

Automation Technology Inc.

**6040 Mach3 mini Numerical Control
Carving Machine manual**

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Part 1 Assembling

Tools and spare parts needed during assembly:



1. Waterpump *1

2. Spanner*2

3. USB cable *1

4. Millingbit *2, engraving bit *3

5. Clamp tool *6

6. Power cable *1

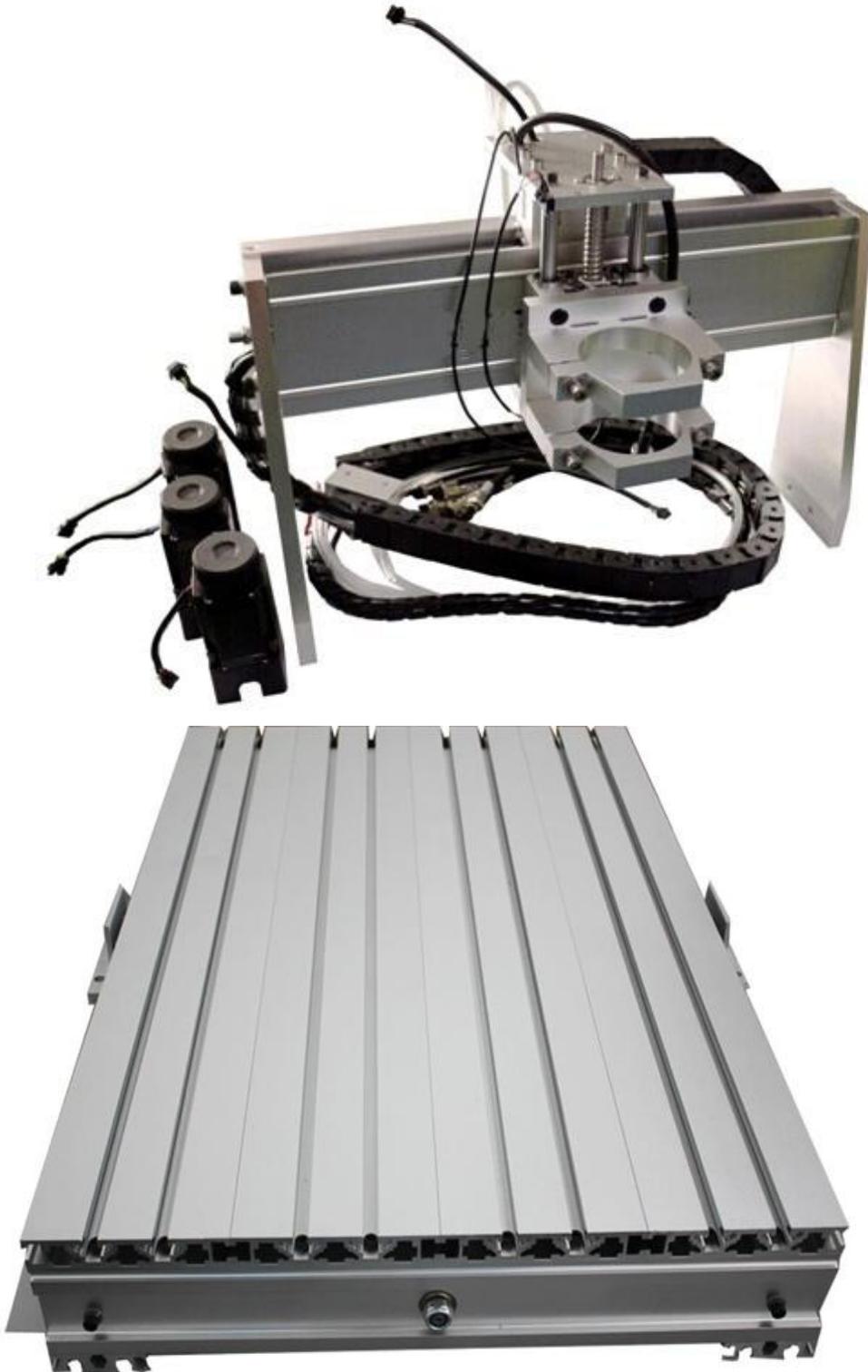
7. Stepper motors *3

8. Spindle *1

1. Open two cartons you received. The square box included the control box, accessories, the 4th axis and the upper gantry of the machine. The other box is bottom base of the machine.



2. Then take out upper gantry of machine , Meanwhile take out bottom base of the machine.



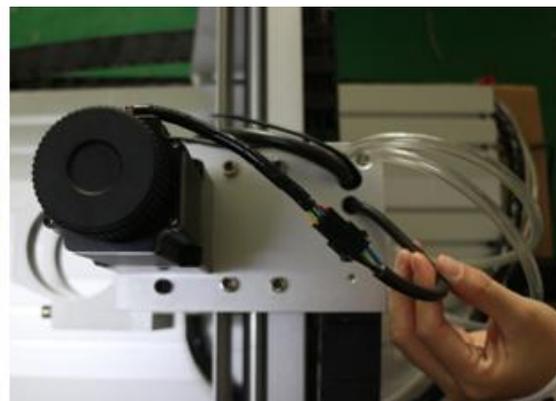
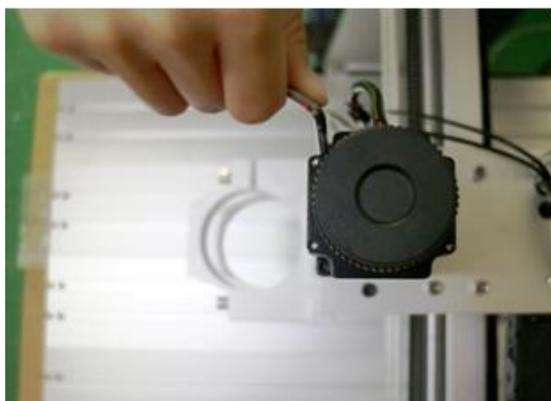
3. Put upper gantry on bottom base, tight screws one by one as below.

Following fixed the belt in one side of machine. At last the two red lines

are for limited switches. connect the red lines with the purple lines under the working table.



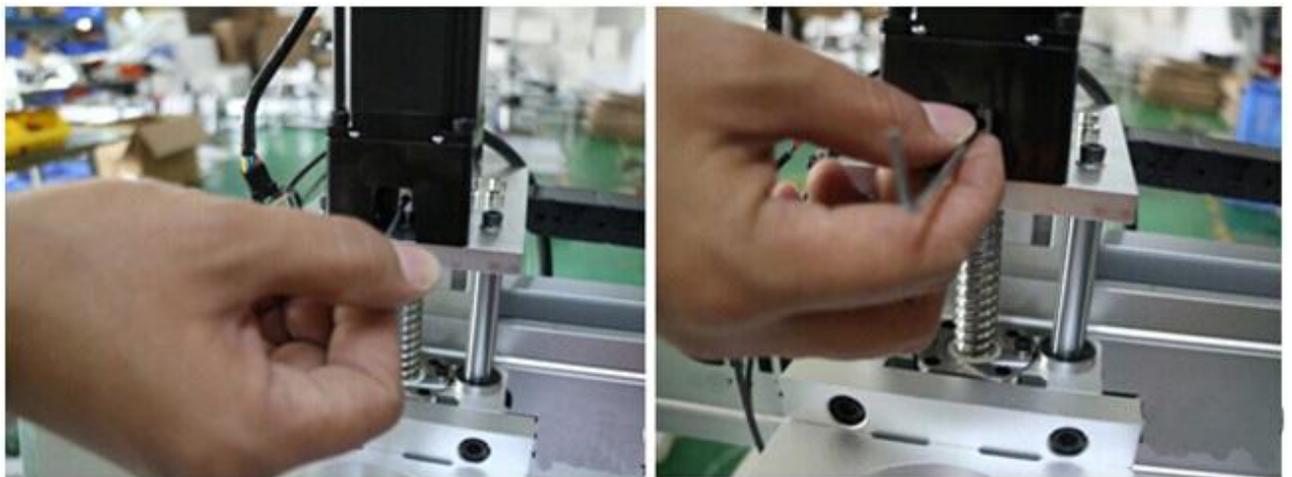
4. Install the step motors. 3 step motors are same for X Y Z Axis. At first, Put step motor to corresponding Axis. Tight the four screws and make sure tighten. Connected that corresponding cable.



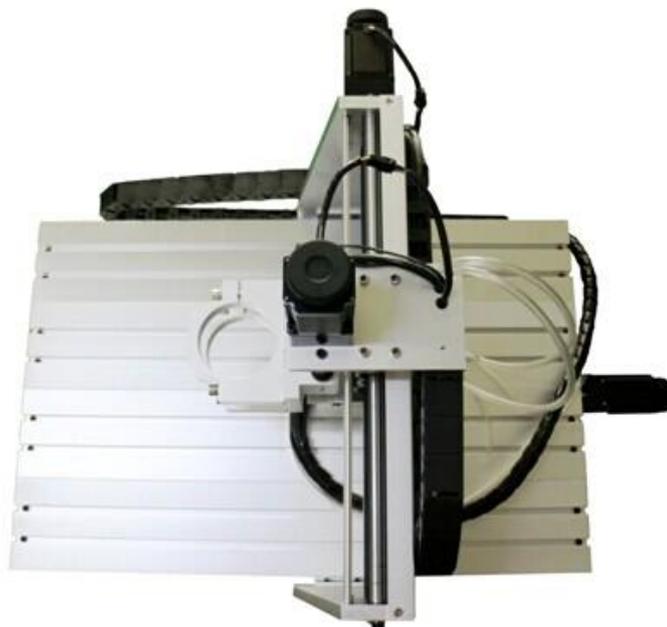
Second, You can try to found the screw position before installation.



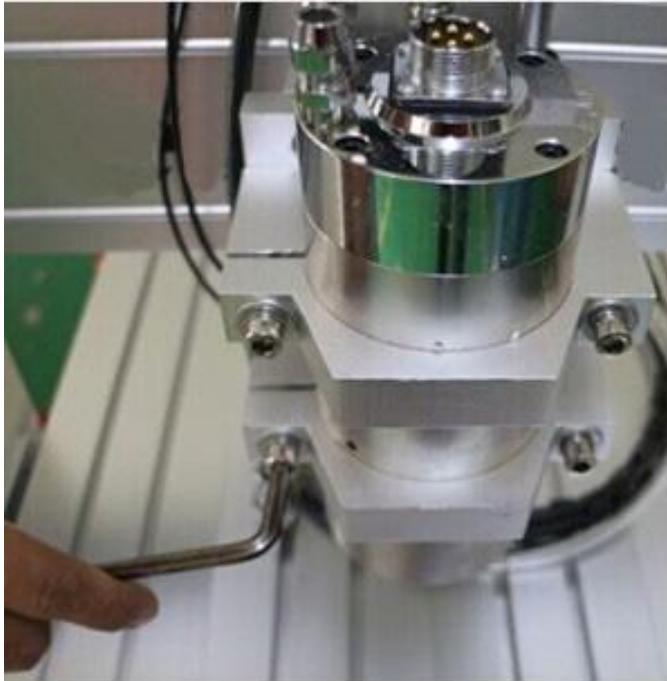
Third, tight the screw of coupling, make sure ball screw and couple good contact.



