WiXHC ®

MACH3-USB控制卡
常见问题解决方案
FAQ solutions
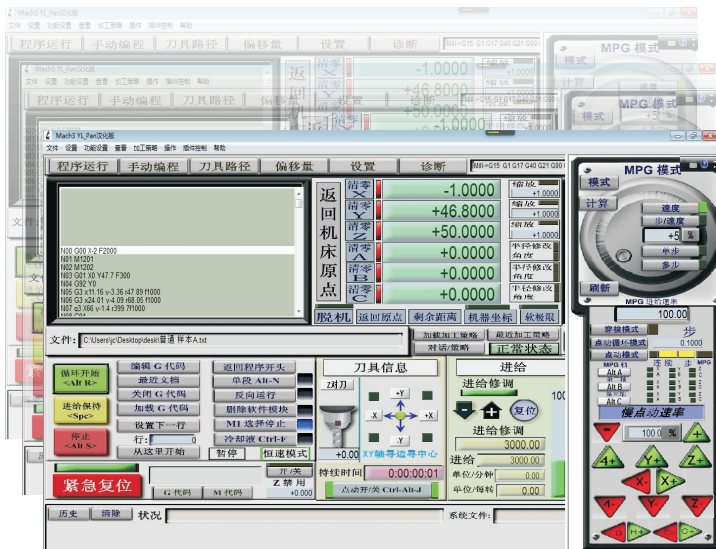
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常见问题描述及解决方案
Problem description and Solutions

前 言
FOREWORD

MACH3是一款全球应用非常广泛的CNC系统软件,它具有极强的稳定性和可扩展性，操作简单，可应用等离子、雕刻机、钻床、车床等。功能的强大，没有任何一个软件可以比拟。
但是MHA3的使用许多人不了解，在此以我们的MACH3-USB控制卡为例，列出常见问题及其解决方案，你就可以轻松使用MACH3软件了。

MACH3 is a widely used CNC system software all over the world for It has strong stability and extendibility, easy operation. It can be used in Plasma, CNC router, drilling machine, Lathe and so on. No other software can compare with it.
But many people do not really know how to use Mach3.
Here we use our Mach3 card as example,we list some FAQs and solutions to help you use mach3 software freely

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1.**Mach**3连接上不控制卡

（1）如果控制卡连接正常,但是在运行程序或者调节主轴速度等情况下,出现下面的提示,就是因为干扰引起。

When you run the program or adjust the spindle speed, the software prompts can not find the card (see figure), this is because the interference caused.

解决方法:主轴变频器的PE线接到机床上，然后机床接地.主轴电机接地,排除干扰.

Solution: the spindle VFD PE line is connected to the machine, and then the machine to the ground.Spindle motor grounding, eliminate interference.
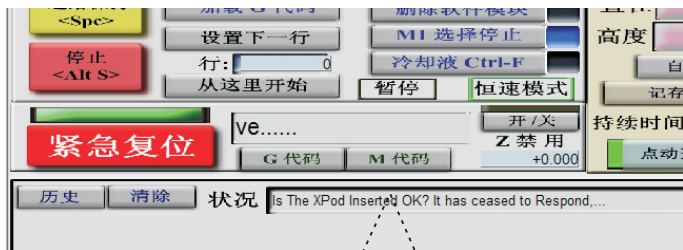
(2)插好控制卡后,打开软件按下复位按键,软件提示找不到控制卡(如图),这是因为控制卡没有和电脑通讯成功.

Insert the control card,and open the software to press the reset button, the software can not find the control card (see figure), because the control card and computer communication is not successful.

解决方法：重新插拔USB线或者以太网线；确认控制卡驱动文件已经拷贝到Mach3目录下的Plugins文件夹内.

Solution: re insert the USB line or Ethernet cable; confirm the control card driver files have been copied to the C/Mach3 directory >> Plugins folder
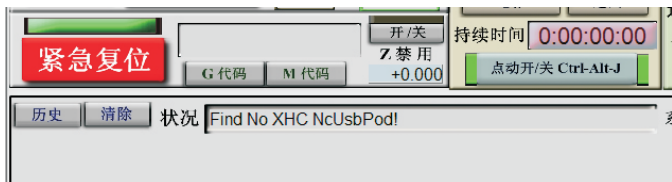
2.在常规速度运动模式下,在走直线拐角时,mach3走出来是圆角.

