I. summary

CNC stepper motor driver board 96560A V1 adopts the new chip TB6560AHQ of TOSHIBA, the max ouput current can reach to 3.5A , this driver board can drive the 2-phase or 4-phase stepper motor whose current is less than 3A.

The advantages of the TB6560AHQ chip：

（1）The vibration of the motor is small and low noise: because of the 2/8/16 resolution can satisfy the different speed.

（2）flush type low heat： The area of the chip can support itself to cool when the current is low

（3）supports a lot of stepper motors

（4）the advantages in the high-speed running condition

Features

1、 4-wire 0-3.5A （normally 3A , the 3.5A is the peak current) can be regulated rate current output, bipolar stepper motor driver

2、 Standard parallel port , supports Mach 2, KCAM 4 etc.

3、 Optical isolated (IO) and DCDC power isolated to protect the PC parallel port and other equipments

4、 Limit and emergency stop port (standard DB9 port)

5、 4 working modes: mixed mode , fast mode, slow mode, standard mode

6、 4-resolution ：1 1/2 1/4 1/16

7、 12-36V single power input uses the switch power chip as the 5V power supply, stable and low heat

8、 Adopts RC + 7414 auto semi-flow

9、 The relay output can control the main axis

10、 5^{th} axis extension control port

Definition of the Pin

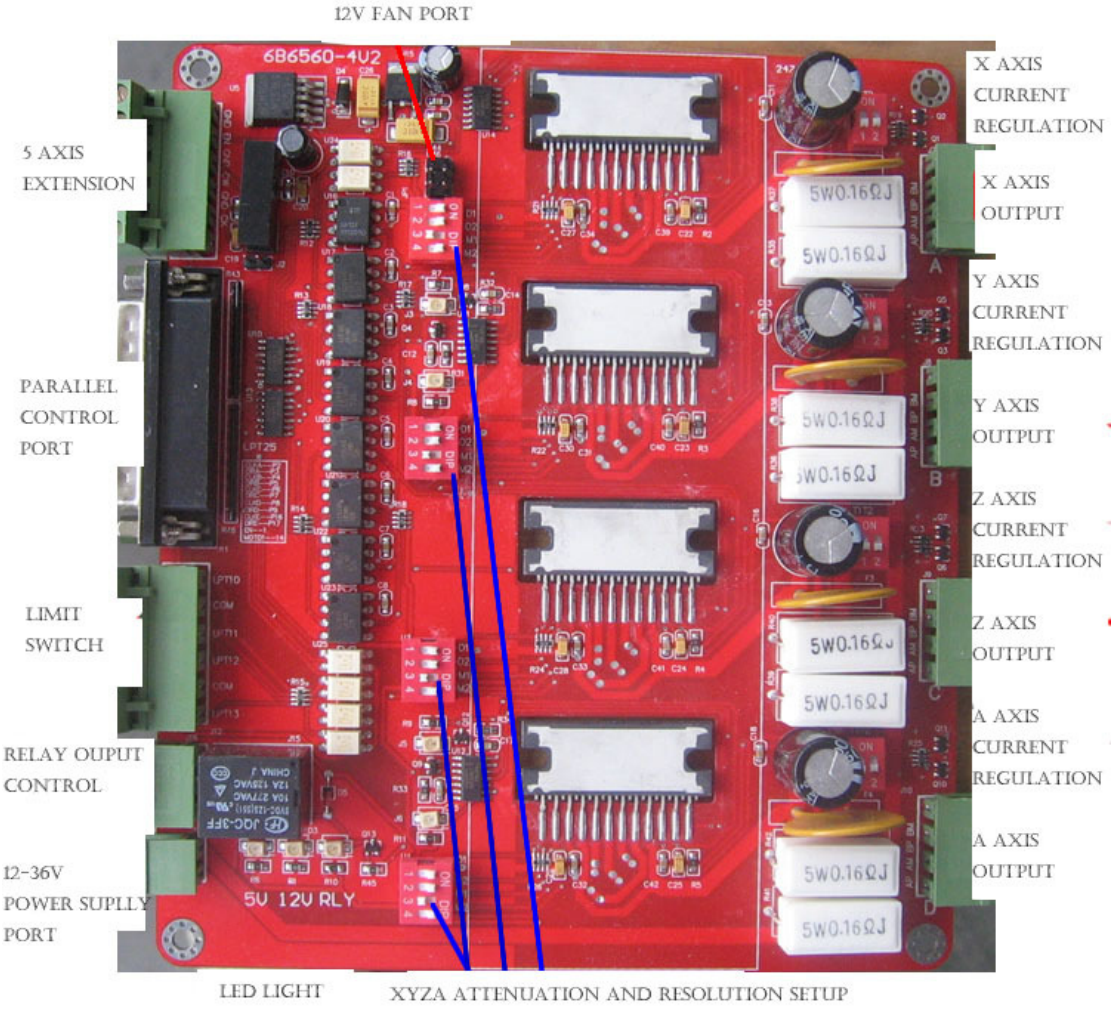
1、 The 25 Pin of the parallel control

DB25 Pin	Function of the Pin	
1	All axis EN(enable)	
2	STEPX	
3	DIRX	
4	STEPY	
5	DIRY	
6	STEPZ	
7	DIRZ	
8	STEPA	
9	DIRA	
10	LIMIT-1	
11	LIMIT-2	
12	LIMIT-3	
13	LIMIT-4	
14	Relay control	
15	Suspended	
16	STEPB-	Connect the extension port DB 9 Pin 8
17	DIRB-	Connect the extension port DB 9 Pin 7
18-25	GND	

2、Please connect the switch power supply larger than 12-24V 4A as the wiring diagram , the + and – of the power are showed on the driver board

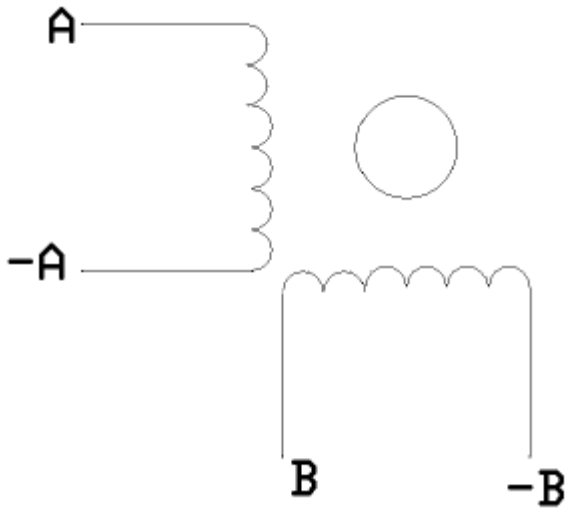
3、Limit port definition : LPT10= P10 of the PC parallel port , LPT11=P11 LPT12=P12 LPT13= P13 , LPT XX and the COM port connect the power switch. The power signal can be collected by the MACH 3.

