



6090 mini Numerical Control Carving Machine manual -MACH3 USB version

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Part 1 Assembling

Tools and spare parts needed during assembly:



1. Waterpump *1

2. Spanner*2

3. USB cable *1

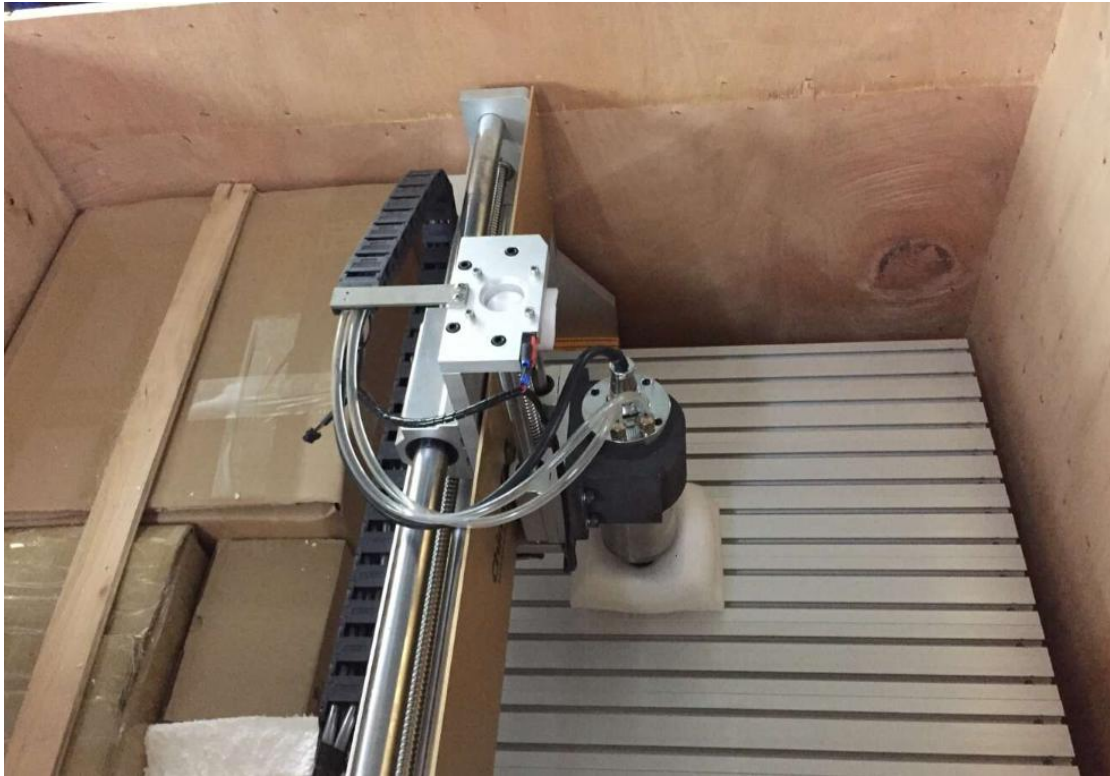
4. Millingbit *2, engraving bit *3

5. Clamp tool *6

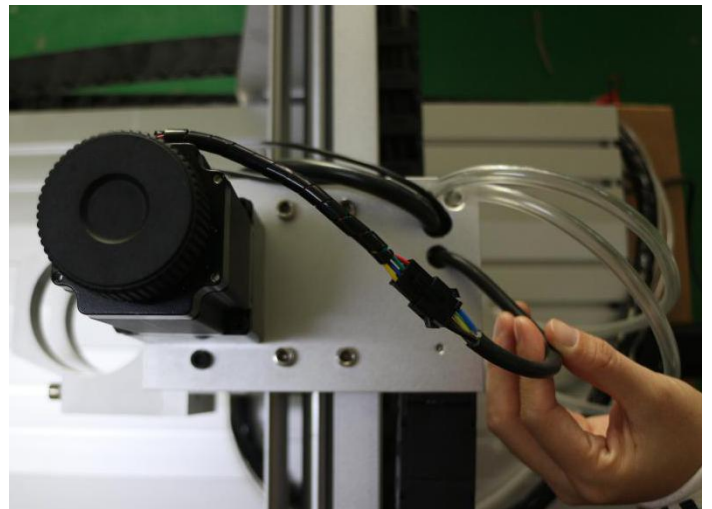
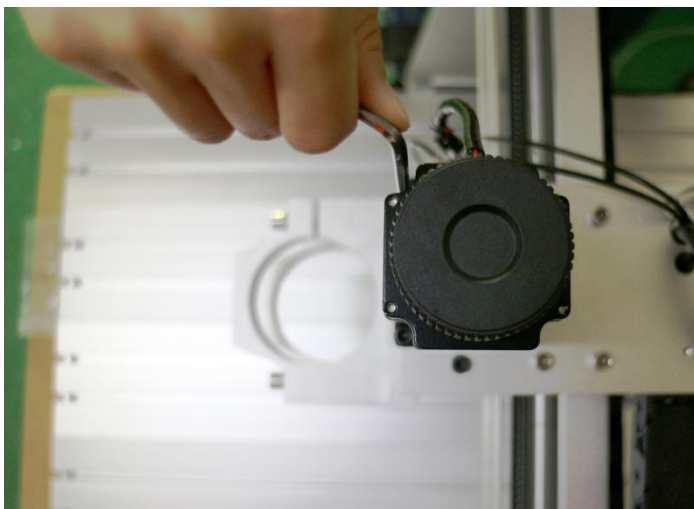
6. Power cable *1

7. Stepper motors *3

1. Open the wooden box you received as below:



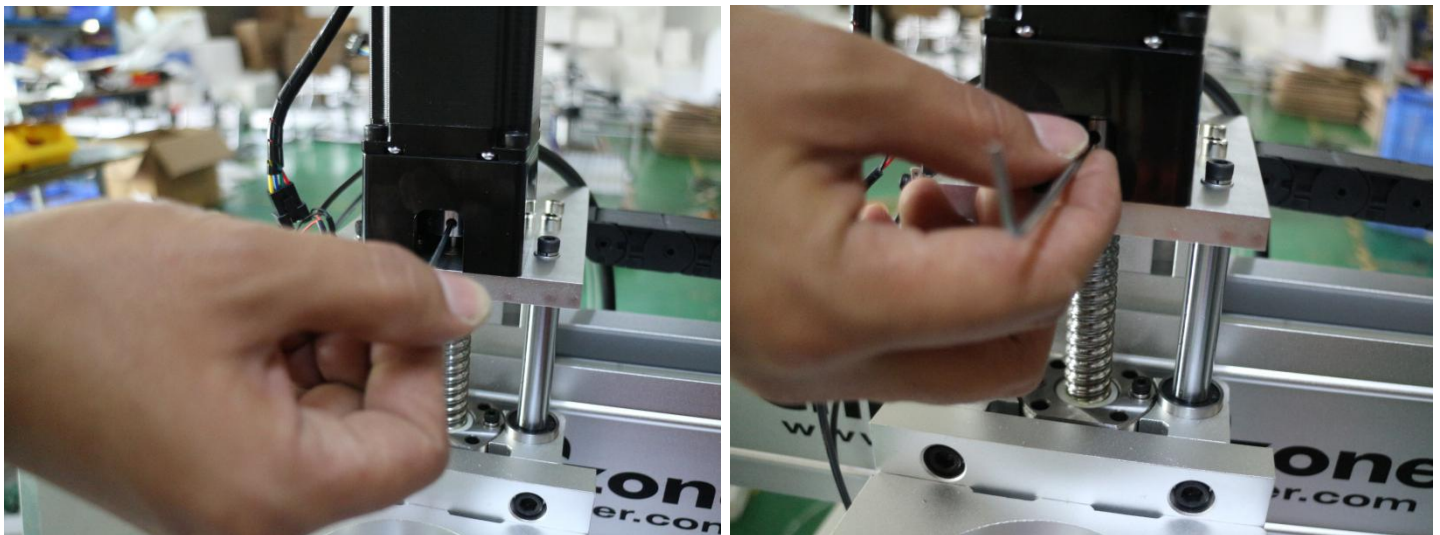
2. Then unpack wooden box , the machine is almost assembled. Only need to install step motors and water pump. All step motors are same for X Y Z Axis. At first, Put step motor to corresponding Axis. Tight the four screws and make sure tighten. Connected that corresponding cable.



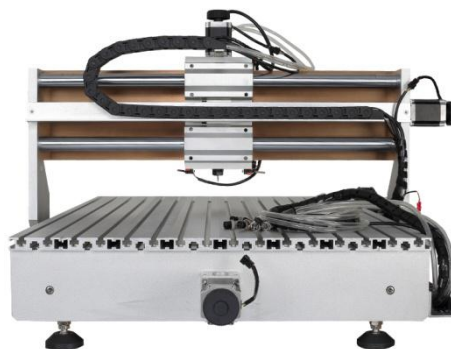
Second, You can try to found the screw position before installation. Third,



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



At last , The step motors installation finished .



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



USB Port

4. Last step , Water pump connection. Connect pipes between water pump and spindle.

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.



And also connect power cable to controller box according to marks.