At last ,The step motors installation finished .



5. Install spindle. First put spindle in spindle clamping, and then tight screws one by one as the first picture show. Second, put the water pipes to the top of the spindle and tight the screws. Then the spindle is assembled.



6. Controller box connection. Connect all lines from machine fram to controller box one by one, According to corresponding marks ,The installation of the machine is finished.





7. Last step , Water pump connection. Connect pipes between water pump and spindle. And also connect power cable to controller box according to marks.



Attention: The water pump can not put into the water, it's very dangerous. Just keep water pump outside of tank. If the water pump is wet, cut off the electricity and dry it.

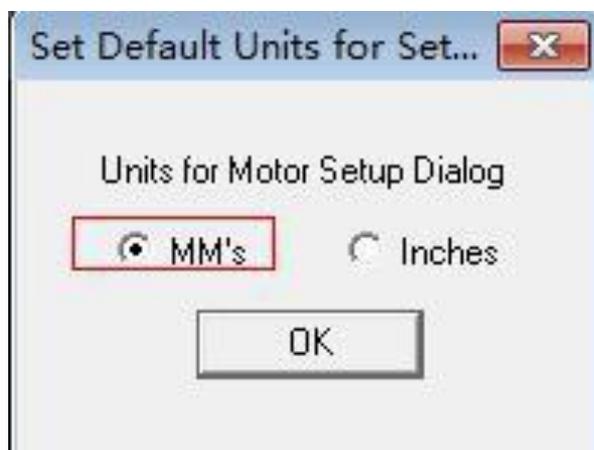
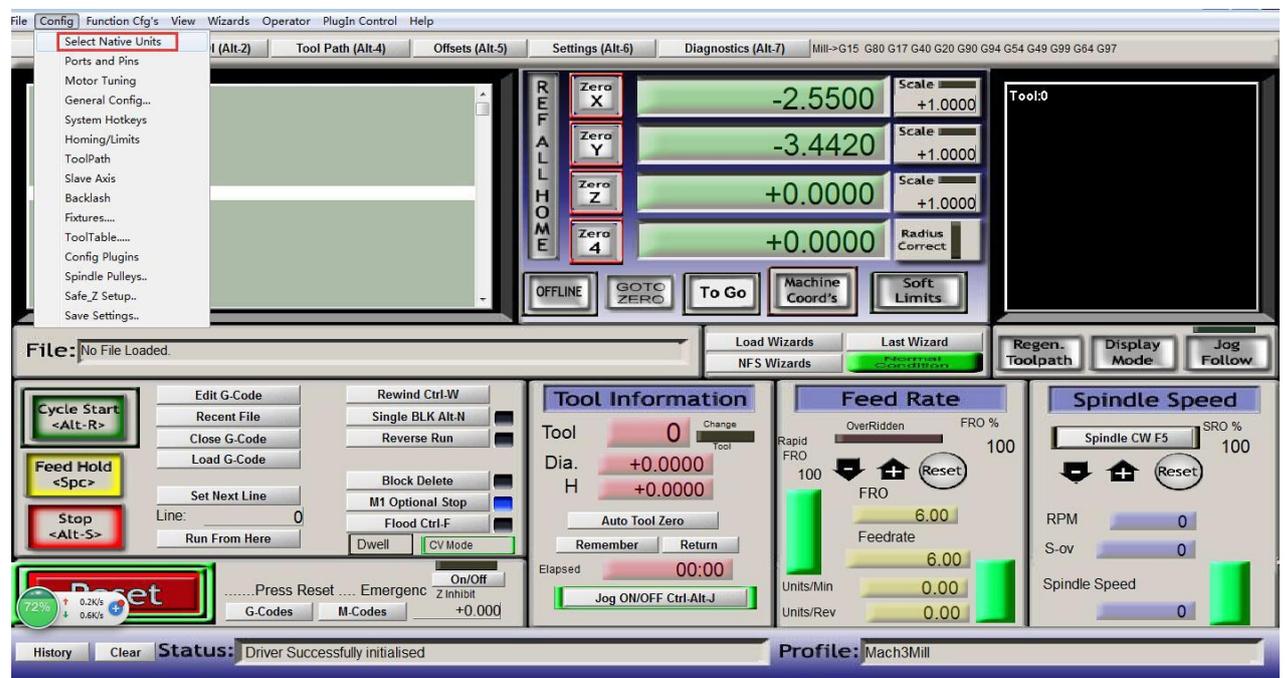
Part 2. How to set the MACH3 software

Step One: Open the MACH 3 MILL

After restarting the PC, choose the MACH 3 MILL icon on the desktop to start the Mach 3.

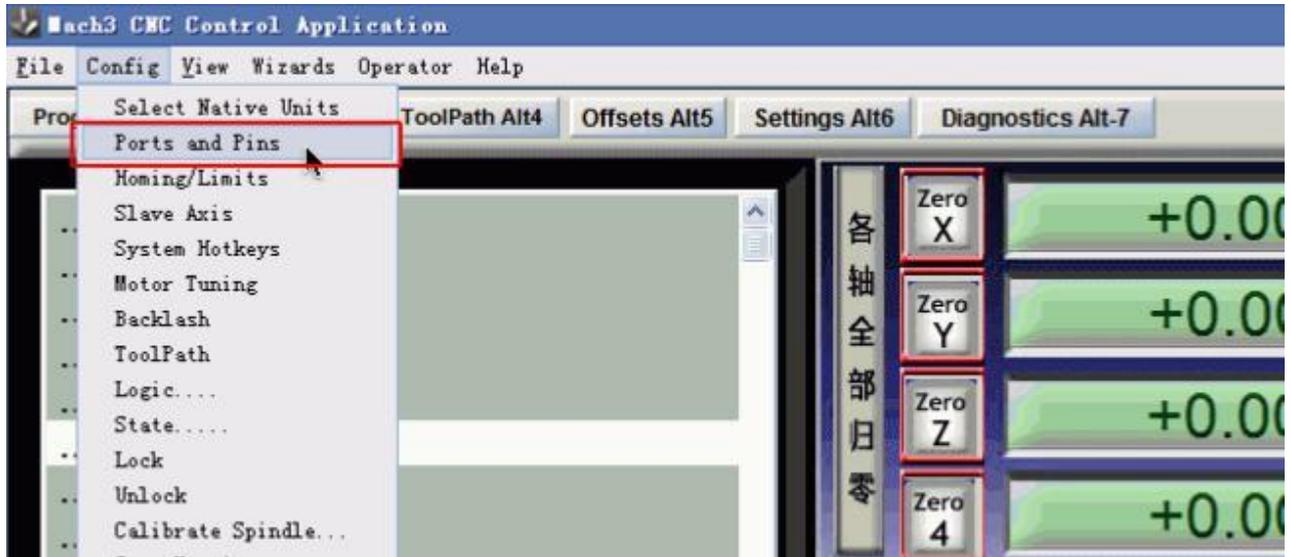
Step Two: Config -- select Native Units

Open the “Config -- select Native Units” menu, then choose the “MM’s”



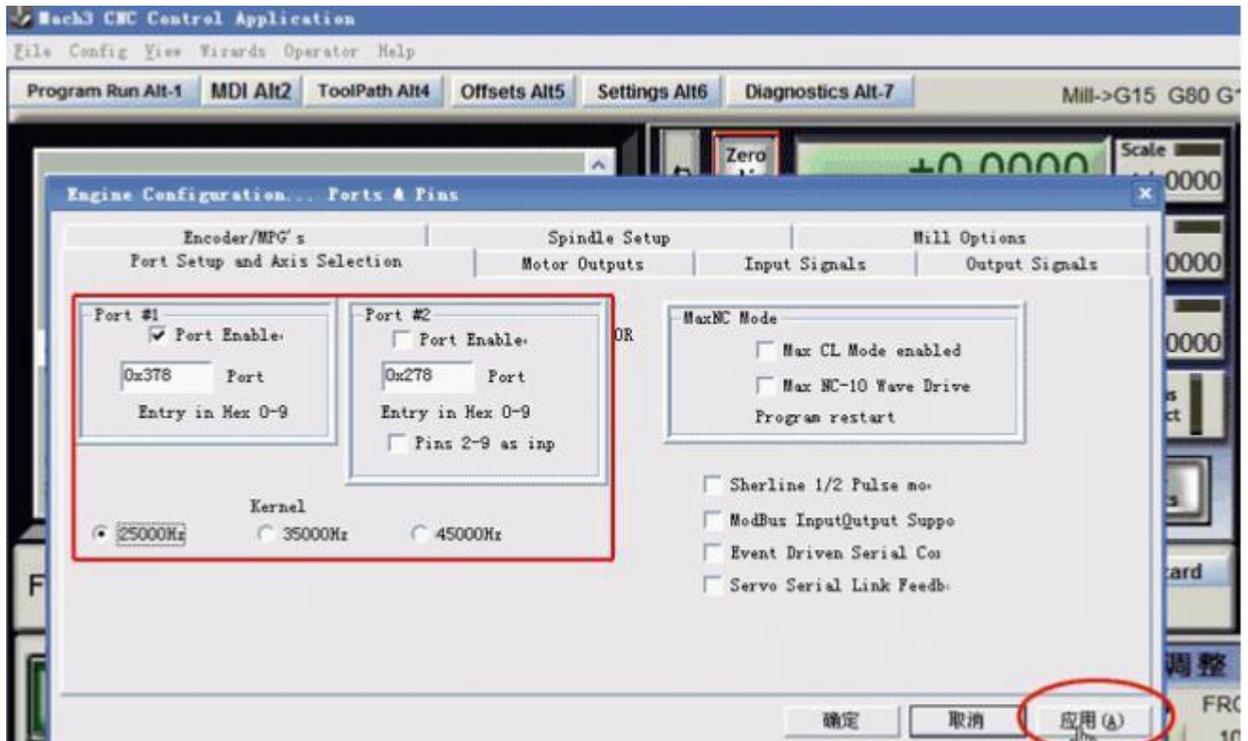
Step Three: Set up Config--Ports and Pins

See as below, open "Config--Ports and Pins" to enter the setup.