4、The 5th extension control port definition: from the top to buttom GND EN GND CW GND CK, they control the EN, pulse- , pluse+, direction- and direction+ of the 5th axis stepper motor

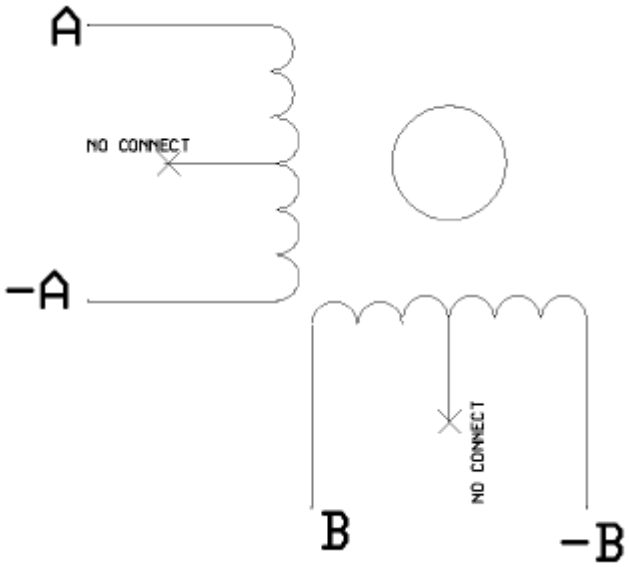

12V FAN PORT
6B6560-4V2
5 AXIS EXTENSION
PARALLEL CONTROL PORT
LIMIT SWITCH
RELAY OUPUT CONTROL
12-36V POWER SUPLLY PORT
X AXIS CURRENT REGULATION
X AXIS OUTPUT
Y AXIS CURRENT REGULATION
Y AXIS OUTPUT
Z AXIS CURRENT REGULATION
Z AXIS OUTPUT
A AXIS CURRENT REGULATION
A AXIS OUTPUT
5W0.16ΩJ
5V 12V RLY
LED LIGHT
XYZA ATTENUATION AND RESOLUTION SETUP

Wiring diagram of the stepper motors

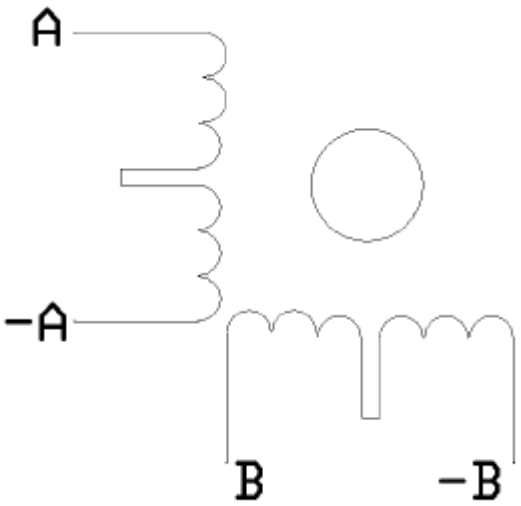
4-wire motor



6-wire motor



8-wire motor



attenuation mode choice (D1D2----control the motor attenuation time)

DIP switch D1 and D2，D2/D1：　　**ON/ON——100%；　ON/OF——25%；**

OF/ON——50%；　OF/OF——0%；

D1	D2	Working mode
ON	ON	100%
OF	ON	50%
ON	OF	25%
OFF	OFF	0%

4. Current Decay Settings

Output is generated by four PWM blasts; 25% decay is created by inducing decay during the last blast in Fast mode; 50% decay is created by inducing decay during the last two blasts in Fast mode; and 100% decay is created by inducing all four blasts in Fast mode.
If there is no input with the pull-down resistor connection then the setting is Normal.

Dcy2	Dcy1	Current Decay Setting
L	L	Normal 0%
L	H	25% Decay
H	L	50% Decay
H	H	100% Decay