Part 2 Mach3 installation and setting

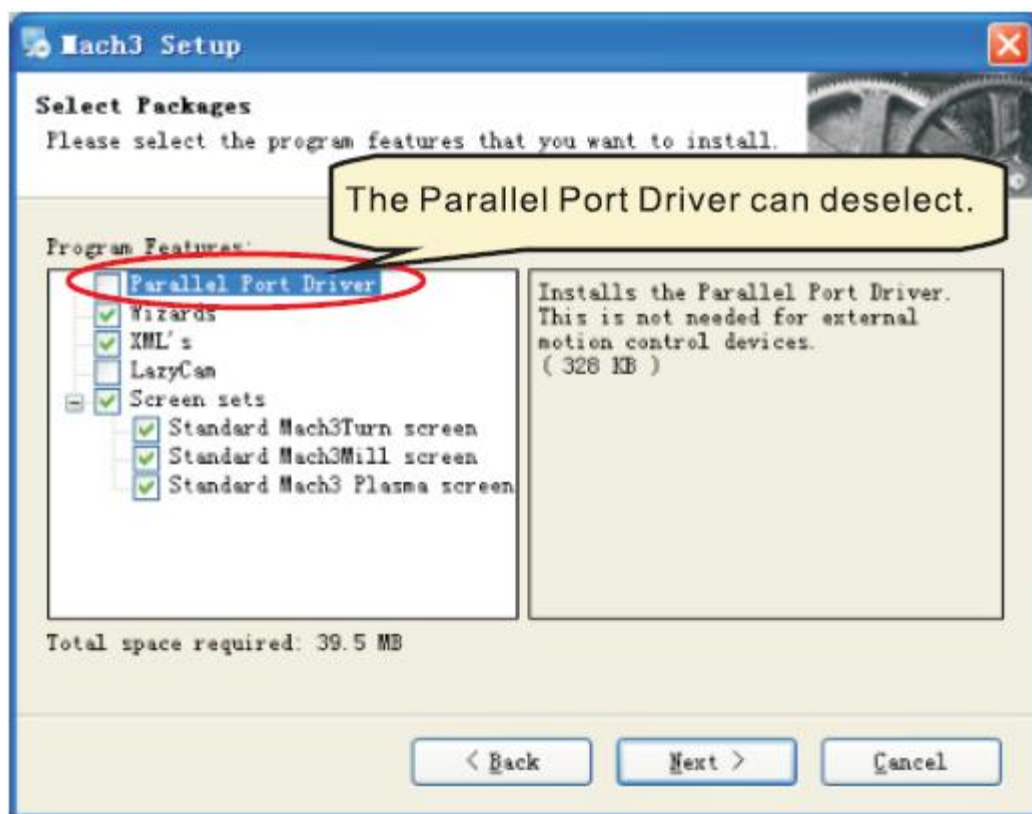
1 Download MACH3

Download latest MACH3 version from MACH3 official website or you can directly install MACH3 from CD.

<http://www.machsupport.com/software/mach3/>

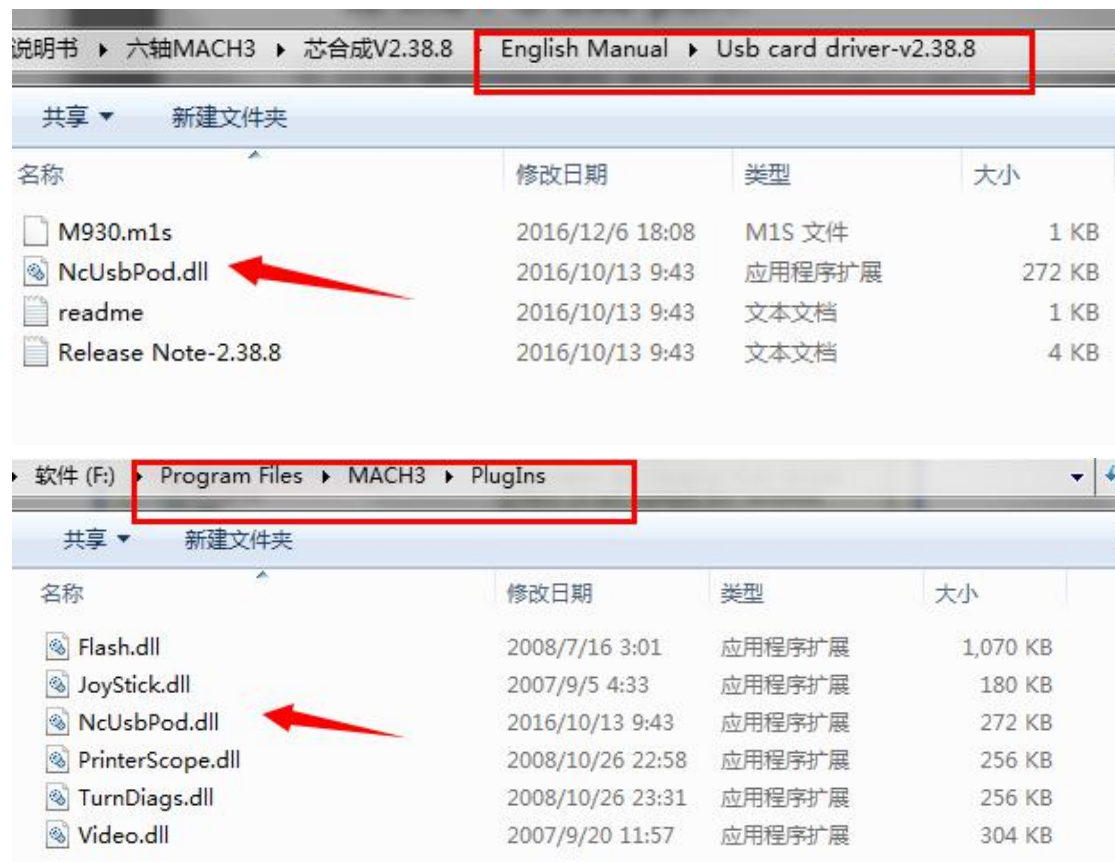
2 Install MACH3

Do not choose parallel port driver

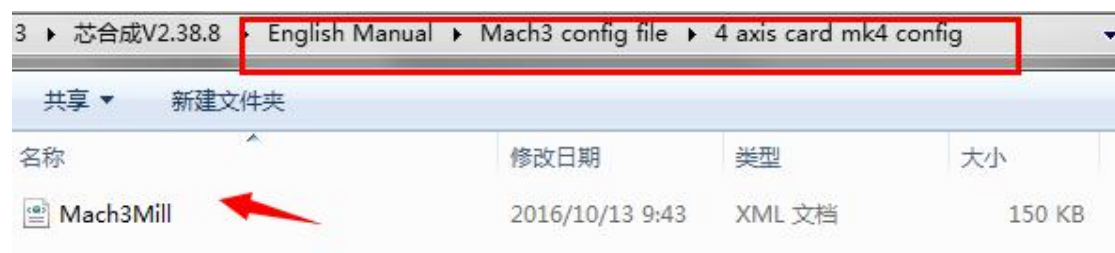


After installation finished ,Connect USB cable between controller box and computer. Copy NcUsbPod.dll from USB card driver file to MAC3/PlugIns file .This file to enable USB motion

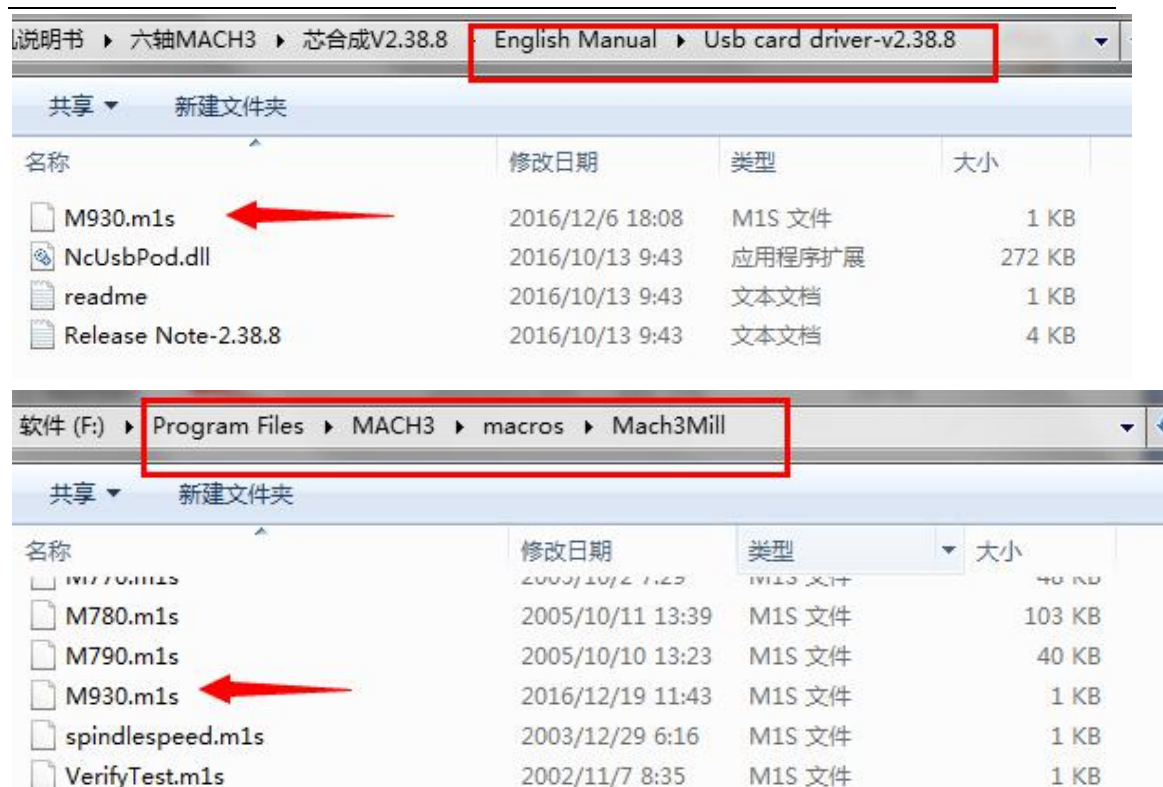
card.



