



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.USBcable *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. Thenunpack 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.

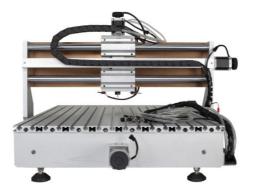




Second, You can try to found the screw position before installation. Third,

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 fram 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

Downlaod lasted 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

Select Packages Flease select the program features that The Parall Frogram Features	el Port Driver can deselect.
Parallel Fort Driver Vizards VML's LazyCan Screen sets Standard Mach3Turn screen Standard Mach3Mill screen Standard Mach3 Plasma screen	Installs the Parallel Port Driver. This is not needed for external motion control devices. (328 NB)
Total space required: 39.5 MB	ck Mext > Cancel

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.



明书 ▶ 六轴MACH3 ▶ 芯合成	V2.38.8 English Manual 🕨	Usb card driver-	/2.38.8
共享 ▼ 新建文件夹	•		
3称	修改日期	类型	大小
	2016/12/6 18:08	M1S 文件	1 KE
🗟 NcUsbPod.dll 🔸	2016/10/13 9:43	应用程序扩展	272 KE
readme	2016/10/13 9:43	文本文档	1 KE
Release Note-2.38.8	2016/10/13 9:43	文本文档	4 KE
软件 (F:) 🔸 Program Files 🕨 M.	ACH3 > PlugIns		•
软件 (F:) → Program Files → M. 共享 ▼ 新建文件夹	ACH3 ▶ PlugIns		•
	ACH3 ▶ PlugIns 修改日期	类型	▼ 大小
共享▼ 新建文件夹		类型 应用程序扩展	▼ 大小 1,070 KB
共享 新建文件夹 名称 ^	修改日期		
共享 ▼ 新建文件夹 名称 ^③ Flash.dll	修改日期 2008/7/16 3:01	应用程序扩展	1,070 KB
共享 ▼ 新建文件夹 名称 ④ Flash.dll ④ JoyStick.dll	修改日期 2008/7/16 3:01 2007/9/5 4:33	应用程序扩展 应用程序扩展	1,070 KB 180 KB
共享 ▼ 新建文件夹 名称 ¹ Flash.dll ¹ JoyStick.dll ¹ NcUsbPod.dll	修改日期 2008/7/16 3:01 2007/9/5 4:33 2016/10/13 9:43	应用程序扩展 应用程序扩展 应用程序扩展	1,070 KB 180 KB 272 KB

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

software setting.

3 🕨 芯合成V2.38.8	English Manual	Mach3 config file ►	4 axis card mk4	config 🚽
共享 ▼ 新建文	件夹			
名称	A	修改日期	类型	大小
🖭 Mach3Mill		2016/10/13 9:43	XML 文档	150 KB

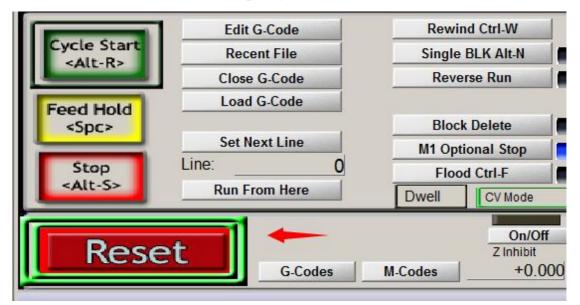
Copy M930.m1s file from Usb card driver to Mach3/macros/Mach3mill

file, This file used to auto zero tool setting.



