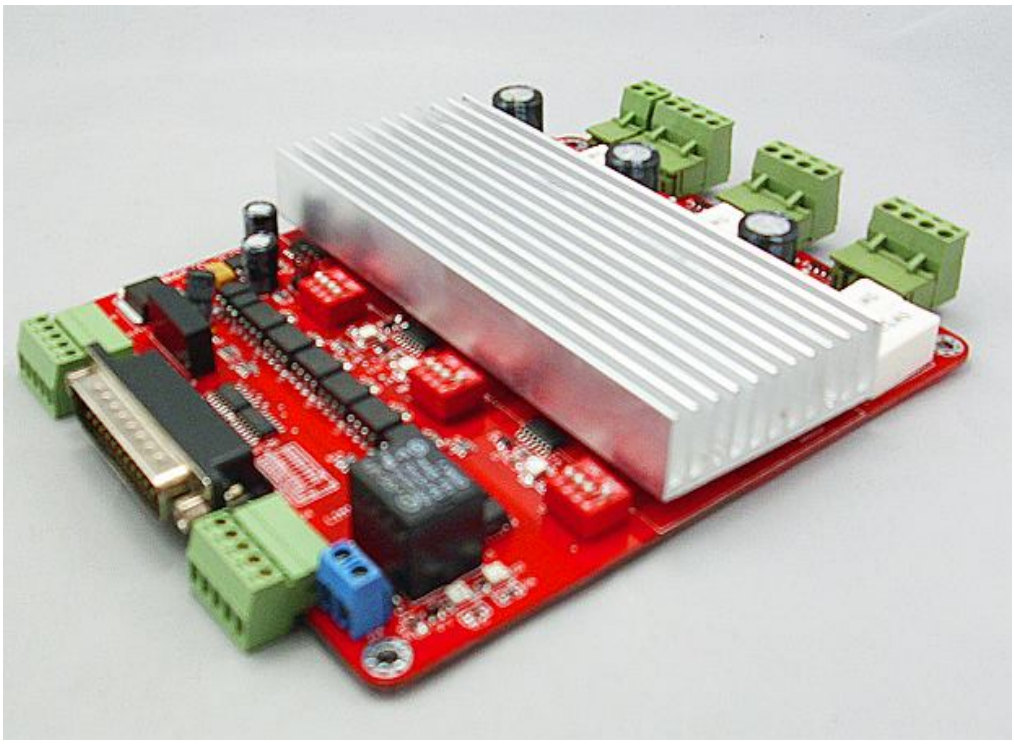
IFS-6560T3-N

The Manual of Drive Triaxial



Content

I.Summary

The computer engraving machine is a new set of engraving and milling. The machine is mainly suitable for processing a variety of colorful patterns mould, such as,matrixes for embossing,sole mould,button mould,Zipper model,Stamping die design and die text,Instrument Mould,glass mold,etc.Also applies to advertising, such as, logo of firms,scutcheon,module,ofbuilding,badge,name-plate,panel,association's,emblem,door-plate,destination,board,decoration,upholster,etc. And applies for graphic engraving,Yin wen and Yang wen profile, and relief sculpture,such as portrait,scenery,Calligraphy Lettering,seal,etc.

The company's 3-axis Engraving machine drive will composed minimum control system, using high-performance special micro-step control of TB6560 chip , open micro-computer control according to user requirements to functional design to the driver board.The control panel suitable for driving any small or four-phase or two-phase hybrid stepping motor. And have 4 files adjustable features of current 0.6A, 1.2A, 1.8A, 2.5A , support MACH2, MACH3 ,KCAM4Series software,Widely used in mold processing, graphic sculpture。As a result of new bipolar constant-current chopping technique, high precision, the motor running,with small vibration, low noise, smooth operation, safe and convenient, it is welcomed by the vast number of DIYers and engraving machine manufacturers.

II.The advantages of TB6560AHQ

1、In the low-speed operation system advantages

Low-speed operation system means clock frequency is not high, a small current drive based , such as several to 100 rpm, under the conditions of the user, in such applications will increase in costs such as using the traditional driver, either due to integrated chip subdivision is too low, leaving the low-speed vibration is too large; either had to choose a high drive segments.

The advantages of TB6560AHQ

- low vibration and noise.Because the chip comes with an optional sub-2,4,16, enough to meet speed nearly a few to high speed.
- Less heat:Large enough to heat the chip comes with a separate support the cooling requirements of small current drive
- Supports a variety of stepper motor:Customers can choose slightly larger moment of a hybrid or permanent magnet stepper motor, the motor work in the allowed

peak torque between 30-50 percent, the motor costs almost the same; the chip set to provide more current file and current decay model, support various parameters under thethe same power index .

2、In the high-speed operation system advantages

High-speed operation system means clock frequency is higher, and a large current drive-based. Such as speed close to thousand rpm, under this application,compare with traditional driven program,Either due to integrated chip segment is too low, leaving the system is too small speed range,Either due to excessive breakdown and increase high costs, may also caused by high torque decrease vibration and noise.

The advantages of TB6560AHQ

- Low vibration and noise.As the chip TB6560AHQ comes with 16 segments, meeting nearly from a few to thousand rpm. and generates automatically a pure sine wave control current,compare with another highly integrated chip, the high torque at the same speed will not only not decreased, but increased..As TB6560AHQ can withstand the peak driving voltage 40V, 3.5A peak current, it provides continuous technical support.when the motor torque in a large, high-speed operation.
- .Supports a variety of stepper motor.Customers can choose a hybrid moment slightly larger or permanent magnet stepper motor, in the maximum torque of between 30-50%, the motorthe costs is almost the same. The chip provide high current set and multi-profile current decay mode, support the same power index of the various parameters under the stepper motor.
- Less heat.The embedded drive compact, easy to heat.When it drive in high current , the chip surface to facilitate the external cooling radiator, the user can also be directly connected to the metal shell of the original controller,

In short, because TB6560AHQ is highly integrated, the external circuit is very simple, it is high reliability, and support 57 and some 86 per minute stepper motor from a few dozen to thousand rpm.in the wide speed application development and enable the both costs down of numerical control equipment and production

Ⅲ.The brief performance of TB6560T3V1

We have accumulated many years of design experience in 3-axis engraving machine drive. And developed this type of TB6560T3V1. The following features:

- Three stepper motor drive can be run simultaneously
- With 4-axis expansion, if you need to extend it
- Spindle relay output, if you use the mach3 to control spindle start and stop
- Semi-flow control, when motor stop, current is reduced to the minimum
- The interface with the fans, you can add any fans
- With 3-way 0.8-3.5A (peak) adjustable current, rated output two-phase bipolar stepper motor driver
- Interface with Standard parallel port , support MACH2, KCAM4 series software
- With photoelectric isolation and DCDC power quarantine, and protect your PC parallel port and equipment
- Limit the interface with quadruple limit switches can be connected simultaneously
- Support the choice of four segments - 1,1 / 2,1 / 4,1 / 16
- Stability,and small heat,24-36V single power supply input with switching power chip supply 5V power
- By RC +7414 automatic semi-flow, reducing motor heating, when motor stops the current decreases automatically.