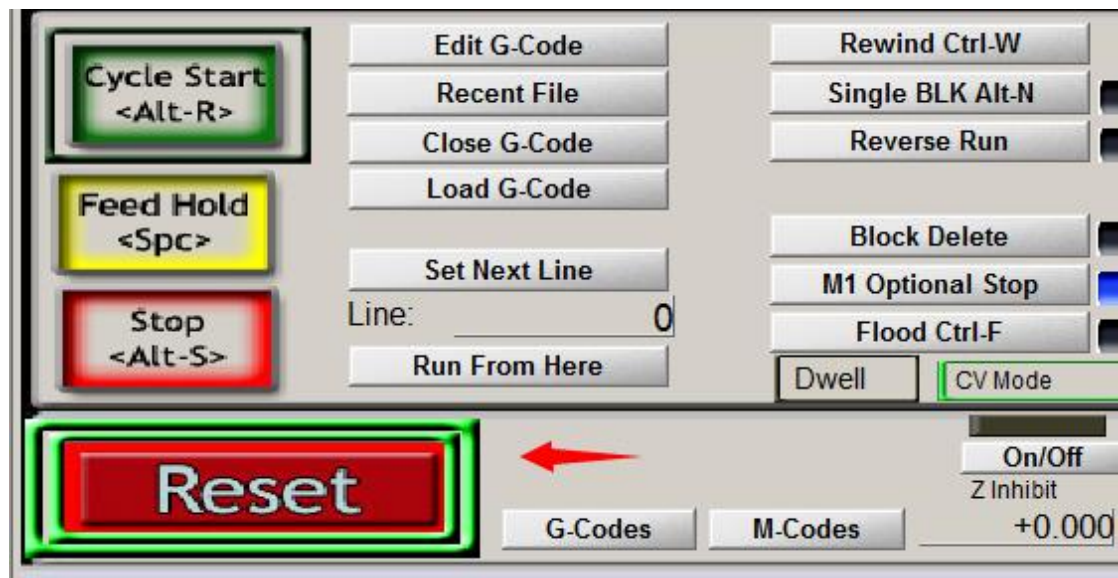
Then ,copy mach3mill.xml from file to mach3, The file is used to basic software setting .



Copy M930.m1s file from Usb card driver to Mach3/macros/Mach3mill file, This file used to auto zero tool setting.

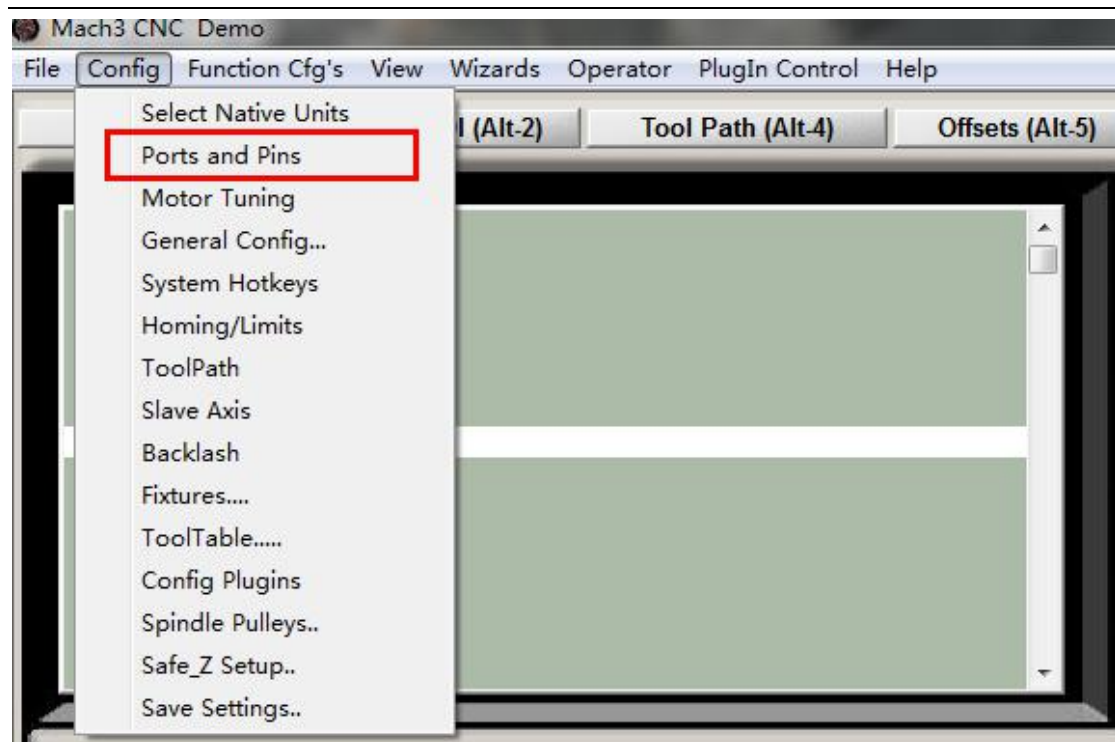


At last, click reset button to keep it green , let machine can normal work.

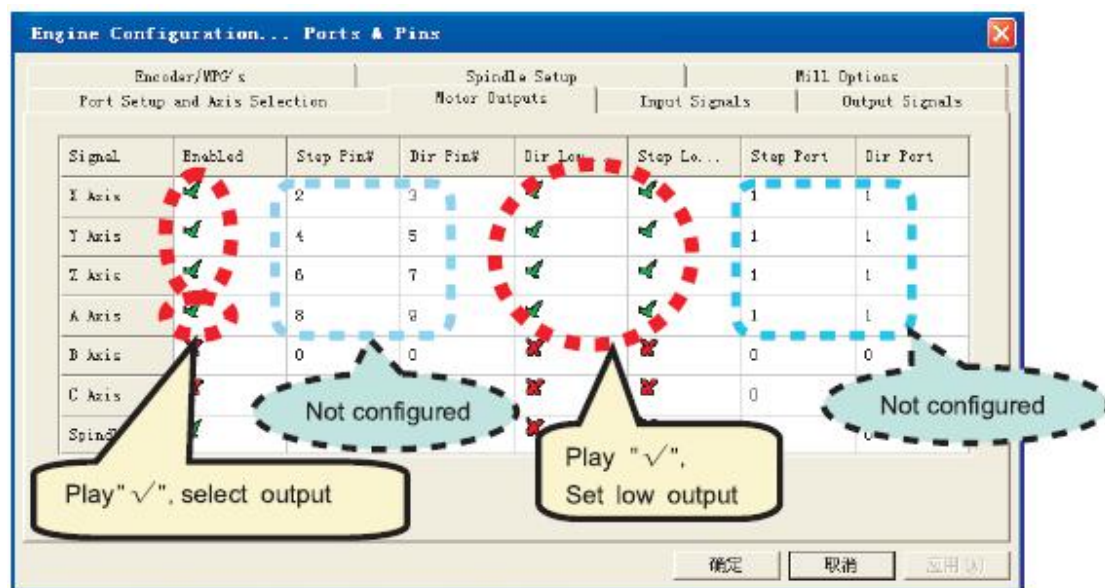


3 Mach3 software setting

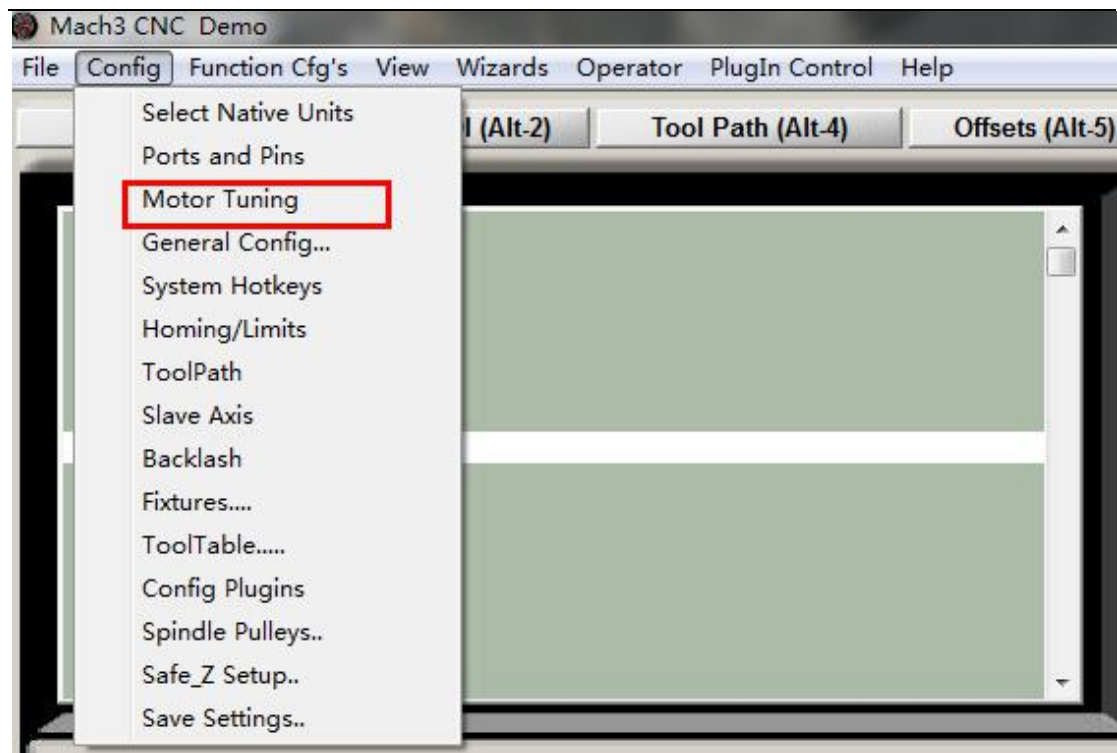
X Y Z A Axis output configuration as below, select config and Ports and pins .