#= ****			
共享 ▼ 新建文件夹			
名称	修改日期	类型	大小
M930.m1s	- 2016/12/6 18:08	M1S 文件	1 KB
NcUsbPod.dll	2016/10/13 9:43	应用程序扩展	272 KB
<mark>readme</mark>	2016/10/13 9:43	文本文档	1 KB
Release Note-2.38.8	2016/10/13 9:43	文本文档	4 KB
	CH3 ▶ macros ▶ Mach3Mi	11	
共享▼ 新建文件夹			222
共享 ▼ 新建文件夹 S称	修改日期	美型	▼ 大小
共享▼ 新建文件夹		类型 IVI13 X1+	▼ 大小 +0 KL 103 KE
共享 ▼ 新建文件夹 名称 ^	修改日期 2003/10/27.23	类型 IV113 文1+ M1S 文件	40 N
共享 ▼ 新建文件夹 名称 M780.m1s	修改日期 2003/10/2 / 23 2005/10/11 13:39	类型 IVI13 X1+ M1S 文件 M1S 文件	103 KE
共享 ▼ 新建文件夹 名称 M780.m1s M790.m1s	修改日期 2005/10/27.25 2005/10/11 13:39 2005/10/10 13:23	类型 IVI13 X1+ M1S 文件 M1S 文件	40 KE

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



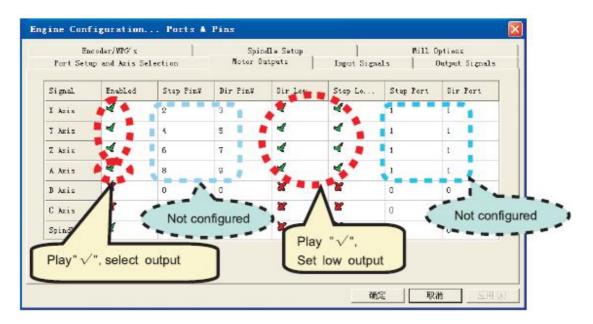
3 Mach3 software setting

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



ile C	onfig Function Cfg's Vie	w Wizards C	Operator PlugIn Control	Help
	Select Native Units	I (Alt-2)	Tool Path (Alt-4)	Offsets (Alt-5)
-	Ports and Pins	(price)		
	Motor Tuning			
	General Config			<u> </u>
	System Hotkeys			
	Homing/Limits			
	ToolPath			
	Slave Axis			
	Backlash			
	Fixtures			
	ToolTable			
	Config Plugins			
	Spindle Pulleys			
	Safe_Z Setup			
	Save Settings			

Then ,make all setting as below:



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

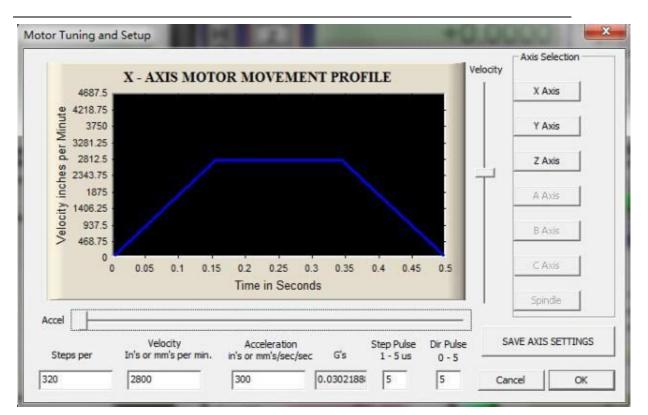


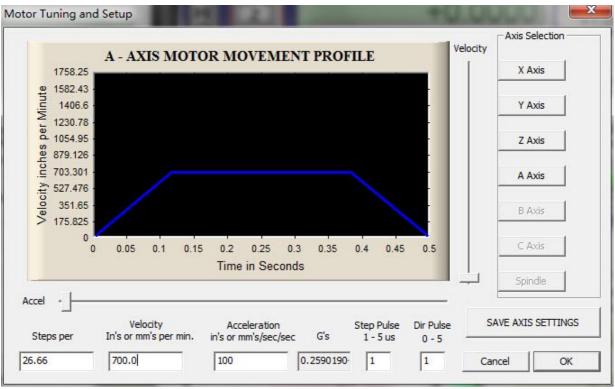
File C	onfig Function Cfg's Vie	w Wizards O	perator PlugIn Control	Help
_	Select Native Units Ports and Pins	I (Alt-2)	Tool Path (Alt-4)	Offsets (Alt-5
	Motor Tuning			_
	General Config			<u>^</u>
	System Hotkeys			
	Homing/Limits			
	ToolPath			
	Slave Axis			
	Backlash			
	Fixtures			
	ToolTable			
	Config Plugins			
	Spindle Pulleys			
	Safe_Z Setup			+
	Save Settings			

