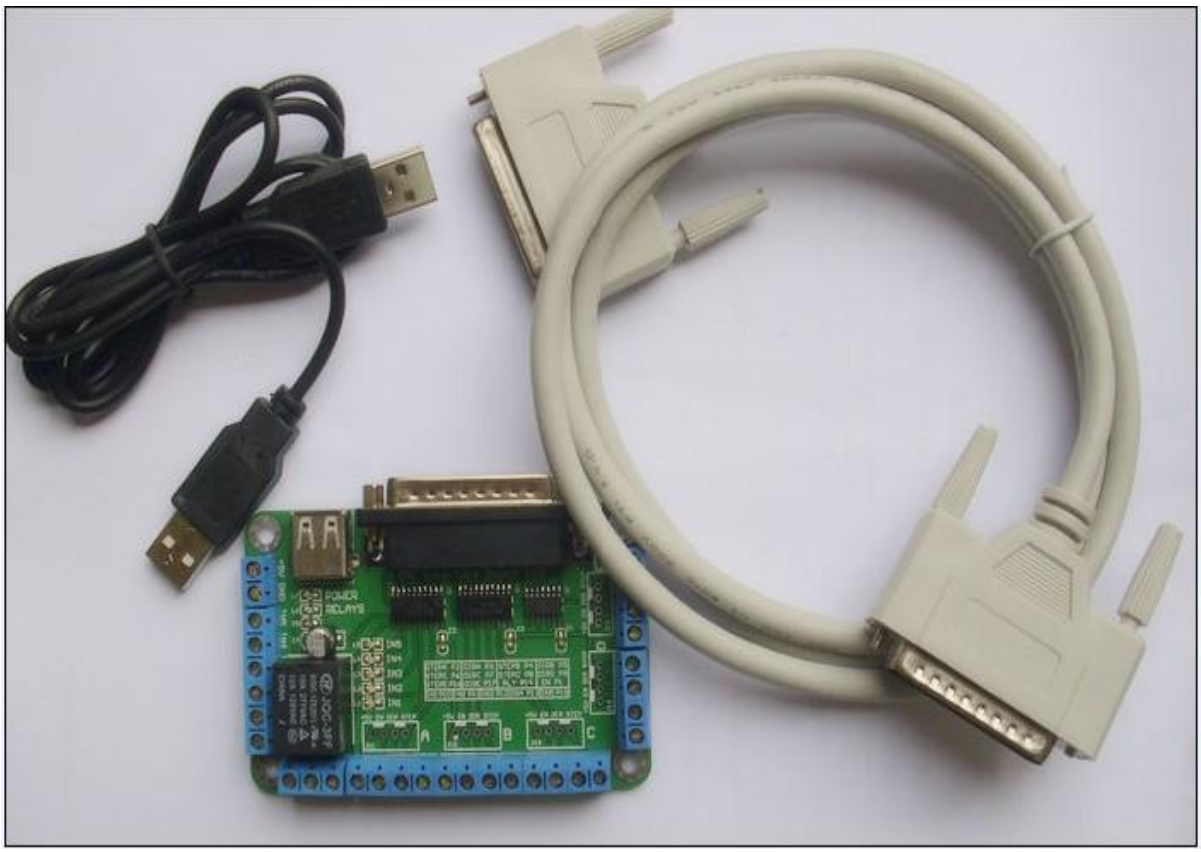
Carving machine 5 axis of the MACH3 interface board



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Product Features

full support for MACH3, KCAM4, EMC2, and support parallel port to

control the host computer software;

leads to all the parallel port output pins of all 12 data transmission, which can control the five stepper motor driver;

with 5-way input interface, you can access the limit switches and emergency stop switch, reset the knife;

5 input LED indicates the status of the input;

with the way 10A relay control, normally open, normally closed are leads, which can be accessed spindle start, or other equipment;

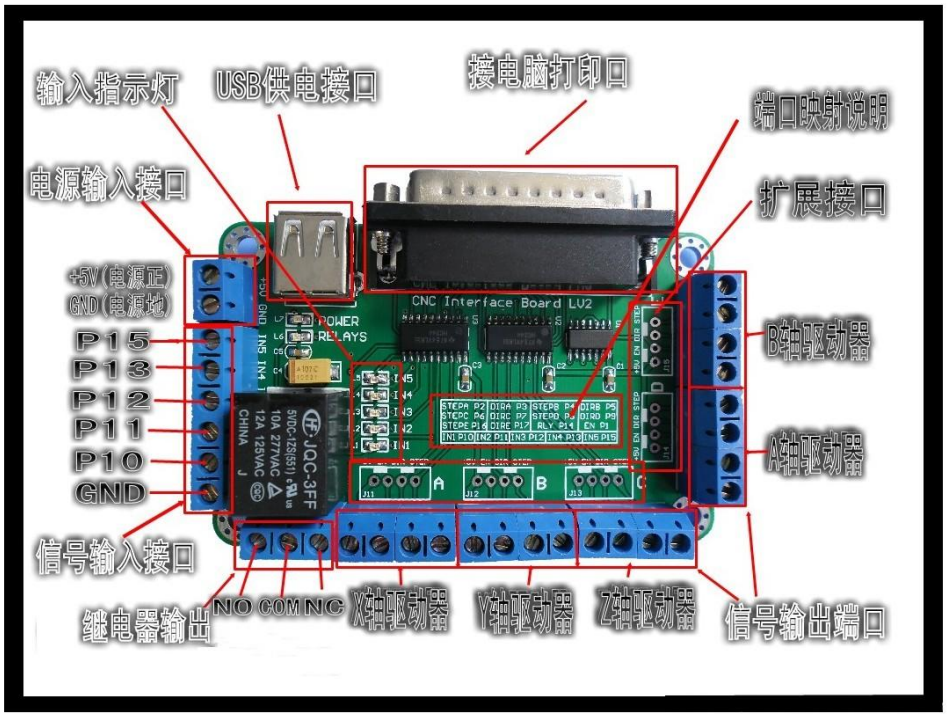
The supply 5V USB power supply or an external 5V power supply to facilitate the access of external power;