2 In Constant velocity mode, In a straight line corner, walked out of mach3 is rounded.
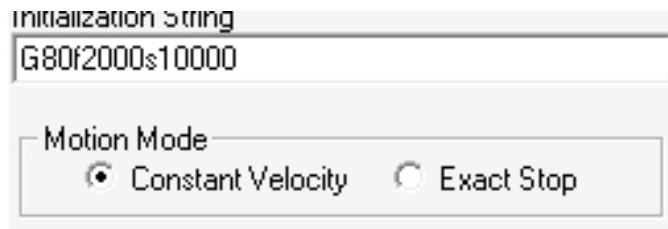
2.1.1 总体设置中这里是constant velocity.常速度模式.

2.1.1 In general setting, please choose constant velocity mode

2.1.2 在mach3 "总体设置"中,选择 "stop cv on anagle>6度"在画小圆时如果抖动,可以将此6度改为12度,此数字越大,画圆时速度越快,但在导直角时,就会变成圆角.

2.1.2 In general setting, choose"stop cv on anagle>6 degree" When drawing small circles, if the machine dither, you can modify 6 degree into 12 degree. With this number become bigger, it moving faster when drawing. But straight line corner will be round.
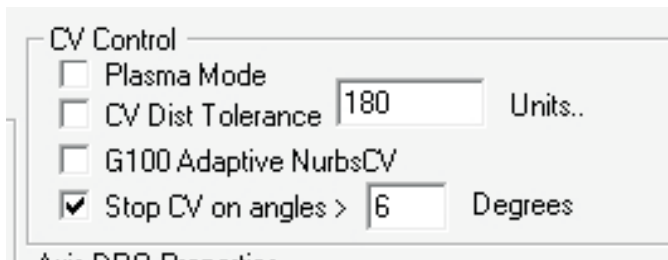
2.1.3 画小圆时不光滑，能看到许多小线段;同时机器在抖动.
在后处理时，需要把画圆的输出代码输出为I,J指令.这样
mach3就会用圆弧插补替代直线插补,而画出光滑的圆.

2.1.3 It is not smooth when drawing little circle, you can see many
line segments. at the same time, machine dithering.
Now please modify the output code of drawing little circle into I,J
Code. Then you can do it.

3.Mach3 回原点如何设置:

3.Mach3 back to origin point setting:

3.1在mach3 配置/configure 菜单下,打开IO 针脚port/pin ,在输入
/inpout配置中使能xhome,yhome ,zhome.并设置为Port# 1,
Pin number :0,1,2 ,active low:打勾.

3.Under Mach3 configure menu, open IO port/pin ,then
/input menu xhome,yhome ,zhome.set it Port# 1,
Pin number :0,1,2 ,active low:Ticked.

3.2打开我们的驱动:在mach3 配置/configure 菜单下,打开设置
插件/config plugins.选择Ncpod??在插件中homing栏选择
Single Stage/Dual stage.

3.2 Open our driver: note mach3 /configure menu ,open
config plugins.choose Ncpod. At homing menu please choose
Single Stage/Dual stage.
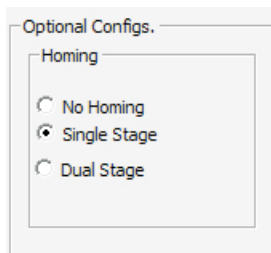
3.3 接好原点开关线.确定开关信号正确点.

3.3 Connect the origin switch wire, make sure switch
signal is right .

3.4 在mach3主界面上选择 返回原点/ref home.
3.4 Mach3 main interface choose ref home.

3.5 开始返回原点.
3.5 Executive command, start to back origin point

如果返回原点时方向和开关相反,进入mach3 配置/configure 菜单下,打开原点/限位,Homing/limits.将相应轴的Home neg打勾.