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

	der/MPG's and Axis Sele	ction	Spind] Motor Out	le Setu puts
Signal	Enabled	Step Pin#	Dir Pin#	Dir Lo
X Axis	4	2	6	X
Y Axis	4	3	7	X
Z Axis	4	4	8	X
A Axis	4	5	9	X







Homing/Limits home direction setting as below



			Entries	are in setup	units.	
Axis	Revers	Soft Max	Soft Min	Slow Z	Home	Home Neg
×	*	100.00	-100.00	1.00	0.0000	4
Y	*	100.00	-100.00	1.00	0.0000	1
z	2	100.00	-100.00	1.00	0.0000	* :
A	*	100.00	-100.00	1.00	0.0000	2
В	*	100.00	-100.00	1.00	0.0000	X
				111	1	
G28	home location coor	dinates	_			
х	0 A	0				
Y	0 B	0				
z	0 C	0				

If home moving way reverse ,change Active low from $\,\sqrt{}\,$ to X ,or

change from X to $\sqrt{}$.

Output signals setting as below

Encoder/ Port Setup and	MPG's Axis Selection		indle Setup Outputs Inj	out Signals	Option: Output
Signal	Enabled	Port #	Pin Number	Active Low	*
Enable6	2	1	0	2	
Output #1	4	1	0	4	
Output #2	4	1	1	4	m
Output #3	4	1	2	4	
Output #4	4	1	3	4	7
Output #5	20	1	0	2	-
Output #6	22	1	0	2	
Charge Dump	2	1	0	22	-



Spindle speed control as below:

Clockwize Output 1 CCN (M4) Output 2 Output Signal #'s Flood Mist Control Flood Output 4 Flood Output 3 Flood Output 3 Flood Output 3 Flood Output 3 Flood Output 5 Flood Output 4 Flood Output 5 Flood Flood Floo	□ Use Spindle Feedback in Sync W □ Closed Loop Spindle Cont P 0.25 I I D 0.3 □ Spindle Speed Averagi
Image: Special Options, Flood Output General Parameters Special Options, Flood Output Flood Output 0 0 0	
Cather Solds II Later Bode. IF	Seconds For Torch Auto Of

USB Motion control card configuration

le	Config	Function Cfg's	View	Wizards	Operator	PlugIn Control	Help	
		lect Native Units rts and Pins		I (Alt-2)	Too	I Path (Alt-4)	Offsets	(Alt-5
		otor Tuning						
		neral Con <mark>f</mark> ig						-
	Sys	stem Hotkeys						ш.
	Ho	ming/Limits						
	То	olPath						
	Sla	ive Axis						
	Ba	cklash		1				
	Fix	tures						
	To	olTable						
		nfig Plugins						
	1000	indle Pulleys						
		fe_Z Setup						-
	Sa	ve Settings						

Enabled	PlugIn Name	Config
4	Flash-FlashScreen-SWF-PlugIn-A.FenertyBBar	CONFIG
X	JoyStick-JoyStick-PlugInArt-Fenerty-Ver-1.0a	CONFIG
4	NcUsbPod-XHC-Mach3-USB-Motion-Card 🔶	CONFIG



