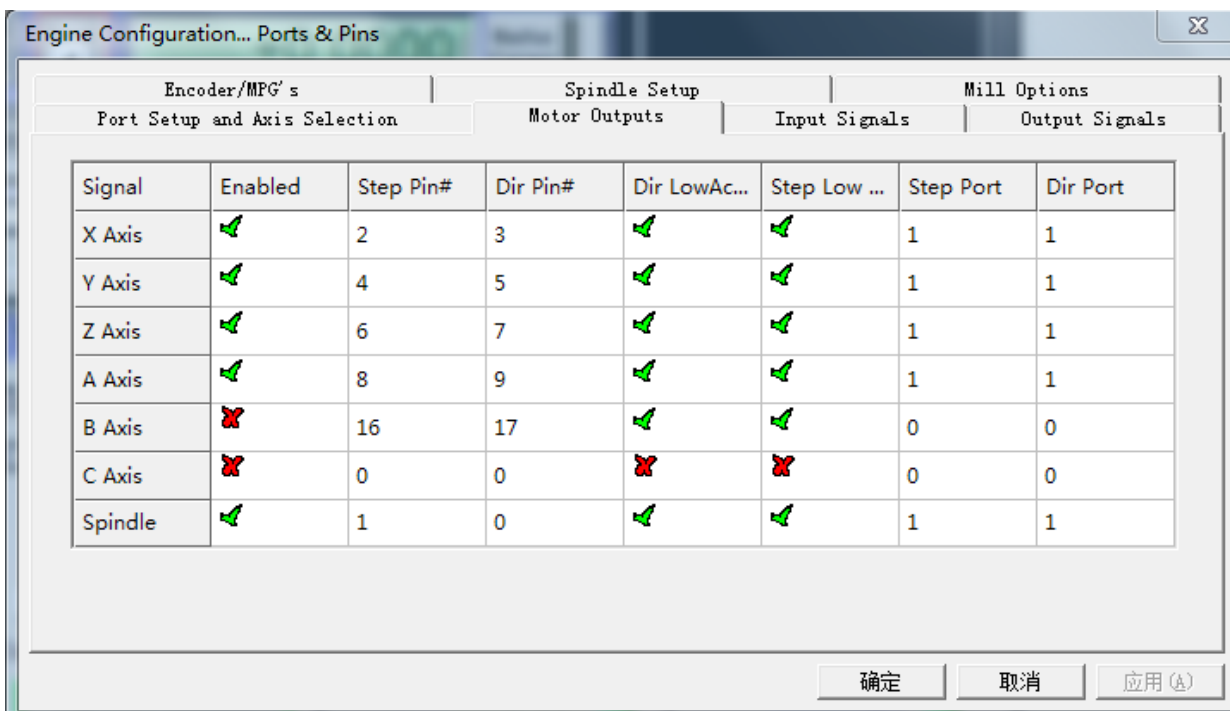

2. Ports and pins:
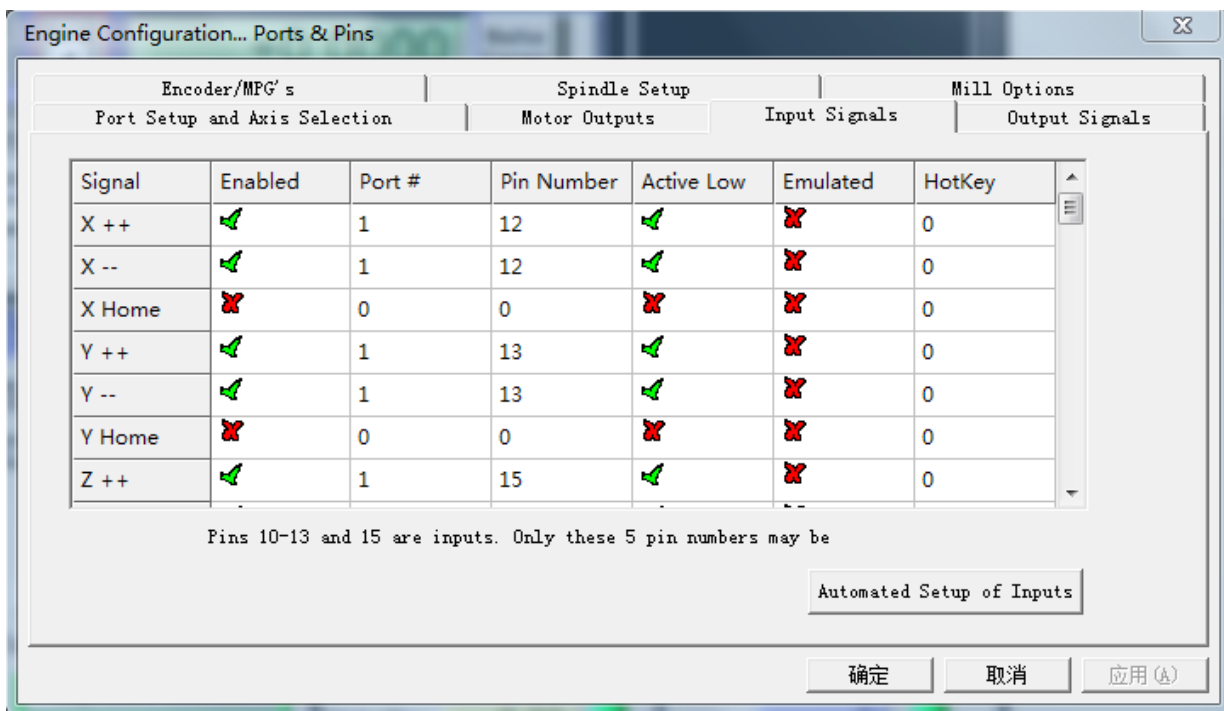