IV.The general diagram of TB6560T3V1

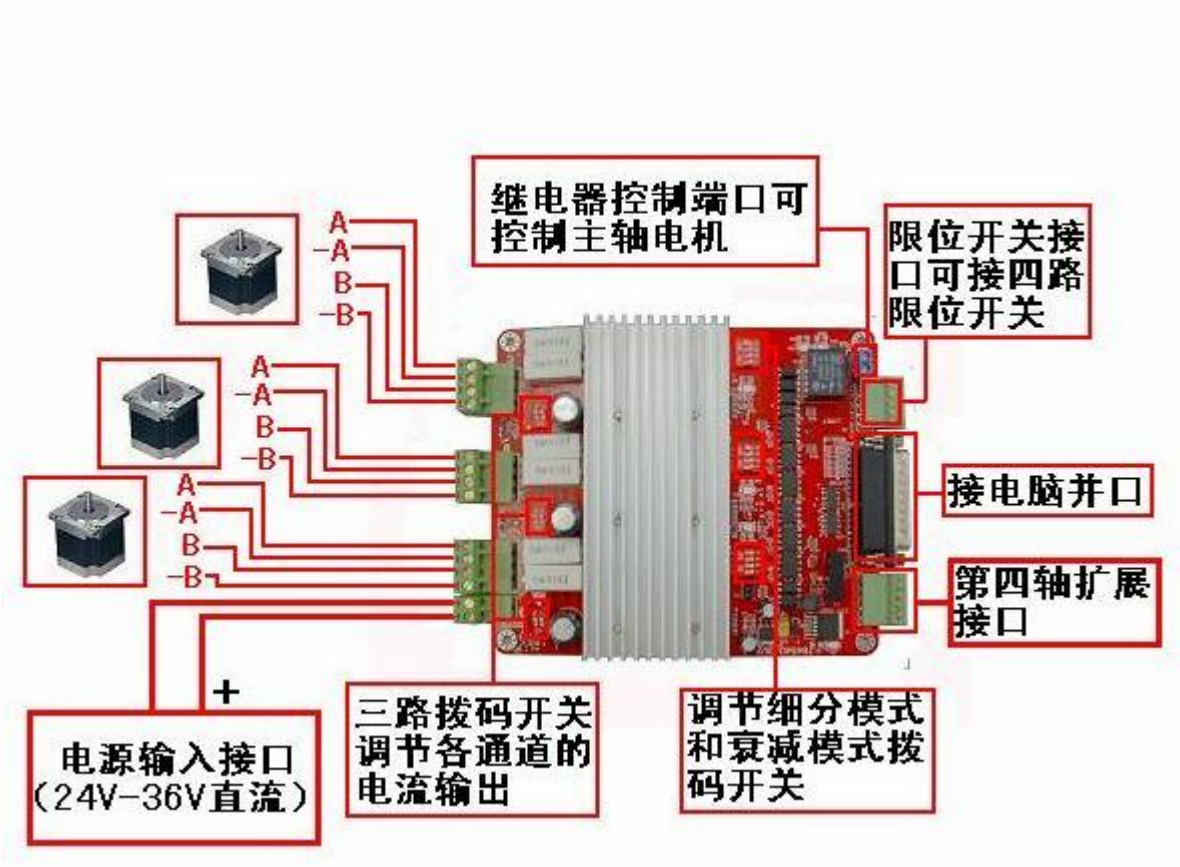


Fig.1

V.The definition of each signal output pin parallel port

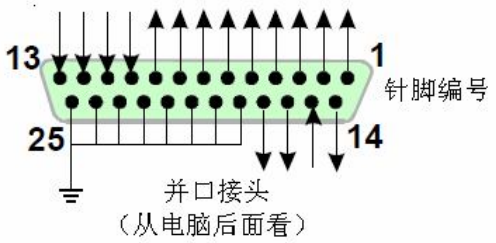


Fig.2

25-pin parallel port control is defined as follows：

DB25 PIN	The role of the pin on driver board	notes
1	EN	Enable all axis
2	STEPX	X pulse signal

3	DIRX	X direction signal
4	STEPY	Y pulse signal
5	DIRY	Ydirection signal
6	STEPZ	Z pulse signal
7	DIRZ	Z direction signal
10	LIMIT-1	Limit input1
11	LIMIT-2	Limit input2
12	LIMIT-3	Limit input3
13	LIMIT-4	Limit input4
14	Relay control	
15	blank	
16	STEPB-	B（4th axis） pulse signal
17	DIRB-	B(4th axis）direction signal
18-25	GND	