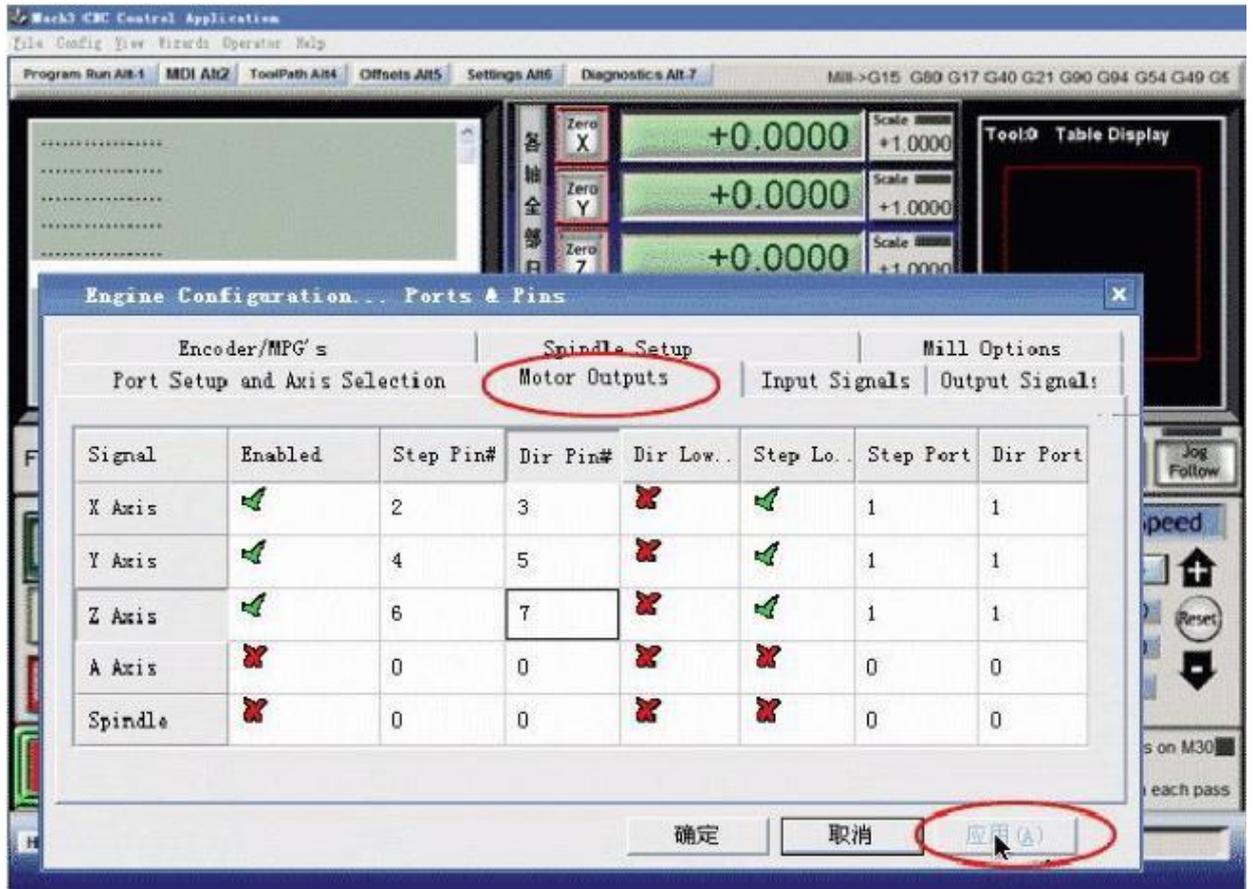
Step Four: Check data

To check whether all the data is same as the following red big rectangle and then choose OK to continue.



Step Five: Click Motor Outputs

Click “Motor Outputs” to setup the Pin of the stepper motor as follow



This part is very important, please check your setup is as same as the data above. Even a small error will cause the machine working incorrectly. Do not forget to save the setup.

Remark:

(1). If you want to use the 4th axis(A axis), you can setup the A axis data as follows

(2).”Dir Low Active” This choice is to set up the Direction of the motor, if you find the

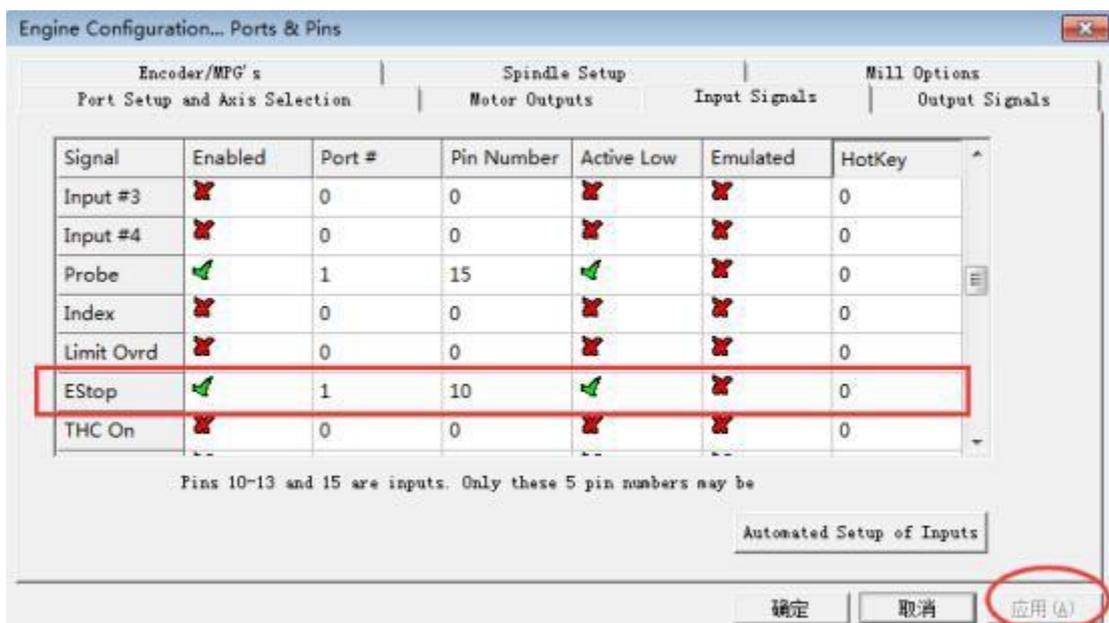
A Axis	✓	8	9	✗	✗	1	1
--------	---	---	---	---	---	---	---

running direction of the axis is inverse, you can choose the “Dir Low Active” to change the direction and then save the setup. As below picture:



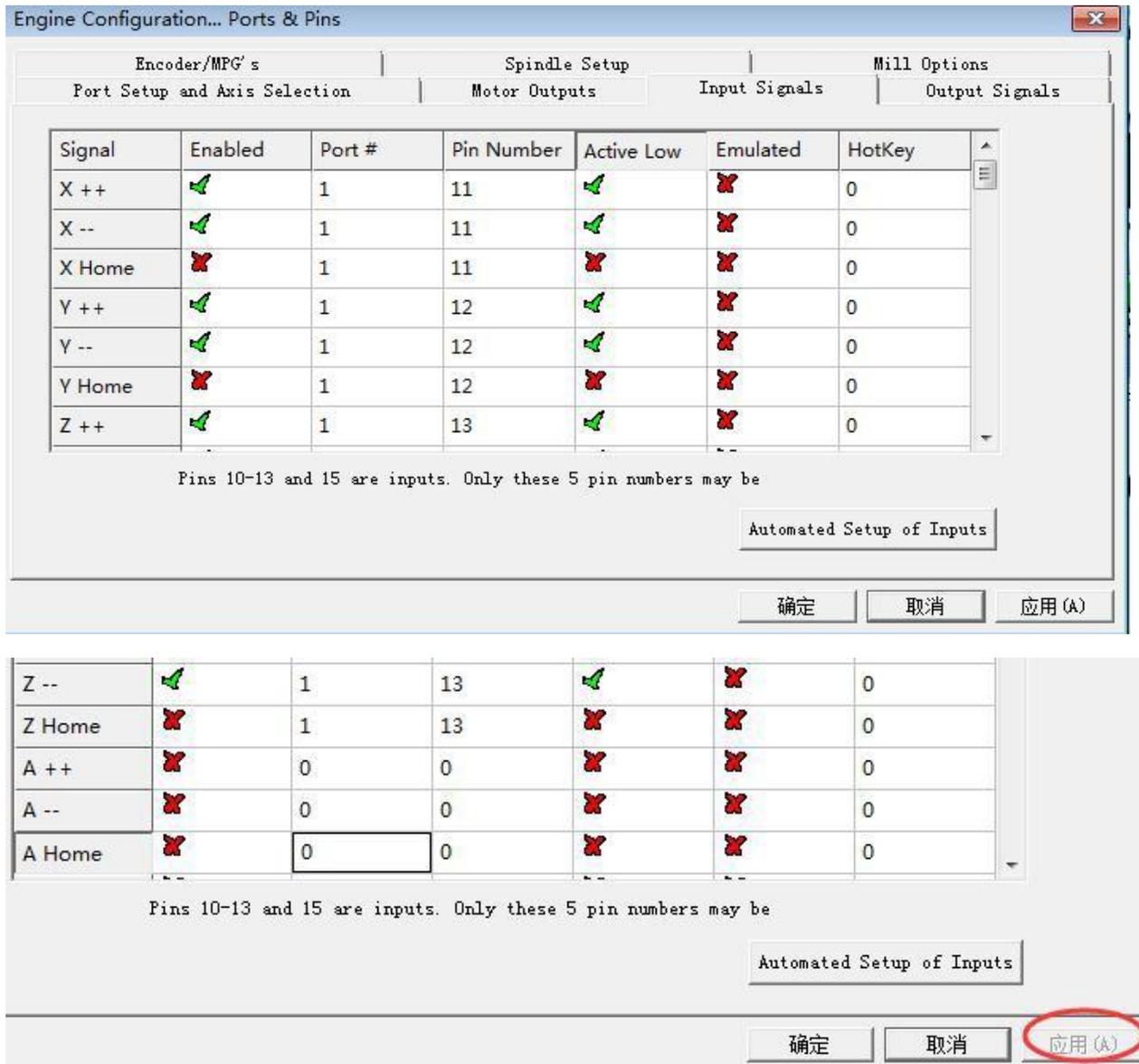
Step Six: Setup the E-stop

The clients who bought the Control box from us, need to setup the E-stop signal, still in “Ports and Pins” menu to click “Input Signals” to find the “Estop”, then setup as follow, final Click “Apply” and then save.(Emergency setting)