If after back to origin point, direction and Switch is opposite,please Enter Mach3 configure, Open home/Limit, Tick the Home neg of the corresponding axis

Motor Home/SoftLimits									
Entries are in setup units.									
Axis	Revers...	Soft Max	Soft Min	Slow Z...	Home ...	Home Neg	Auto Z...	Sp
X	✘	100.00	0.00	1.00	0.0000	✔	✔	20
Y	✘	100.00	0.00	1.00	0.0000	✘	✔	20
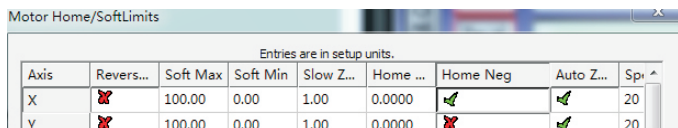
4.如何调节主轴速度?
4.How to adjust the spindle speed?

4.1按下图接好主轴控制线.

4.1 Connect the spindle control line like the picture showed.

DCM,FWD 为启动信号.短接时就会启动变频器。
AVI,ACM为模拟电压调节信号,用来调节主轴速度,
10V为变频器输出的10V电压。

DCM,FWD belong to Starting signal. Short circuit will start VFD.
AVI,ACM are Analog voltage adjustment signal for spindle speed
adjustment,
10V is VFD output Voltage

4.2.Mach3卡工作正常后,点主轴正转F5，用鼠标拉傍边滑动条调节速度.

4.2.Mach3 work, click spindle F5, move slider for speed adjustment.

4.3.确保此时的速度不为0,如果是0，你需要在主轴速度里面输入 10000，然后回车.检查mach3主轴启动信号是否正确.

4.3.Make sure that the speed not 0 now,if it is 0,Please input 10000 of spindle speed, and Enter.Check if the mach3 start signal is right

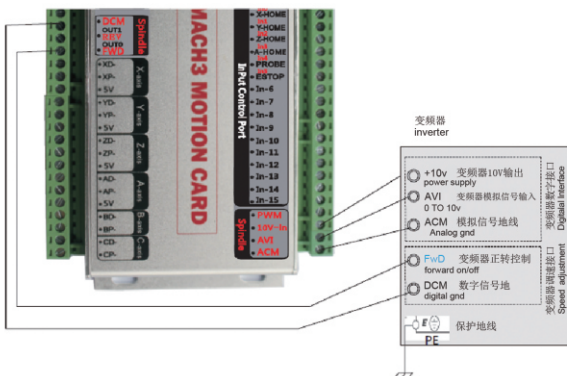4.4.如果主轴没有起动，请检查接线是否正确;变频器是否设为模拟电压控制.

4.4.If the spindle is not started, please make sure that connection is right
And VFD belong to analog voltage control

4.5mach3 主轴启动信号需要设两个地方:

4.5 mach3 spindle start need to set 2 places

4.5.1在设置硬件端口->输出口：

4.5.1 Set hardware port->Output port：

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		
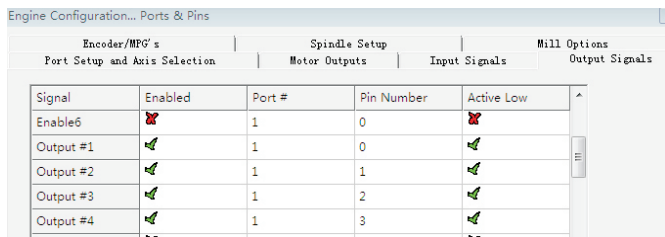
确保Output #1- Output #8，打勾，其它不打勾.
Please make sure that Output #1- Output #8 are ticked, other not.

4.5.2在主轴设置里面:
4.5.2 Spindle setting:
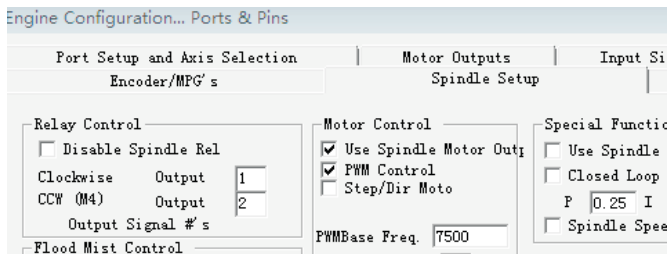
4.5.3 把PWM控制打勾，使用主轴电机控制打勾,Clockwise正转设为输出1,反转设为输出2.