external drive enable signal amplification, filtering, enhancement processing;

pulse and direction signal shaping, enhanced with a carrying capacity, data transfer speeds reach 10 MBit / S;

drive interface in two ways leads, of 4PIN XH seat with OUR 6560 driver board for easy connection terminal interface can be used with other brands of drives;

Interface Description



Pin Definitions

1.DB25 pin to pin definitions:

P	power	Explain	PI	power	Explain
1	EN	Enable control signal	10	IN1	Signal input port 1
2	STEPX	A(first axis) pulse signal	11	IN2	Signal input port 2
3	DIRX	A(first axis) direction of the signal	12	IN3	Signal input port 3
4	STEPY	B(second axis) pulse signal	13	IN4	Signal input port 4
5	DIRY	B(second axis) direction of the signal	14	RLY	Relay control signal
6	STEPZ	C(third axis) pulse signal	15	LIMIT5	Input interface 5

7	DIRZ	C(third axis) direction of the signal	16	STEPB	E (fifth axis) pulse signal
8	STEPA	D(fourth axis) pulse signal	17	DIRB	E (fifth axis) direction of the signal
9	DIRA	D(fourth axis) direction of the signal	18	GND	Ground signal

2. Interface Terminal Description

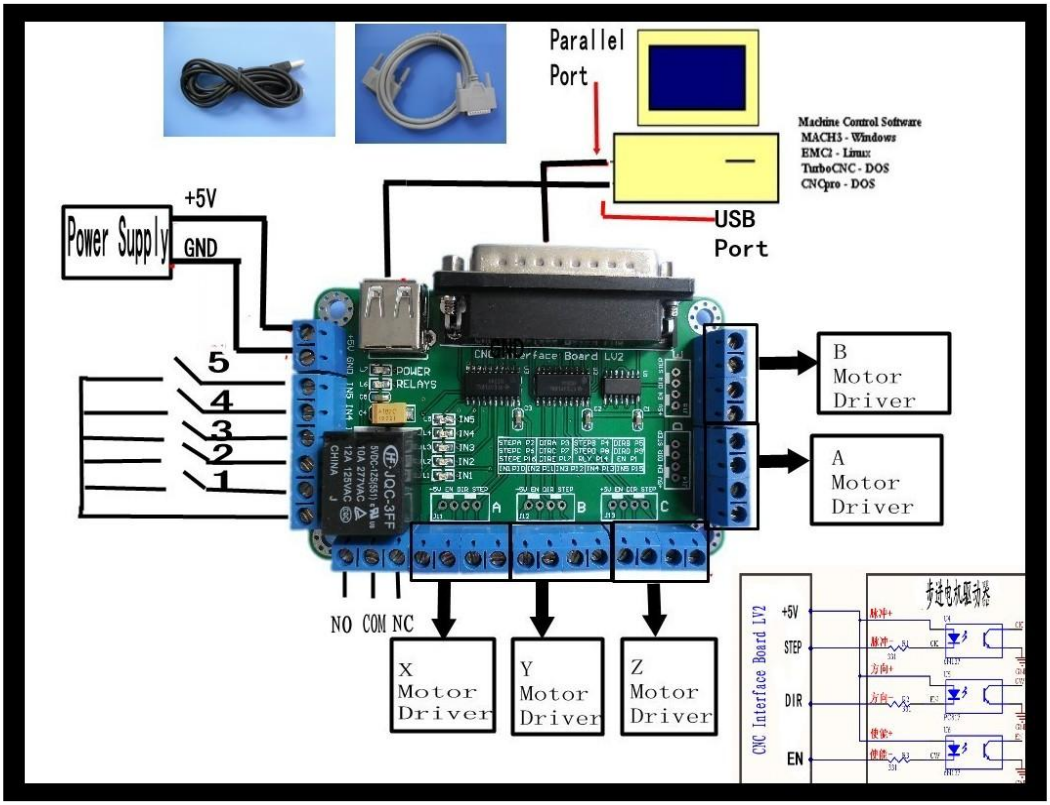
Name	Explain	Remarks
Parallel port	Then the computer DB25 pin connector	With the computer communication interface
USB □	Then the computer USB port	Interface board 5V power supply interface
+5V	An external power source +5 V input interface	
GND	External power ground	USB power port
IN5	External signal input	Light signal input
IN4	External signal input	Light signal input
IN3	External signal input	Light signal input
IN2	External signal input	Light signal input
IN1	External signal input	Light signal input
NO	Normally open relay contact	When the parallel port P14 is low, this pin is connected with COM
COM	Relay commons	
NC	Relay normally closed contact	When the parallel port P14 is low this pin is not connected with COM
+5V	+5V output pin	Access drive signal input + 5V
EN	Enable output pin	Enable effective hair pulse motor to be able to respond to
DIR	Direction output pins	
STEP	Pulse output pin	