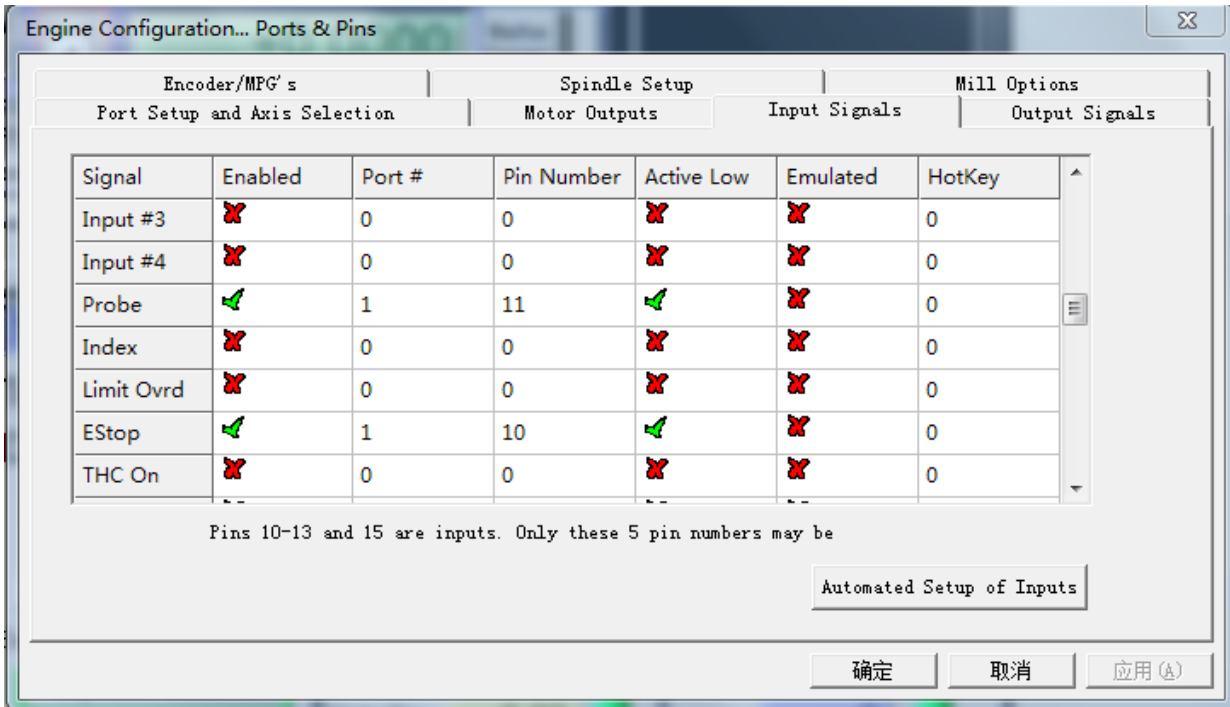
(1). Port setup and axis selection:

(2). Motor outputs: set as per below

Engine Configuration... Ports & Pins

Signal	Enabled	Step Pin#	Dir Pin#	Dir LowAc...	Step Low ...	Step Port	Dir Port
X Axis	✔	2	3	✔	✔	1	1
Y Axis	✔	4	5	✔	✔	1	1
Z Axis	✔	6	7	✔	✔	1	1
A Axis	✔	8	9	✔	✔	1	1
B Axis	✘	16	17	✔	✔	0	0
C Axis	✘	0	0	✘	✘	0	0
Spindle	✔	1	0	✔	✔	1	1

Tabs: Encoder/MPG's | Spindle Setup | Mill Options
Port Setup and Axis Selection | Motor Outputs | Input Signals | Output Signals
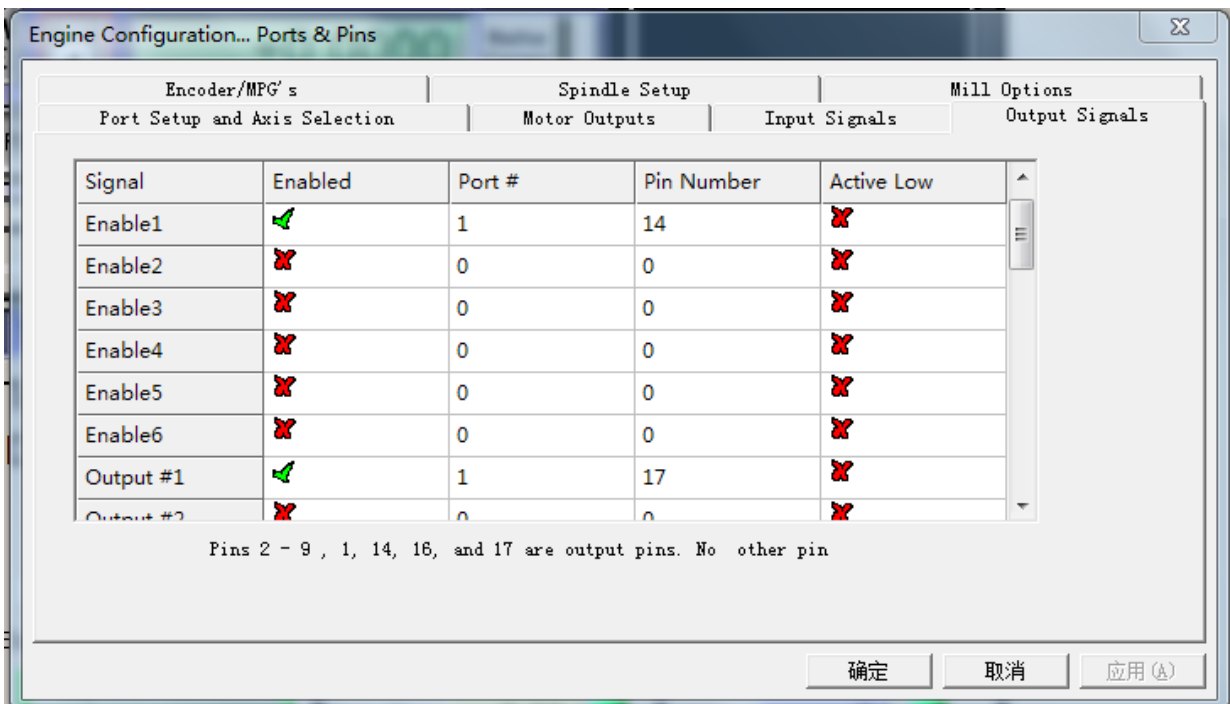
确定   取消   应用(A)

Please note: motor turning direction is relevant to its connection method.
If the direction is not right, you can adjust "Dir LowActive" as on the diagram.

(3). input signals: set as below, then click the "confirm" button.