Resolution setup

DIP switch M2 and M1，S4/S3： **OFF/OFF——1 ；** **ON/OFF—— 1/2 ；**

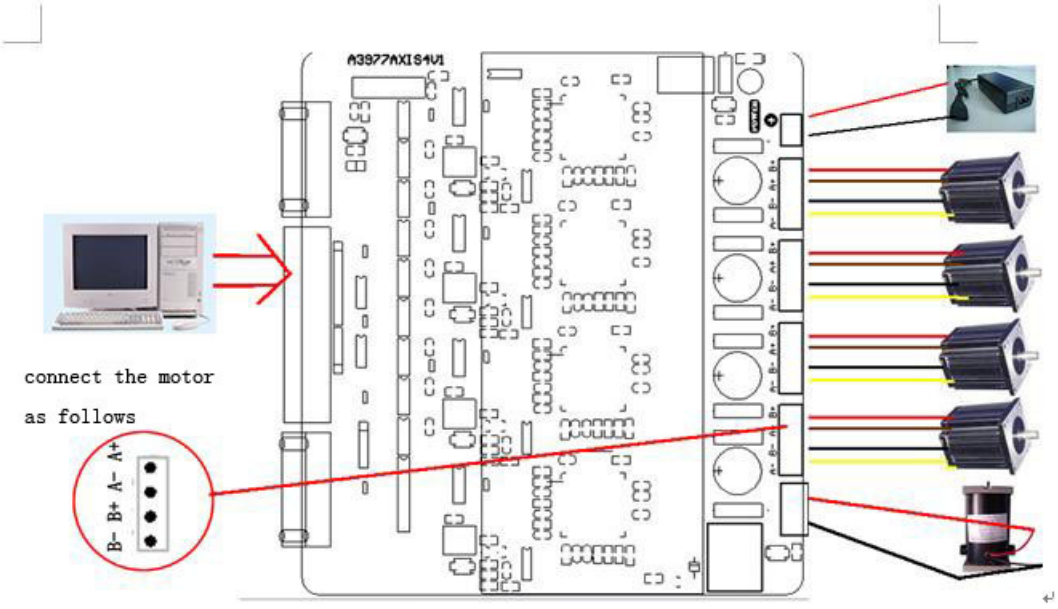
ON/ON——1/8 ； **OFF/ON——1/8 ；**

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

Current setup

T2/T1： OFF/OFF 100%*2.5A, OFF/ON 75%*2.5A

ON/OFF 50%*2.5A, ON/ON 25%*2.5A



Attentions:

1 ---the choice of the voltage of the power supply

Generally speaking, the higher the voltage, the larger the torque of the high-speed running motor , it can avoid the loss of step when running in high-speed , but the high voltage may do some damages to the driver , and in the condition of high voltage, the low speed running motor will vibrate a lot

2 ----the setup data of the output current

To the same motor, the current is larger, the output torque of the motor is larger , but the large current will cause the over-heat .so we have to set up the current in a perfect condition

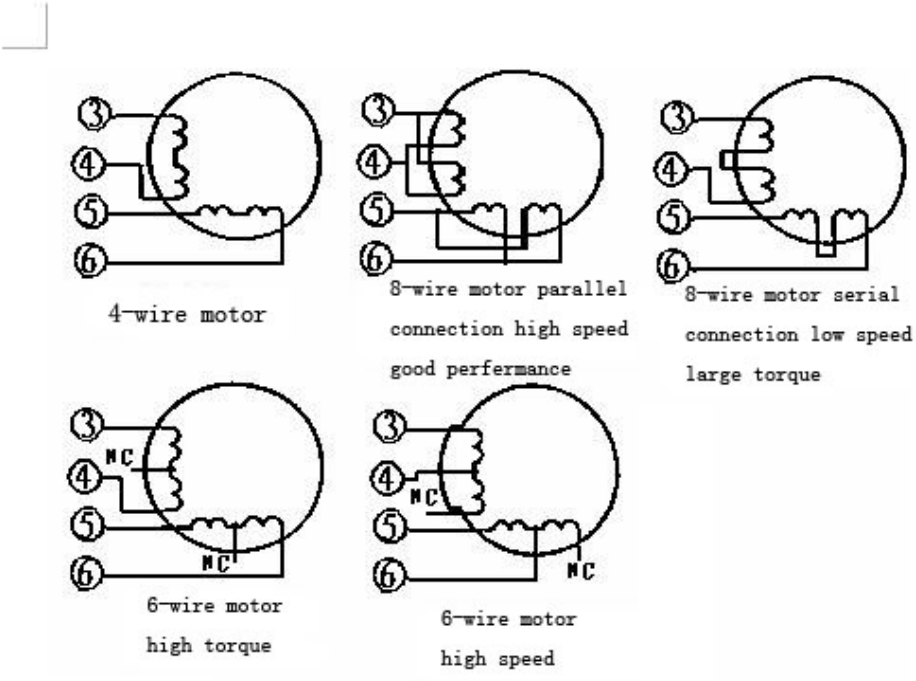
(1)4-wire and 6-wire high speed running motor : the output current should be the same or lower than the rate current

(2) 6-wire motor large toque mode: the output current should set up as the

70% of the rate current

(3)8-wire motor serial connecting mode: the output current should set up as the 70% of the rate current

(4)8-wire motor parallel connecting mode: the output current should set up as the 1.4X the rate current



After running 15-30 mins when the setup of the motor current is done, if the motor is over-heat , you should reduce the current, if the reduce of the current causes the lack of the output of the torque , please add the fun or improve the cooling condition to protect the motor and the driver.

How to use the MACH3 software.