4.5.3 Tick Use spindle motor Output and PWM Control, and Clockwise Output set 1, CCW output set 2

4.5.4 设主轴最大速度
4.5.4 Set Spindle Max Speed.
    在配置->皮带轮设置中,将主轴最大速度设为24000.

Config menu -> Pulley selection, Please set the Max Spindle speed into 24000
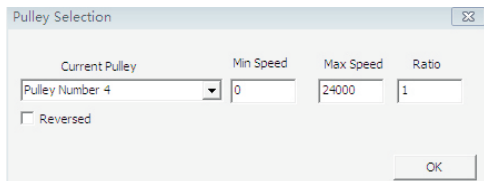
5.如何对刀?
5.How to do tools setting?

5.1 在设置硬件端口->输入口中把Probe输入信号打勾.对应的
PinNumber一定要和硬件卡的输入脚Inx对应.
如下图对应的输入脚为In4.

5.1 Setting hardware port->input port, please tick Probe input signals.
Pin Number should be corresponding with Inx of hardware card as follow
output pin should be In4.

Engine Configuration... Ports & Pins

	Encoder/MPG's		Spindle Setup			Mill Opt
Port Setup and Axis Selection		Motor Outputs		Input Signals		Ou

| Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
Input #2	✘	1	0	✘	✘	0
Input #3	✘	1	0	✘	✘	0
Input #4	✘	1	0	✘	✘	0
Probe	✔	1	4	✔	✘	0
Index	✘	1	0	✘	✘	0

5.2 点菜单操作->编辑按钮脚本.
然后用鼠标点主介面上的自动刀具清零.

5.2Menu->Edit button script
Click auto tool zero clearing.

刀具信息

刀具   0   换
                刀
直径 +0.0000
高度 +0.0000
    自动刀具清零
  记存   返回
持续时间   00:00
  点动开/关 Ctrl-Alt-J

5.3 在弹出的窗口里面把我们光盘里面的对刀文件m930.
　　m1s的内容拷贝过来.然后保存并退出编辑文件窗口.
　　然后点自动刀具清零按钮，便可以开始自动对刀.

5.3 Copy the file m930.m1s in the CD we offered, save it and
quit documents edit window.
Then click auto tool zero clearing button, it starts to do auto tool
guide.

5.4 对刀的厚度在mach3偏移量窗口中设置.

5.4 For thickness of tool setting please set it in mach3 offset window.
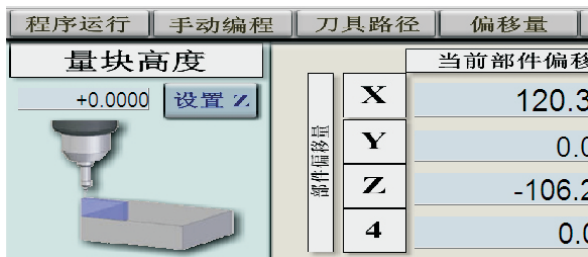
6.如何手动移动机床和调节移动速度？
6.How to manually move lathe and adjust moving speed

6.1 按键盘的TAB键调出手动移动窗口.按点动模式,可以在步进和
　　连续间切换.