Engine Configuration... Ports & Pins

Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
X ++	✔	1	12	✔	✘	0
X --	✔	1	12	✔	✘	0
X Home	✘	0	0	✘	✘	0
Y ++	✔	1	13	✔	✘	0
Y --	✔	1	13	✔	✘	0
Y Home	✘	0	0	✘	✘	0
Z ++	✔	1	15	✔	✘	0

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

Pins 10-13 and 15 are inputs. Only these 5 pin numbers may be
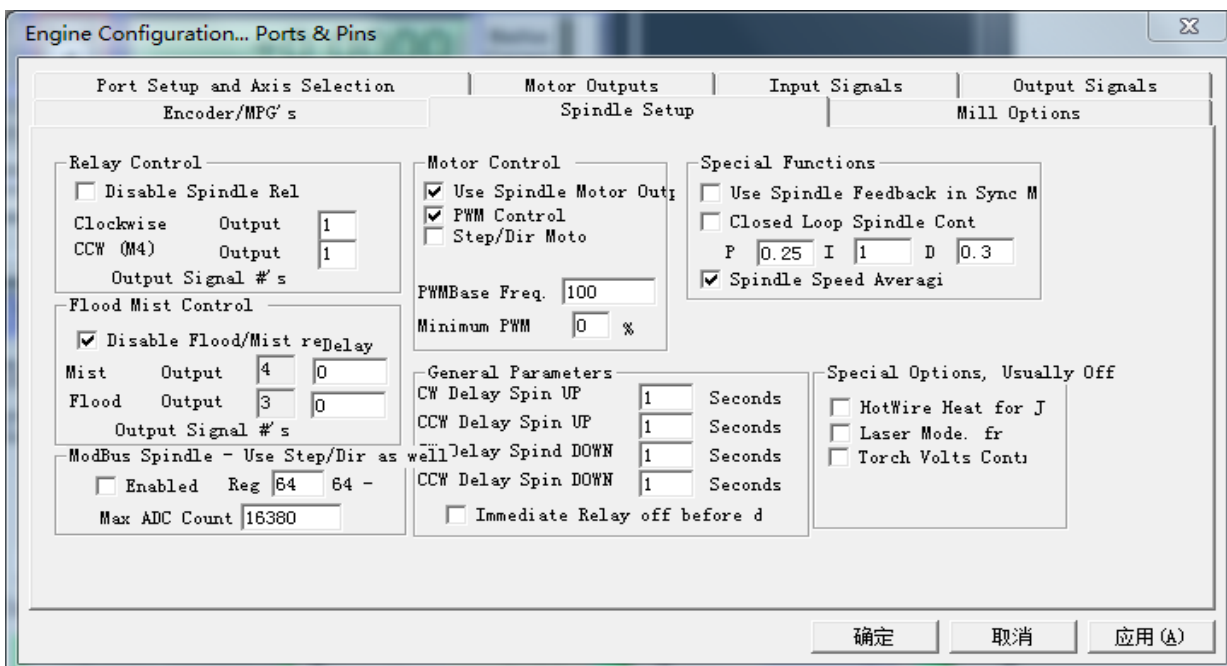
Automated Setup of Inputs

确定   取消   应用(A)

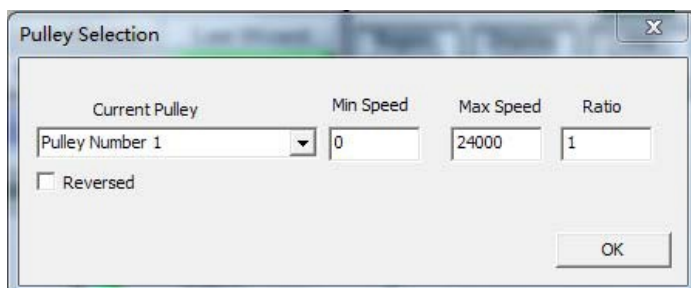(4). Output signals: set as below, then click the "confirm" button.