	Status			User Configs
Pod Powered On	Outputs	Inputs	s->MachPins ▼ P1 - Pin8	Pulse per Rotate
Pod in Pause	C Out2		P1 - Pin9	4
Pod in Wait condition	C Out3		P1 - Pin 10	G Code Time Buffer Time: 512 ms
Probe Hit	Out4	▼ P1 - Pin3	P1-Pin11	
Limit or Estop hit	C Out5	▼ P1 - Pin4	P1-Pin12	
	C Out6	▼ P1 - Pin5	P1 - Pin 13	
	C Out7	▼ P1 - Pin6	P1 - Pin 14	
	C Out8	P1 - Pin7	P1 - Pin 15	
I LimitEn ∏ X ∏ Y ∏				
otional Configs.				Output Test
Homing	Homing Pull C	off		
	X Pull Off	5	A Pull Off 5	
No Homing	X Pull Off			
No Homing		5	B Pull Off 5	
• Single Stage	Y Pull Off	<u> </u>		
절대한 동안 동안한 특징이다.	Y Pull Off Z Pull Off		C Pull Off 5	ResetOutput

At last, Open

 $software\ , Choose "NcUsbPod-XHC-Mach3-USB-Motion-Card", and Choo$

se "Don't ask me this again"

Your system is showing more	e than one control device
Please pick the one you wo	uld like this profile to use.
C Normal Printer port	Operation.
RcUsbPod-XHC-M	lach3-USB-Motion-Card
🔍 No Device	Choose
No Device	"NcusbPod-XHC-Mach3-USB-Motion-Ca
○ No Device	

All above, The MACH3 installation and setting is finished.

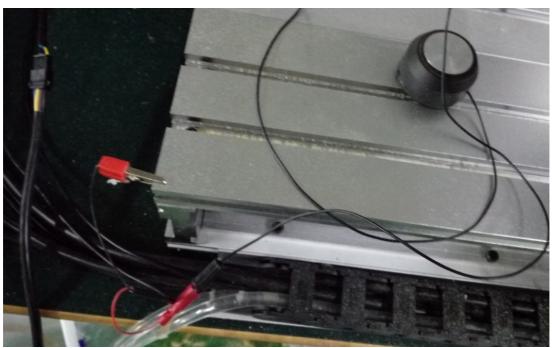


Part 3Start position setting

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

1Confirm 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=26.5mm.



3 Test Probe

Click Diagnostics, Entry intoDiagnostics interface ,test the probe whether



is	correct	connection

File Config Function Cfg's View Wizards Operator	PlugIn Contro	l Help		
Program Run (Alt-1) MDI (Alt-2) Tool Path (Alt-4) Of	fsets (Alt-5)	Settings (Alt-6)	Diagnostics (Alt-7)	MIII->G15 G80 G17 G40 G21 G90 G94 0
	Â	R Zero F Zero		.5500 scale +1.0000
	- 11	L Zero H Z		.0000 +1.0000 +1.0000
		M Zero 4		.0000 Radius Correct
File: No File Loaded.		ZER	Load Wiza NFS Wizar	
Zero All Current Position Machine Coord Ref X X Pos -2.550 = +0.0000 - Ref X Y Pos -3.4420 = +0.0000 - Ref X Z Pos +0.0000 = +0.0000 - Ref A A Pos +0.0000 = +0.0000 - Ref B B Pos +0.0000 = +0.0000 - Ref C C Pos +0.0000 = +0.0000 - Ref C C Pos +0.0000 = +0.0000 -		Inostics (Alt-7) Milline Gis of G92 Offset - +0.0000 - +0.0000 - +0.0000 - +0.0000 - +0.0000 - +0.0000 - +0.0000 - +0.0000		abs max x,y,z +0.0000 +0.0000 Min +0.0000 +0.0000 +0.0000 Ben Time (ms)
Spindle Toggle Flood Toggle Flood Toggle Dwell Active Run Cycle Start Feedfold Rewind Stop Single	Jog ON/OFF 4 Time in Int. Blended Spd Duffer Load Quee Deph Www Cas PWM Sase Time Scale Reduced LookAhead CPU Speed		1 Pins current State Liggnals current State ElogX+ ElogY+ ElogX+ ElogY+ Input 1 M1+Limit Input 2 M2+Limit Input 3 M3+Limit Upgtae M4+Limit Digtae M3+Limit Digtae M3+Limit LimitOV Torch On Emergency Torch On Stangaels Current State	+0 Pulse Frequency 23257 Elog2+ Elog4+ Elog4+ Ma-Limit Ma
ToolPath on/off		=	Enable 5 Enable 6 Output 1 Output 2	Enable 3 Enable 4 Output 3 Output 4 Digitize

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.





