®
XHC

适用于MACH3系统
Application system：MACH3

雕刻机无线遥控器
The MACH3 Remote instructions

说 明 书

型号 MODEL	
WHB04–S	不带电子手轮，无线最远距离40米
	40 meters wireless distance without electronic handwheel
WHB04–L	带电子手轮，无线最远距离40米
	40 meters wireless distance with electronic handwheel
LHB04	带电子手轮，5米USB连接线
	With 5 m USB cable with electronic handwheel

无线性能描述

- 采用2.4G无线RF传输技术，发射功率0DB，接收灵敏度-98DB
  The RF is Standard with 2.4G ISM ,the Tx power is 0DB and the RX sensitivity is -98DB

- 具有64个跳频频道，每个频道间隔1MHZ
  The RF has 64 channels,the channel gap is 1Mhz

- 智能无线技术，实现自动跳频，自动节约功耗，自动ID码学习
  The protocol Designed with high performance；Low power consumption；Automatic learning ID Number

- 采用跳频传输，抗干扰能力强；能自动避开无线路由器，2.4G无线耳机，蓝牙设备的干扰。
  To jump frequency Adaptively when noised ,which can work with 2.4G wireless Mic ,Wlan and Bluetooth etc. devices.

- 跳频传输技术，同一个房间，能支持64套设备，同时使用，相互不受影响
  64 sets Wireless Handle work fine at the same time in one room ,with no-interference each other

- 支持电子手轮功能，铝合金电子手轮
  has the function of the hand wheel, 100PPR the manual pulse generator output

- 显示X，Y，Z，A轴的机械坐标和工件坐标
  display, real-time display of the machine the workpiece coordinates, mechanical coordinates. Coordinates X, Y, and Z three-axis with the screen display

WHB04-L型

● 带手轮，无线使用距离40米
40 meters wireless distance with
electronic handwheel

WHB04-S型

● 不带手轮，无线使用距离40米
40 meters wireless distance without
electronic handwheel

LHB04型

● 带5米USB屏蔽电缆
USB shielded cable with 5 m

机床控制面板
Computer Control Center

机床
CNC machine tools

Usb口无线接收器
Wireless receiver

雕刻机无线遥控器
The wireless MPG manual

备注：为了信号的稳定，请将接收器安装在机箱外面（不能安装在机箱内部）
Note：In order to signal stability of the receiver to be installed outside the chassis

在使用手轮前，先安装驱动文件，操作方式如下：
Before using the hand wheel, install the driver file, mode of operation is as follows：

❶ 安装了MACH3后,在MACH3安装目录下有个 "PlugIns" 文件夹，如果没有请建一个名为"PlugIns"的文件夹。然后把驱动文件XHC−ShuttlePro.dll拷贝到此文件夹\Mach3\PlugIns下
When Mach3 is installed , there will be a folder created named "PlugIns" in the Mach3 folder. This folder is the location to put and Plugin files that you want Mach3 to know about. Place "XHC−ShuttlePro.dll" in the \Mach3\PlugIns folder. Check and make sure it is there

❷ 对刀驱动安装：将XHC−MACH3手轮驱动文件夹下的M930.m1s拷贝到MACH3安装目录..\Mach3\macros\Mach3Mill下.
对刀使用说明：请参考附件：对刀使用
Setup diver for Probe Z surface function；M930.m1s copy the installation directory to the MACH3 ..\Mach3\macros\Mach3Mill

❸ 插入MACH3 手轮的usb控制器到计算机的usb口.第一次时,计算机会提示发现新硬件,并自动安装控制器需要的驱动
Now that the XHC−ShuttlePro.dll file is in \Mach3\PlugIns, the next step is to connect the huttlePro. If you are certain that your ShuttlePro is working and your hardware is working then you can simply plug in the ShuttlePro to one of the USB ports
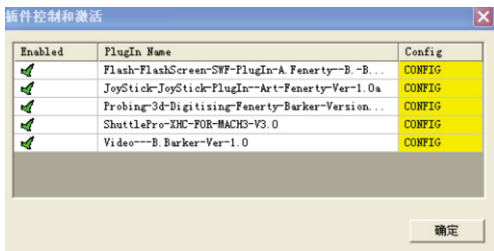
❹ 打开mach3软件,在"Config"配置菜单下,选择"Config Plugins"配置插件.在弹出的配置插件窗口中,将" ShuttlePro−XHC−FOR−MACH3…"enable使能,这时会看到有绿色的钩.然后点黄色的"config"配置按钮,会弹出键的配置窗口,在配置窗口中,你可以选择每个按键的功能.如果不选择,全部的按键将是默认功能.
插件配置说明请参考附件：配置宏定义说明