VI. The extend connection of 4th axis

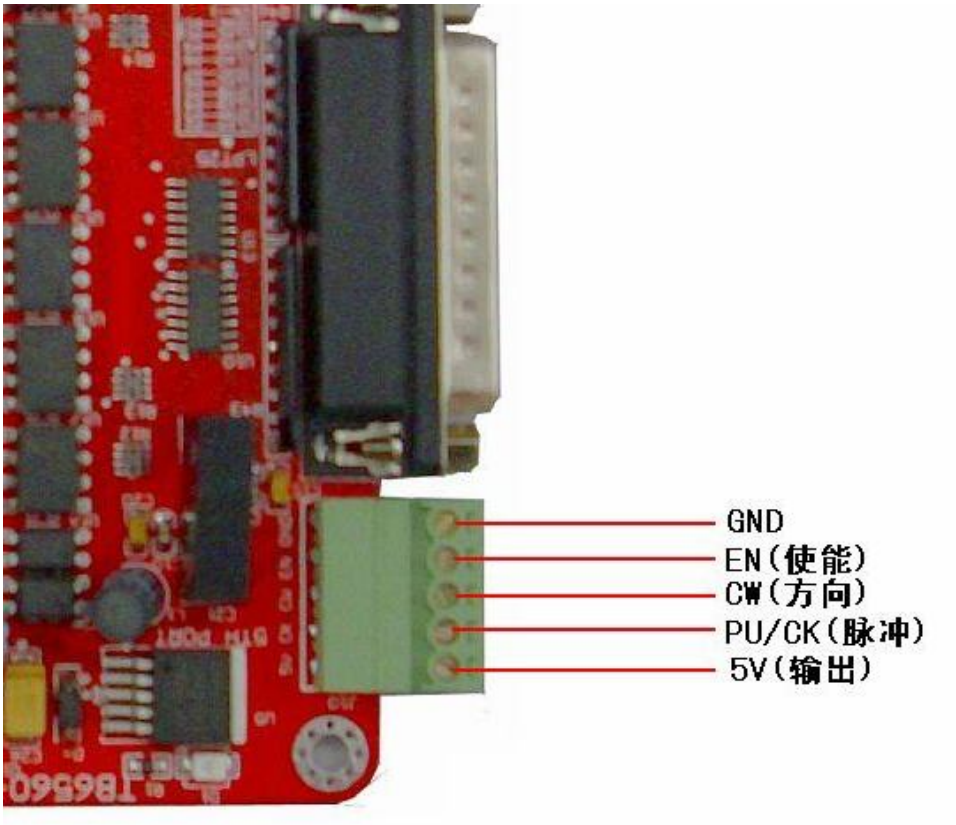


Fig.3

VII.Limit switch connection

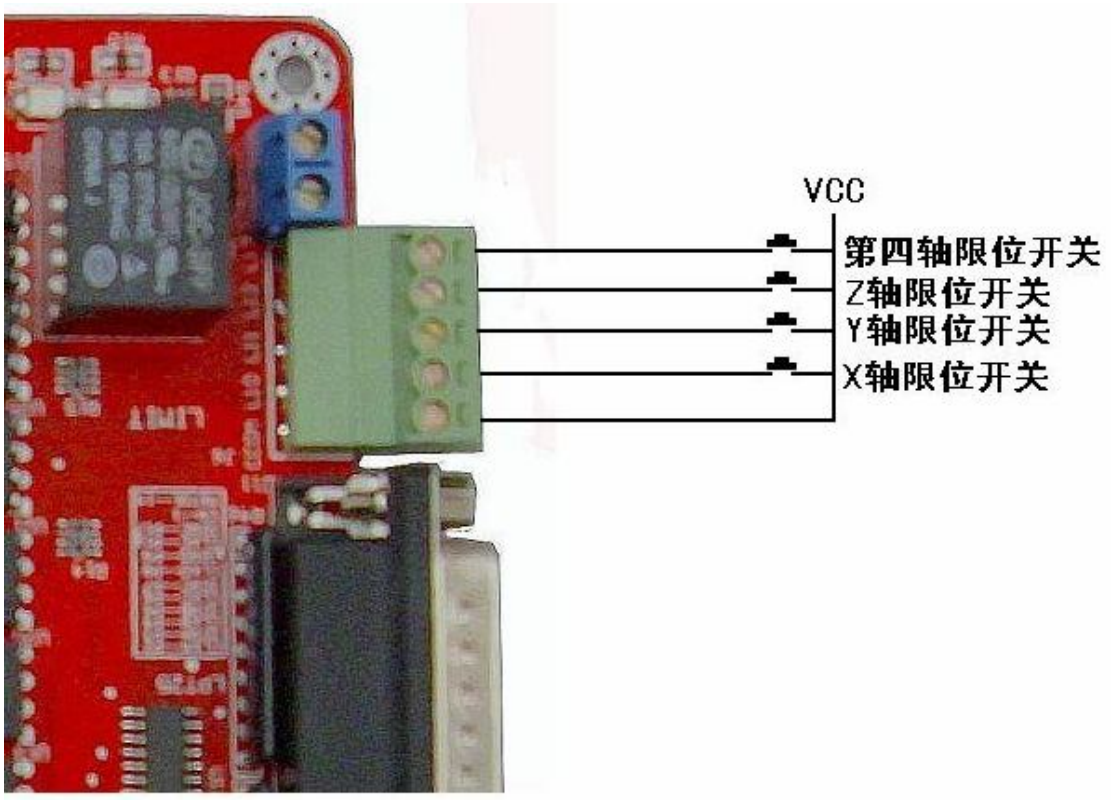


Fig.4

VIII.The Regulation of Current, Subdivision, Decay Modes

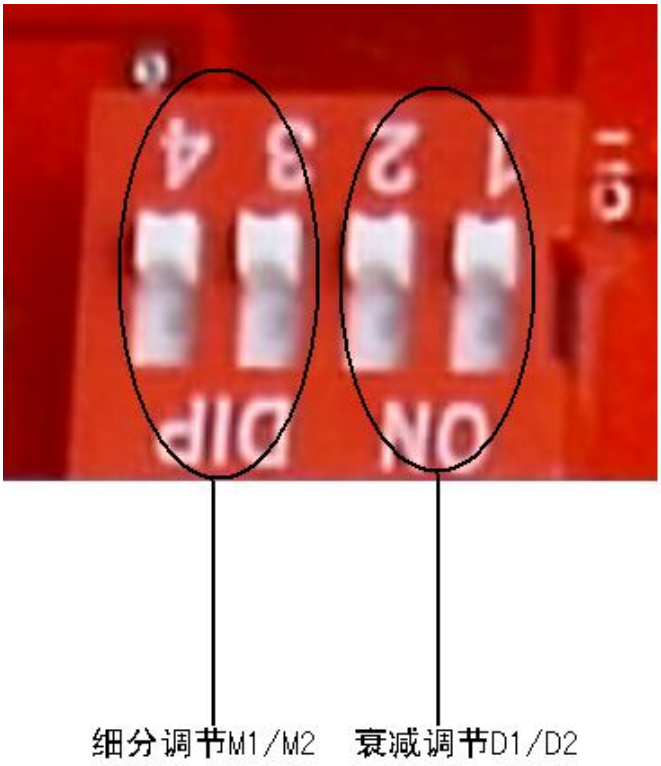


Fig.5

1. Current decay adjustment

The D1D2 are switches on the panel to set the current decay value

DIP switch on of two D1D2:，D1/D2：

ON/ON——100%； ON/OF——25%；

OF/ON——50%； OF/OF——0%；

DIP D1	DIP D2	Mode
ON	ON	Fast decay
OF	ON	50%fast decay
ON	OF	25%fast decay
OFF	OFF	Slow decay

Q： What are the specific role of the current decay of stepper motor driver board?

A：Subdivision is now the current subdivision of stepping motor. The phase current according to the sinusoidal tangent the current point as a basic point subdivision.when phase current reaches the subdivision that through to control current to control decay.Otherwise, if angle overshoot will occur, can not be stuck in sub-angle。Different modes of decay depends on different in speed of motor. Fast decay at high speed, low decay at low speed,Slow decay occurs vibration, noise, when high-speed.In severe cases, will lead to position not allowed,when we select low speed motor to faster decay. Motor Control IC for the current decay of the H bridge is the control mode switch.The high side of the tube when the slow decay off, fast decay tube are closed when the high and low side.Mixed decay is the fast decay and then a slow decay, mixing ratio of decay and power for the chip also will be different.

2.Subdivision regulation

DIP switches on the M1, M2 two to adjust, driver board subdivision may be adjustable,DIP switch The correspondence location and mode of between segments as follows:

DIP M1	DIP M2	Subdivision mode
ON	ON	1/8
OFF	ON	1/16
ON	OFF	1/2
OFF	OFF	1

To make the motor run smoothly, please try to choose high segments, such as 1 / 16 segments

3、Current setting

电流调节拨码开关T1/T2

Fig.6

Current regulation is by the panel to T1T2 two DIP switches to control .Figure XYZA current regulation identifies the location of the 2-way DIP switch

Dip T1	Dip T2	Value of current
ON	ON	20%*2.5A
OFF	ON	50%*2.5A
ON	OFF	75%*2.5A
OFF	OFF	100%*2.5A

Proposed stepper motor current as close as possible the rated current

IX.Connected in a variety of stepper motor

Motor connection diagram, please refer to Figure 1

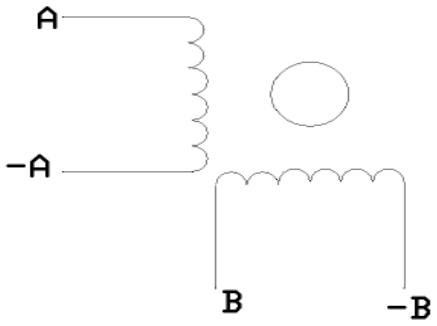


Fig.7 Four-wire stepper motor connection

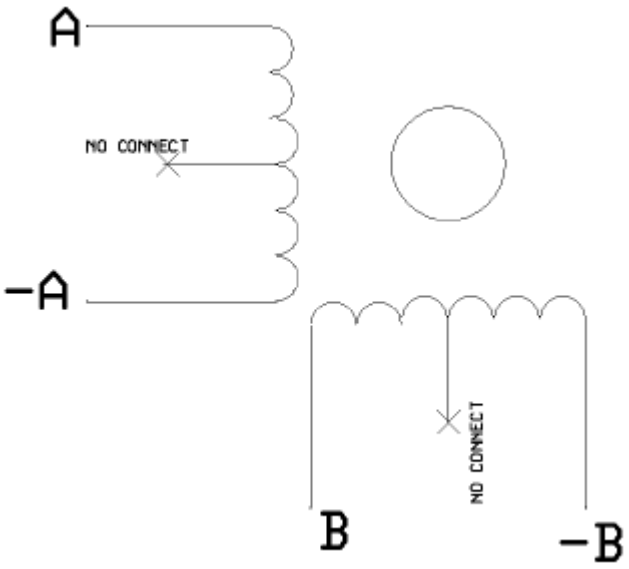


Fig 8 Six-wire stepper motor connection

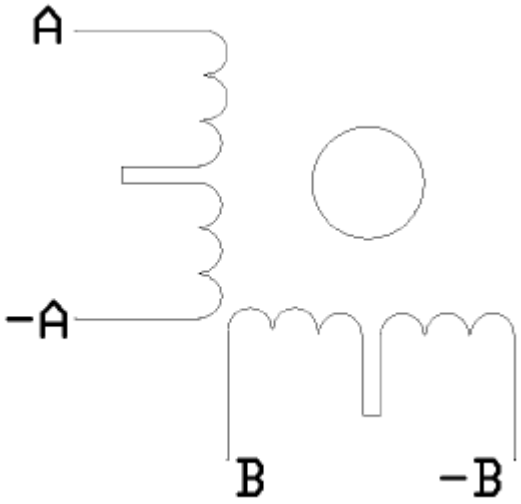


Fig 9 eight-wire stepper motor connection

Notes:Motor A,-A, B,-B, connected respectively, four wires connected driver board AP, AM, BP, BM

X.The choice of stepper motors and its power

The panel of **IFS-6560T3-N** axis match with two and four-phase motor drive of domestic and foreign manufacturers , in order to obtain the most satisfactory results, need to set a reasonable supply voltage and current. The high-speed performance

depends on the degree of the motor supply voltage.but the current set value determines the output torque of the motor.