Electrical Characteristics

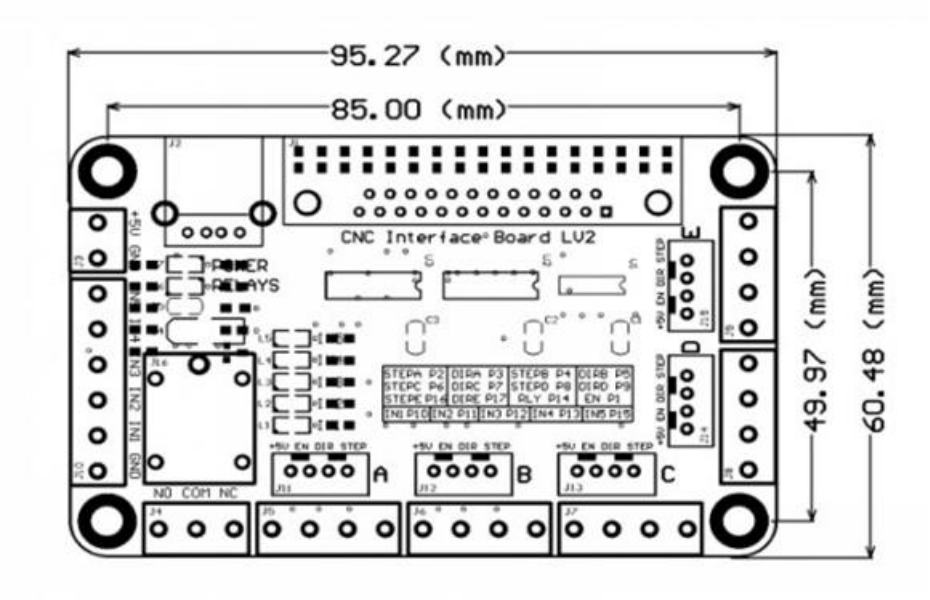
	Minimum	Rated	largest	Unit	Remarks
Supply voltage	4.5	5	5.5	V	
Enter high VIH	2			V	IN1~IN5
Input low VIL			0.8	V	IN1~IN5
Output high VOh		5		V	EN、DIR、STEP
Outputs low voltage VOL		0.1		V	EN、DIR、STEP
Output high current IOH			20	mA	EN、DIR、STEP
Input low current IOL			24	mA	EN、DIR、STEP

Typical wiring diagram:

Interface board to connect a typical wiring diagram of the controller and drive:



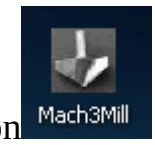
Mounting dimensions:



Mach3 Software to set up and use:

Description: here will be to explain the mach3 of basic settings, we introduced here mainly for interface plate board, so you can make the motor rotate properly, some settings please refer to mach3 manual, there are very detailed and professional explanation.

1.Mach3's start:

MACH3 software is installed on the desktop, there are three icons, restart your computer, click on 

the icon, open the interface as shown below:

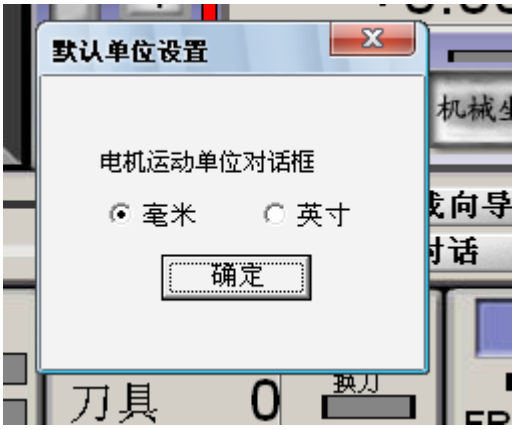
Mach3 software is not open after the direct use, you are using the parallel port of the drive plate pin definitions and driver board features, set to be able to control the motor normal operation.

2.Mach3 Software port settings:

MACH3 open interface as shown above, with the control button, where we first MACH3 software the basic set.

Click the units are set to appear as shown below:

Click OK, and the below:



Mm, and click OK.

3.Port and pin settings:

As shown above, open the Settings menu under the port and pin menu, the pin is set, click the red circle as shown in the project, click the interface shown below:

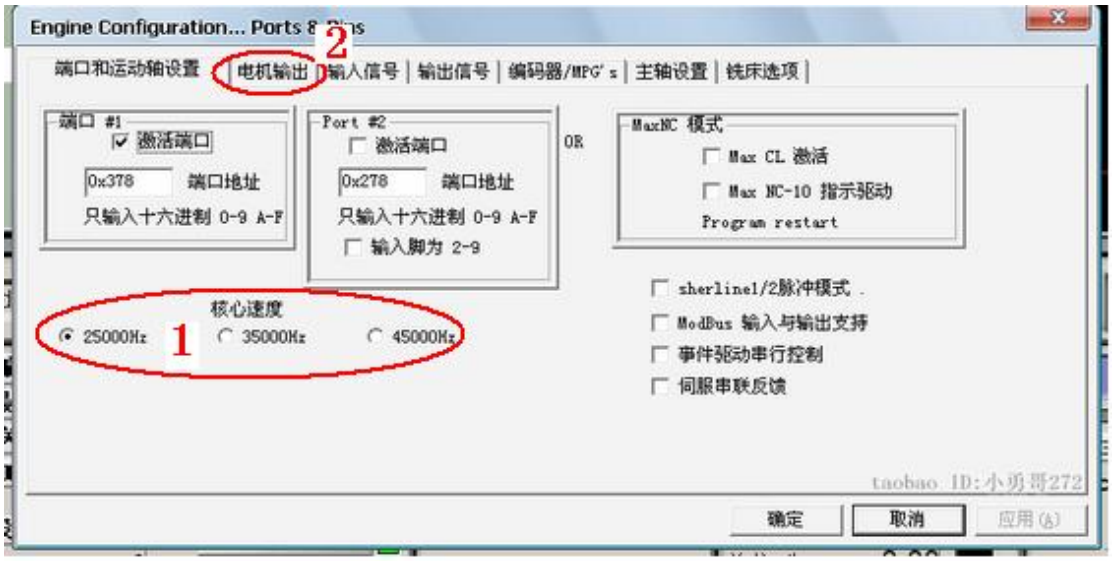


Figure ring a place where you can set the fundamental frequency, this parameter of the motor rotation speed, stepper motor, then, we generally use the default 25000HZ it. Select circle place, set the following diagram of the interface, and following our directions and pulse pin settings:

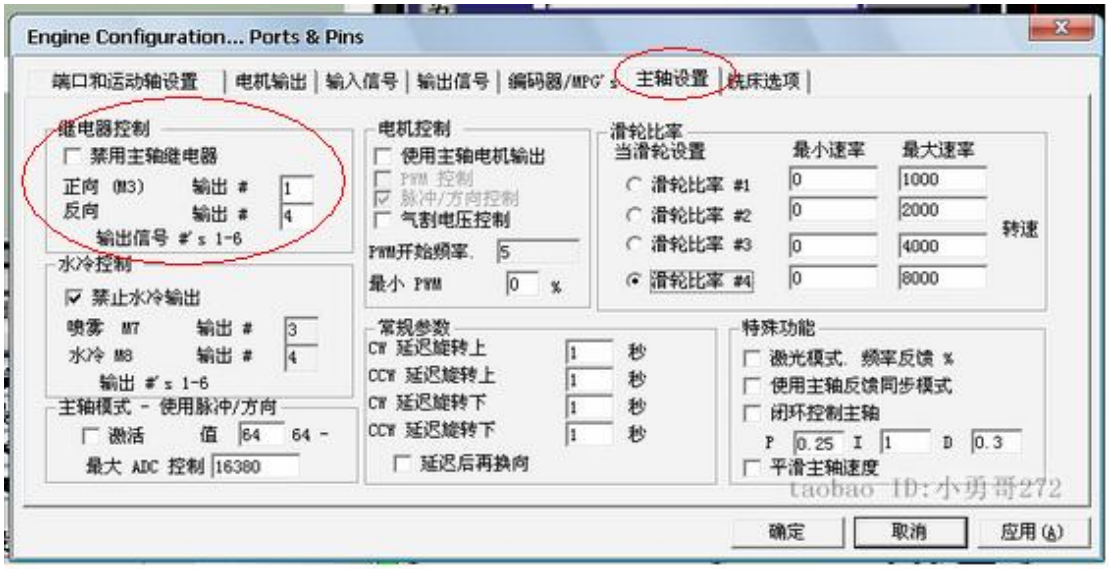
Note: Be sure to click Apply to save your data set is completed.

Direction and pulse settings, click on the output signal of the figure below,

and relay control pin settings:

1 foot control enabled pins, if the motor is not locked, the switch one position can be, only the motor lock, send the pulse of the drive response.

14-pin relay control pin, the relay does not pull to control the relay by the following set.



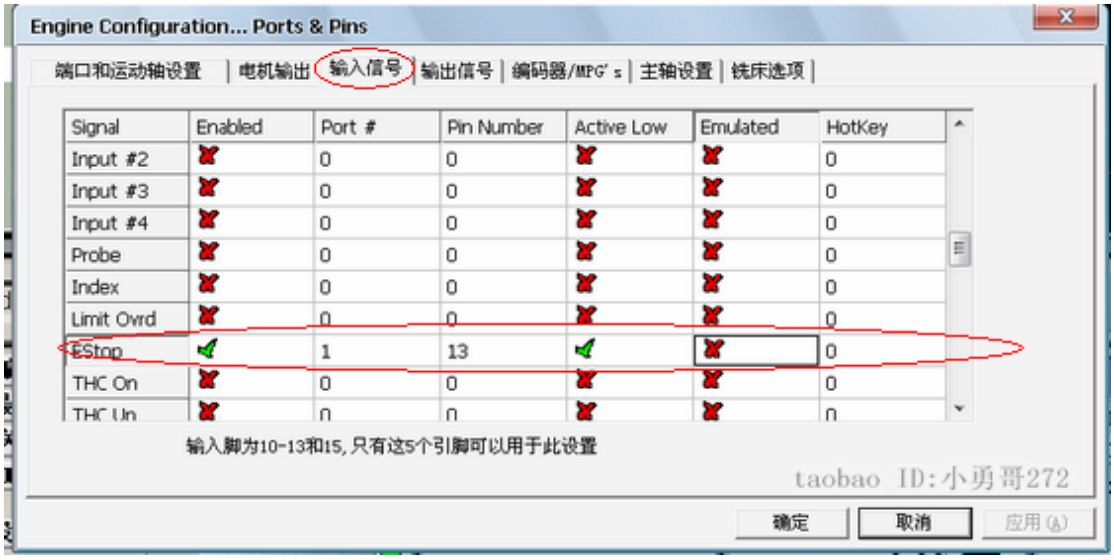
Spindle relay can control the pull or release through the code M3 relay

together, M5, relay release.