Once the ShuttlePro is connected, start Mach3 and go to the "Config" menu choice and select "ConfigPlugins". You should see the ShuttlePro choice with a green checkmark in front of it. If it is not checked, you can check it. The checkmark means that Mach3 found the ShuttlePro on tartup. Click the "CONFIG" in yellow and set the buttons as you wish

❺ 退出配置窗口后,MACH3 手轮就能正常使用了.在mach3软件使用前,你需要按"Reset"复位键,mach3软件才能正常使用

Once you have the proper button selected in the Mach3 ShuttlePro Plugin CONFIG menu, your Shuttle device should be working properly

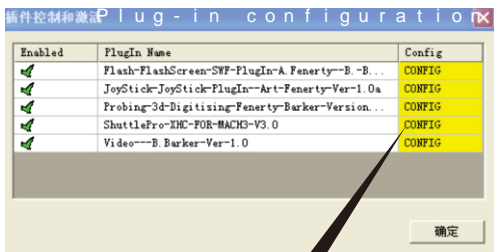## 插件配置说明 Plug-in configuration instructions

打开mach3软件,在"Config"配置菜单下,选择"Config Plugins"配置插件.在弹出的配置插件窗口中,将"ShuttlePro-XHC-FOR-MACH3…"enable使能,这时会看到到有绿色的钩.

点黄色的"config"配置按钮,会弹出键的配置窗口,在配置窗口中,你可以选择每个按键的功能.

如果不选择,全部的按键将是默认功能.鼠标点击:Reset ToDefult

start Mach3 and go to the "Config" menu choice and select "ConfigPlugins". You should see the ShuttlePro choice with a green checkmark in front of it. If it is not checked, you can check it.

The checkmark means that Mach3 found the ShuttlePro on tartup. Click the "CONFIG" in yellow and set the buttons as you wish.

Enabled	PlugIn Name	Config
✓	Flash-FlashScreen-SWF-PlugIn-A.Fenerty--B...	CONFIG
✓	JoyStick-JoyStick-PlugIn--Art-Fenerty-Ver-1.0a	CONFIG
✓	Probing-3d-Digitising-Fenerty-Barker-Version...	CONFIG
✓	ShuttlePro-XHC-FOR-MACH3-V3.0	CONFIG
✓	Video---B.Barker-Ver-1.0	CONFIG

确定

选择ShuttlePro-XHC-FOR-MACH3
Select "ShuttlePro-XHC-FOR-MACH3"

Custom Key As You Do

Macro-1
Rewind
Macro-2
Goto Safe_Z
Macro-4
Jog increment cycle
Macro-5
Auto Lim Override Toggle

Macro-3
NONE
Macro-6
NONE
Macro-7
Custom Macro #1

Please input Mach3 OEM
Button Code Number:

Please input M Code Number,then choose it in Macro box

Custome OEM Code #1
28

Macro number 1
8

Macro number 3
0

Macro number 5

Macro number 7
0

Custom OEM Code #2
0

Macro number 2
0

Macro number 4
0

Macro number 6
0

Macro number 8
0

ResetToDefault   OK

配置界面
Configuration interface

按键功能说明 handwheel key function

对应图标 Icon	功能 Function		
RESET	复位 Reset	**Stop**	停止 Stop
(go to zero icon)	回工件原点 Go to zero	**Start Pause**	开始/暂停 Start/pause program
Rewind	返回到程序开始 return to the program start	**Probe-Z**	对刀 Probe Z surface
Spindle	主轴开/关控制 Spindle On/off	**Safe-Z**	将Z轴回退到安全高度 go to Z safehigh
(go home icon)	全部轴执行回机械原点操作 Go home	**Macro-1**	通过M–代码控制机床 Macro–code
Macro-2	通过M–代码控制机床 Macro–code	**Macro-3**	通过M–代码控制机床 Macro–code
Macro-6	通过M–代码控制机床 Macro–code	**Macro-7**	通过M–代码控制机床 Macro–code
=1/2	坐标除2，通过波段开关选择是哪个轴的坐标除2 coordinate Divided by 2, Determine the coordinates X, Y, Z, A–axis through the position of the band switch	**=0**	坐标清0，通过波段开关选择是哪个轴的坐标清0 coordinate Clear，Determine the coordinates X, Y, Z, A–axis through the position of the band switch
STEP ++	步距循环调节 Step cycle regulation	**MPG Model**	手轮切换到MPG模式；在该模式下，快速摇动手轮，机床快速移动，慢摇，机床慢移动 And JOG work to MPG mode