A.Setting supply volatage

In general, when the higher the supply voltage, more great torque at the motor high speed, and avoid the motor out of step at high speed. On the other hand, the voltage too high may damage the drive, and work in high-voltage,vibratory at low speed Reference value of power between 24-36VDC 6A

B.Setting output current

The larger of setting current, the greater of output torque in the same motor. But the problem is the larger current the more heat of motor and driver. So in general,we set the value at when it warm but not too hot to run at long-term.

- AT high speed mode of 4 and 6-wire: the output current equal or less rated value
- Larger torque mode of 6-wire: output current is 70%of rated value.
- Tandem-type connection of 8-wire:output current is 70%of rated value
- Parallel connection of 8-wire:output current is 1.4times of rated value.

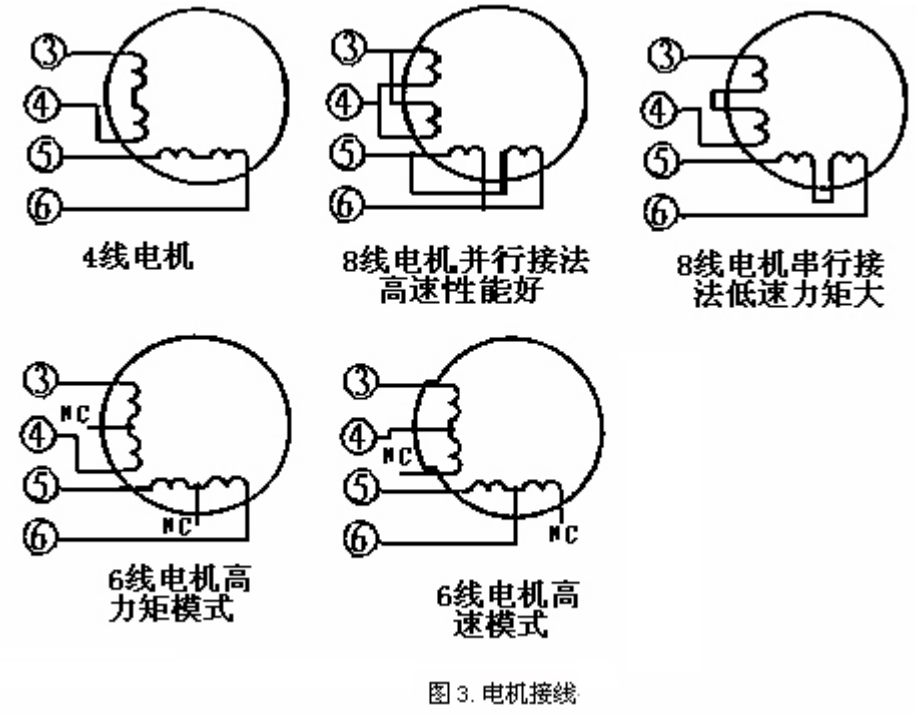


Fig.10 the diagram of motor

Notes: please operating motor 15-30 minutes when you finished the setting of current.If the motor temperature is too high, you should reduce the value. If reducing the current value, the motor output torque is not enough to improve the cooling conditions, are invited to ensure motor and drive are not hot.

XI.Usage of MACH3 Software

1、Startup of Mach3

Fig 11 open mach3

Open MACH3，setting mach3MILL, then click OK button

2、The basic setting of Mach3：

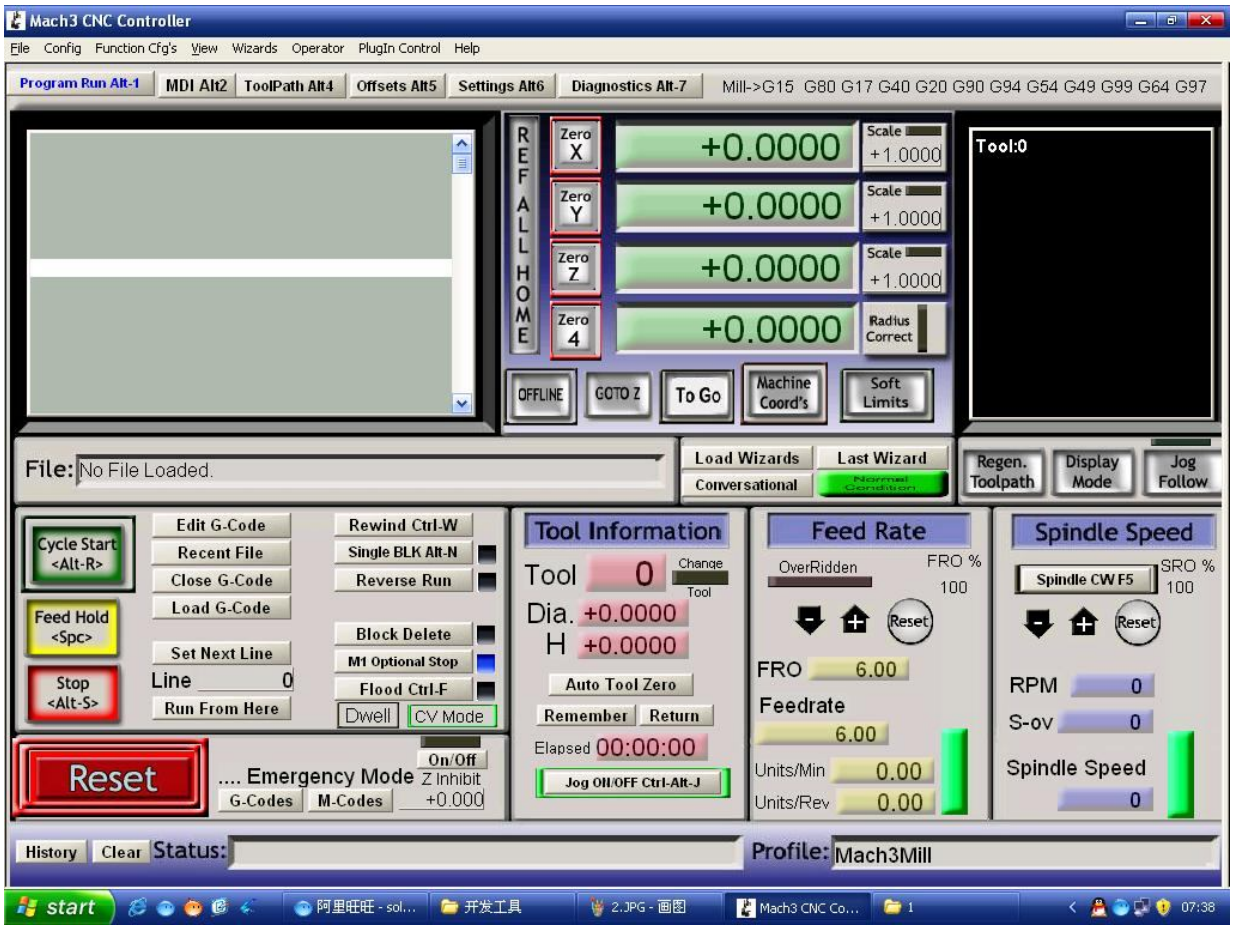


Fig 12　The main interface of mach3

The main interface of MACH3 as fig 12 ， some basic buttons on it,Here, we first configure MACH3.