Then ,make all setting as below:



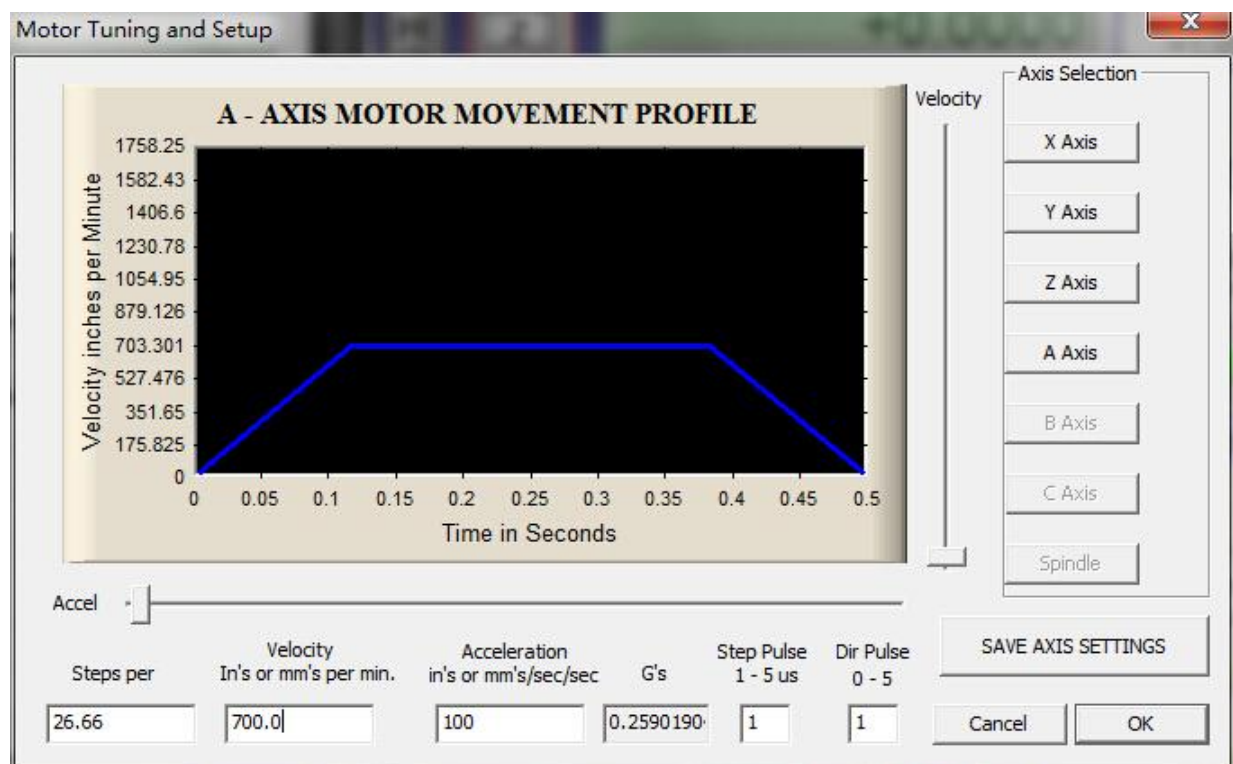
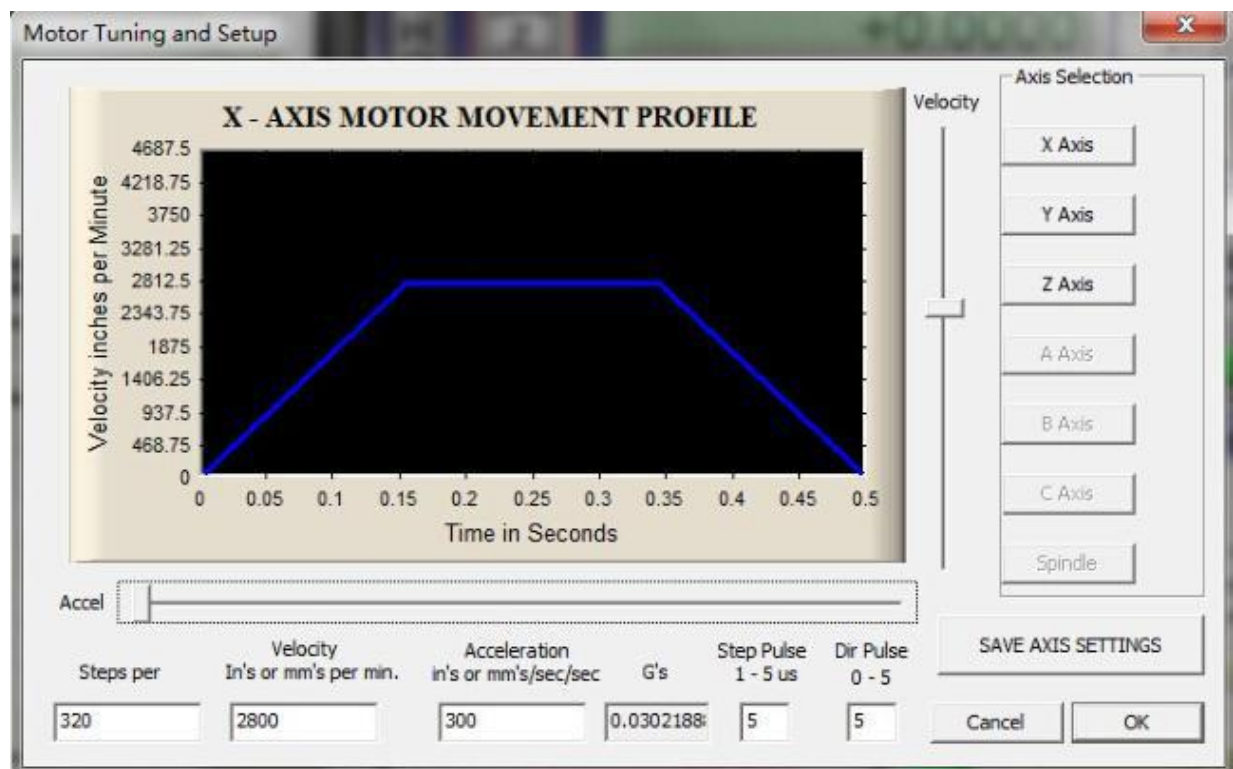
Motor parameter settings, X Y Z Axis setting is completely same ,The Axis setting is different.



If can not set A Axis ,Need to Enable A Axis firstly in Motor

Encoder/MPG' s			Spindle Setp	
Port Setup and Axis Selection			Motor Outputs	
Signal	Enabled	Step Pin#	Dir Pin#	Dir Lo
X Axis		2	6	
Y Axis		3	7	
Z Axis		4	8	
A Axis		5	9	

outputs



Homing/Limits home direction setting as below

Motor Home/SoftLimits

Entries are in setup units.

Axis	Revers...	Soft Max	Soft Min	Slow Z...	Home ...	Home Neg
X		100.00	-100.00	1.00	0.0000	
Y		100.00	-100.00	1.00	0.0000	
Z		100.00	-100.00	1.00	0.0000	
A		100.00	-100.00	1.00	0.0000	
B		100.00	-100.00	1.00	0.0000	

G28 home location coordinates

X	0	A	0
Y	0	B	0
Z	0	C	0

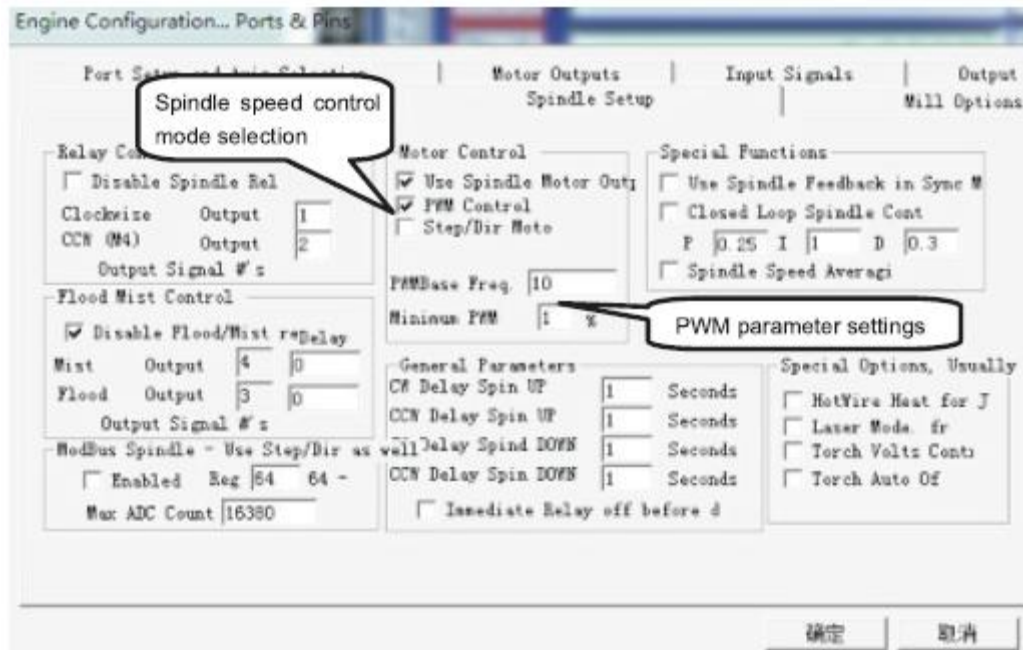
If home moving way reverse ,change Active low from to , or
change from to .