6.1 Press TAB key will show manual move window, enter
Jog mode, you can switch it between Step and Continuous.

6.2 按X+,Y-等便可移动机床。
6.2 Press X+,Y- then you can move the lathe
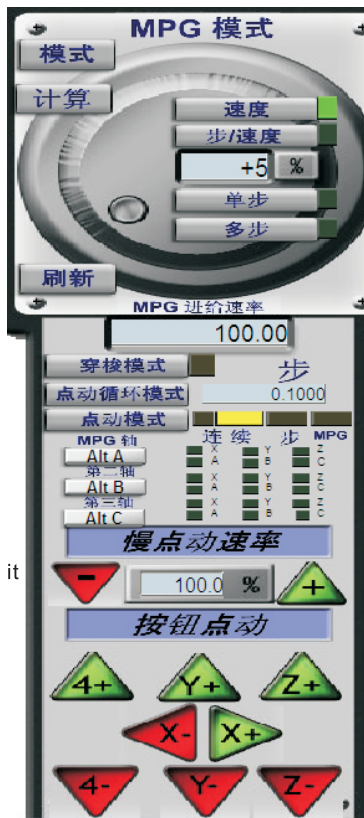
6.3 点+/-调节连续
移动的速度百分比.
当为100%时,移动的
速度为最大速度，
即在电机调试里面的
设的电机速度.

6.3 press+/- to
adjust the moving
speed percent, when it
up to100%, moving
speed will be Max.
This is the motor
speed of your
motor adjustment.

7. 如何根据机床大小设置软件限位.

7. How to set software limit according to the size of lathe.

7.1 回机器原点.把机器坐标清零.

7.1 Back lathe origin, zero clearing Machine coordinate.

7.2 在配置中打开原点/限位窗口.

Open Origin/Limit window in Config setting

Axis	Revers...	Soft Max	Soft Min	Slow Z...	Home ...	Home ...	Auto Z...	Speed %
X	✔	200.00	-1.00	1.00	0.0000	✘	✔	40
Y	✔	300.00	-1.00	1.00	0.0000	✘	✔	40
Z	✔	-1.00	-80.00	1.00	0.0000	✔	✔	40
A	✘	370.00	-370.00	1.00	0.0000	✘	✔	20
B	✘	100.00	-100.00	1.00	0.0000	✘	✔	20
C	✘	100.00	-100.00	1.00	0.0000	✘	✔	20

7.3 把softmax设为正最大值，soft min为负最小值，
单位为mm/inch.你可以根据你的机床大小来设置此数据.
但是此数据是机器坐标,不是工作坐标.

7.3 Set softmax as max positive , soft min as min negative, unit is
mm/inch.This data can be set according to your size of machine. But
This data is machine coordinate, not working coordinate

7.4. 点"软件限位"按钮,打开软件限位.正常时此按钮会变成绿色.

7.4. Press Software limit button, Open it. It will turn green
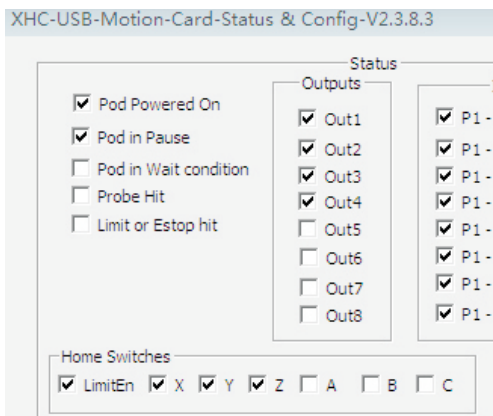If it is working normally.

8. 如何设置限位开关?

8. How to set limit switch?

8.1 如果你把原点开关作为限位开关,那么你只需要打开我们的驱
动插件,把LimitEn和对应的原点打打勾就行了.不需要其它的设置.

8.1 if you use origin switch as limit switch, then you only
need to open our driver plugin, tick LimitEn and
corresponding origin, no need other setting.

通常A,B，C为旋转轴不需要限位.

Generally specking, A, B，C are rotation axis, no need limit.

8.2. 如果你接有专门的限位开关,并已经把如X++正限位接在了In8上.那么你需要如下的mach3设置.

在配置->硬件端口中:输入信号把x++打勾,并设为P1.8,低电平有效.

8.2.If you got a special limit switch, and connect X++ and positive limit to the In8, you need to set it like below..
Config -> hardware port: Input port please tick x++,set P1.8, and active low like the form below.

Signal	Enabled	Port #	Pin Number	Active Low	Emulated
X ++	✔	1	8	✔	✗
X --	✗	1	0	✔	✗

9. 在加工文件时如何控制GO的速度?

9. How to control feed speed when run G-code?

在设置页面,把进给调整设为3000,打开快速控制按钮,此时G0的
速度将变为F3000.