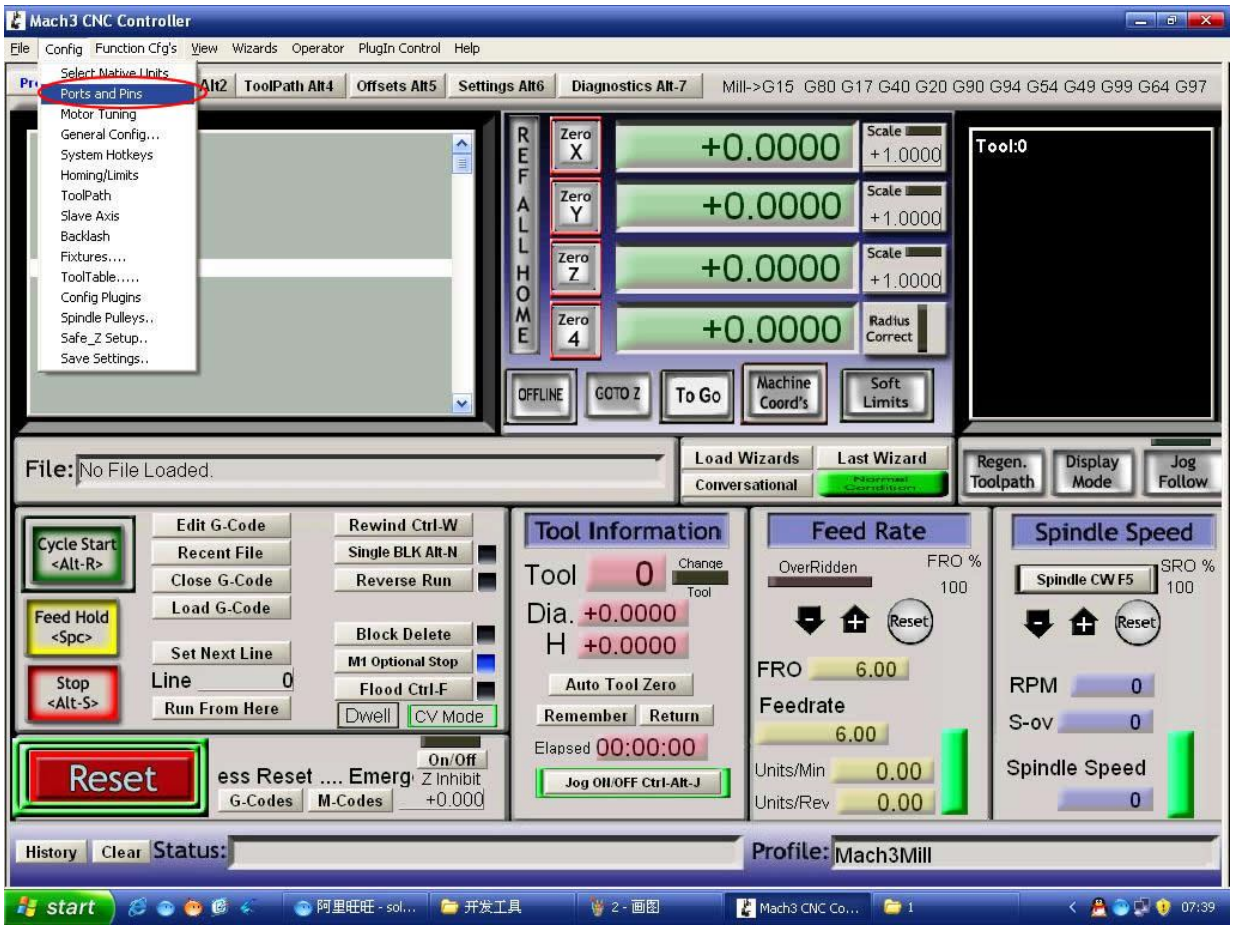


Fig 13 setting menu of mach3

Open the config menu, PORT & PIN menu,as fig 13

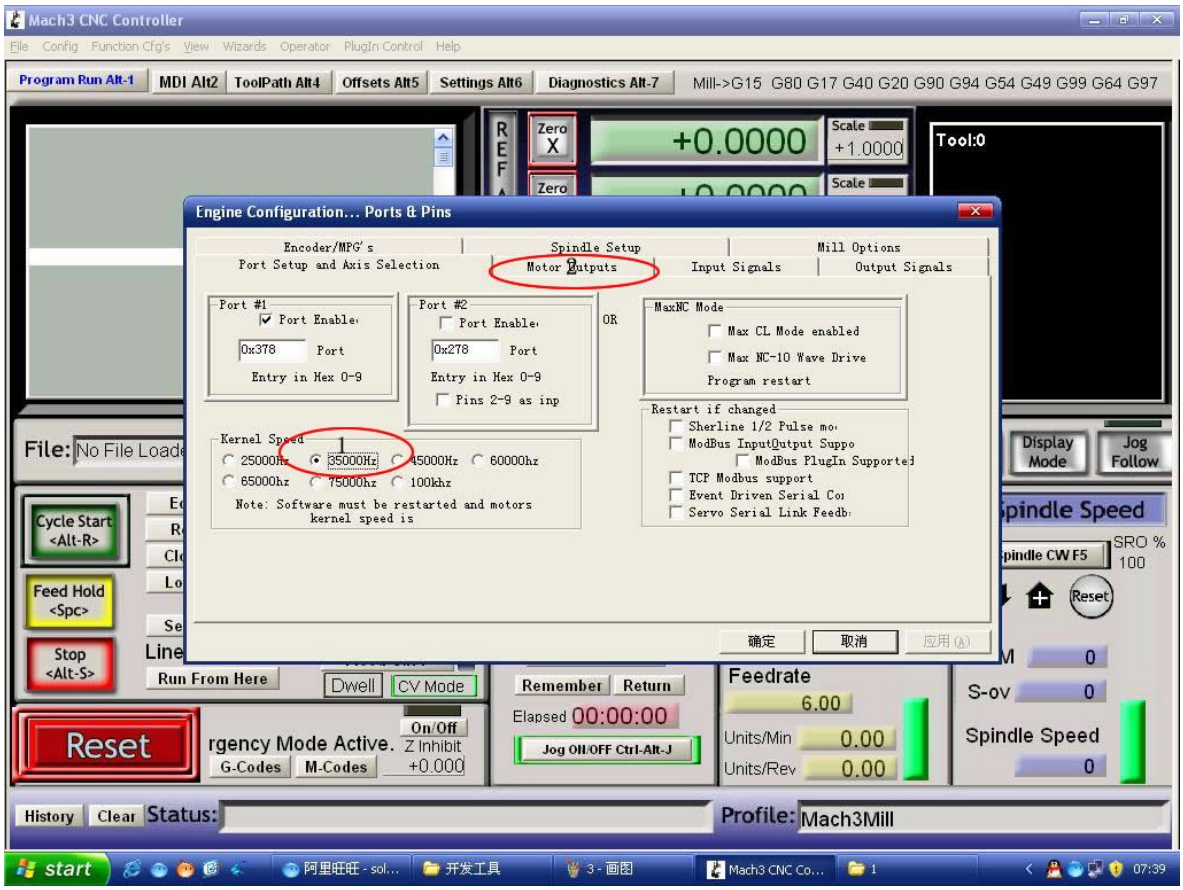


Fig 14.setting the basic frequency

You may set the basic frequency on the circlet1,the parameters will change the rotation speed of motor. Then click circlet2.