Output signals setting as below

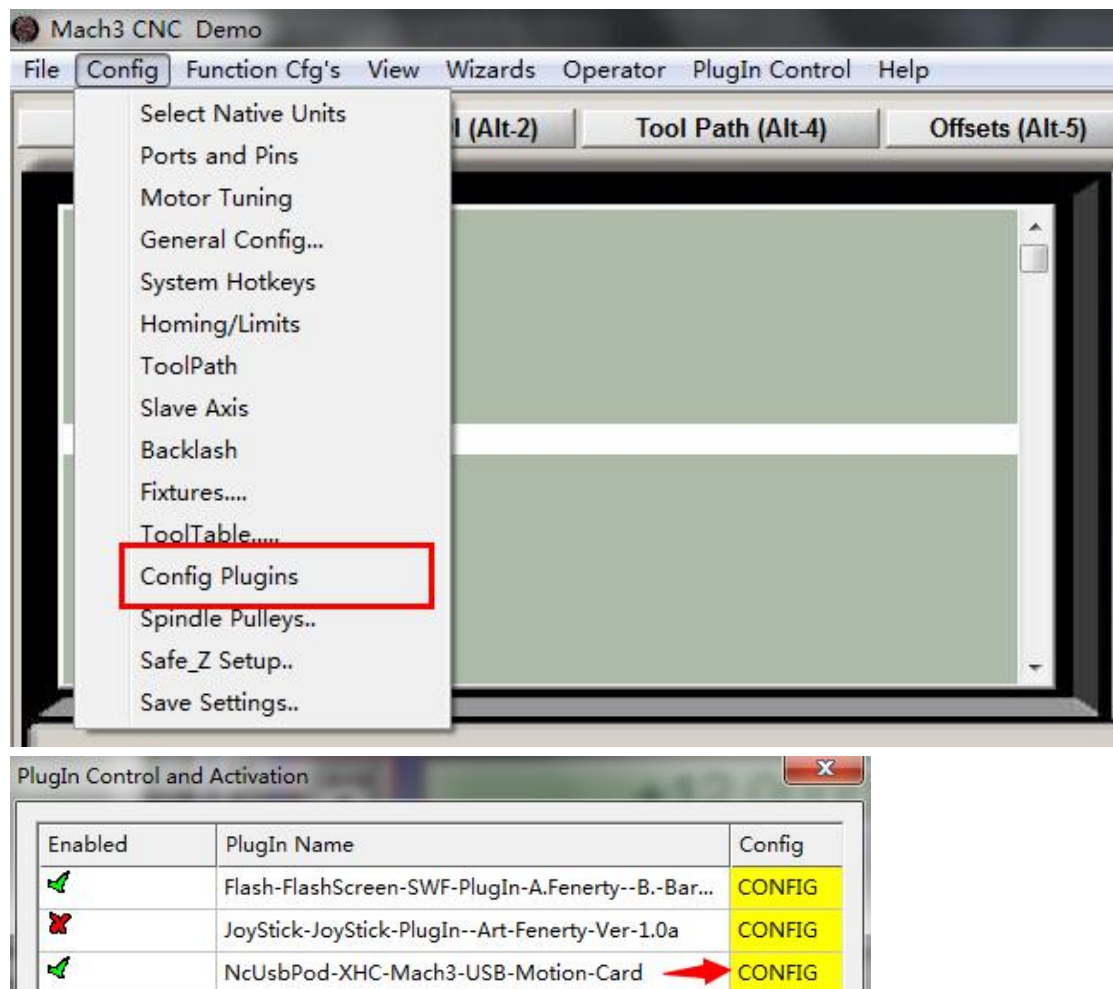
Engine Configuration... Ports & Pins

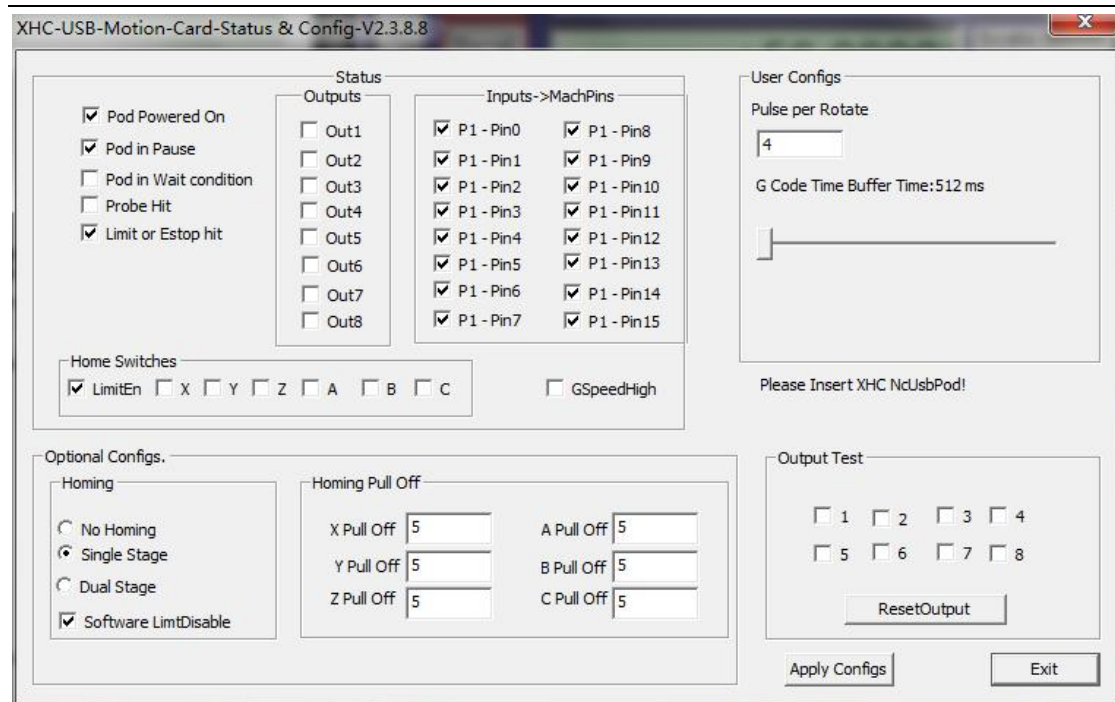
Encoder/MPG's		Spindle Setup		Mill Options
Port Setup and Axis Selection		Motor Outputs		Output S
Signal	Enabled	Port #	Pin Number	Active Low
Enable6		1	0	
Output #1		1	0	
Output #2		1	1	
Output #3		1	2	
Output #4		1	3	
Output #5		1	0	
Output #6		1	0	
Charge Pump		1	0	

Spindle speed control as below:

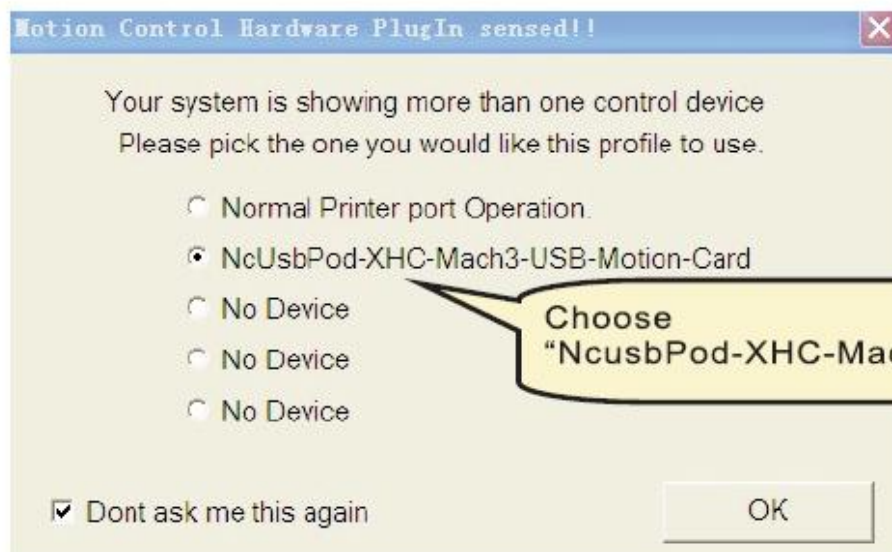


USB Motion control card configuration





At last , Open software , Choose "NcUsbPod-XHC-Mach3-USB-Motion-Card", and Choose "Don't ask me this again"

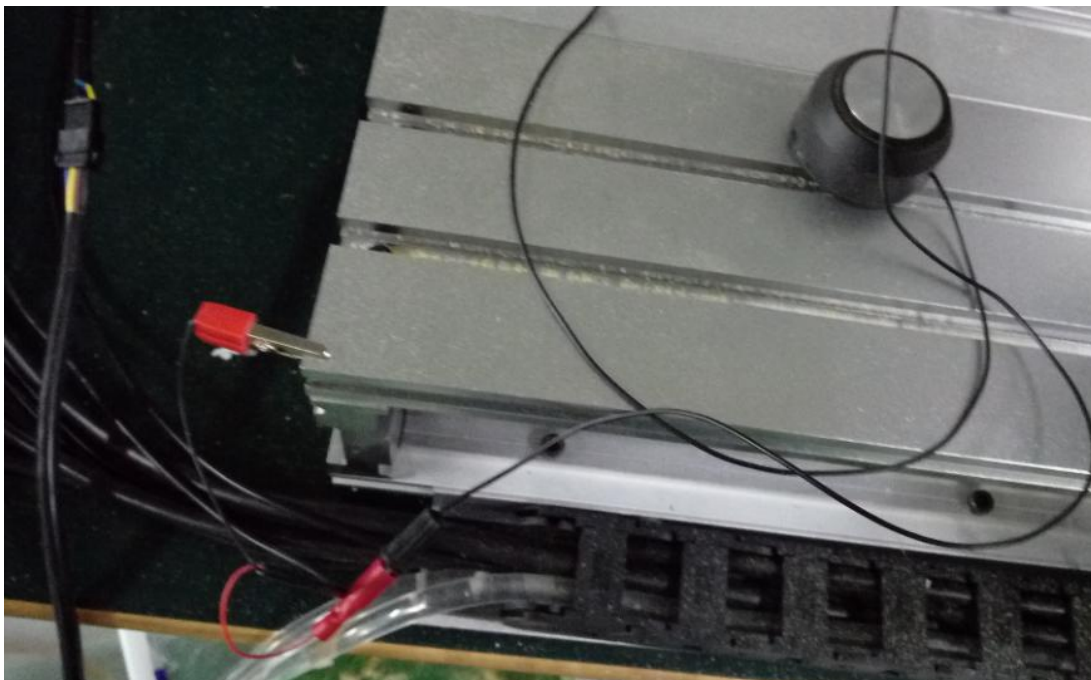


All above , The MACH3 installation and setting is finished.