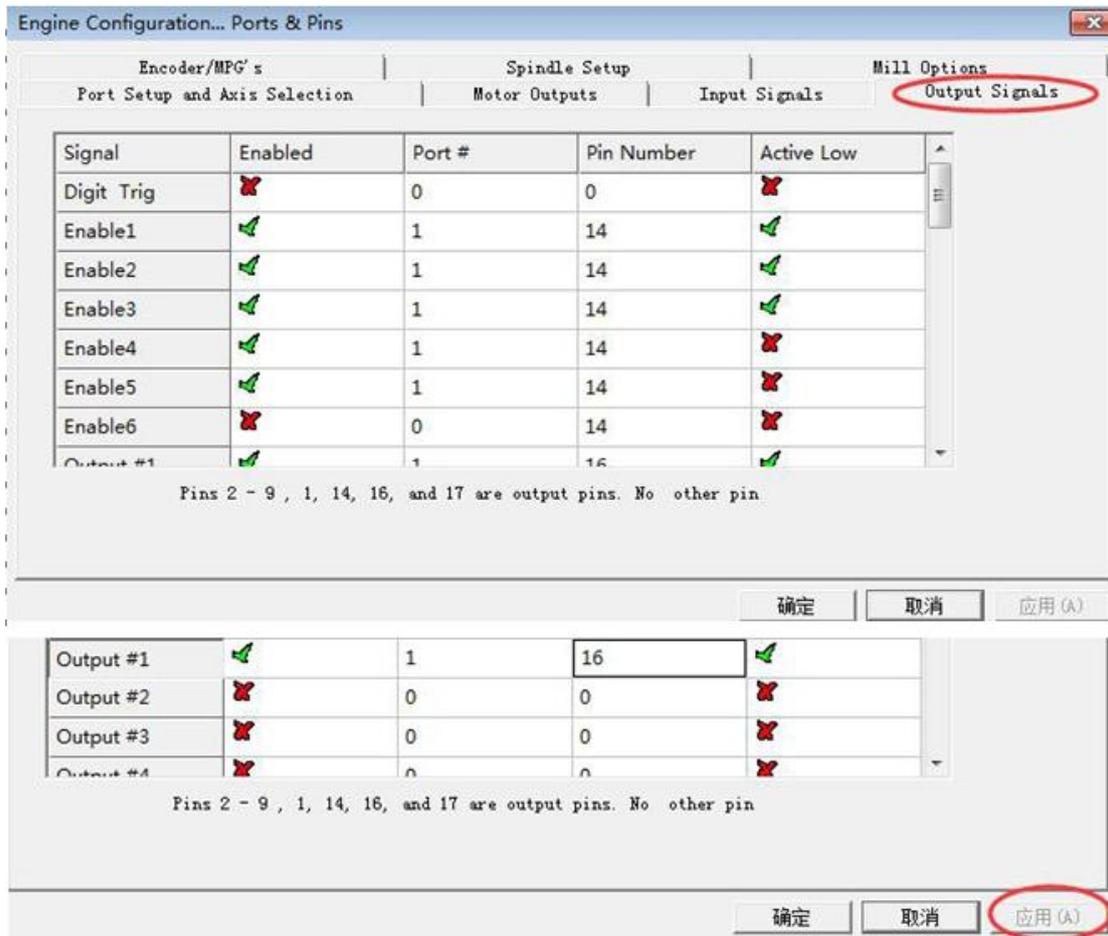
Step Seven: Setup the Limited Switches

Limited Switch Setting in “Ports and Pins” menu to click “Input Signals” and set X, Y, Z as below:



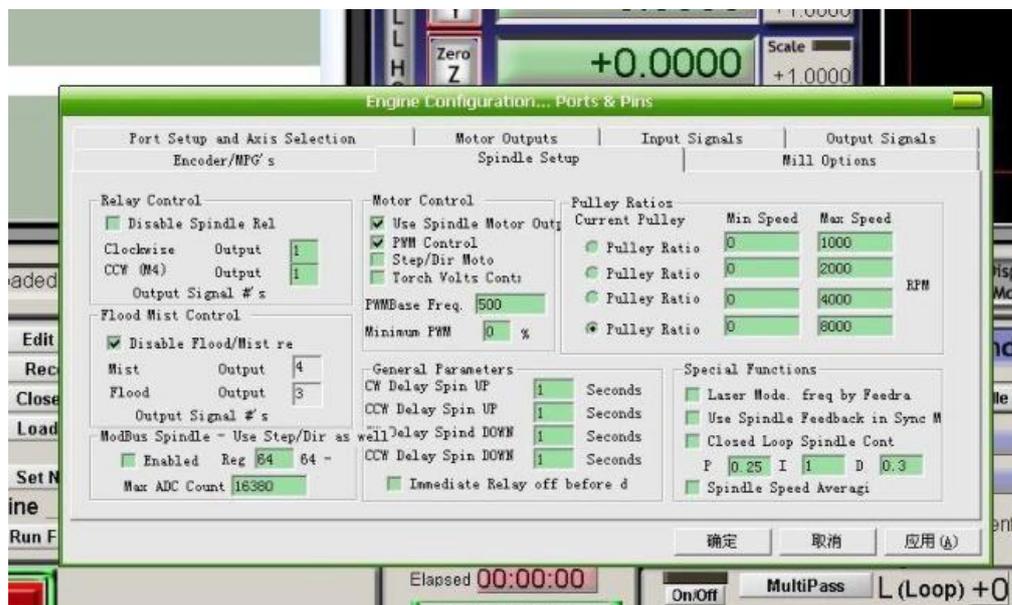
Step Eight: Setup the output signals

Output signals setting in “Ports and Pins” menu to click “Output Signals”, set as below, and then save.



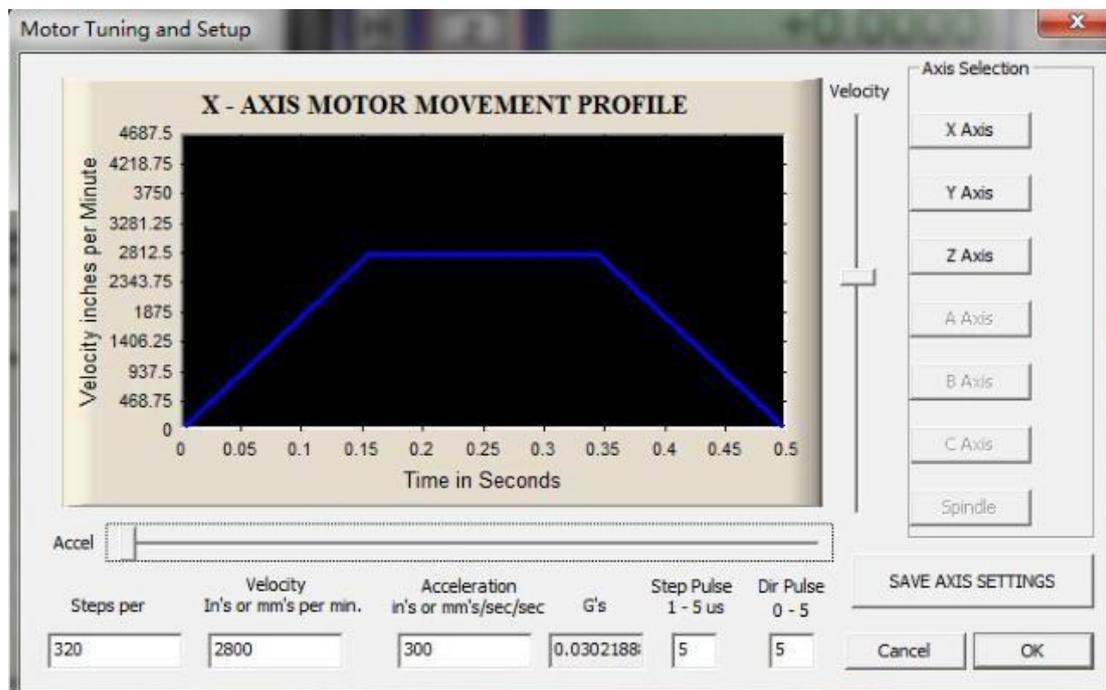
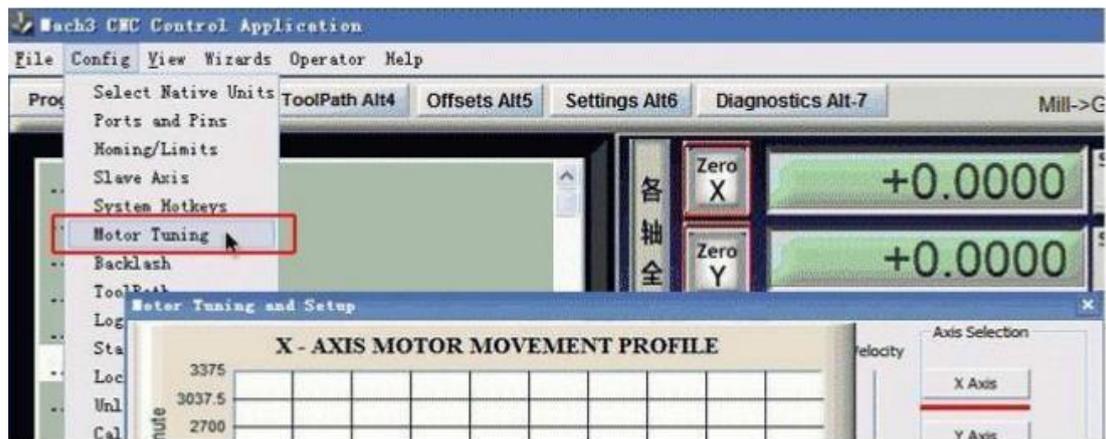
Step Nine Setup the spindle

Spindle setup in “Ports and Pins” menu to click “Spindle Setup”, set as below, and then save.

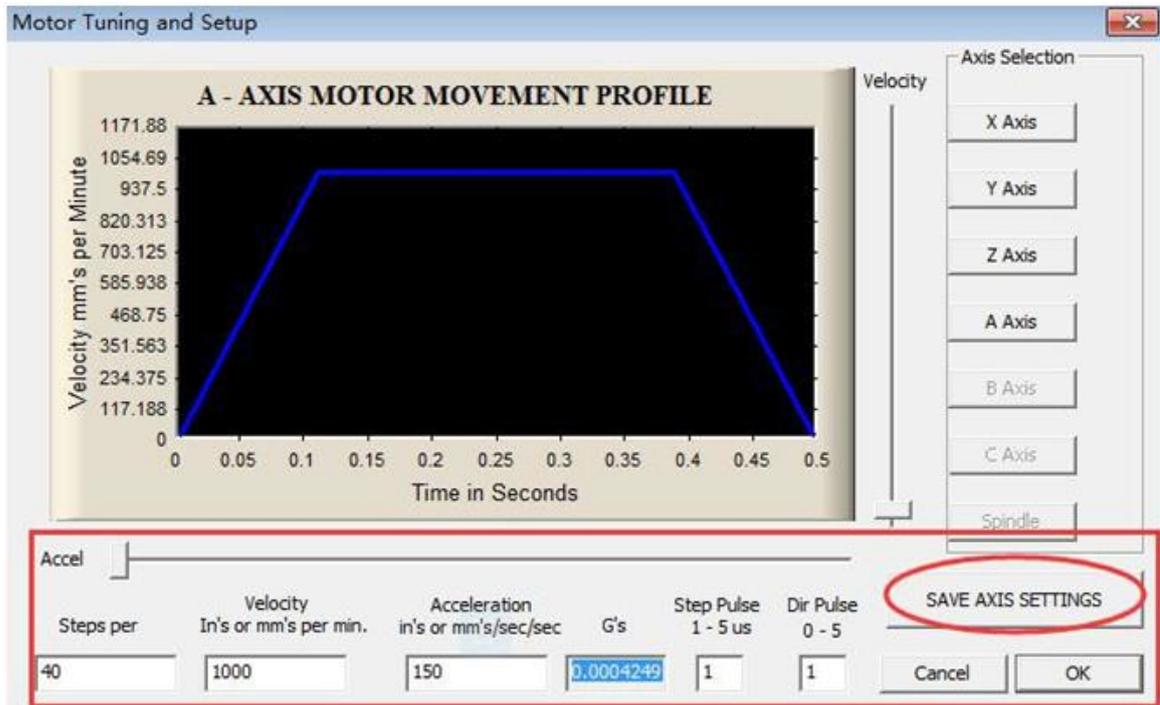


Step Ten: Setup the stepper motor and A axis

The setup of the Stepper motor: Config-- Motor Tuning--- X Axis---setup the X axis as follows---then“SAVEAXIS SETTINS”, then setup the Y axis and Z axis,final click “OK”.X Axis, Y Axis, Z Axis parameters should be the same.