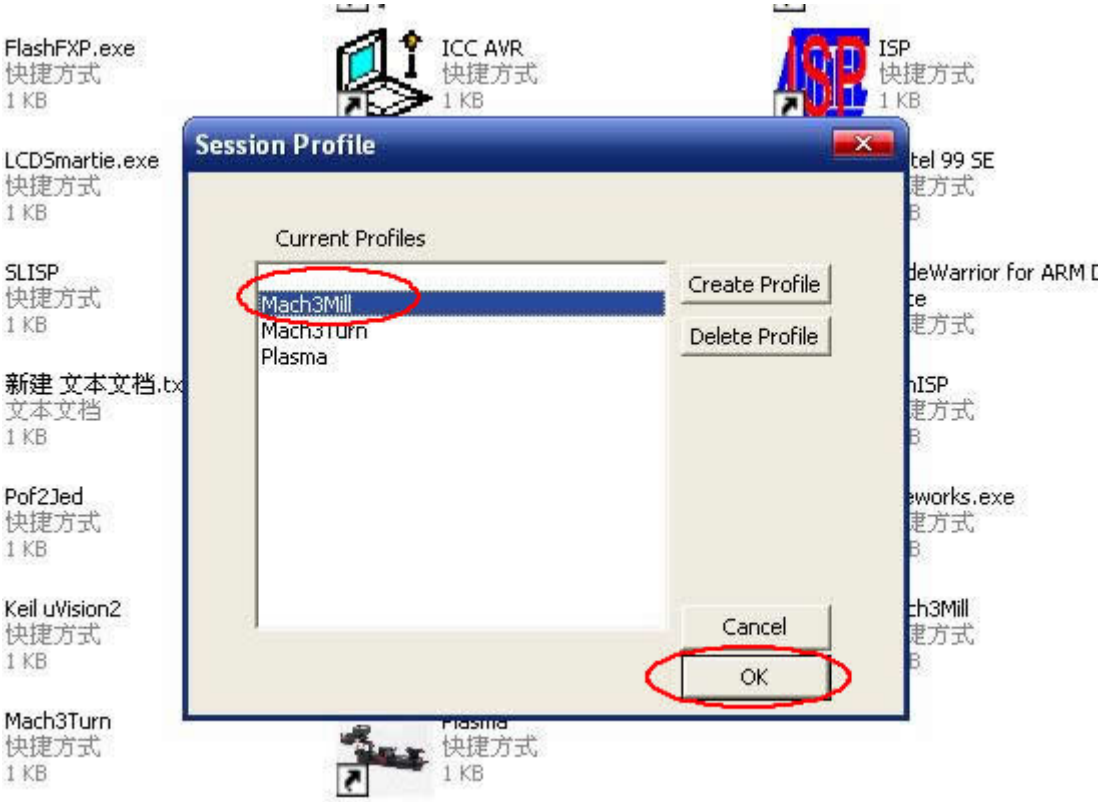


FIG 1

Fig1: open the mach3 software , choose the mach3 MILL ---choose ok.

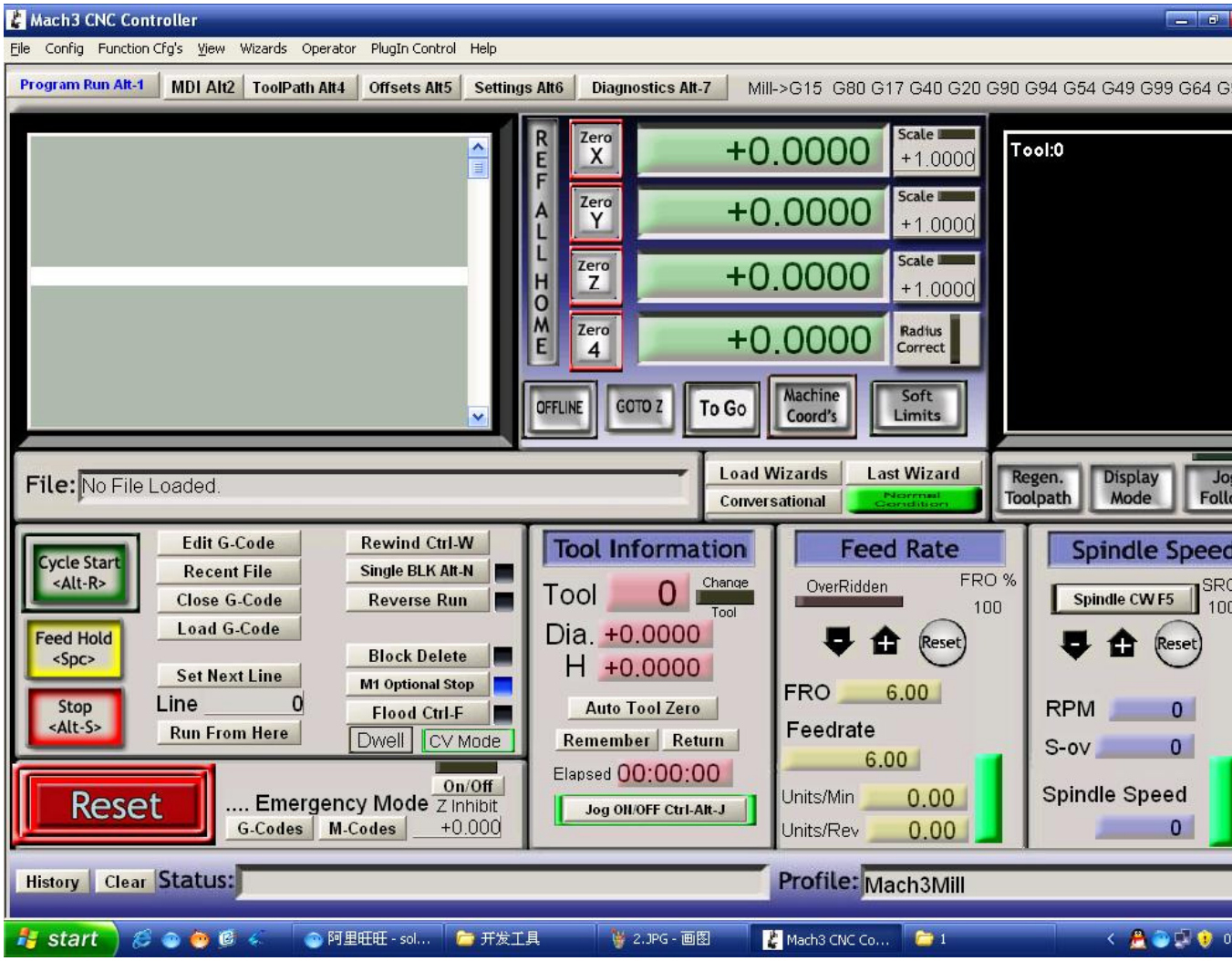


FIG 2

Fig2: we deploy the mach3 software.