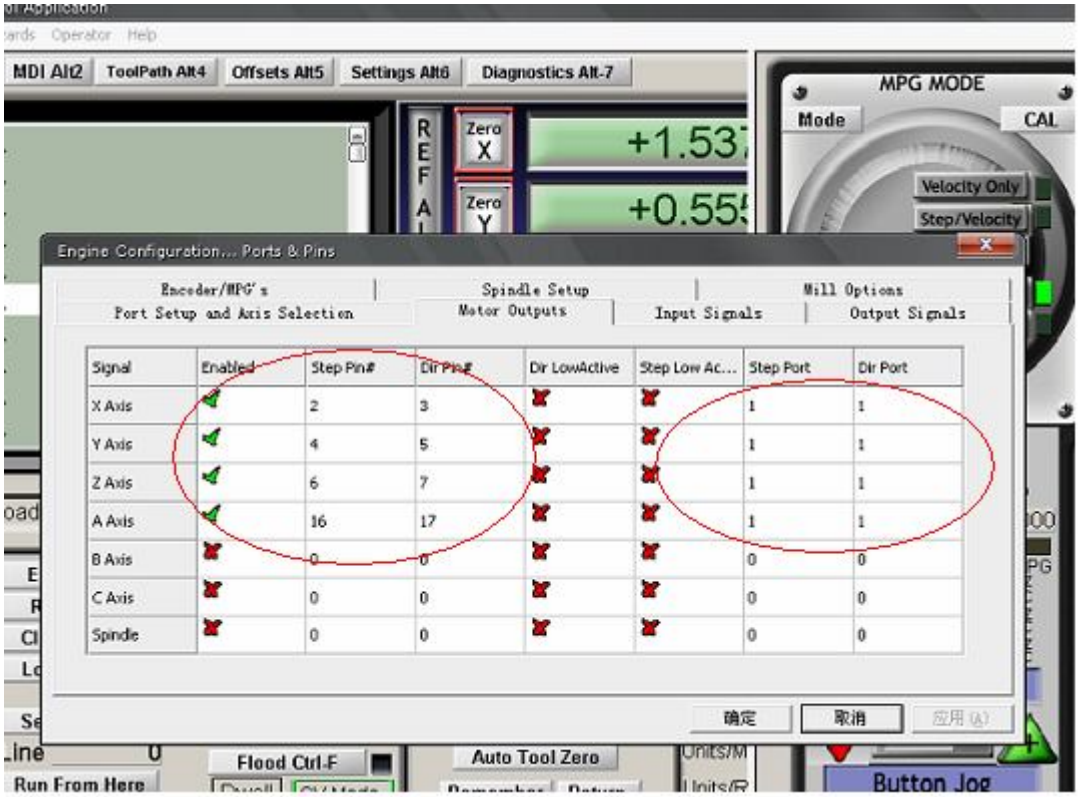


Fig15. Setting pulse and direction pin

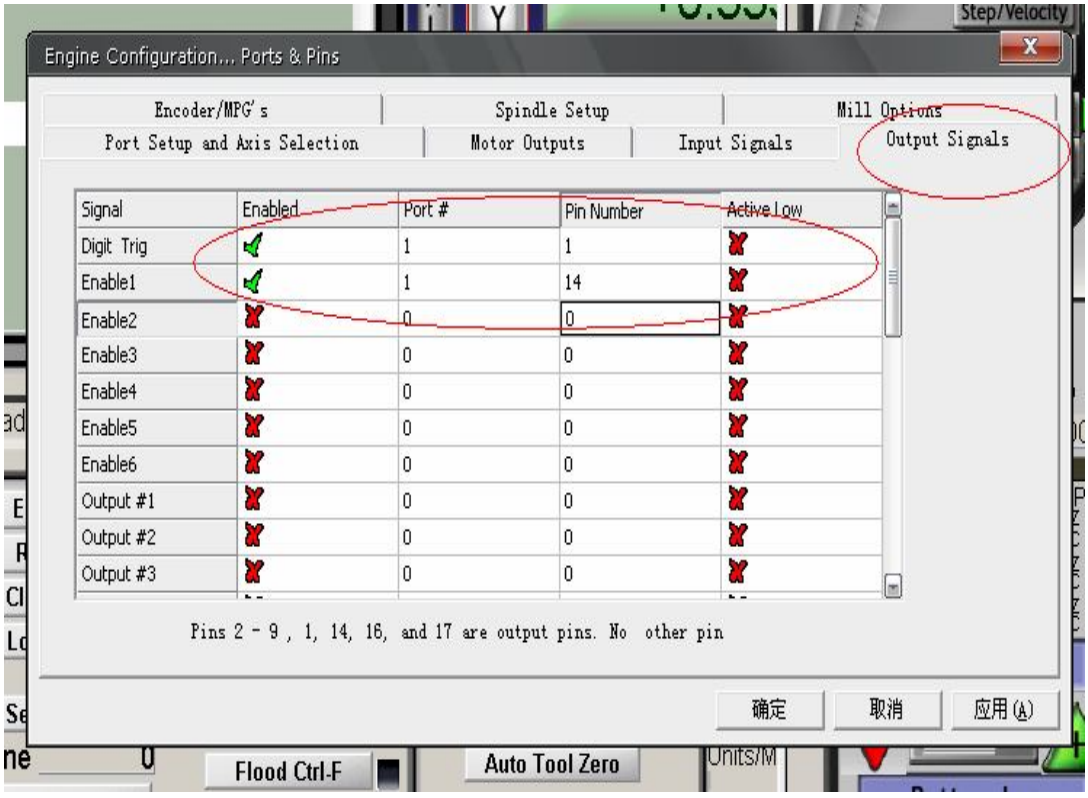


Fig 16

According to the definition of the board parallel port, follow the map on the circlet

settings to indicate the definition of modification

Then select the output signals in part, see in Figure 16, according to the setting circlet, where 1 means enabled, the 14 is relay.