4.Mach3 of the limit switch settings:

Click on the input signal, set the parameters as shown below:

The emergency stop switch settings: in case of emergency is in need of emergency to stop the machine, the parallel port pin 13 as an emergency stop input pin, mach3 set corresponding to the following diagram:

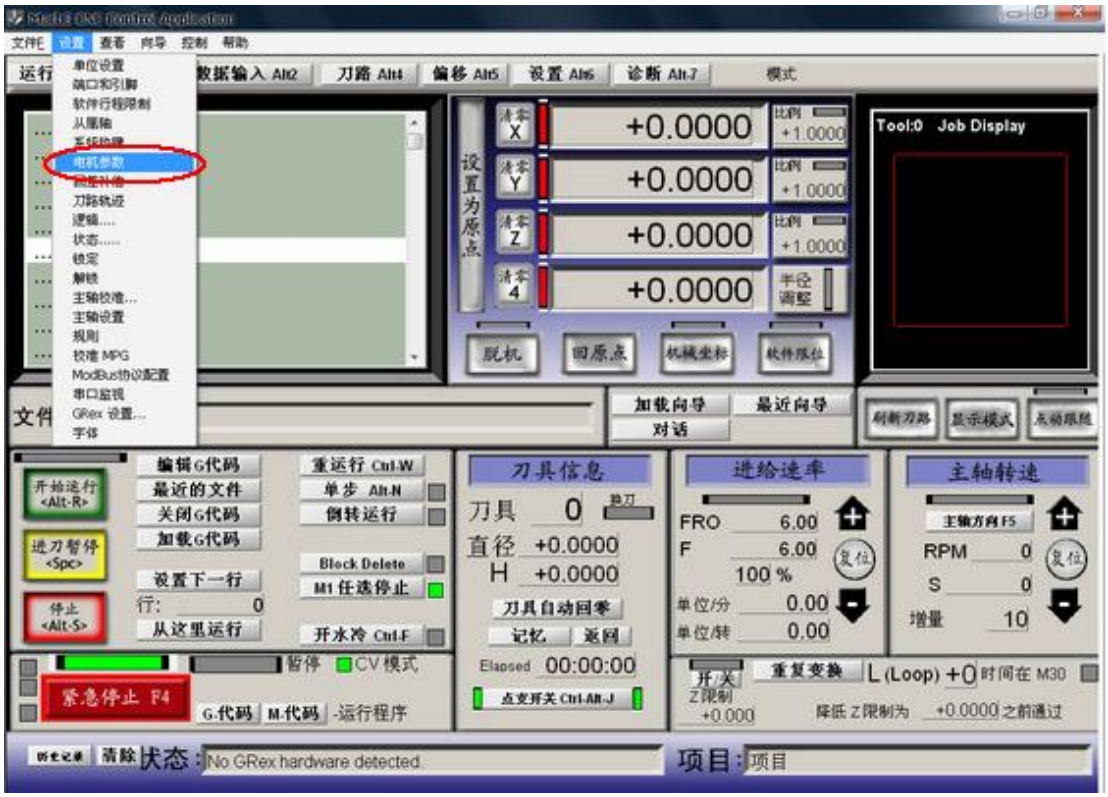


Three-axis systems, the five input interface can set the limit switches, emergency stop switch, reset switch, there are many ways to set, I only listed one of them, you can refer to your actual needs mach3 The user's manual on mach3 settings.

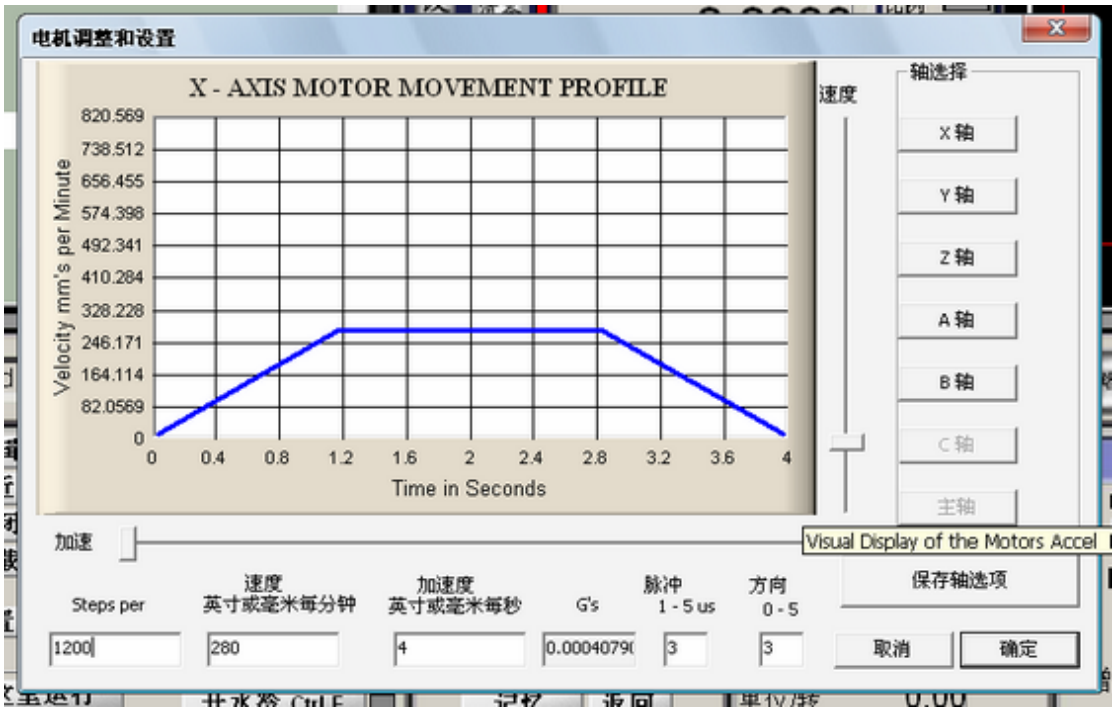
5.Motor debugging:

Motor debugging refers to debugging software on the state of motion of the motor here need to do the work of three, a) calculation tool or table moves one millimeter of the desired number of pulses, (b) set the maximum motor speed, (c) Set the acceleration of the motor.