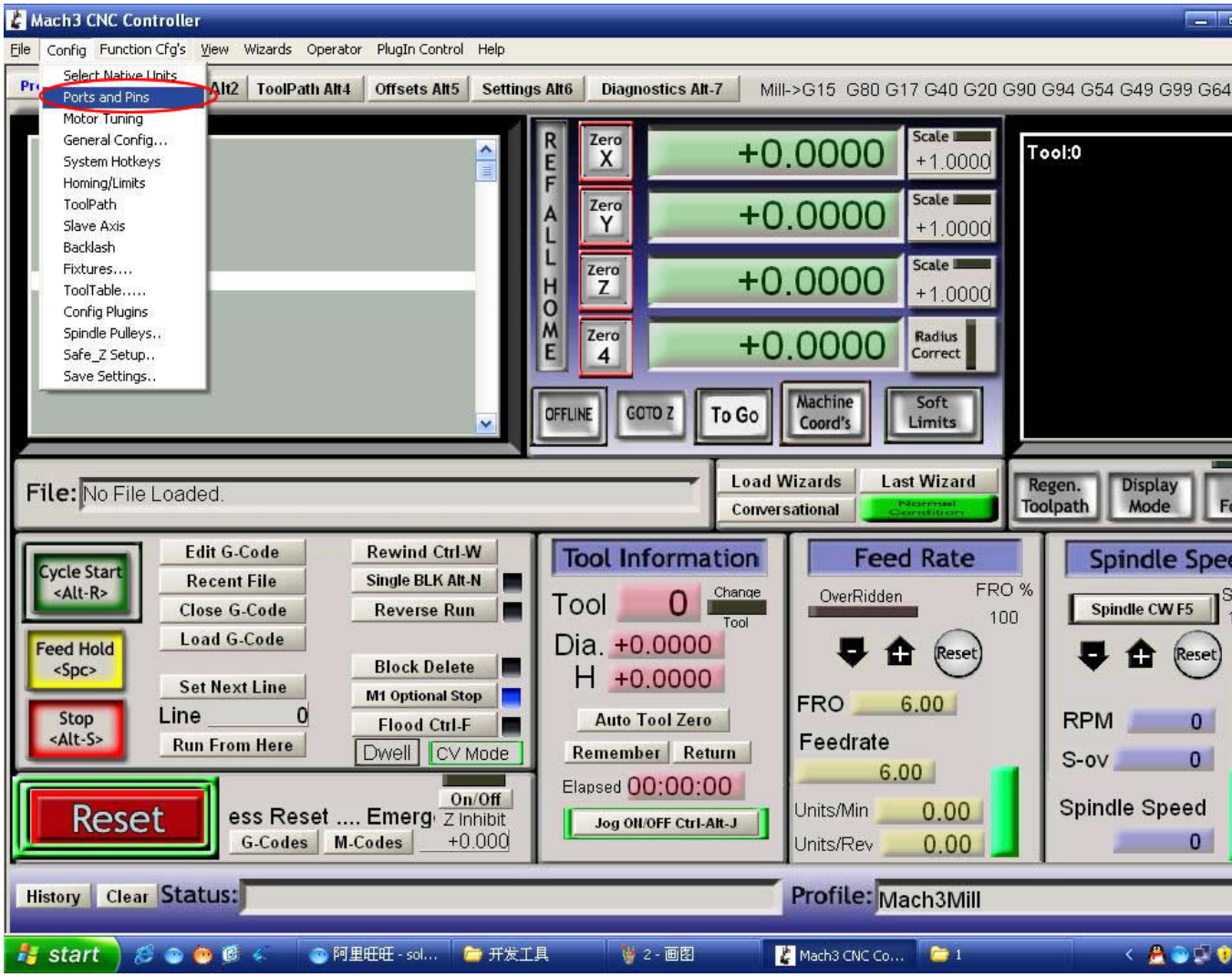


FIG 3

Fig3: open the port and pin menu under the config menu.

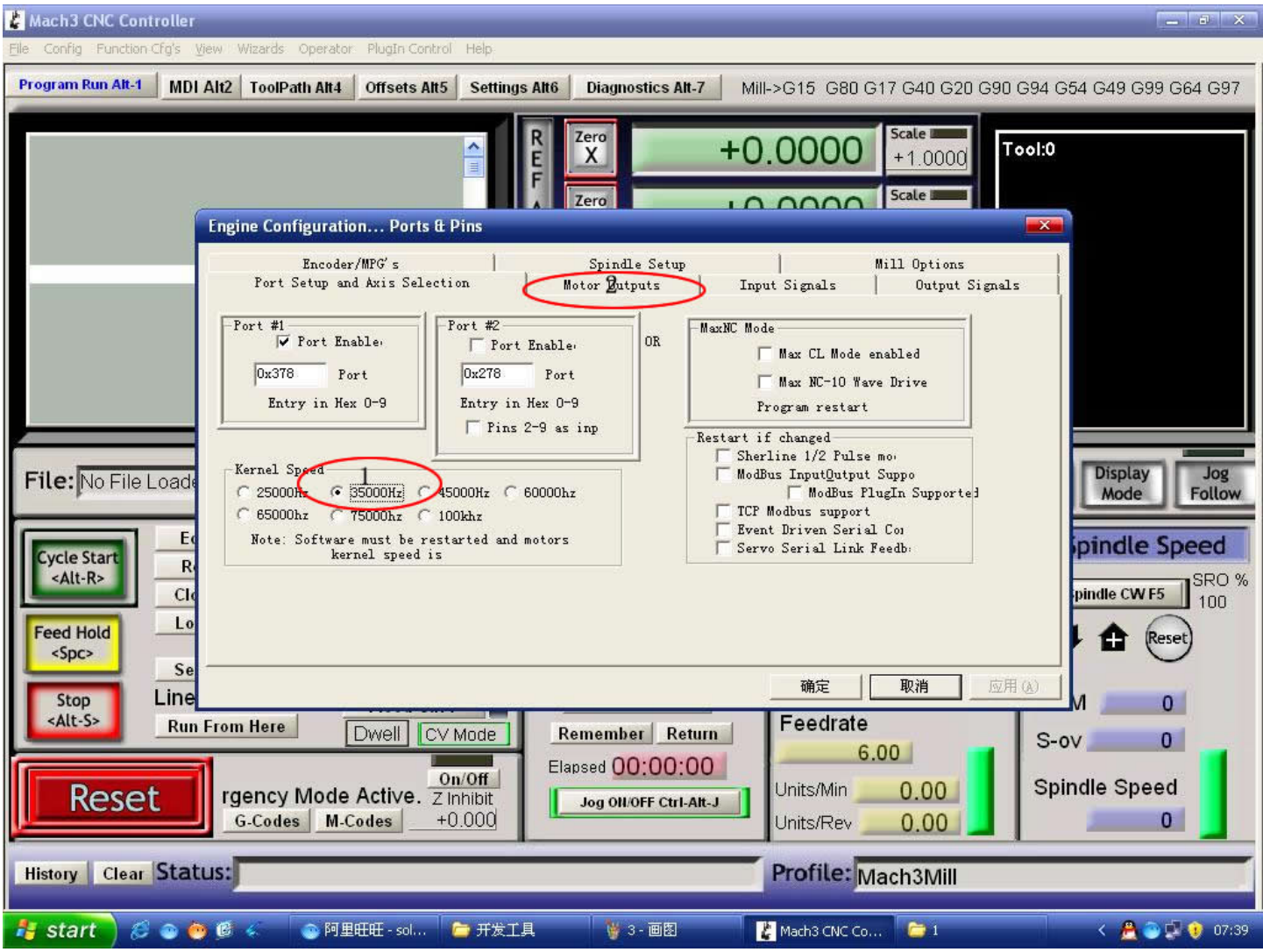


FIG 4

Fig4:set the standard frenquency in the first circle , this data influence the speed of the motor , and then choose the definition in the second circle to set up the pin.