3.setting of limit switch of mach3

Click input signal, the parameters as fig 17

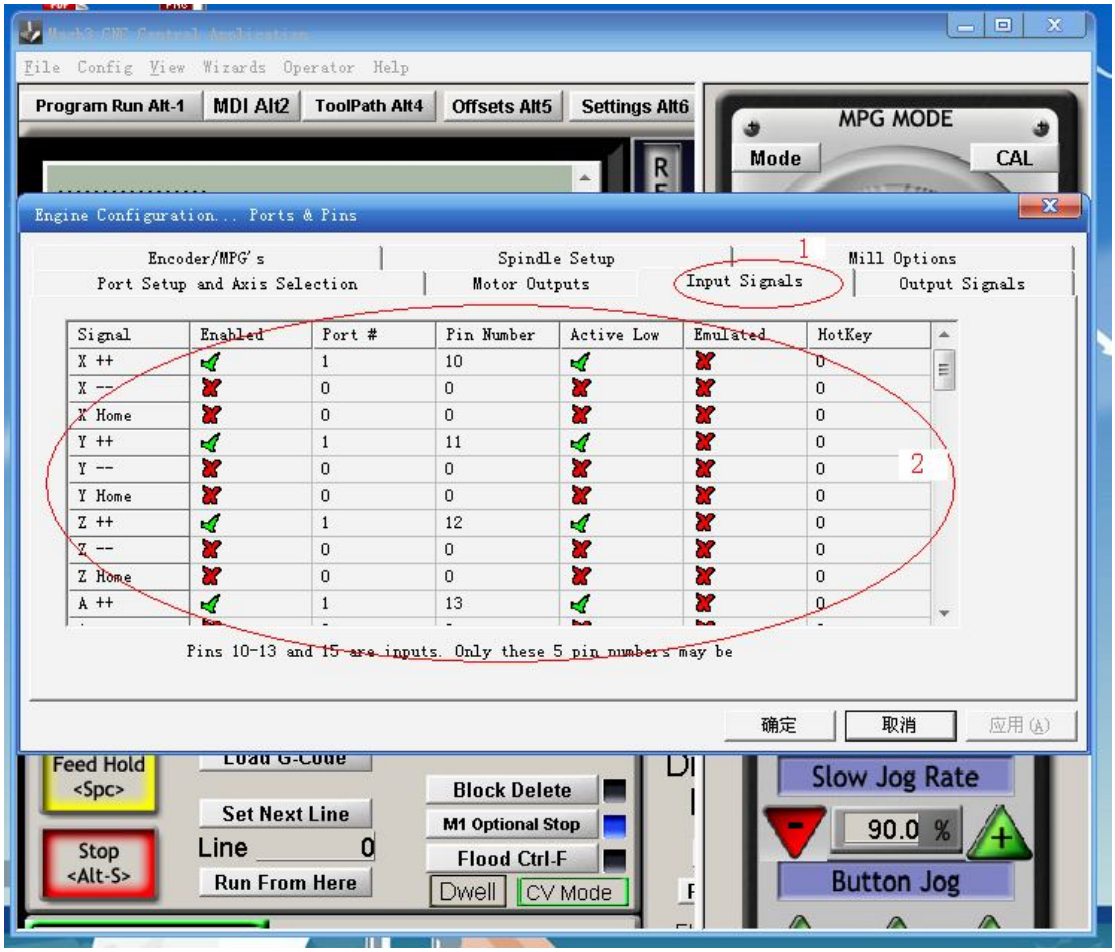


Fig 17

4. Running G code

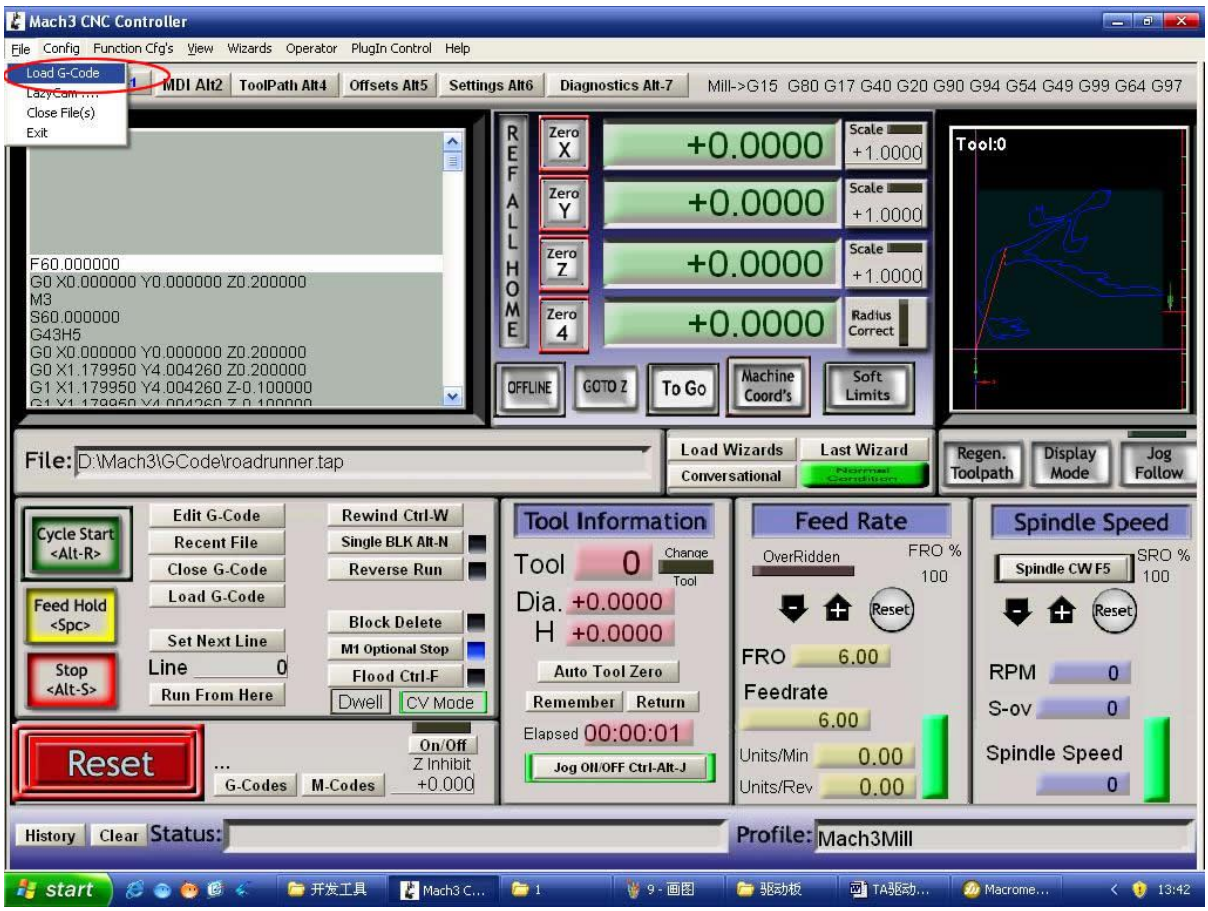


Fig 18 open the G

All settings are okay, then open your G code

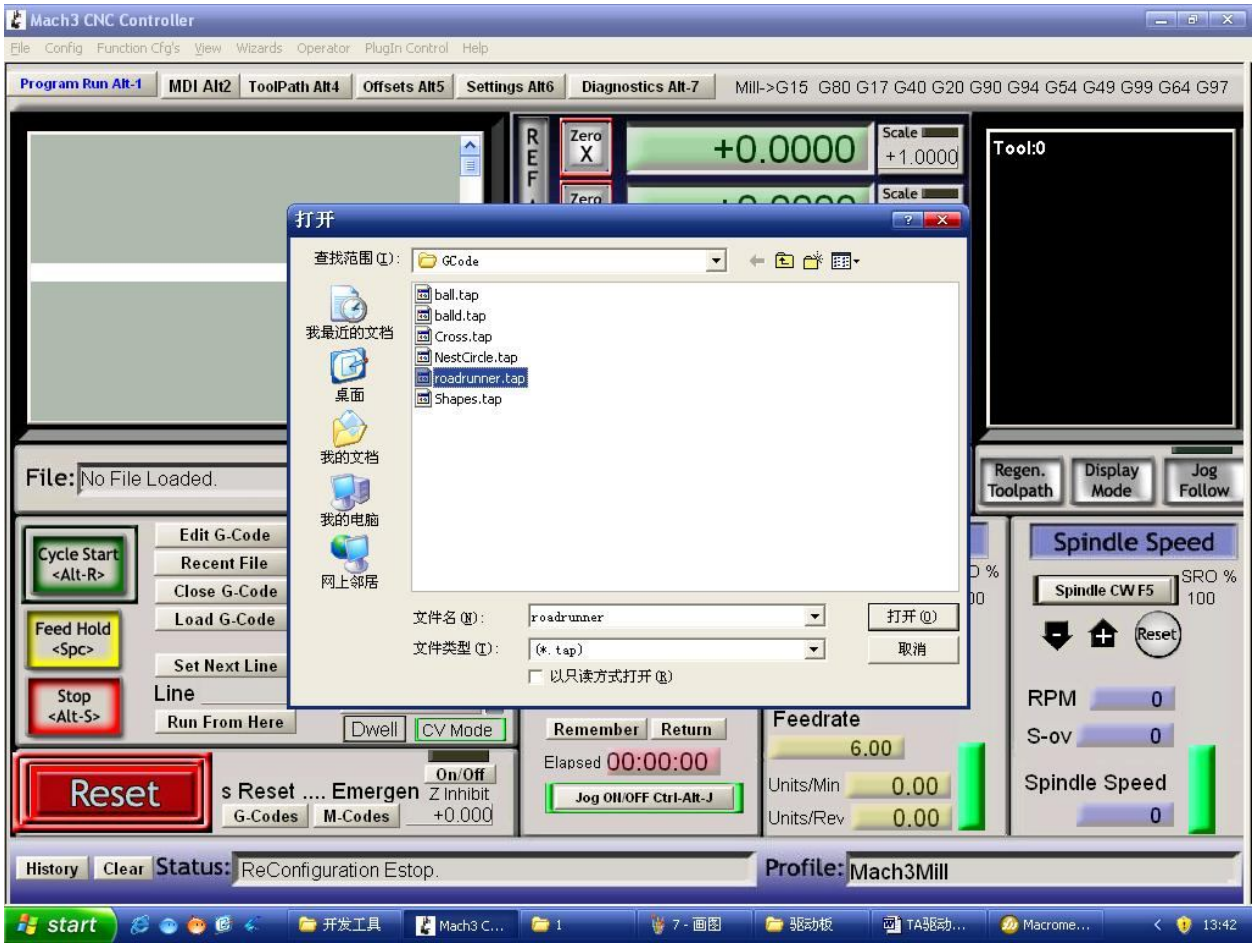


Fig 19. Open MACH3 own G code testing procedures

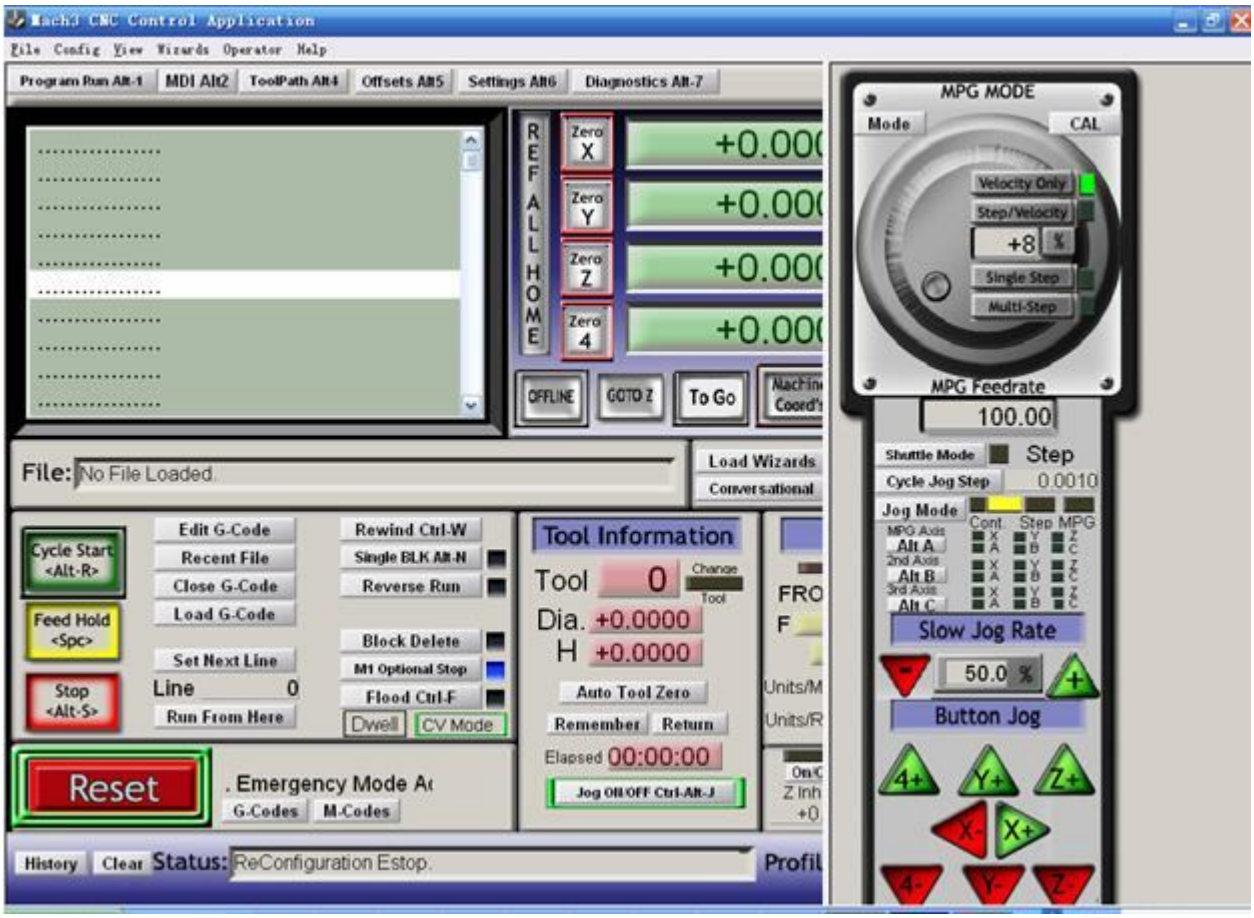


Fig 20