Jog ON/O	FF Ctrl-Alt-J	Port 1 Pins c	
Time in Int.	+3.6		
Blended Spd	0.00	Input Signals	current State
Buffer Load	0 %	EJogX++	EJogY-
Queue Depth	+0	EJogX Input 1	EJogY-
WestCase	+0.000000	Input 2	M2 ++Linit
PW/M Base	+5	Input 3	M3++Linit
Time Scale	+1.0000 (Digitize	M5++Link
Reduced		Index LimitOV	MS++Linit Torch On
LookAhead	20	Emergency	- AND MORE
CPU Speed	+2793 0000	Output Signals curre	nt State
Servo Freg	. Generator	Enable 1	Enable 2
		Enable S	Enable 6
		Contraction of the second	Calent 2 III
		g output 5	

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

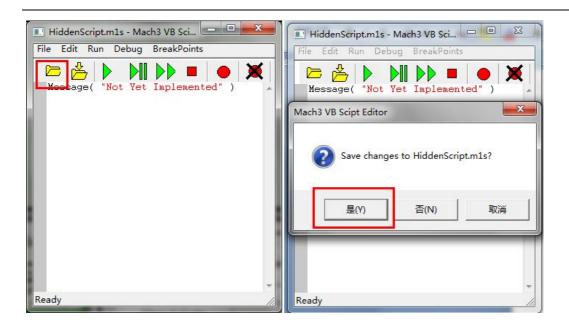
(Meanwhile other button also flash, ignore it)

File Config Function Cfg's View Wizards	Operator PlugIn Control Help
Program Run (Alt-1) MDI (Alt-2) Tool Pati	Lock Al Unlock Auto-Calculator Control OffLine Maintenance Hours VB Script Editor
File: No File Loaded.	Edit Button Script Set Normal Condition Restore Settings Brain Control Brain Editor Check Config
Cycle Start Edit G-Code <alt-r> Recent File Close G-Code Load G-Code <spc> Close G-Code</spc></alt-r>	GCode Var Monitor Single BLK Alt-N Reverse Run Block Delete H

Click Auto zero tool button ,and enter into MACH3 VB script interface,

and click open file ,and choose save.

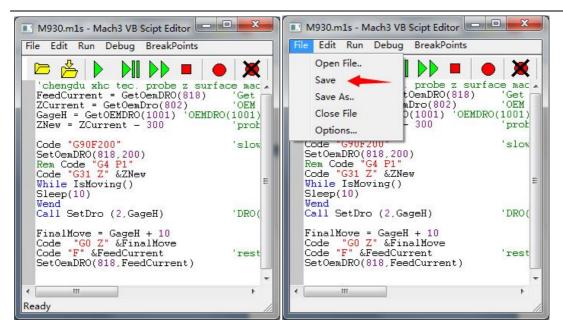




Then find M930.m1s file from MACH3/macros/Mach3mill,open it .