Setting page, change feed adjustment into 3000,open
rapid control button, now the speed of go will be F3000

10. 如何计算脉冲当量

10. How to calculate Steps per?

脉冲当量是机器移动1mm 所需要的脉冲数.所以单位是(脉冲/mm)
计算公式:
丝杆传动:
脉冲当量=(360度)/步距角*细分数/丝杆螺距

Steps per is the number value that the machine
move 1mm, unit is: pulse/mm
Computational Formula:
Screw drive:
Steps per =
(360 degree)/step angle*micro-stepping level/Screw lead

齿条传动:
脉冲当量=(360度)/步距角*细分数/传动比/模数*齿数*3.1415

Rack Gear:
Steps per=
(360 degree)/step angle*micro-stepping levels/
transmission ratio/modulus*number of teeth*3.1415

未知参数
先假设脉冲当量为200脉冲/毫米----输入，进入手动加工的距离模式输入g0x300（即当输入正确的脉冲当量X值时应该行进的距离为300毫米），看此时行进的实际距离a得到公式X/300＝200/a
正确的脉冲当量X＝200*(300/a)

Unknown parameter
if steps per is 200 pulse/mm,----Input,enter
manual processing mode then input g0x300(it means
when you input pulse X value the distance it will move
300mm)moving actual distance we call it a. Here is the
Formula: X/300=200/a.
 right steps per X=200*(300/a)

11. 如何正确设置速度及加速度
11. How to set velocity and acceleration velocity correctly

在MACH3的电机调试里面,建议按以下表设置速度和加速度。
通常，对于步进电机，该值在100--500之间；
　　　　对于伺服电机系统，可以设置在400--1200之间。
如果未正确设置加速度,
可能会在加工过程中出现机器抖动,或者失步。

MACH3, Motor adjustment, please set velocity and like the form showed
Generally, for stepper motor, value should be 100-500.
　　　　For servo motor system, can be 400-1200
Acceleration velocity should be set right,
It maybe cause problems, like machine dither, lose step.

速度	加速度（步进电机）	伺服电机
3000及以下	200	300
4000-6000	300	500
7000-8000	400	600
9000及以上	500	800

Speed	acceleration velocity (Step motor)	acceleration velocity (Servo Motor)
3000 and below	200	300
4000-6000	300	500
7000-8000	400	600
9000 and above	500	800

12. MACH3控制输出IO的M代码
12. Mach3 Control Ouput IO-M code

ActivateSignal（OUTPUT5） 打开输出口5
DeactivateSignal(OUTPUT5) 关闭输出口5
将m200,m201拷贝到C:mach3\macro\mach3mill。
在程序编程里面输入m200打开输出5,M201关闭输出5.
用户可以把输出OUTPUT5改为OUTPUT6等，就可以控制其它输出口.
输出后在mach3诊断里面可以看到输出口5闪烁.就表示输出口已经打开.

ActivateSignal（OUTPUT5） Open Output port5
DeactivateSignal(OUTPUT5) Close Output 5
Please copy m200,m201 to c:mach3\macro\mach3mill
In programming ,input m200 open output 5,M201 close output 5
User can change OUTPUT5 into OUTPUT6,Then you can control other
Output Port.
In Mach3 diagnosis,If Output 5 is flashing, it shows that Output port opened

13.如何调节Mach3加工速度
13.How to adjust the processing speed of Mach3

1.输出在MACH3电机调试里面,确定电机速度设置能达到你需要的加工速度.
如下图X电机最大速度可以达到8000米/秒.如果需要Y轴也要运行到此速度,
那也需要调节Y电机速度参数.