波段开关对手轮功能起到控制作用，手轮的各种功能，通过波段开关的档位切换，而进行相应切换
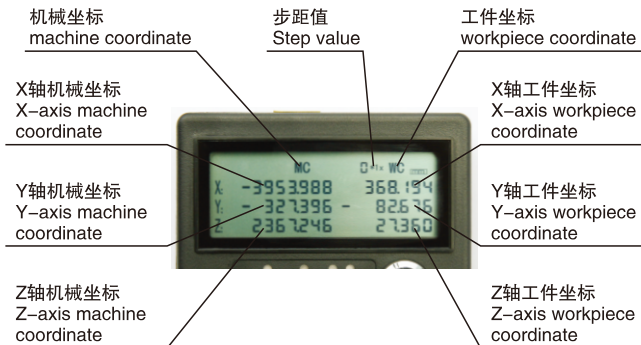
Through the stalls of the band switch switch to control the various functions of the hand wheel

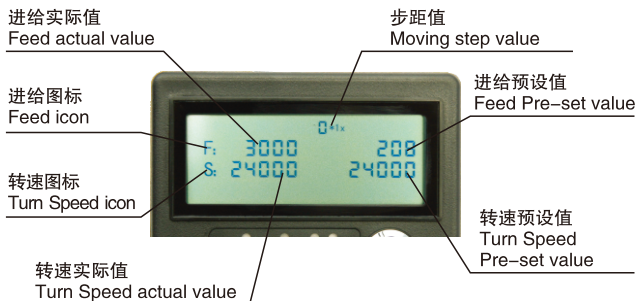| 图标 Icon	功能 Function
OFF	关闭手轮功能 Close the hand wheel
X	将波段开关定位到该档位，摇动手轮，对X轴进行移动控制：移动的距离根据倍率来决定 Positioning the band switch to the stall, shaking the hand wheel on the X–axis movement control: the distance traveled according to the magnification
Y	将波段开关定位到该档位，摇动手轮，对Y轴进行移动控制：移动的距离根据倍率来决定 Positioning the band switch to the stall, shaking the hand wheel on the Y–axis movement control: the distance traveled according to the magnification
Z	将波段开关定位到该档位，摇动手轮，对Z轴进行移动控制：移动的距离根据倍率来决定 Positioning the band switch to the stall, shaking the hand wheel on the Z–axis movement control: the distance traveled according to the magnification
4	将波段开关定位到该档位，摇动手轮，对4轴进行移动控制：移动的距离根据倍率来决定 Positioning the band switch to the stall, shaking the hand wheel on the A–axis movement control: the distance traveled according to the magnification
S%	波段开关定位到该档位，通过摇动手轮可进行主轴转速调节 The band switch to locate the stall by shaking the hand wheel, spindle speed of adjustment
W%	波段开关定位到该档位，通过摇动手轮可进行进给速度调节 The band switch to locate the stall by shaking the hand wheel, Feed adjustment

● LCD显示说明 LCD Display Description

■ 当波段开关在X，Y，Z，A档时，显示坐标信息
When the band switch in the X, Y, Z, A gear display coordinate information

机械坐标
machine coordinate

步距值
Step value

工件坐标
workpiece coordinate

X轴机械坐标
X–axis machine
coordinate

X轴工件坐标
X–axis workpiece
coordinate

Y轴机械坐标
Y–axis machine
coordinate

Y轴工件坐标
Y–axis workpiece
coordinate

Z轴机械坐标
Z–axis machine
coordinate

Z轴工件坐标
Z–axis workpiece
coordinate

■ 当波段开关定位在 和 位置的时候，显示进给和主轴信息
When the band switch position in the and position display feed and spindle Information