Part 3 Start position setting

The start position setting is a important preparation before start work .

1 Confirm probe connection is correct



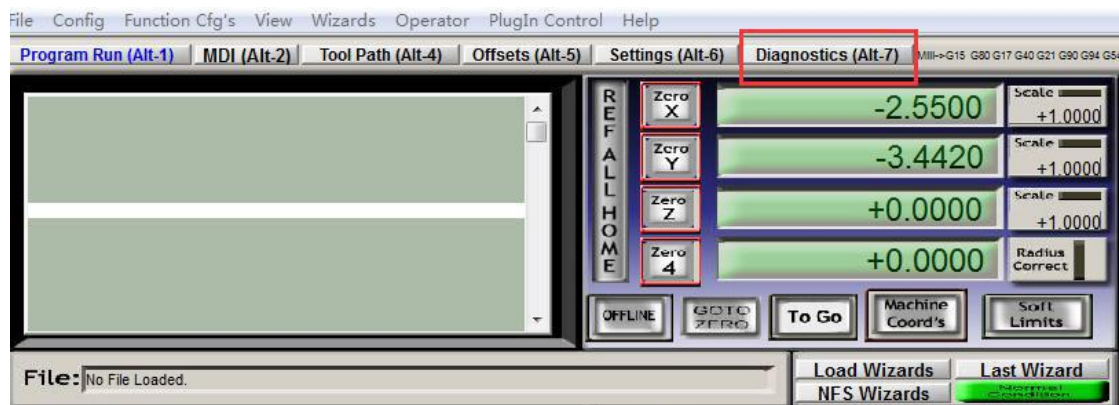
2 To confirm actual height of probe

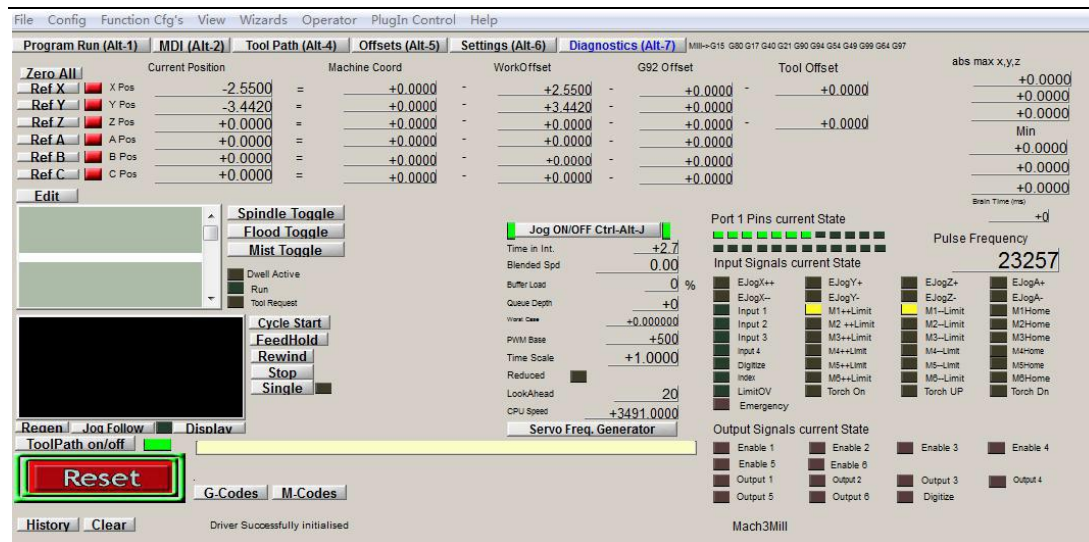
Generally ,It is 26mm. The offset is actual height +0.5mm. For example ,The actual height is 26mm ,The offset is $26+0.5=26.5\text{mm}$.



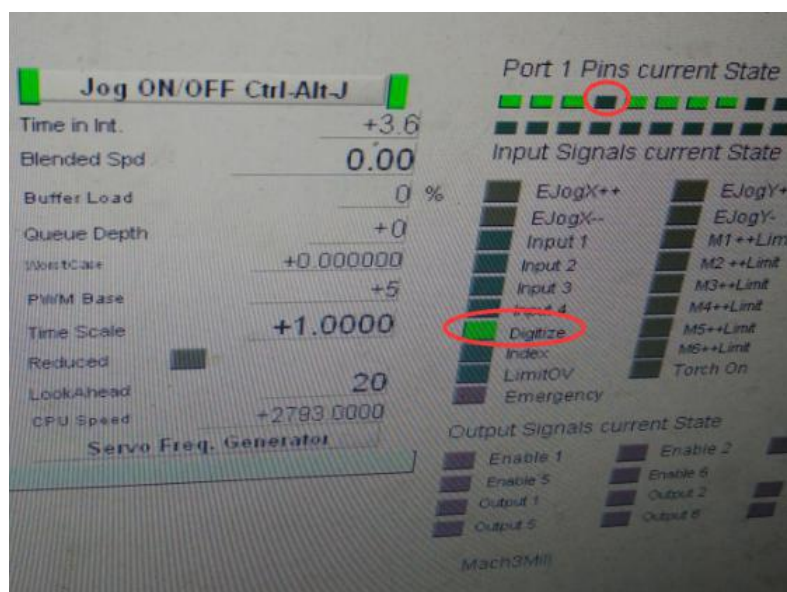
3 Test Probe

Click Diagnostics, Entry into Diagnostics interface ,test the probe whether is correct connection



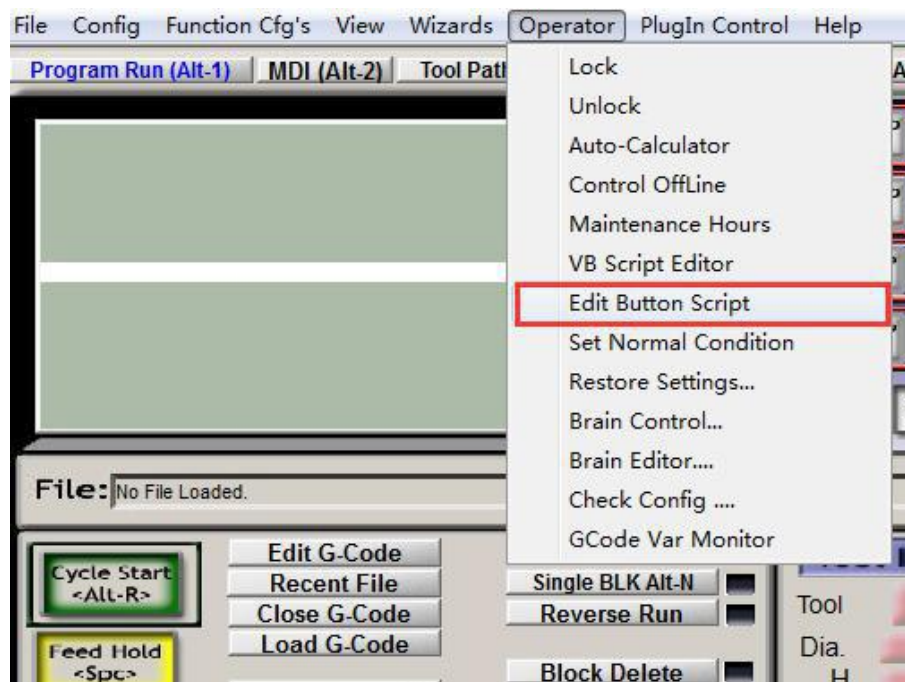


Then using probe to touch engraving bits ,The below one will get black ,and the other one will get light ,The test is finished ,it shows the probe hardware connection is correct.