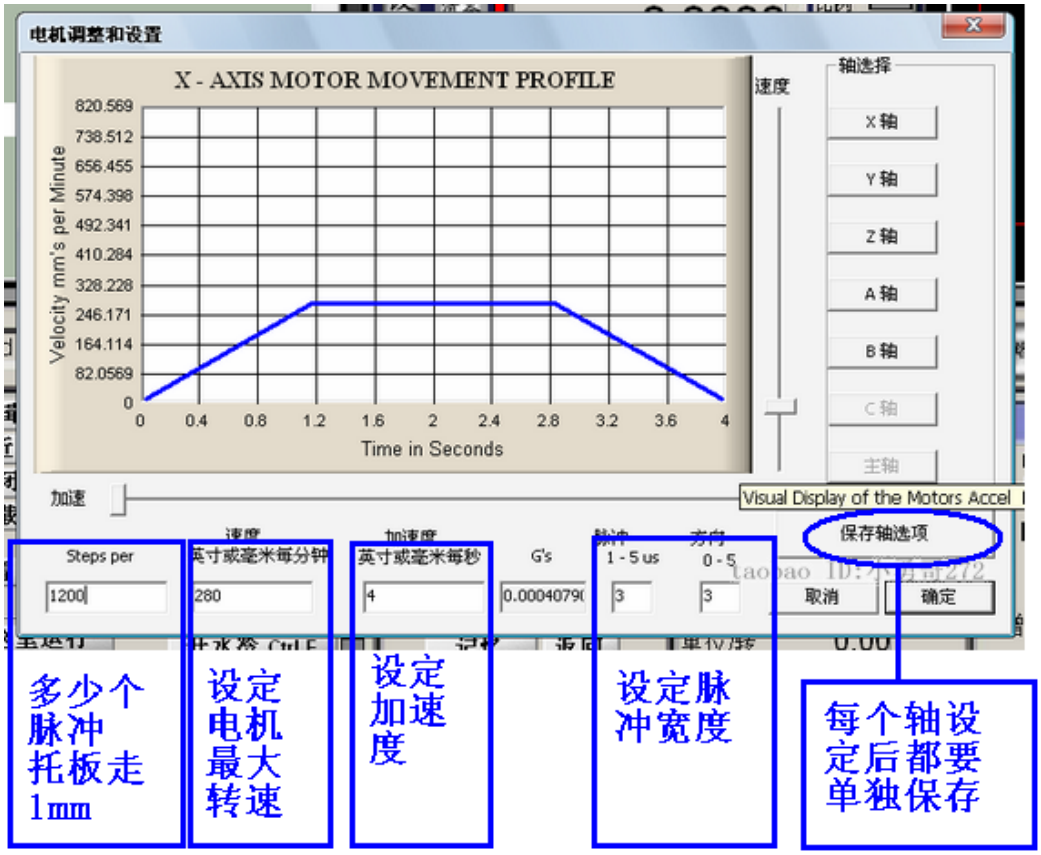
Motor debug menu to open the steps as shown below:



Click the following figure:



Here we Figure Each item is explained as follows:



The number of pulses required for the calculation of the tool or worktable move one millimeter, according to your machine, the screw pitch, the number of segments drives, stepper motor step angle is calculated.

The maximum motor speed will be limited by the the Mach3 maximum pulse rate, if the configured Mach3 frequency of 25000Hz, the unit impulse is 2000, you can get the maximum motor speed of 750 units per minute. Set the maximum motor speed of motor-driven device or machine is not safe, the Mach3 may be tired running, you need to calculate or test to determine the maximum speed if it is safe.

Is a very important part of the motor acceleration settings, the maximum speed of the motor from rest to an accelerated process, we set the value to the motor does not lose steps, the normal operation of the subject. The

pulse width of the optocoupler interface board and the drive is set up, we regard it is set to 3us.

The above data is only indicative, not the data you want to set, depending on your equipment, computing and debugging.