进给实际值
Feed actual value

步距值
Moving step value

进给图标
Feed icon

进给预设值
Feed Pre–set value

转速图标
Turn Speed icon

转速预设值
Turn Speed
Pre–set value

转速实际值
Turn Speed actual value

产品名称 Name	工作电压 Voltage	工作电流 Current	备注 Note
无线USB接收器 Wireless USB Receiver	4.5V ~ 5.0V	小于50mA Less than 50mA	
无线手柄 Wireless Handle	1.5V ~ 3.0V	平均电流小于2mA Average Current Less than 2mA	2000MAH的2节电池能使用2个月 Use of time More than 2 months USE Two 2000MAH Battery

注意: 无线手柄采用2节AA高容量电池. 当低压指示灯亮的时候，表示电池电
量快用完了，建议更换电池。

Note: Wireless Handle Need Two AA Battery, When the Low voltage
indicator LED light, the battery is completely, Proposed to replace
the battery

序号 No.	性能参数描述 Performance or Parameters Description
1	采用2.4G无线RF传输技术，发射功率0DB，接收灵敏度−98DB The RF is Standard with 2.4G ISM ,the Tx power is 0DB and the RX sensitivity is −98DB
2	具有64个跳频频道，每个频道间隔1MHZ The RF has 64 channels,the channel gap is 1Mhz
3	空旷直线传输距离大于15米 The transmission distance is further than 15 meters with no barrier
4	智能无线技术，实现自动跳频，自动节约功耗，自动ID码学习 The protocol Designed with high performance, Low power consumption, Automatic learning ID Number
5	采用跳频传输，抗干扰能力强，能自动避开无线路由器，2.4G无线耳机，蓝牙设备的干扰。 To jump frequency Adaptively when noised ,which can work with 2.4G wireless Mic, Wlan and Bluetooth etc. devices.
6	跳频传输技术，同一个房间，能支持32套设备，同时使用，相互不受影响 32 sets Wireless Handle work fine at the same time in one room ,with no −interference each other

# 附件1(Attachment 1)

◎ 对刀器设置 Probe Z surface

★ **1.** 将XHC–MACH3手轮驱动文件夹下的M930.m1s拷贝到MACH3安装目录..\Mach3\macros\Mach3Mill下
Copy the file M930.m1s to MACH3 the directory \Mach3\macros\Mach3Mill

★ **2.** 对刀器接线：自动对刀是您有安装了对刀器时使用，对刀分两次进行，取中间值做为补偿值，补偿方式为绝对坐标。对刀精度0.005mm(具体根据您的对刀器) （Connect the probe）
安装接线完毕后，我们就可以来调试对刀功能了，对刀的开始是在"MDI"方式下输入"M930"执行的，"M930"是内在调试好的宏程序。首先我们在MACH3软件"OFFSETS"（偏移设定）画面下，在"TOOL CHANGE LOCATION"（换刀位置）输入您的对刀器位置。如下图：
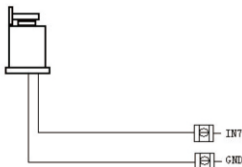
★ **3.** 输入Z轴触发高度值：注意Z轴的数字要比对刀器高5–10MM左右，比如您的对刀器接触面是Z – 68.000 mm ，那么Z方向换刀位置为Z – 63.000 mm。设定好对刀器位置后，我们就可以在"程序"画面下"MDI"输入框输入"M930"回车执行。在此之前请先选择刀具号，如下图：
Input the z offset the Tool change location. Notice:the z offset(– 63.000 mm) Is higher 5–10MM than the surface (– 68.000 mm) of the probe. Set Probe Z surface Value, we can "program" screen "MDI" box, enter "M930" ENTER to proceed; Prior to this, please select the number of the tool, as shown in
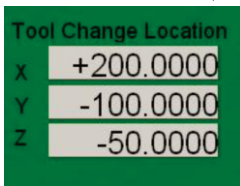
★ **4.** MACH3设置Probe脚：注意使用此对刀功能时要把"探针"（Probe）输入使能，如下图