1. In the Mach3 motor commissioning, determine the motor speed can reach you need processing speed. As shown in the following picture x motor maximum speed can reach 8000 meters / sec. If the Y axis to run to the speed, it also requires regulation y motor speed parameters.
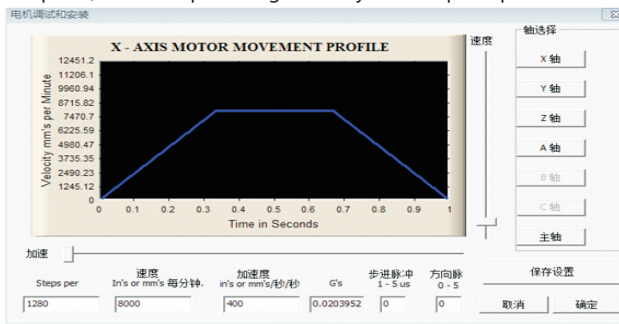
2.修改加工文件中G代码的F速度.
如下G代码的速度为1000,改为8000.
T1M6
G0Z15.000
G0X0.000Y0.000S18000M3
G0X111.172Y238.144Z10.000
G1Z-6.000F1000.0   ->改为8000

2.Modify the G code in the processing file F speed.
The speed of the following G code is 1000, change to 8000
T1M6
G0Z15.000
G0X0.000Y0.000S18000M3
G0X111.172Y238.144Z10.000
G1Z-6.000F1000.0 ->Change to F8000

3.如果文件中没有F指令,那么可以在MACH3 设置页中进行进给调整,如图设为
  8000,但是此速度在加工文件中有F指令时会失效,在遇到g0后又恢复.

If the file does not have a F instruction, you can set the feed adjustment
in the MACH3 settings page, as shown in Fig.8000, but this speed will
fail when there is a F directive in the file, and it will resume after G0.

4.如果速度仍然很慢,那么在端口/针脚中调节增加MACH3核心速度.把25000HZ
  改为75000hz或者100khz.

If the speed is still very slow, then the port / pin is adjusted to increase
the speed of the MACH3 core. 25000HZChanged to 75000hz or 100khz.

14.如何设置旋转轴A轴的参数

14.How to set the parameters of the rotating axis A

1. 在MACH3总论设置中,把rot 360 rollover取消.它是指A旋转轴总在0-360度
的范围内运行.如加工时有g0a380,A轴就会一直旋转.

1. In general Mach3 settings, the rot 360 rollover canceled. It is that a
rotating shaft in 360 degrees range operation. Such as processing
g0a380, a axis will always rotation.

2. 如果是旋转轴,旋转的路径不对,如当前A坐标是359,在加工运行g0a1,
A会反转360度后才会运行到A1.此时就需要把ang short rot on g0打勾.
表示走短路径.

2 if the rotation axis, the rotation of the path is wrong, such as the
current A coordinates is 359, in the process of running g0a1, A will
reverse 360 degrees will run to A1. at this time you need to short rot
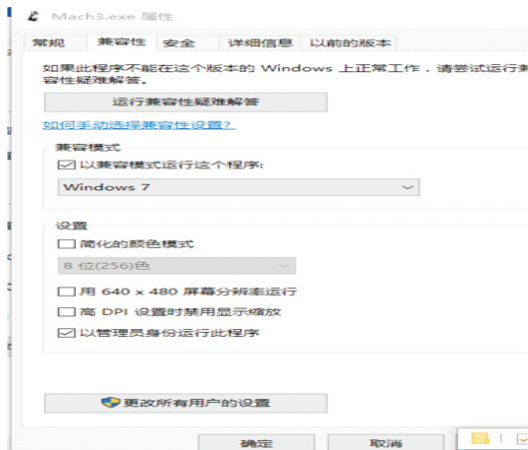on G0 ang hook.

15.Mach3如何在WIN10系统下运行

15.How to run Mach3 software in WIN10 system

1.在mach3.exe图标上点击右键，选择属性,如下图:

1 right click on the mach3.exe icon, select properties, as shown below:

16.如何在Mach3返回工件原点时,Z轴不清零

16.How to return to the workpiece origin, the Z axis is not cleared

1.拷贝XHC-4 轴文件到MACH3目录替换原文件， 在mach3 查看菜单中选择加载新界面,选择XHC-4.set.在点返回原点时,Z会返回到安全高度而不下降.

1.copy the XHC-4 axis file to the MACH3 directory to replace the original file,In the Mach3 software opened the "view" menu. Choose to load the new interface, choice XHC-4.set. again to return to the origin, Z will return to a safe height is not cleared