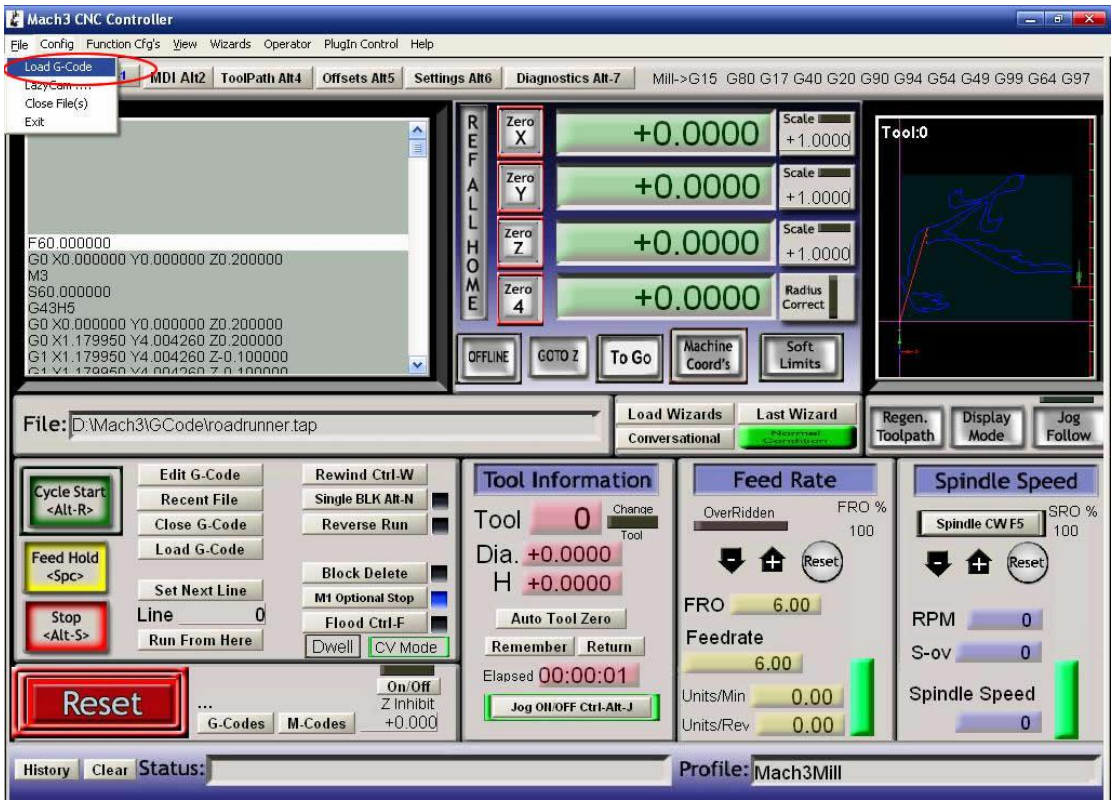
Appendix: the number of pulses table go 1mm calculated as follows: The formula = (motor rotating a circle of the standard number of pulses * drive number of segments) / screw pitch

For example: the stepper motor step angle of 1.8 °(the most common motor), turn a circle the number of pulses is 360 °/ 1.8 °= 200 pulses, the drive segments 16 segments, screw pitch 4mm. Steps per = 200 * 16/4 = 800.

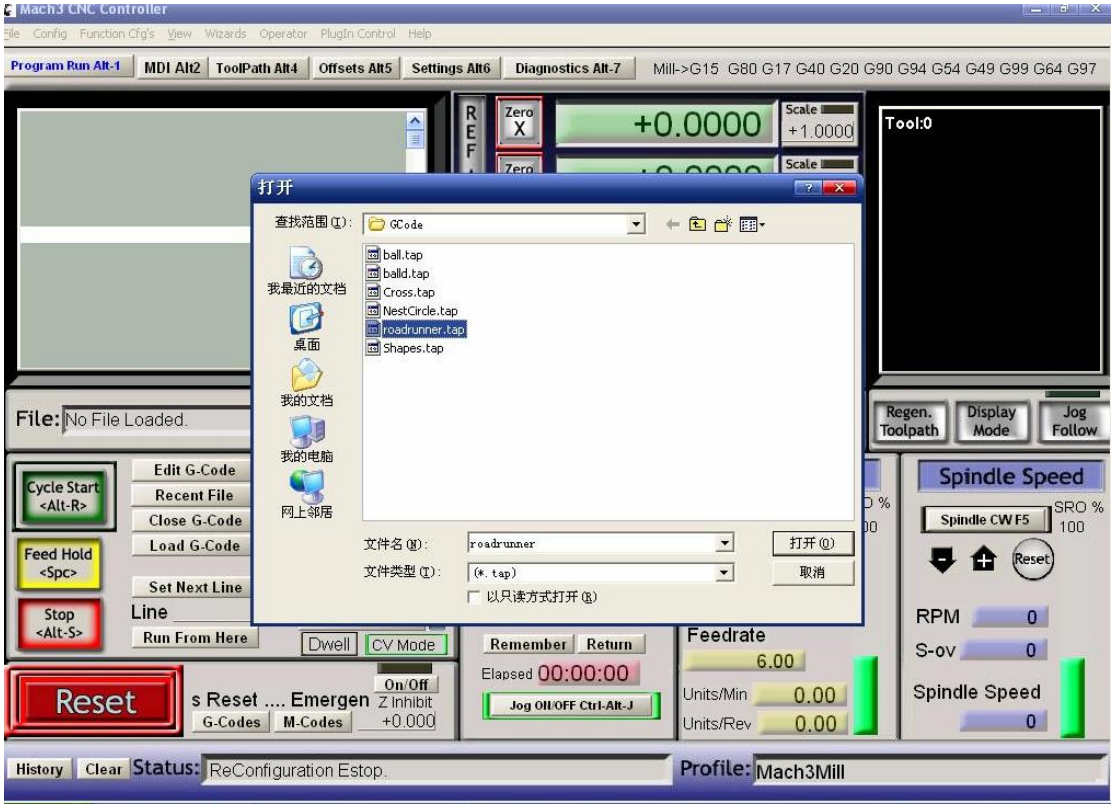
Note: be sure to click save axis option to save the data set is completed, each axis must be kept separate!