Define the MACH3 Probe pin.; In the config :ports and pins.define probe pin

Signal	Enabled	Port #	Pin Number	Active Low	Emulated	HotKey
Input #2	✗	0	0	✗	✗	0
Input #3	✗	0	0	✗	✗	0
Input #4	✔	1	24	✔	✗	0
Probe	✔	1	7	✗	✗	0
Index	✗	0	0	✗	✗	0
Limit Ovrd	✗	0	0	✗	✗	0
EStop	✔	1	8	✔	✗	0
THC On	✗	0	0	✗	✗	0
THC Up	✗	0	0	✗	✗	0
THC Down	✗	0	0	✗	✗	0

★ **5.** 在插件里边设置对刀功能

in my plugin define the key function "Probe Z Surface"

Probe Z Surface
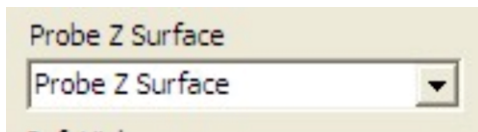
Probe Z Surface ▼

It will auto probe z surface when you press the key

附件2(Attachment 2)

◎ M指令设置 　Macro–code

★ 1. 在插件配置里边，选择M#；比如该例子为选择了Custom Macro #1
select the plug–in configuration M #; such as the example to select
the Custom Macro # 1

★ 2. 在插件里边，对应的"Macro # 1"里边输入M指令代码；M指令代
码的含义参考附件M指令说明
In my plugin setting,you input number in the "custom macro
number1" ,the number is M code.then choose "Custom macro
#1" function in the key combox,, you get the M8 function when
you press the key
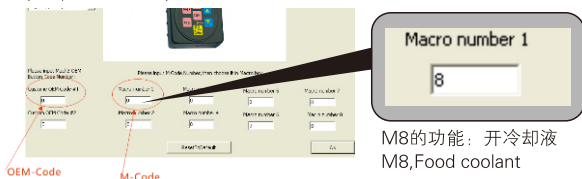
M8的功能：开冷却液
M8,Food coolant

use VB Scripting to do M code:To activate an output5, you should
enable output#5 in ports and pins config.then write the following script:
ActivateSignal(OUTPUT5)
Then you save it as m200.m1s （to signify the output active）in the
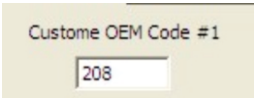directory C:\Mach3\macros\Mach3Mill
To deactivate an output, you write the following script:
DeactivateSignal(OUTPUT5)
Then you save it as m201.m1s （to signify the output inactive）in the
directory C:\Mach3\macros\Mach3Mill
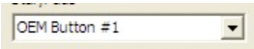then you could define the m code number 200 and 201 in the "macro
number" box.

★ 1. In my plugin setting,you input number in the "Custom OEM CODE #1" ,the number is mach3 OEM code.then choose "OEM button #1" function in the key combox,, you get the code 208 function when you press the key

Custome OEM Code #1

208

Clear Z tool offset (Turn) Key define：

OEM Button #1

附件3(Attachment 3)

M代码 M-code	功能 Functions	M代码 M-code	功能 Functions
M0	程序停止 Program stop	M8	冷却液开 Flood on
M1	可选择程序停止 Optional program stop	M9	冷却液关 Mist & flood off
M3/M4	主轴正/反转 Rotate spindle clockwise/ counterclockwise	M30	返回程序结束 Program end and rewind
M5	主轴停止 Stop spindle rotation	M47	从第一行从新运行 Repeat program from first line
		M48	Enable speed and feed override
M6	刀具更换 Tool change (by two macros)	M98	Call subroutine
M7	Mist on	M99	Return from subroutine/repeat

M代码 M-code	功能 Functions	Custom M-code*	功能描述 Functions
M200	输出IO口5打开 /Output 5 on	M208	输出IO口9打开 /Output 9 on
M201	输出IO口5关闭 /Output 5 off	M209	输出IO口9关闭 /Output 9 off
M202	输出IO口6打开 /Output 6 on	M210	输出IO口10打开 /Output 10 on
M203	输出IO口6关闭 /Output 6 off	M211	输出IO口10关闭 /Output 10 off
M204	输出IO口7打开 /Output 7 on	M212	输出IO口11打开 /Output 11 on
M205	输出IO口7关闭 /Output 7 off	M213	输出IO口11关闭 /Output 11 off
M206	输出IO口8打开 /Output 8 on	M214	输出IO口12打开 /Output 12 on
M207	输出IO口8关闭 /Output 8 off	M215	输出IO口12关闭 /Output 12 off

XHC®