Enable1: stepper motor enable setting. --p14
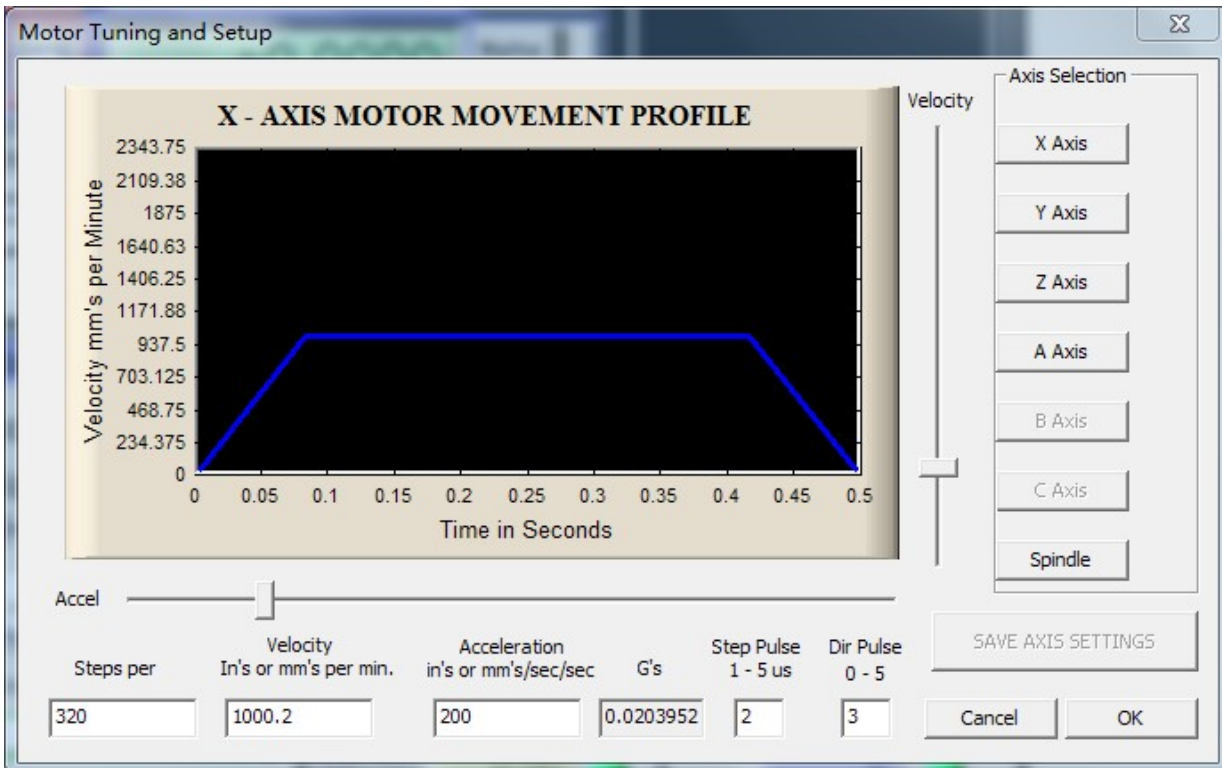Output #1: spindle relay switch setting. --P17

(5). Spindle setup:

Using PWM to control the spindle speed, also need to set "spindle pulleys" as below:

C. Motor turning:

Its relate to the screw pitch and the excitation mode of the motor driver. The below diagram setting is base on 5mm screw pitch and excitation mode is 1/8 mircostepping.

Steps per is means how many steps it need for moving 1 mm.
The seting of Y Z A axis is similar to X, and please save the settings after all.
Please set Step Pulse at least 5 us for driver M542T and M860H.

5. System hotkeys setup:
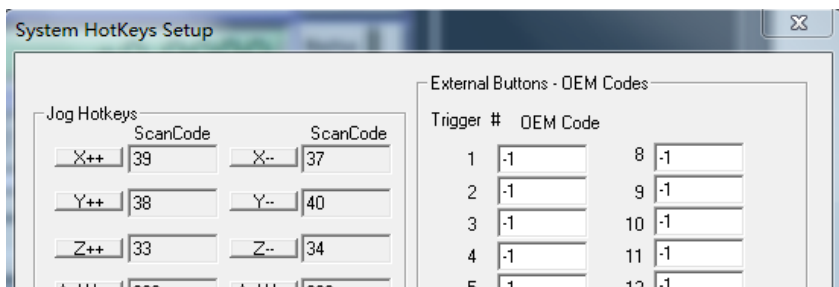
Set the hotkeys of X. Y. Z axis as this diagram, then you can control the motors by this hotkeys on the keyboar.