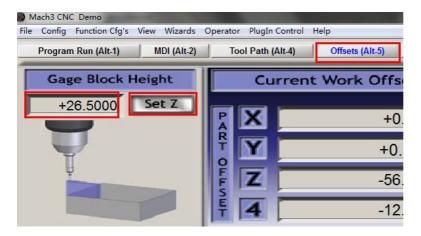
建文件到	Ę		833
*	名称	修改日期	类型
1	WI/43.0115	2003/10/2 /:14	WITS X4+
es.	M750.m1s	2005/10/7 15:14	M1S 文件
HDI	M755.m1s	2005/10/9 12:50	M1S 文件
E	M760.m1s	2005/10/9 12:49	M1S 文件
	M770.m1s	2005/10/2 7:29	M1S 文件
	M780.m1s	2005/10/11 13:39	M1S 文件
	M790.m1s	2005/10/10 13:23	M1S 文件
(C	M930.m1s	2016/12/19 11:43	M1S 文件





At last Click "Offsets(Alt-5)", and change Gage Block Height to "26.5"

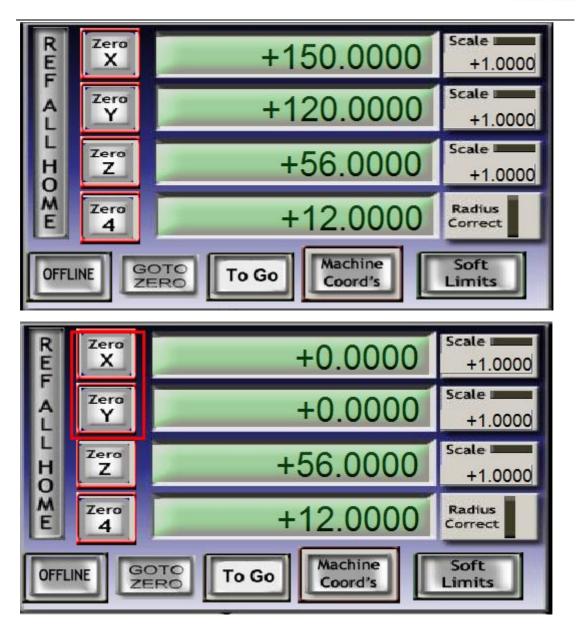
which previous measured offset.



5 Select start position

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

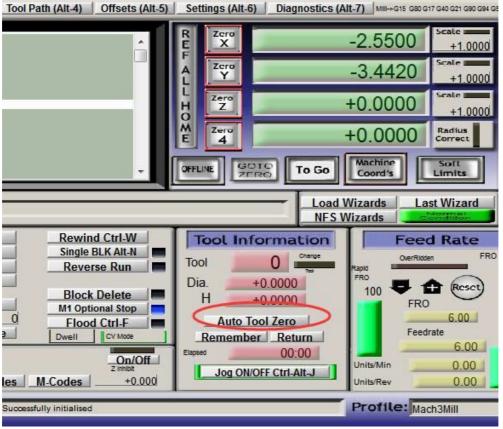




Put probe under spindle again, click auto zero tool again, The Z Axis will automatic touch probe and return back, Meanwhile Z Axis will Automatic Zero Z.

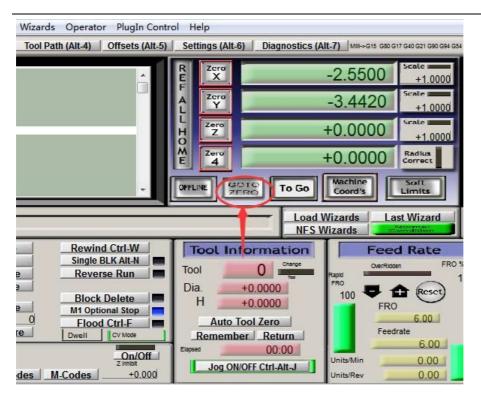






At last, Take probe away from work piece, Click Goto Zero button, The machine will automatic go to zero point. The start point setting is finished.