If you need to use A axis, pls settp as below:



The setup is over, Please close the Mach software that all data setup can be available. And then open it again to check whether all the data is correct otherwise can't run your machine well.

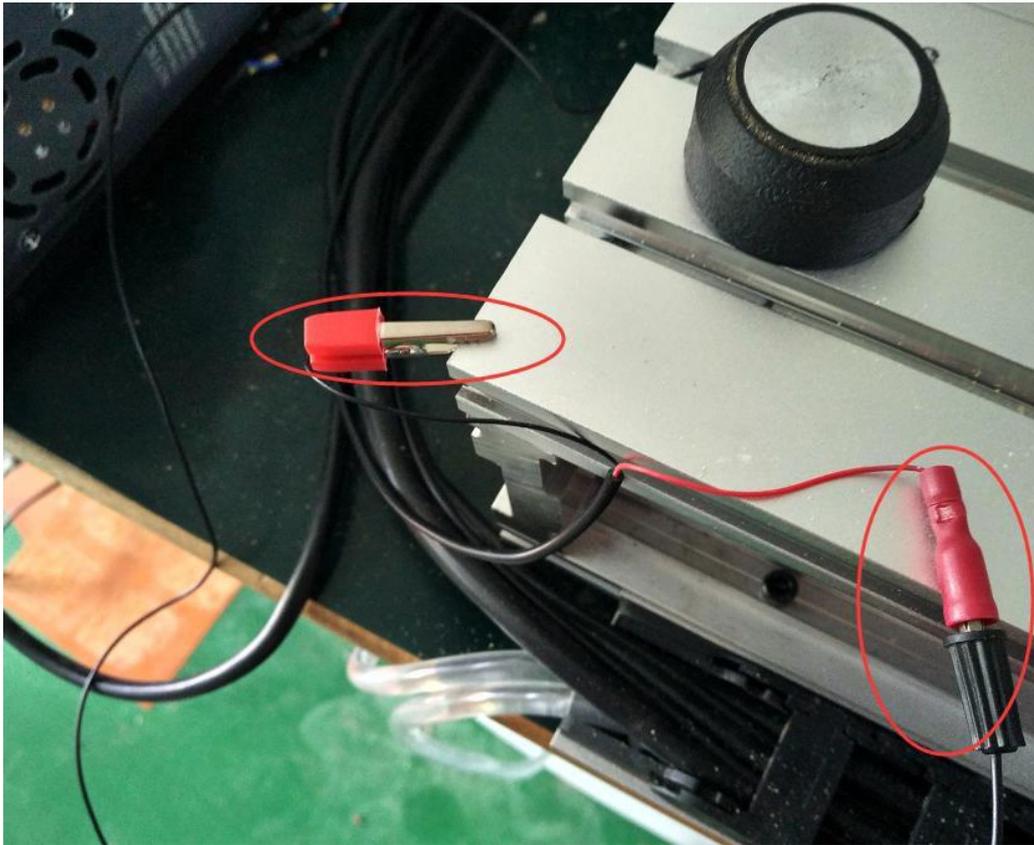
Part 3 Common problems

How to setup Auto-checking tool function ?

Check the Tool Button

Check whether your cables connect well as below?





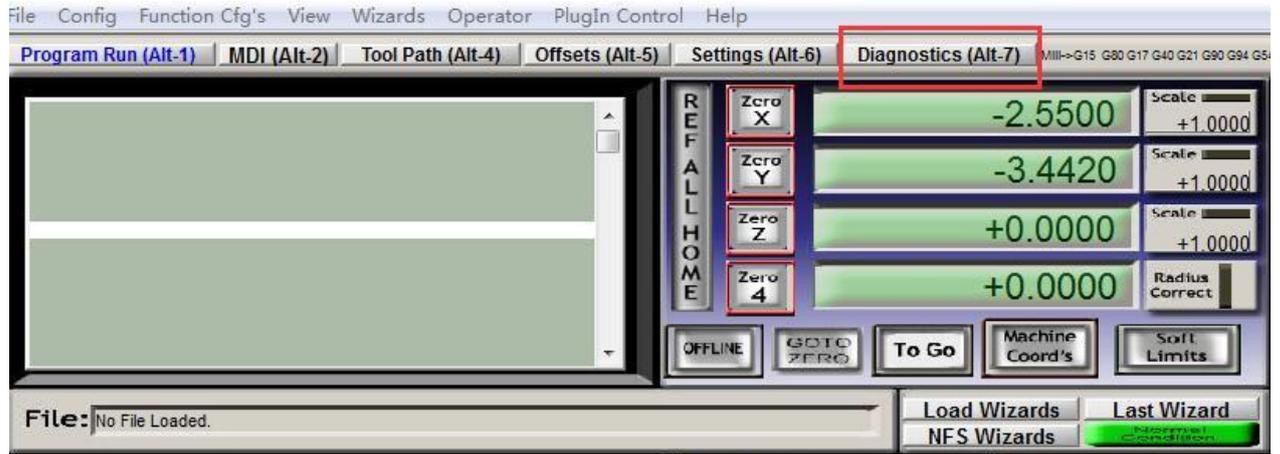
To confirm actual height of probe ,Generally ,It is 26mm. The offset is actual height +0.5mm. For example ,The actual height is 26mm ,The offset is $26+0.5=26.5$ mm.



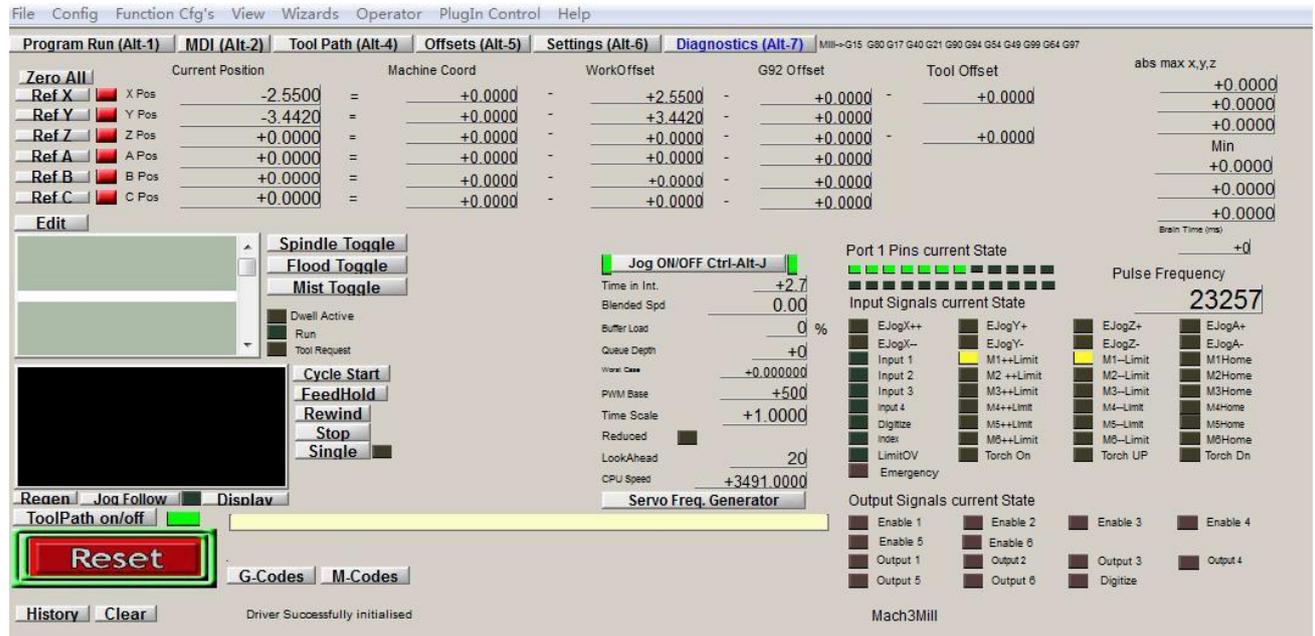
Software setting

Diagnostics (Alt_7)