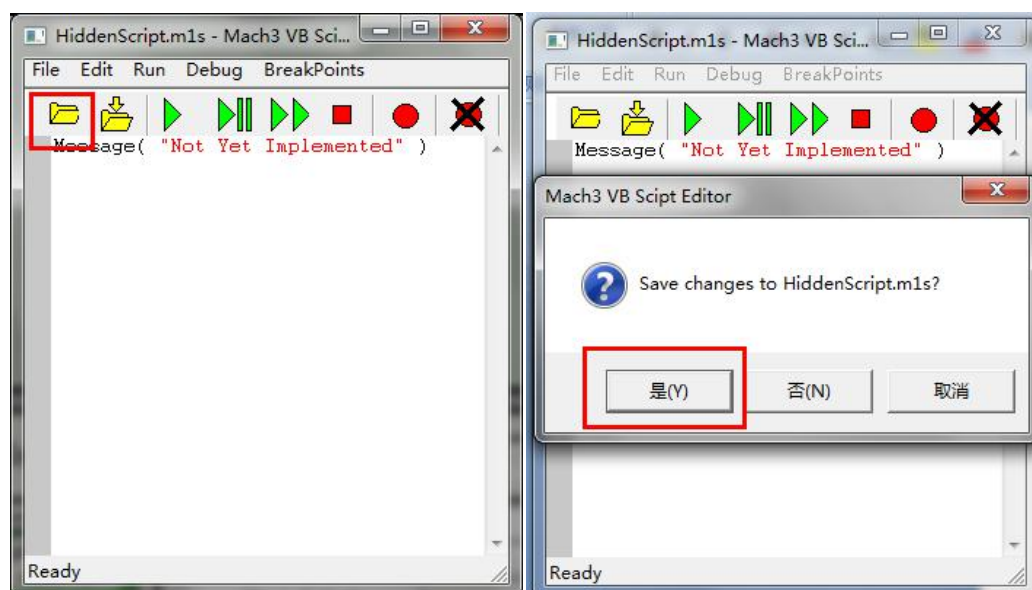


4 Button Script setting

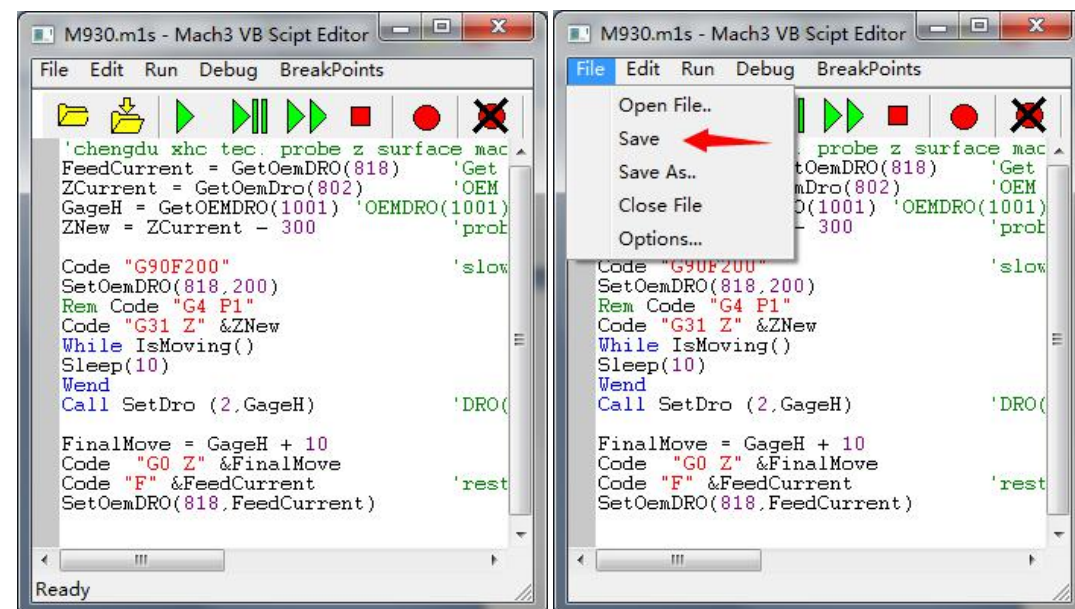
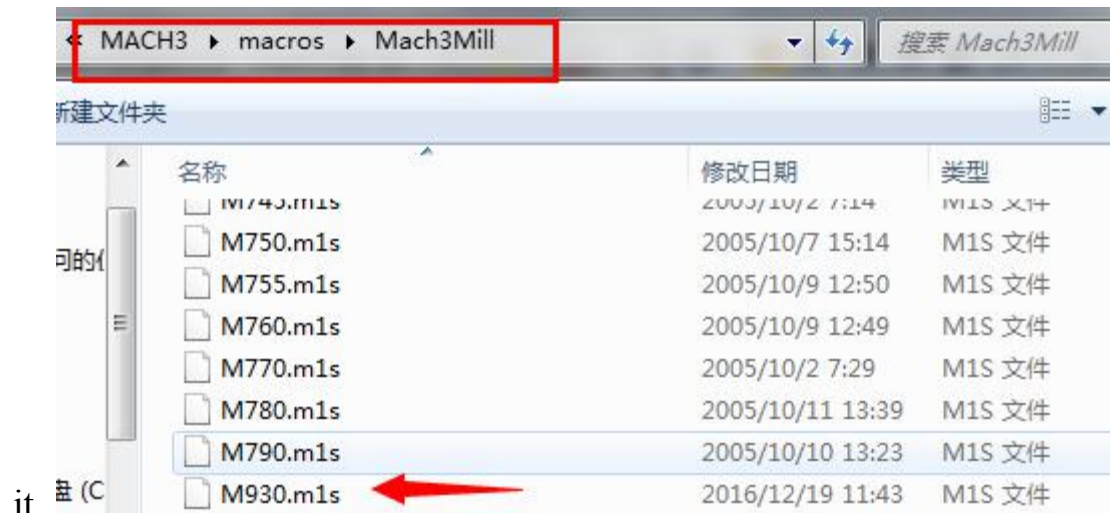
Then Click “Program Run (Alt-1)”,then click “Operator” and choose “Edit Button Script”, Then The Auto zero tool button will flash (Meanwhile other button also flash , ignore it)



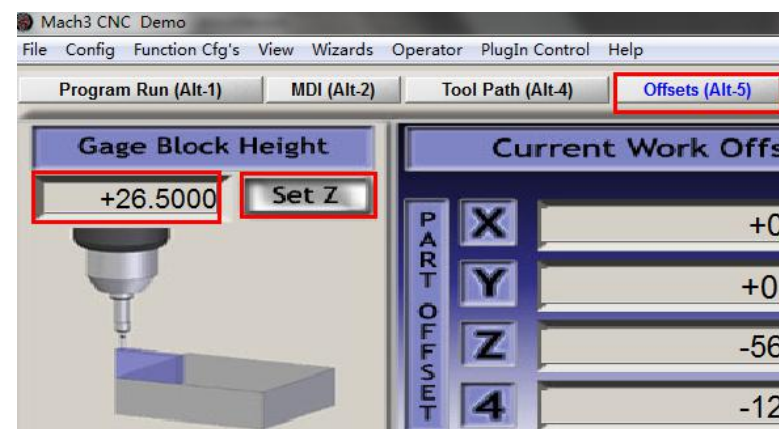
Click Auto zero tool button ,and enter into MACH3 VB script interface, and click open file ,and choose save.



Then find M930.m1s file from MACH3/macros/Mach3mill,open



At last Click “Offsets(Alt-5)”,and change Gage Block Height to “26.5” which previous measured offset.

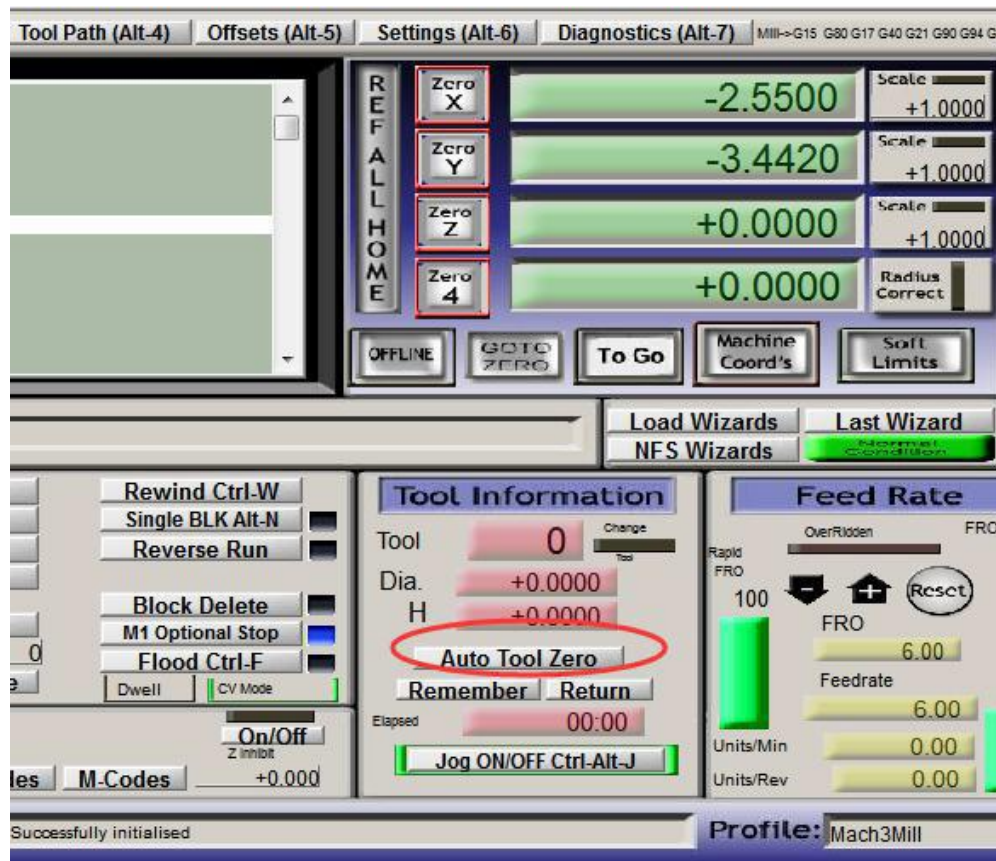


5 Select start position

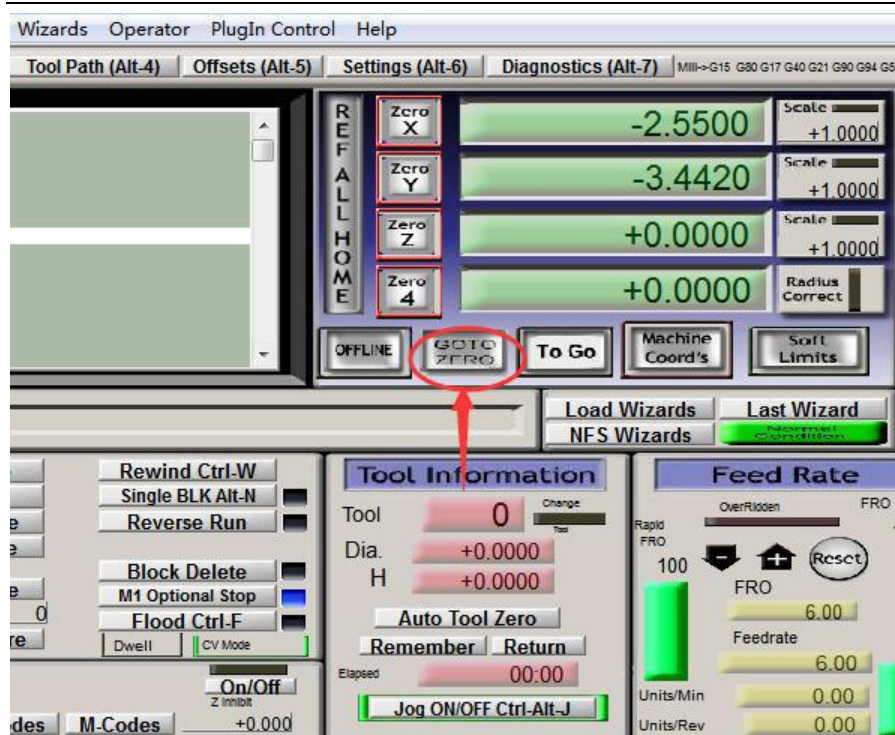
the spindle to the position where you want , Then cleaning X and Y Axis using Zero X , Zero Y .