FIG 5

Fig5：follow the circle in the figure to set the software.

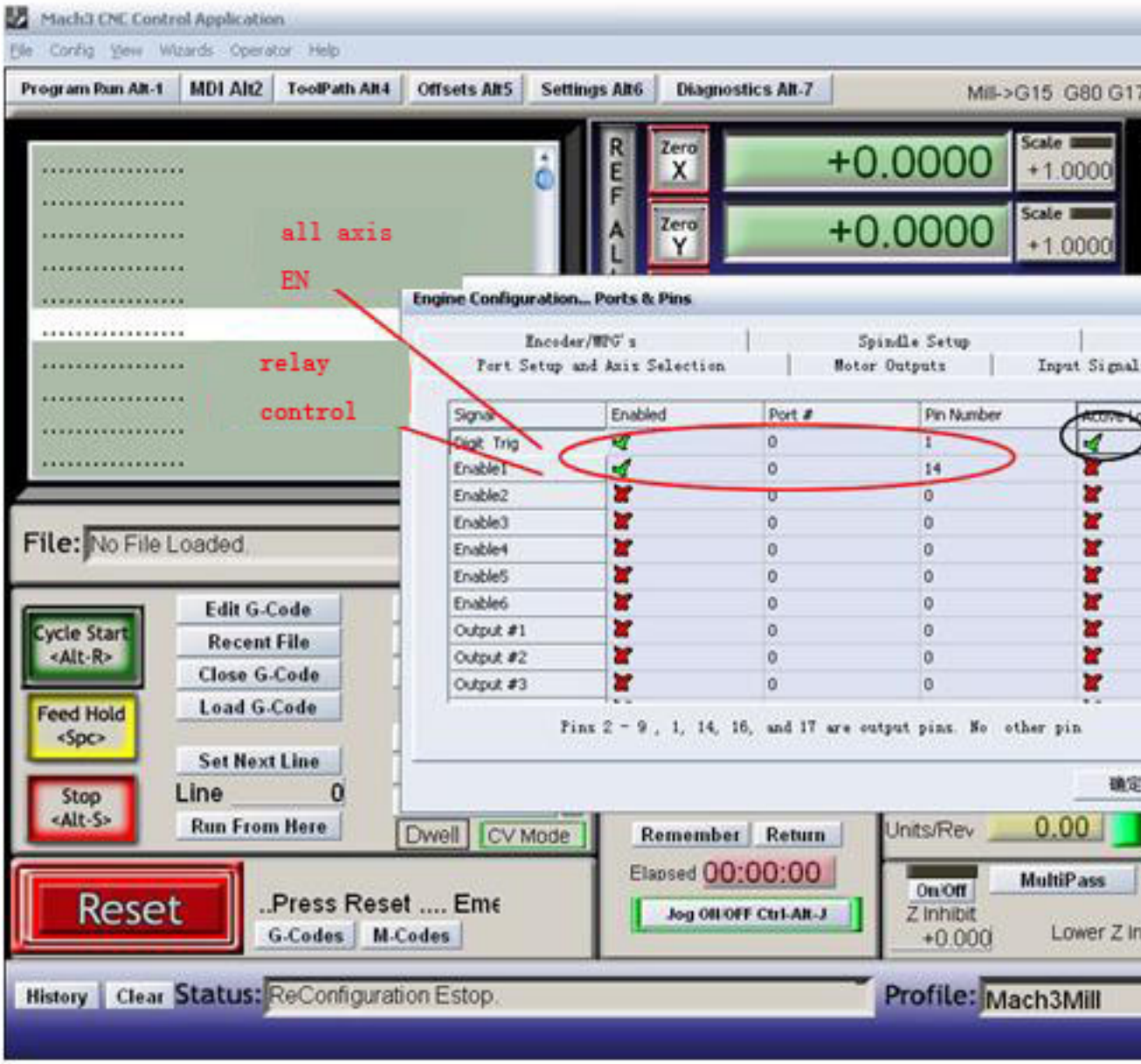


FIG 6

Fig6:choose the output signals , follow the circle in the figure to set .