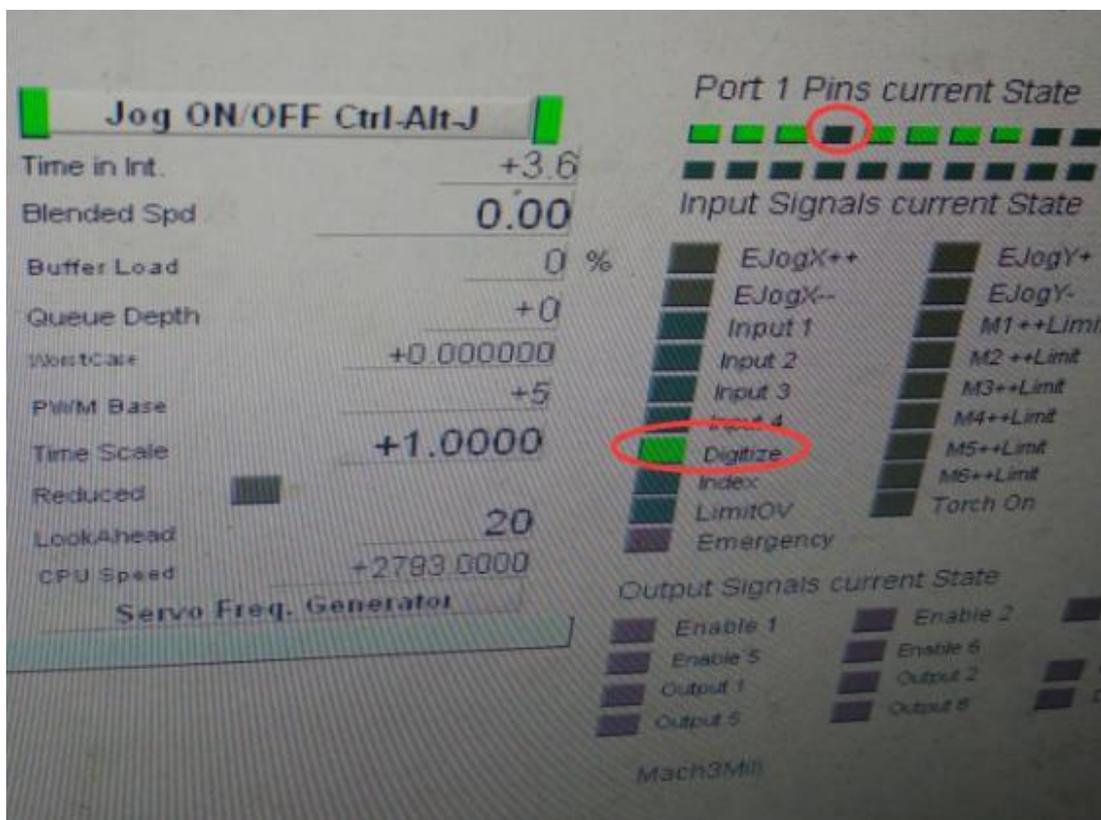
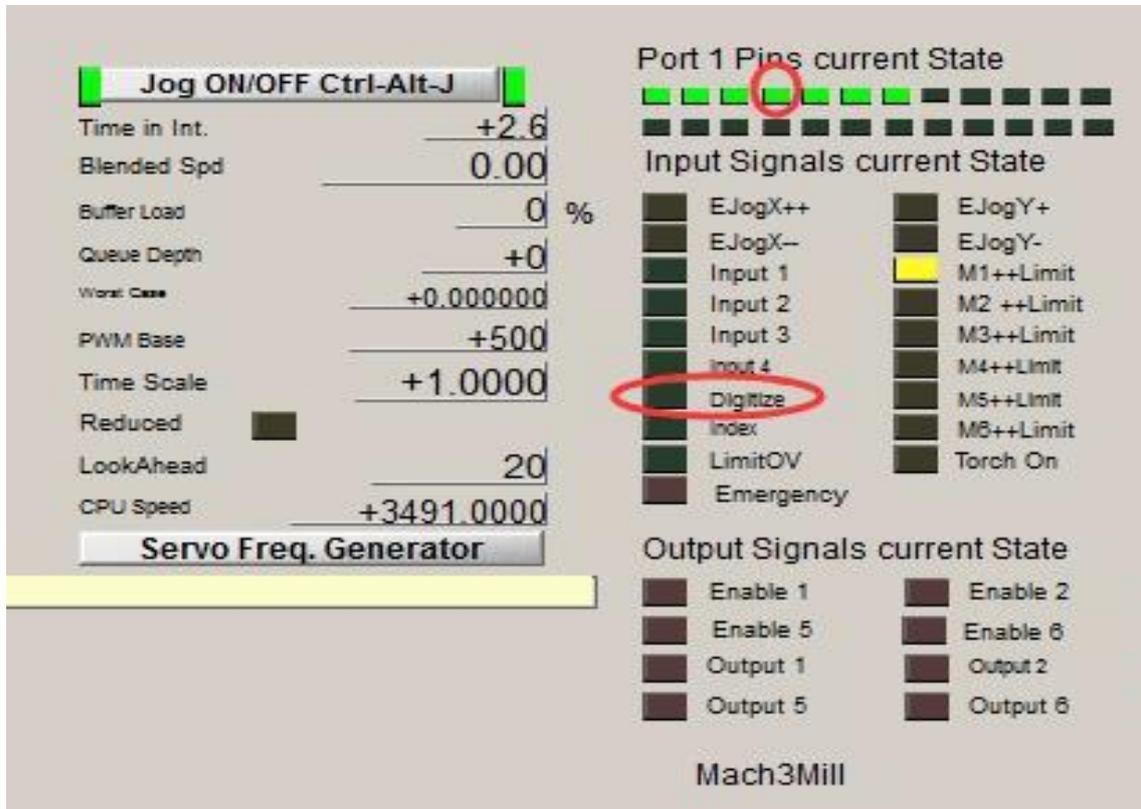
Click “Diagnostics (Alt_7)” as below:



Then you will see below page:

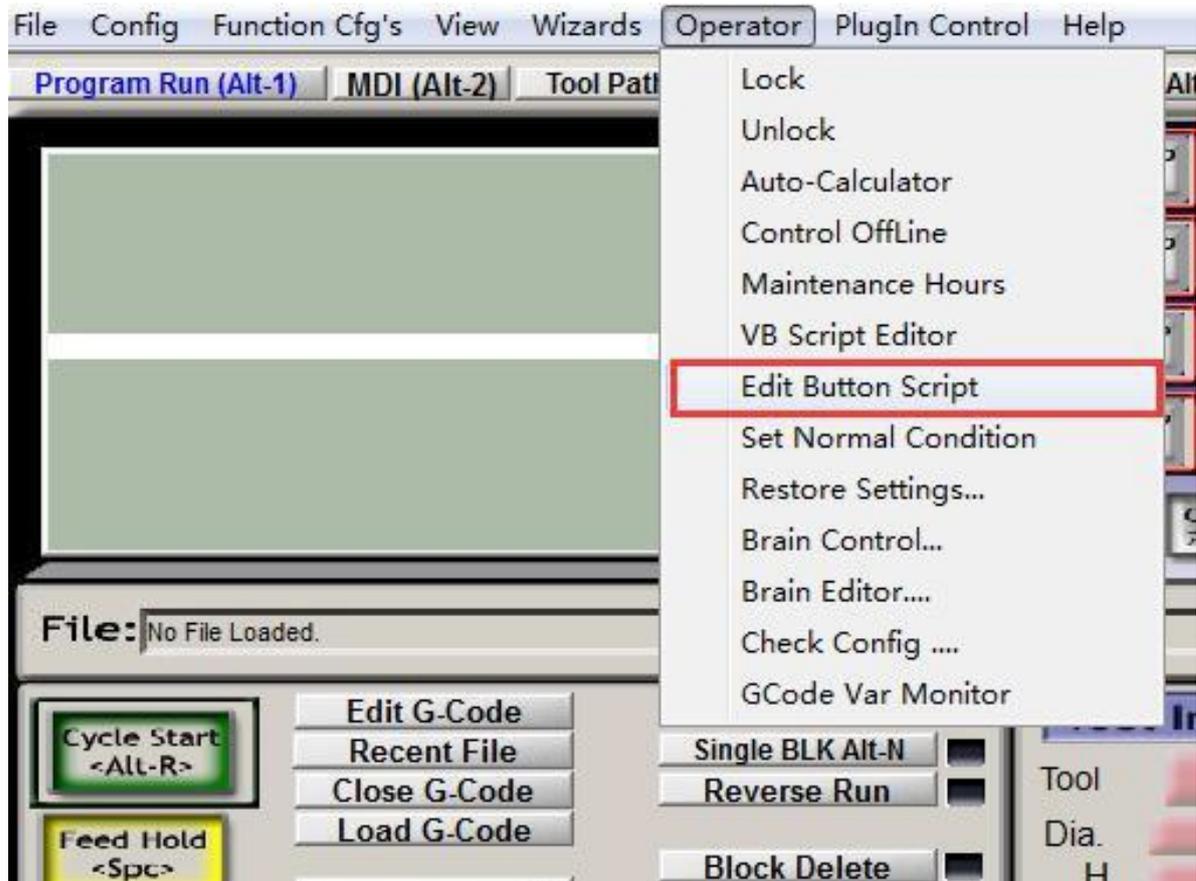


After that, below two buttons in red should be flashing, if not pls check again if your above cables didn't connect well.



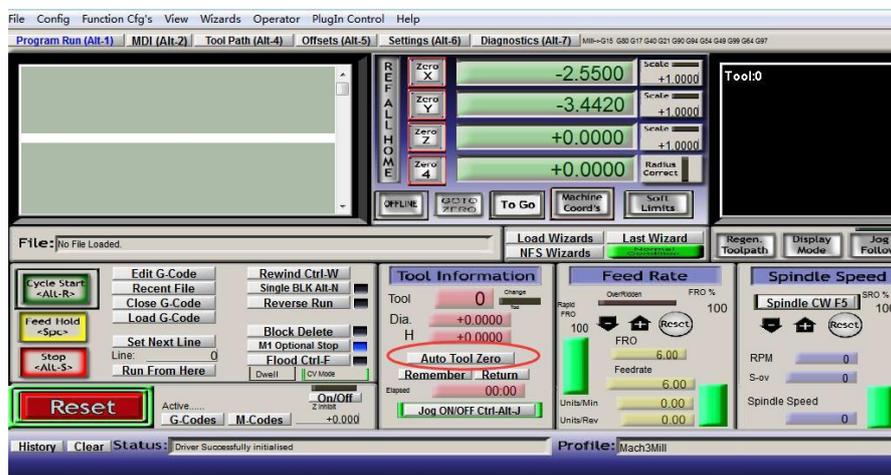
Program Run (Alt-1)

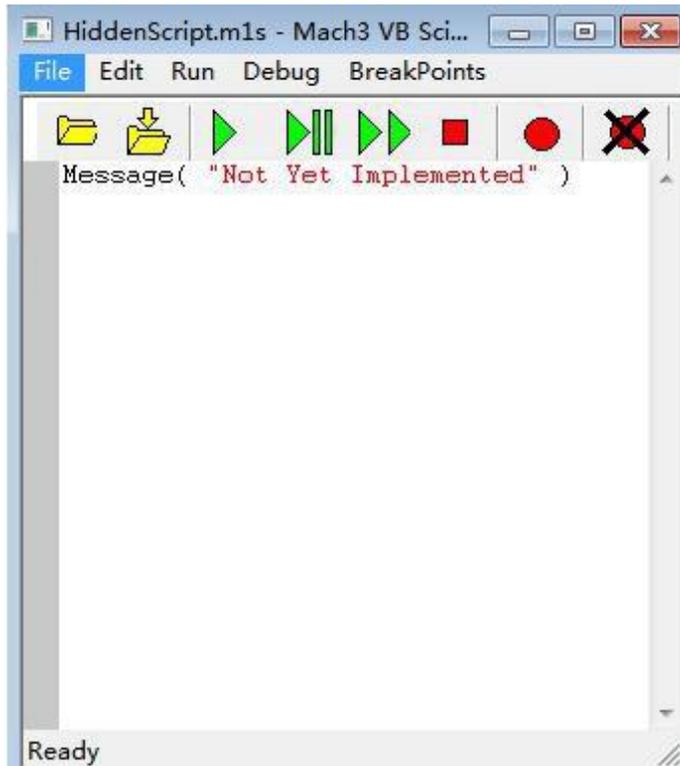
Click “Program Run (Alt-1)”, then click “Operator” and choose “Edit Button Script”



Auto Tool Zero

Click “Auto Tool Zero”, you will see below





Then pls copy below Codes to above place and then click save. Codes as below in blue:

```
'chengdu xhc tec. probe z surface macro
```

```
FeedCurrent = GetOemDRO(818) 'Get the current settings, OEM
```

```
DROs (818)=Feedrate DRO
```

```
ZCurrent = GetOemDro(802) 'OEM DROs (802)=Z DRO
```

```
GageH = GetOEMDRO(1001) 'OEMDRO(1001)=Gage Block Height
```

```
ZNew = ZCurrent - 300 'probe down 20 mm
```

```
Code "G90F200" 'slow feed rate to 100 MM/MIN
```

```
SetOemDRO(818,200)
```

```
Rem Code "G4 P1" 'Pause 1 second to give time to position probe plate
```

```
Code "G31 Z" &ZNew
```

```
While IsMoving() Sleep(10)
```