When you run the G code, RESET can see the red flashing,click it to stop flashing,then running as CYCLESTART marked with circlet 2

Also if you need manual control, you can press the keyboard's TAB key to open the manual .of control panel as fig 21

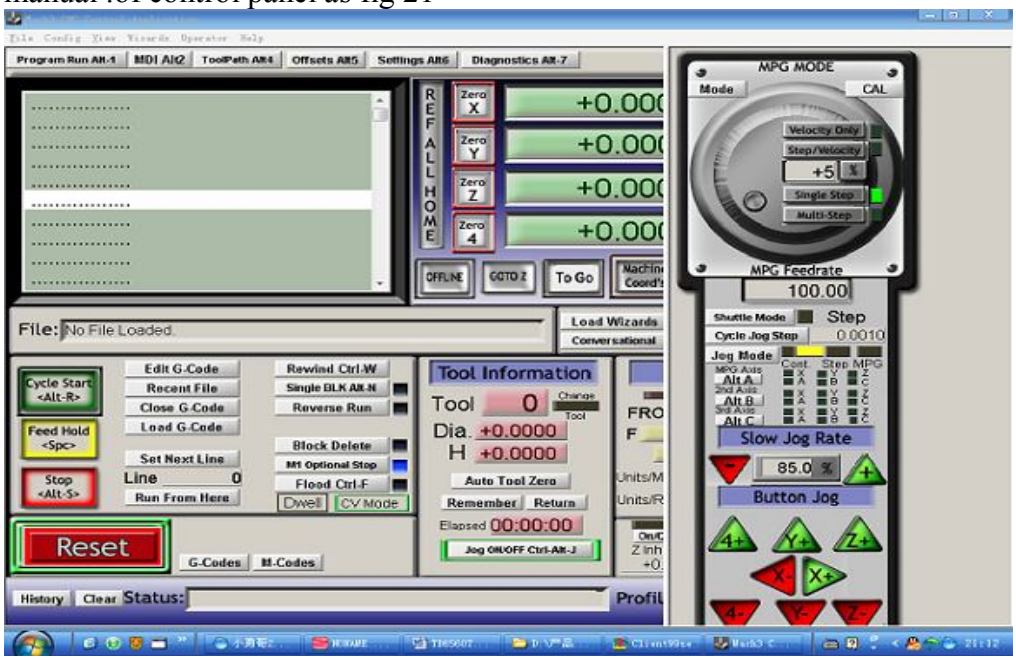


Fig 21

XII.Contact us

Thank you for purchasing this product, if you have any in the course of opinions and suggestions or want to understand our stepper motor drive for more detailed information, please contact us.
Thank you!