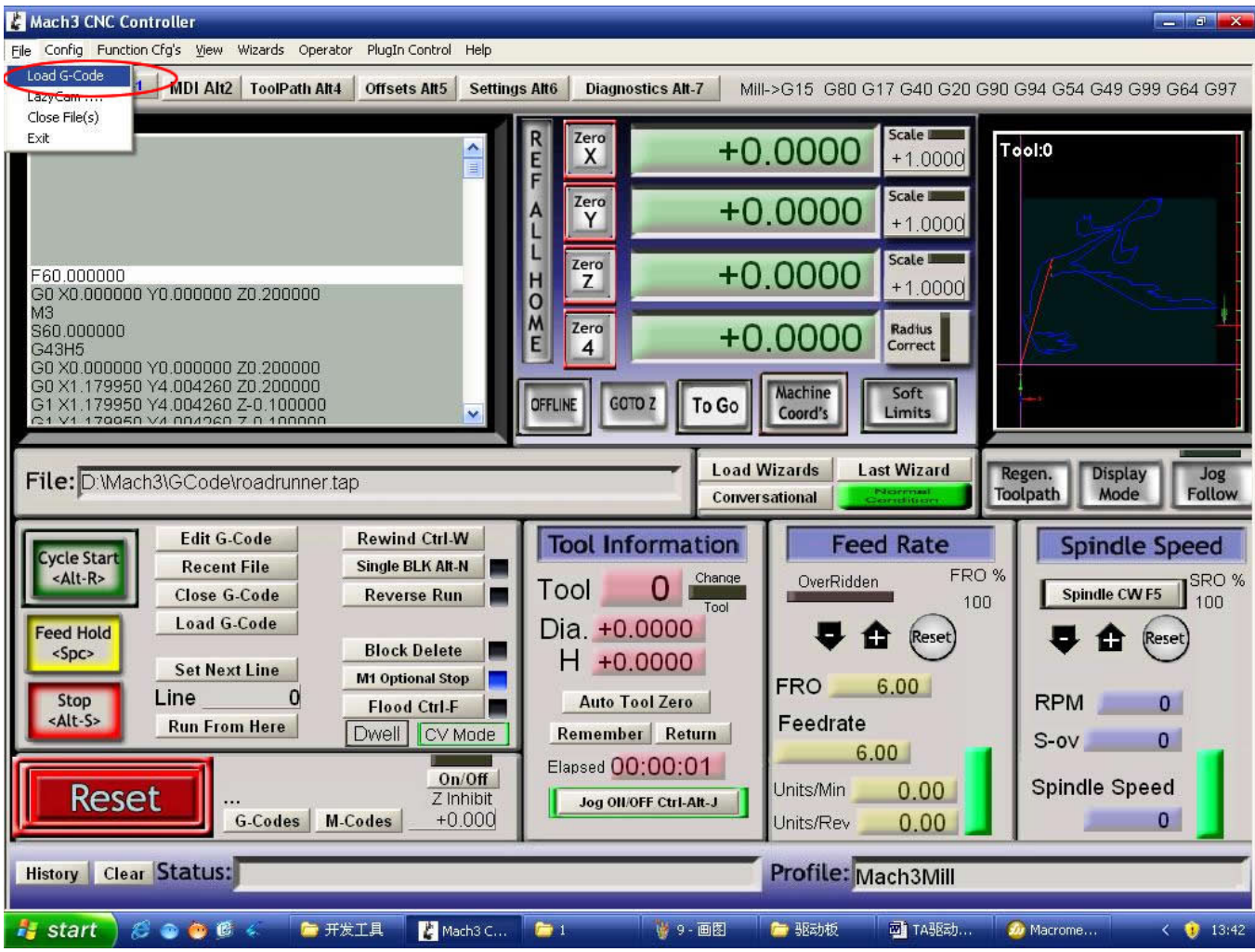


FIG 7

Fig7: choose ok and the open the G code that we need to run.