Part 4 FAQ

1. The Axis moving direction is wrong

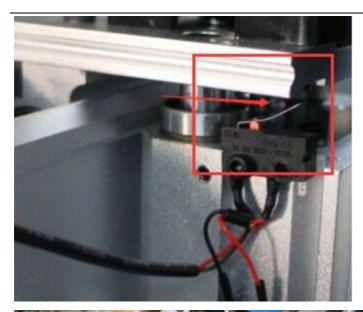
Which Axis goes wrong direction , you change that Axis below Dirlow active setting ,If home moving way reverse ,change Active low from $\sqrt{}$ to X ,or change from X to $\sqrt{}$.

Encoder/MPG's		Spindle Setup			Mill (Options		
Port Set	Port Setup and Axis Selection		Motor Outputs		Input Signals		Output Signals	
Signal	Enabled	Step Pin#	Dir Pin#	Dir LowAc	Step Low	Step Port	Dir Port	
X Axis	4	2	6	4	4	1	1	
Y Axis	4	3	7	4	4	1	1	
Z Axis	4	4	8	4	4	1	1	
A Axis	4	5	9	4	4	1	1	

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:

Initialization String	
G80f2000s10000	CV Control Plasma Mode
Motion Mode	CV Dist Tolerance 180 Units
Constant Velocity C Exact Stop	✓ Stop CV on angles > 6 Degrees
	Auto DDO Deservices



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

Engine Configuration... Ports of Pin

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

	coder/MPG's p and Axis Sel	ection	Spindle Motor Outp		Input Signals	Mill Option Outpu
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
X ++	4	1	0	4	×	0
x	4	1	0	4	×	0
X Home	4	1	0	4	X	0
Y ++	4	1	1	4	×	0
Y	4	1	1	4	X	0
Y Home	4	1	1	4	8	0
Z ++	4	1	2	4	X	0

Encoder/MPG's Port Setup and Axis Selection		Spindle Setup Motor Outputs Input Signa			Mill Options s Output Sign		
Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey	×
X Home	4	1	0	4	X	0	
Y ++	4	1	1	4	X	0	
γ	4	1	1	4	*	0	
Y Home	4	1	1	4	×	0	
Z ++	4	1	2	4	X	0	
Z	4	1	2	4	X	0	
Z Home	4	1	2	4	X	0	-

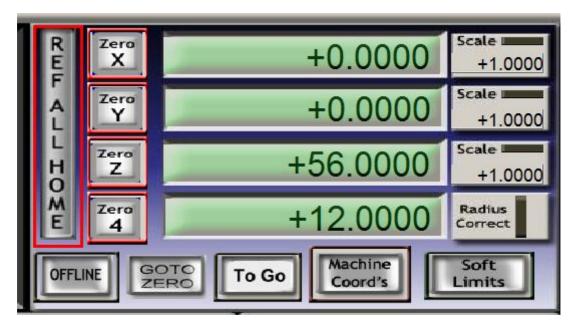
Pins 10-13 and 15 are inputs. Only these 5 pin numbers may be

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



	Status			User Configs
 ✓ Pod Powered On ✓ Pod in Pause ☐ Pod in Wait condition ☐ Probe Hit ☐ Limit or Estop hit 	Outputs Outputs Out1 Out2 Out2 Out3 Out4 Out5 Out5 Out6 Out7 Out8	✓ P1 - Pin1 ✓ P1 - Pin2 ✓ P1 - Pin3 ✓ P1 - Pin3 ✓ P1 - Pin4 ✓ P1 - Pin5 ✓ P1 - Pin5 ✓ P1 - Pin6	 ✓ P1 - Pin8 ✓ P1 - Pin9 ✓ P1 - Pin10 ✓ P1 - Pin11 	Pulse per Rotate 4 G Code Time Buffer Time: 512 ms
Home Switches	Z A B Homing Pull X Pull Off Y Pull off	Off	GSpeedHigh ull Off 5 ull Off 5	Please Insert XHC NcUsbPod! Output Test I I 5 6 7 8
Dual Stage	Z Pull Off	CPI	ull Off 5	ResetOutput

At last ,click ref all home button in MACH3.



ChinaCNCzone, to be your best mini CNC router manufacturer.