Put probe under spindle again, click auto zero tool again , The Z Axis will automatic touch probe and return back , Meanwhile Z Axis will Automatic Zero Z .



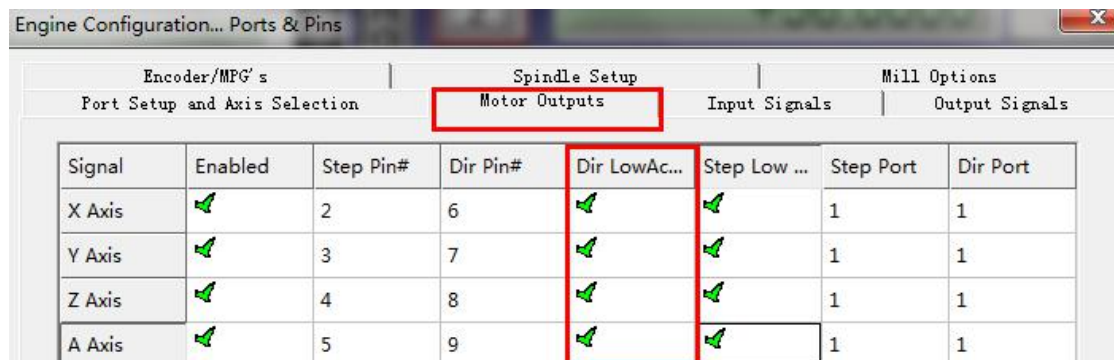
At last , Take probe away from work piece ,Click Goto Zero button ,The machine will automatic go to zero point. The start point setting is finished.



Part 4 FAQ

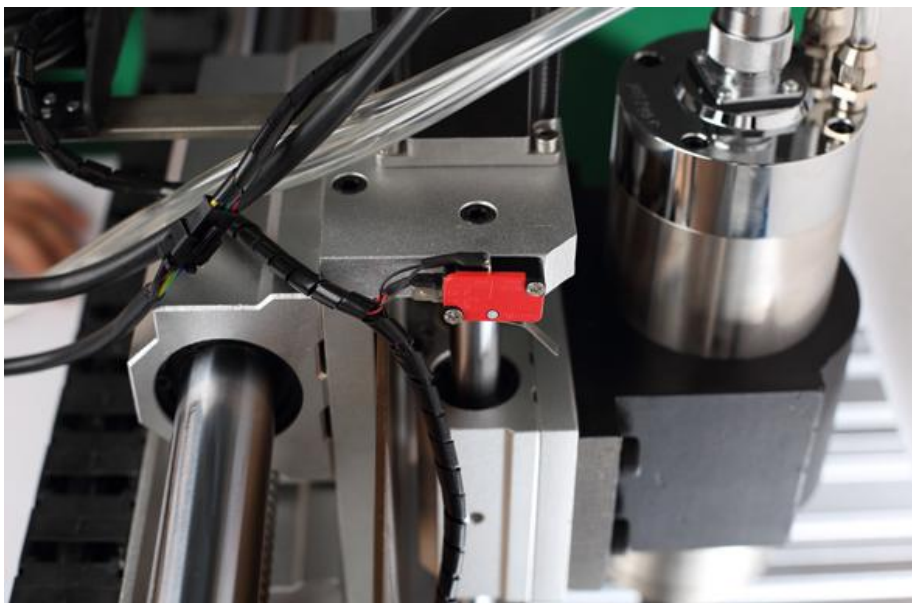
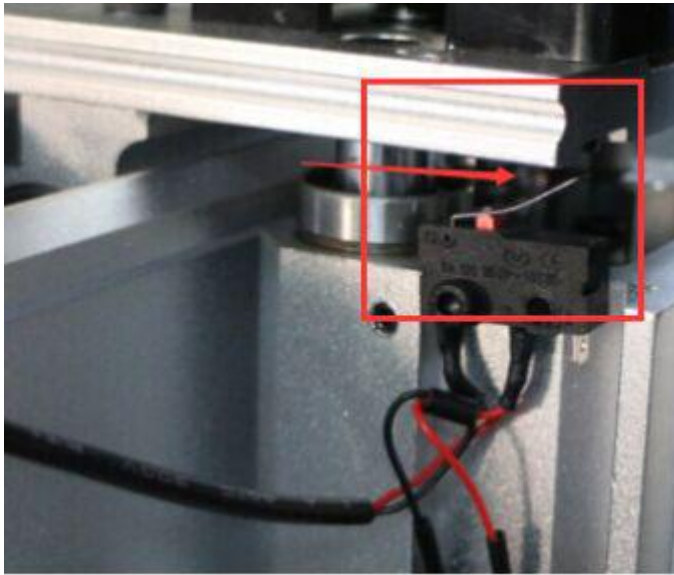
1.The Axis moving direction is wrong

Which Axis goes wrong direction , you change that Axis below Dir low active setting , If home moving way reverse ,change Active low from ☒ to ☐ ,or change from ☐ to ☒.



2. Manual reset limit switch

All X Y Z has 2 limited switch . Once the Axis touch below limit switch ,Machine will stop work ,and reset button will get red in controller box . Then Manually Moving axis away from limit switch(switch off machine, easy to move) , press reset to make sure to get green at last restart machine to work .



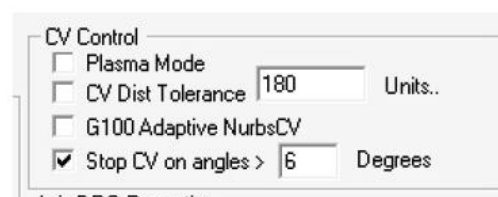
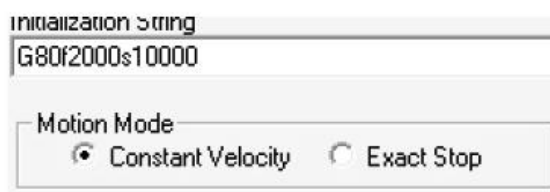
3. Package information

When unpack wooden box, some client thought machine lack accessories , That is misunderstanding .After you installed step motor ,The machine will be ready



4 Rectangle work to round

Enter into General Logic configuration , select Motion mode to constant Velocity , Select CV control stop CV on angles > 6 degrees as below:



5 USB motion card can be found by MACH3

Make sure USB cable connection is good ,make sure VFD has ground and input power of VFD has electrical filter to isolate noise.

6 How to ref all home

Firstly enable X Home ,Y Home ,Z Home , and confirm setting is correct.

Engine Configuration... Ports & Pins

Encoder/MPG's		Spindle Setup		Input Signals		Mill Options
Port Setup and Axis Selection		Motor Outputs				Output
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
X ++		1	0			0
X --		1	0			0
X Home		1	0			0
Y ++		1	1			0
Y --		1	1			0
Y Home		1	1			0
Z ++		1	2			0

Engine Configuration... Ports & Pins

Encoder/MPG's		Spindle Setup		Input Signals		Mill Options
Port Setup and Axis Selection		Motor Outputs				Output Signal
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
X Home		1	0			0
Y ++		1	1			0
Y --		1	1			0
Y Home		1	1			0
Z ++		1	2			0
Z --		1	2			0
Z Home		1	2			0

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

Secondly ,Confirm plugin setting correct ,especially ,Choose single stage

XHC-USB-Motion-Card-Status & Config-V2.3.8.8

☒ Pod Powered On
☒ Pod in Pause
☐ Pod in Wait condition
☐ Probe Hit
☐ Limit or Estop hit

Status Outputs
☐ Out1
☐ Out2
☐ Out3
☐ Out4
☐ Out5
☐ Out6
☐ Out7
☐ Out8

Inputs->MachPins
☒ P1 - Pin0 ☒ P1 - Pin8
☒ P1 - Pin1 ☒ P1 - Pin9
☒ P1 - Pin2 ☒ P1 - Pin10
☒ P1 - Pin3 ☒ P1 - Pin11
☒ P1 - Pin4 ☒ P1 - Pin12
☒ P1 - Pin5 ☒ P1 - Pin13
☒ P1 - Pin6 ☒ P1 - Pin14
☒ P1 - Pin7 ☒ P1 - Pin15

Home Switches
☒ LimitEn ☐ X ☐ Y ☐ Z ☐ A ☐ B ☐ C ☐ GSpeedHigh

User Configs
 Pulse per Rotate

 G Code Time Buffer Time:512 ms

Optional Configs.
Homing
☐ No Homing
☒ Single Stage
☐ Dual Stage
☒ Software LimitDisable

Homing Pull Off
 X Pull Off A Pull Off
 Y Pull Off B Pull Off
 Z Pull Off C Pull Off

Output Test
☐ 1 ☐ 2 ☐ 3 ☐ 4
☐ 5 ☐ 6 ☐ 7 ☐ 8

At last ,click ref all home button in MACH3.

The image shows the Mach3 software interface. On the left, a vertical button labeled "REF ALL HOME" is highlighted with a red box. To its right, there are four "Zero" buttons for X, Y, Z, and 4, also highlighted with red boxes. The main display area shows position readouts for these axes: X is +0.0000, Y is +0.0000, Z is +56.0000, and 4 is +12.0000. Each axis has a "Scale" control set to +1.0000, except for axis 4 which has a "Radius Correct" indicator. At the bottom, there are buttons for "OFFLINE", "GOTO ZERO", "To Go", "Machine Coord's", and "Soft Limits".