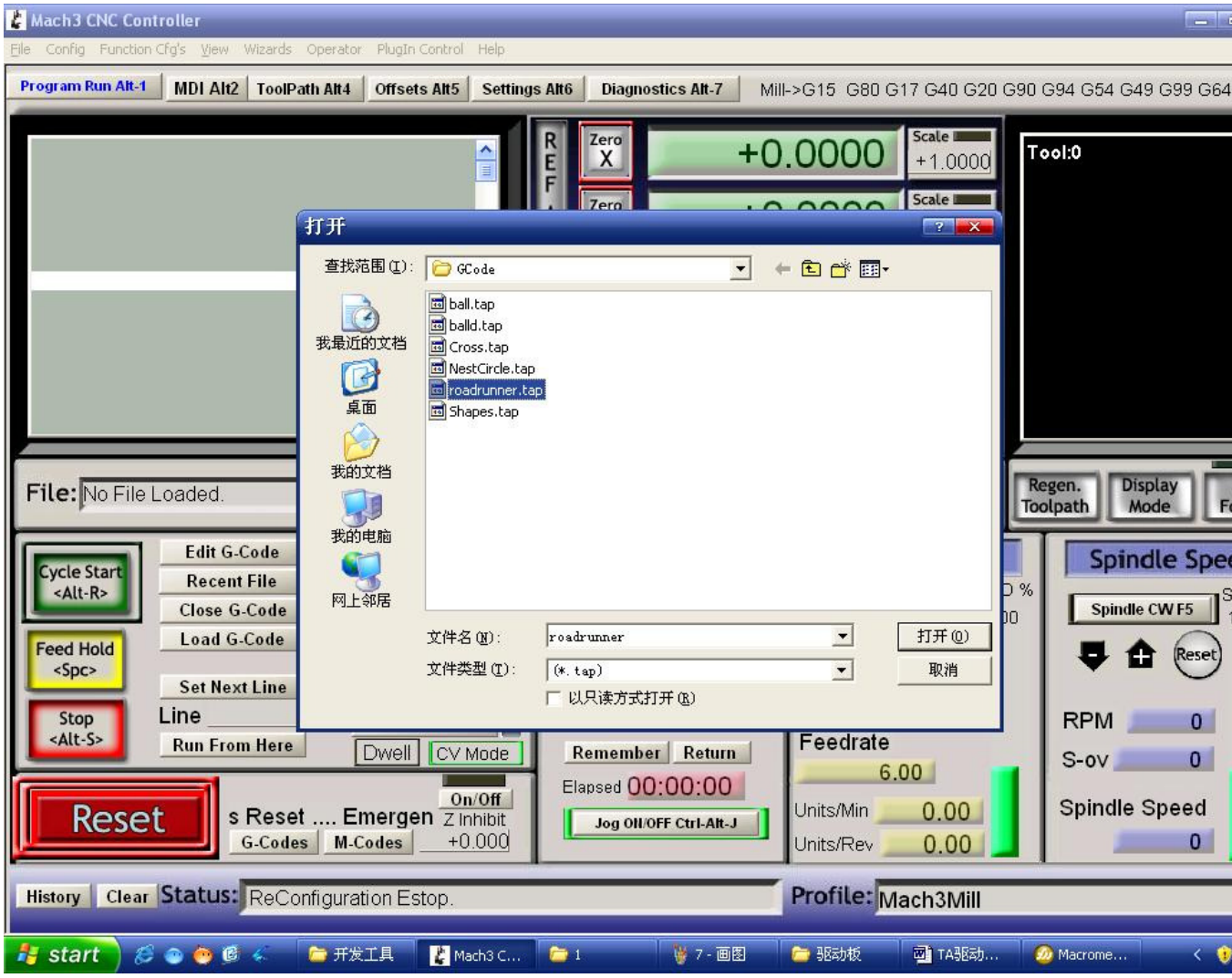

Mach3 CNC Controller
File Config Function Cfg's View Wizards Operator PlugIn Control Help
Program Run Alt-1
MDI Alt2
ToolPath Alt4
Offsets Alt5
Settings Alt6
Diagnostics Alt-7
Mill->G15 G80 G17 G40 G20 G90 G94 G54 G49 G99 G64
Zero X
+0.0000
Scale
+1.0000
Tool:0
打开
查找范围(I):
GCode
ball.tap
balld.tap
Cross.tap
NestCircle.tap
roadrunner.tap
Shapes.tap
我最近的文档
桌面
我的文档
我的电脑
网上邻居
文件名(N):
roadrunner
打开(O)
文件类型(T):
(*.tap)
取消
以只读方式打开(R)
File: No File Loaded.
Regen. Toolpath
Display Mode
Cycle Start <Alt-R>
Feed Hold <Spc>
Stop <Alt-S>
Edit G-Code
Recent File
Close G-Code
Load G-Code
Set Next Line
Line
Run From Here
Dwell
CV Mode
Remember
Return
Elapsed 00:00:00
Jog ON/OFF Ctrl-Alt-J
Feedrate
6.00
Units/Min 0.00
Units/Rev 0.00
Spindle Spee
Spindle CW F5
Reset
RPM 0
S-ov 0
Spindle Speed 0
Reset
s Reset .... Emergen
On/Off
Z Inhibit
+0.000
G-Codes
M-Codes
History
Clear
Status: ReConfiguration Estop.
Profile: Mach3Mill
start
开发工具
Mach3 C...
1
7 - 画图
驱动板
TA驱动...
Macrome...

FIG 8

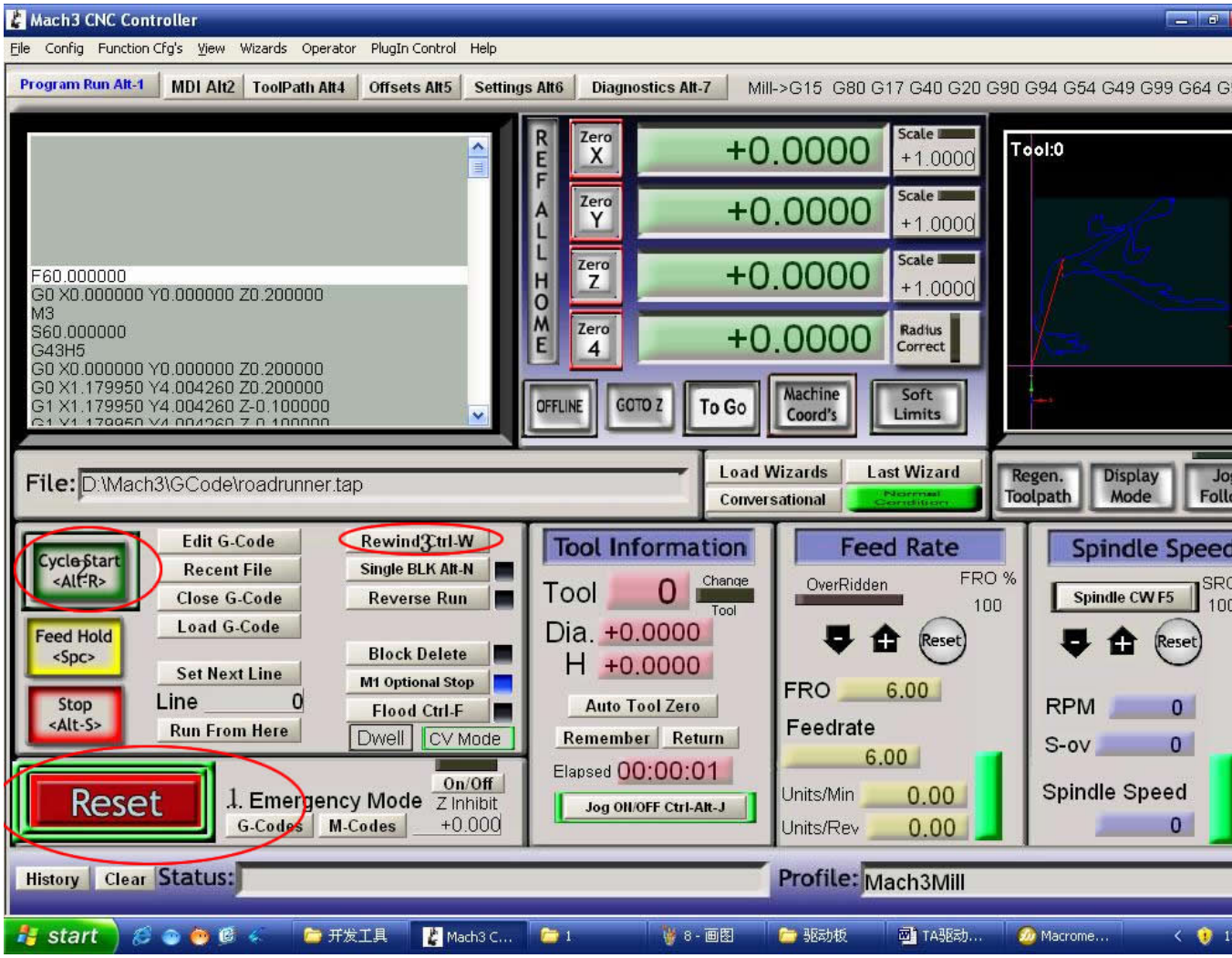


FIG 9

Fig8:after opening the G code , you will see the red reset , click it and then run the

cyclestart.

If need the manuel control , you can use the TAB to control it .

For the 3 axis driver

Definition of the Pin

1、 The 25 Pin of the parallel control

DB25 Pin Function of the Pin

1All axis EN(enable)

2STEPX

3DIRX

4STEPY

5DIRY

6STEPZ

7DIRZ

8STEPA

9DIRA

10LIMIT-1

11LIMIT-2

12LIMIT-3

13LIMIT-4

14Relay control

15Suspended

18-25GND