6.G-code is run:

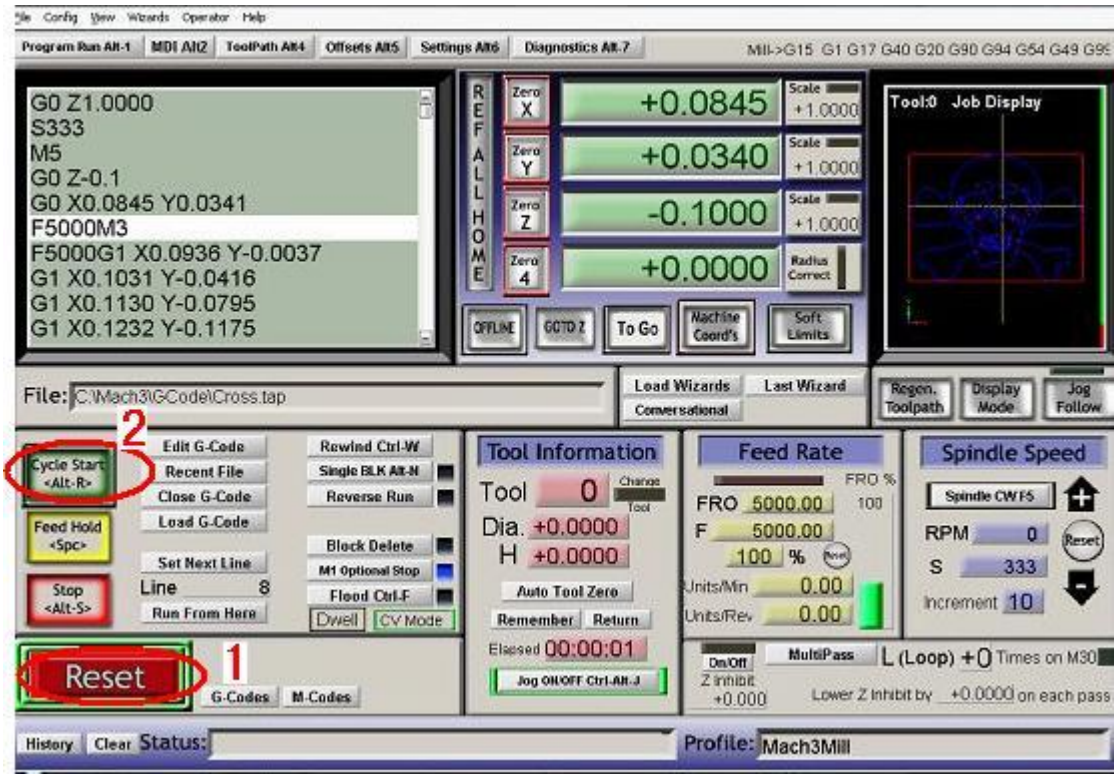
G-code instructions in the NC program of mach3 software comes for customers to test the G code, you can easily call when customers test machine. Load the G-Code, click on the File menu bar, as shown below:



Open the folder that contains the mach3 software, Mach3 open include testing of the G code GCode and click open and select a G-code interface as shown below:



Click to run G-code the following figure:

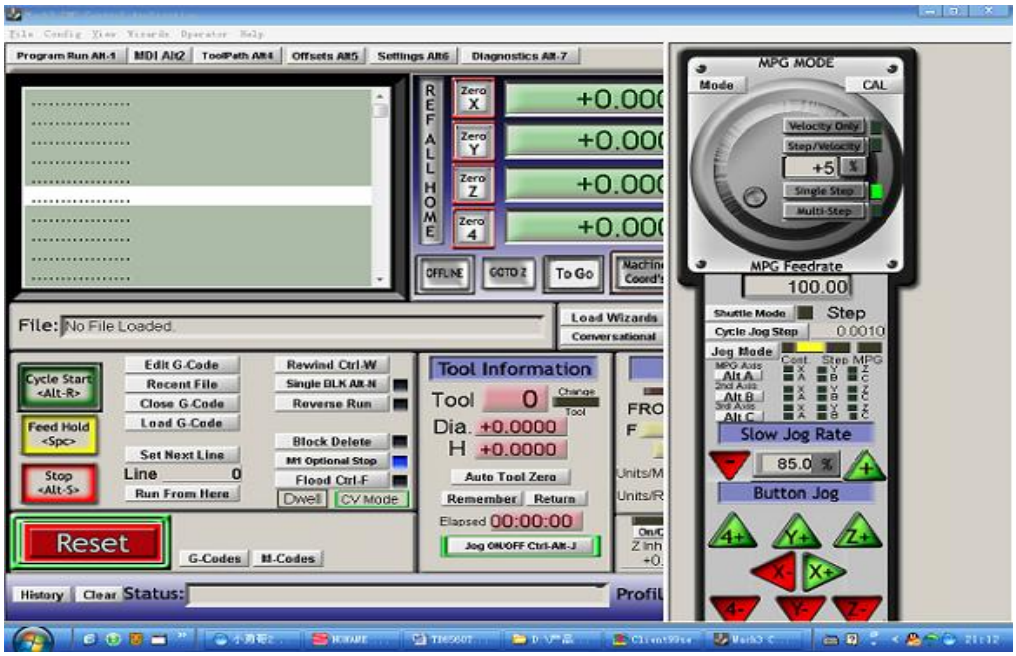


You can see the red emergency stop button RESET (circle one location) in a flash, use the mouse to click this button to stop flashing, and then click circle the location CYCLESTART run.

If you want to run their own G-code for processing, the same way, find the folder to store your G-code, G code to import to run.

7.how to use the MACH3 the manual interface:

Test, with hand control, you can press the TAB key, the keyboard, you can open the manual control panel as shown below:



Software configuration, click the stop switch reset allowed not to flash the mouse to click on the appropriate channel button, you can make the corresponding channel of the stepper motor rotates, the figure below is the manual control panel:

50.0 %
Button Jog
4+
Y+
Z+
X-
X+
4-
Y-
Z-