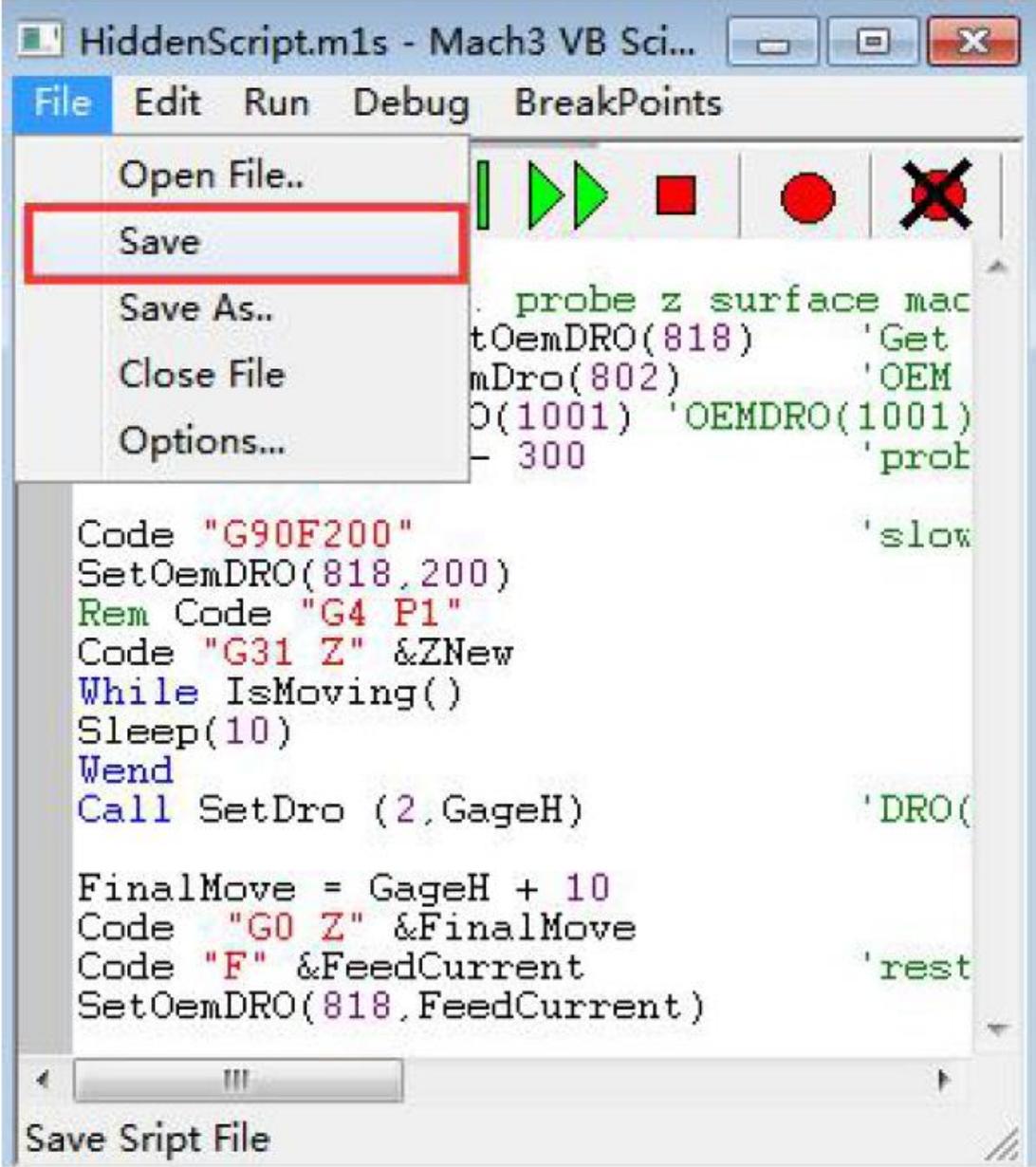
Wend

Call SetDro (2,GageH) 'DRO(2)=Z DRO

FinalMove = GageH + 10 Code "G0 Z" &FinalMove

Code "F" &FeedCurrent 'restore starting feed rate

SetOemDRO(818,FeedCurrent)



The screenshot shows a window titled "HiddenScript.m1s - Mach3 VB Sci...". The menu bar includes "File", "Edit", "Run", "Debug", and "BreakPoints". The "File" menu is open, with "Save" highlighted by a red rectangle. The script content is as follows:

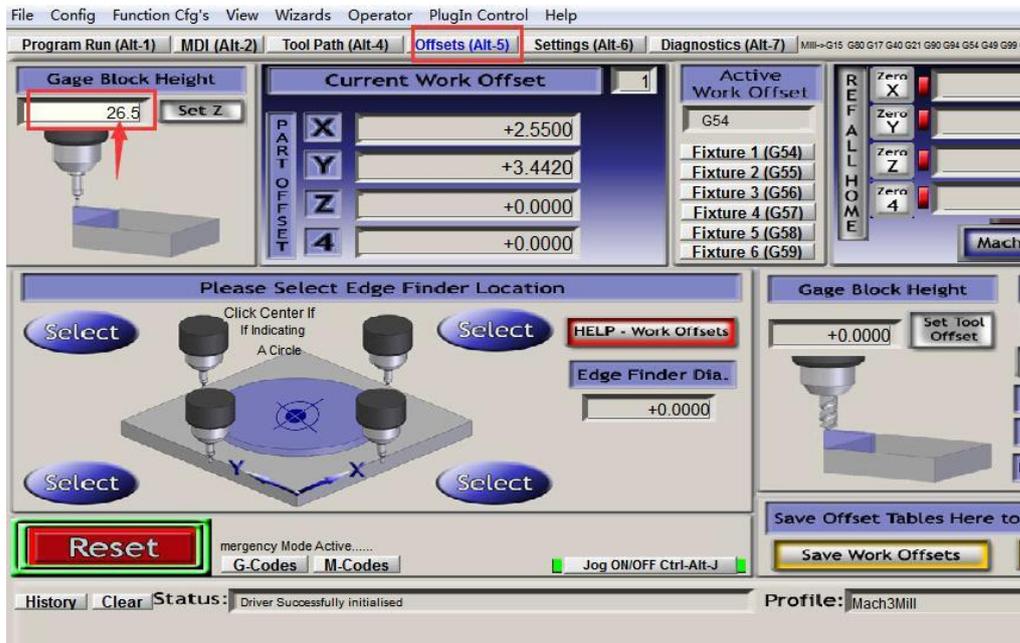
```
Code "G90F200" 'slow
SetOemDRO(818,200)
Rem Code "G4 P1"
Code "G31 Z" &ZNew
While IsMoving()
Sleep(10)
Wend
Call SetDro (2,GageH) 'DRO(

FinalMove = GageH + 10
Code "G0 Z" &FinalMove
Code "F" &FeedCurrent 'rest
SetOemDRO(818,FeedCurrent)
```

At the bottom of the window, the text "Save Sript File" is visible.

Offsets(Alt-5)

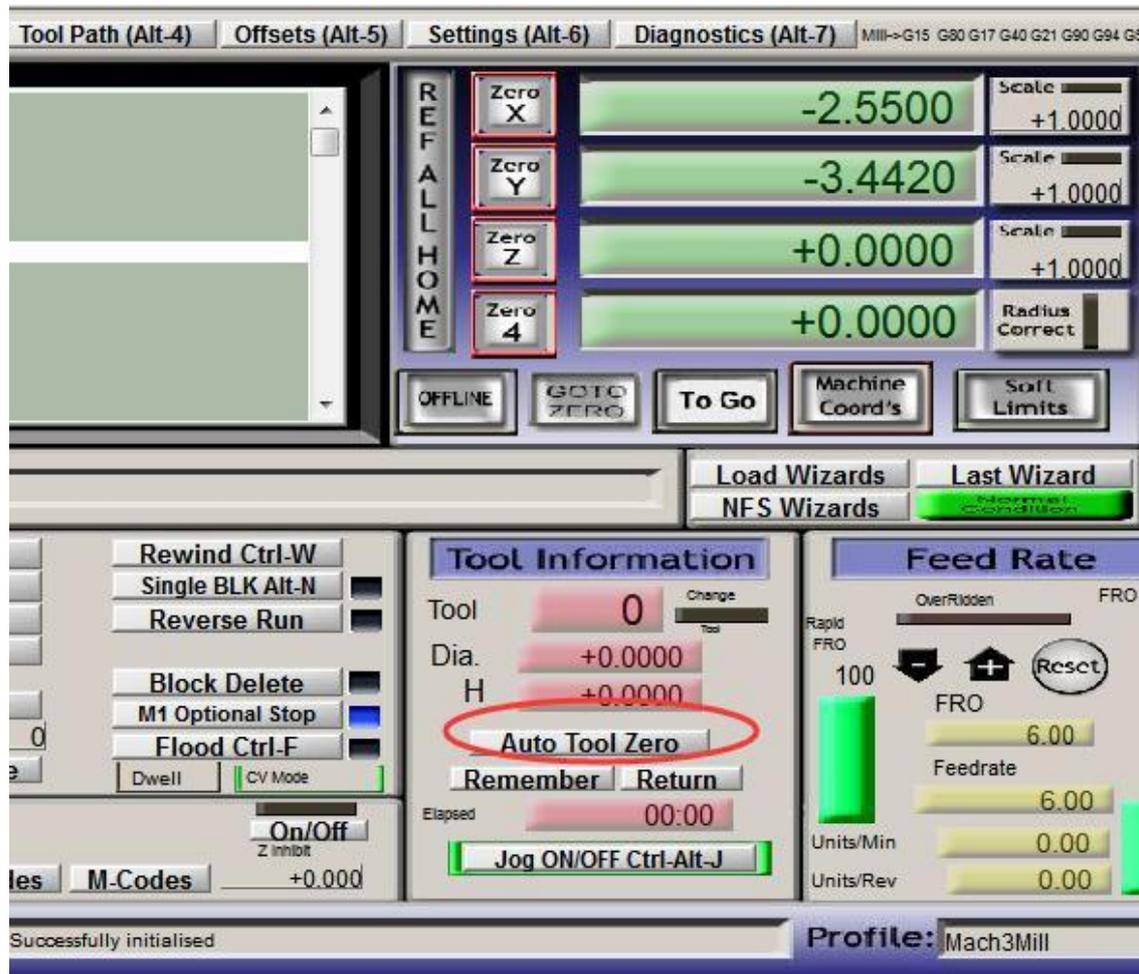
Click “Offsets(Alt-5)”,and change Gage Block Height to “26.5” ,as below:



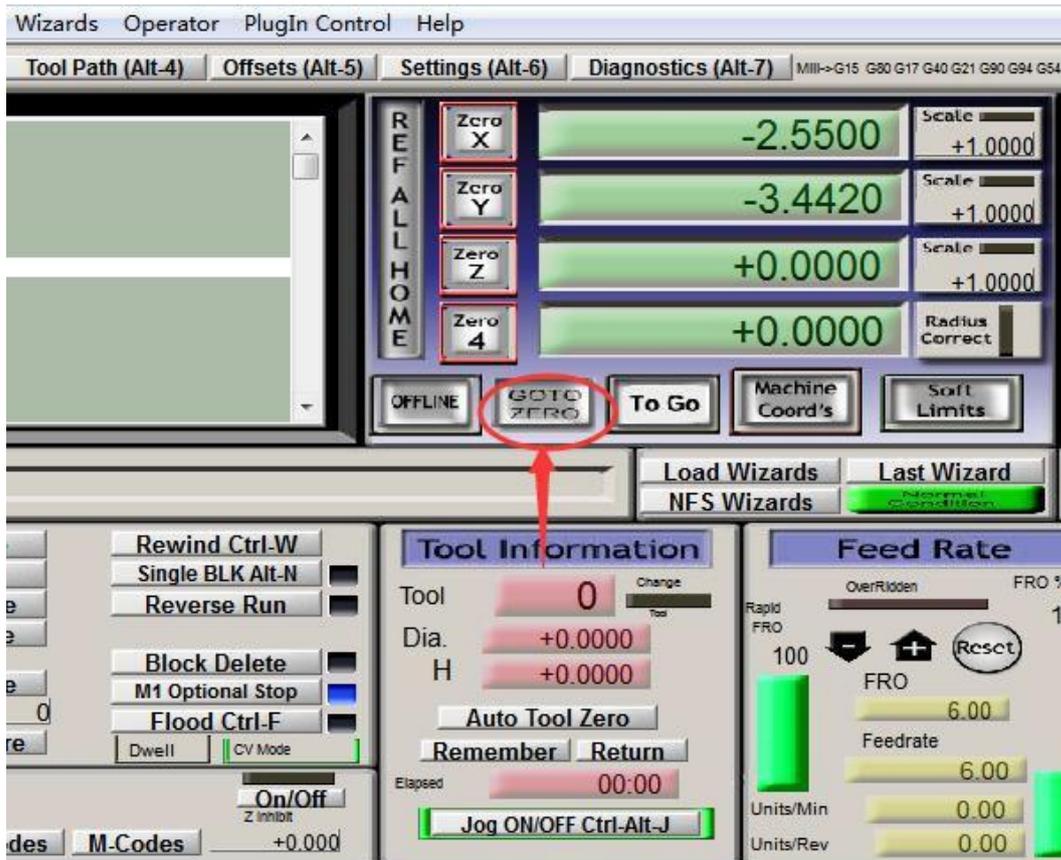
Then click “ Set Z” or enter putton:



After that Click “Auto Tool Zero ” as below:

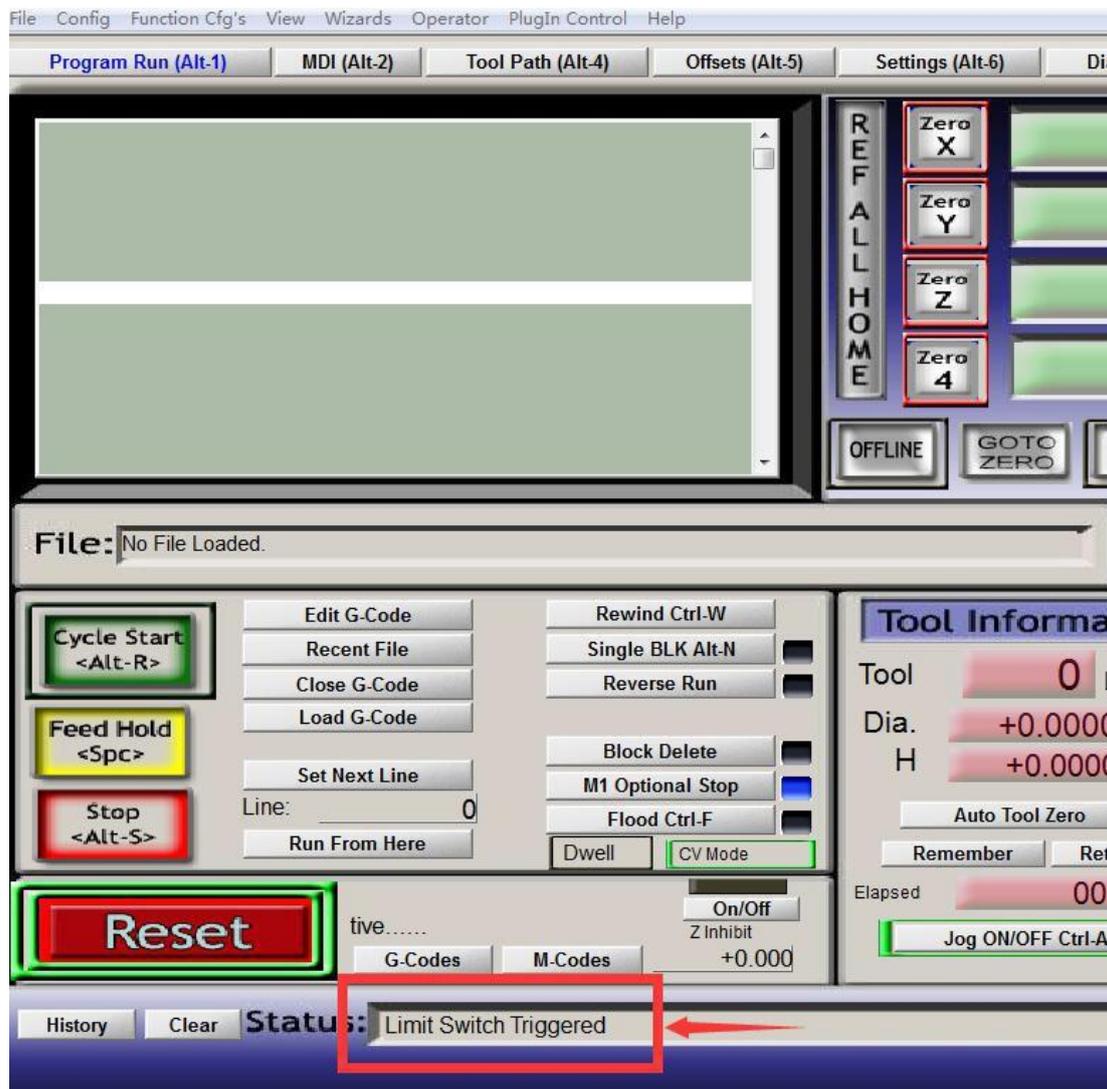


At last Click “GO TO ZERO”

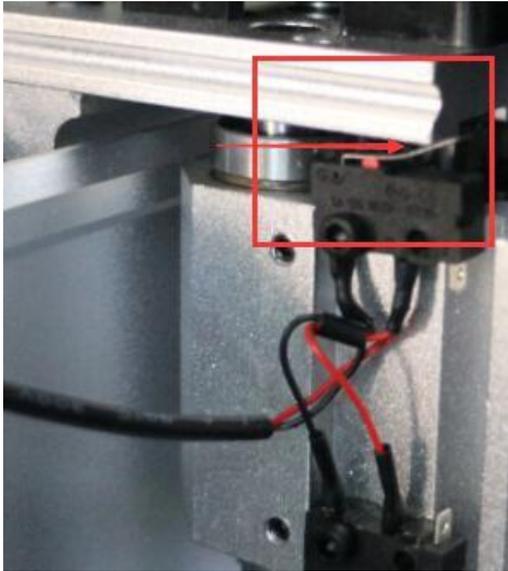


Part 4 How to manual reset limit switch ?

When the software status show that the limited switch triggered as the picture attached. Then you need to reset the switches manually.

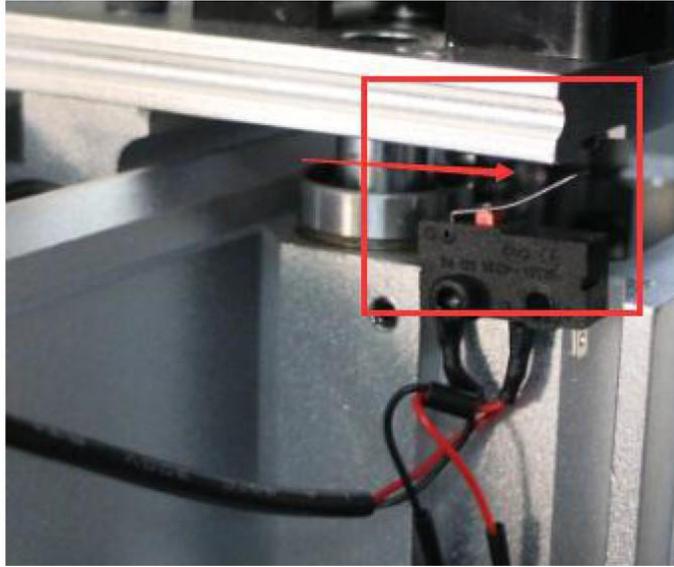


Please check Limit Switch triggered as below:



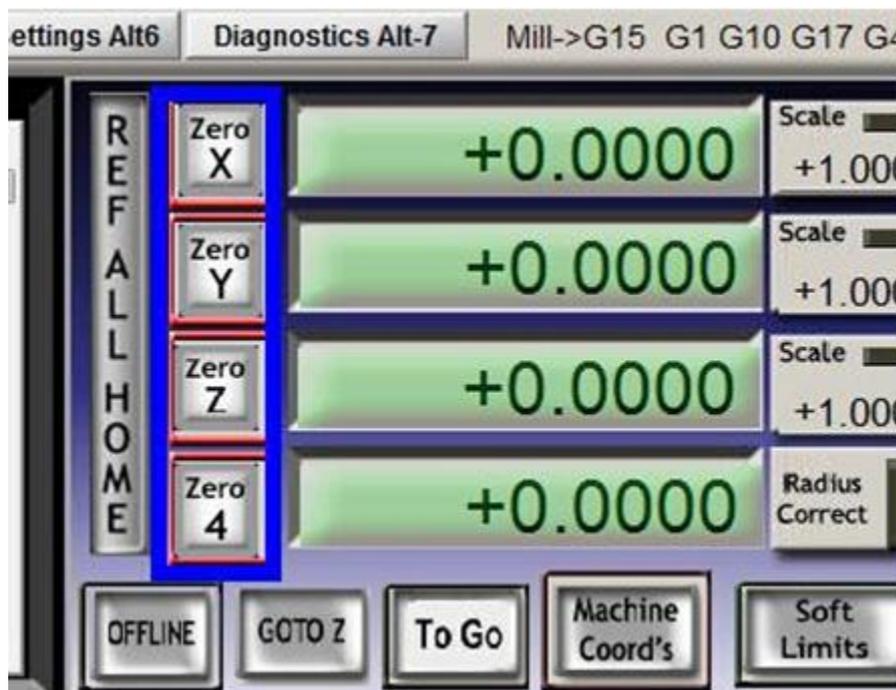
First, find out which limited switch is triggered. Then loose the hat of the step motor as the picture below. The X Y Z axis are the same.





Part 5 How to setup Starting point ?

1) Move the cutting tools to the starting engraving point, then Click Zero X, Zero Y, Zero Z, Zero A as below to Reset.



After that,click “Cycle Start “ as below

