

LY-CNC

Engraving machine



User Manual

Mach3

Componet and accessories of engraving machine (packing list)

Number	Accessories	Quantity	Unit
01	Engraving machine	1	set
02	Control box	1	set
03	Power cord	1	piece
04	Cable	1	piece
05	Parallel port cable	1	piece
06	Wrench	1	piece
07	Plain vice	4	piece
08	Tool bis	5	piece
09	CD of software and manual	1	piece
10	Water pump (except for air cooling spindle)	1	piece
11	ER11-3.175 (6) except for air cooling spindle	1	piece

1、Introduction

First of all, thank you very much for choosing our series of mini LY-CNC engraving machine, before using it, please be patient to read the following:

(1) the machine uses a parallel interface and control computers connected via the parallel port control software MACH3 control to make each axis of engraving machine run in accordance with instructions, make sure your computer has a parallel port and parallel port requires working in EPP mode, any other mode may cause the engraving machine can not run properly (EPP mode settings for the computer should be carried out on motherboard BIOS, different manufacturers 'set methods vary, please refer to the manual of the computer set). Part of the desktop computer comes without parallel port, users can purchase separately parallel PCI expansion card slots to use, any available USB to parallel port riser card can not make the machine run.

(2) when the control box electric power on, never pull or plug wire terminals of the control box; must be at low speed control knob to restart each time you open the spindle power; the spindle switch or driving switch , repeated switching interval must be at least 30 seconds or more. Pay attention to these problems, if not, may cause damage to the control circuit section.

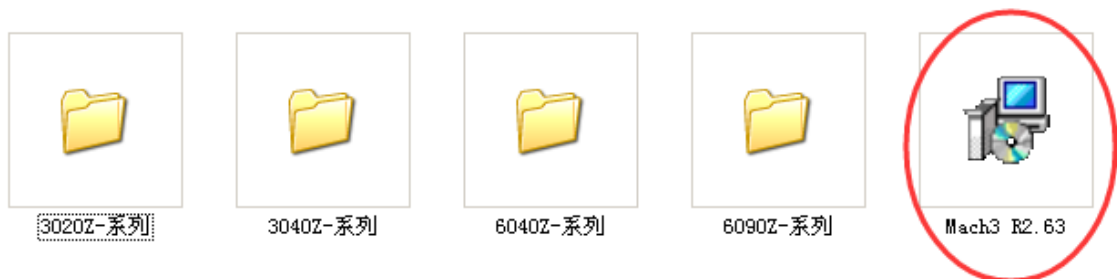
2、Installation

Warning: All operations shall be de-energized operating! ! !

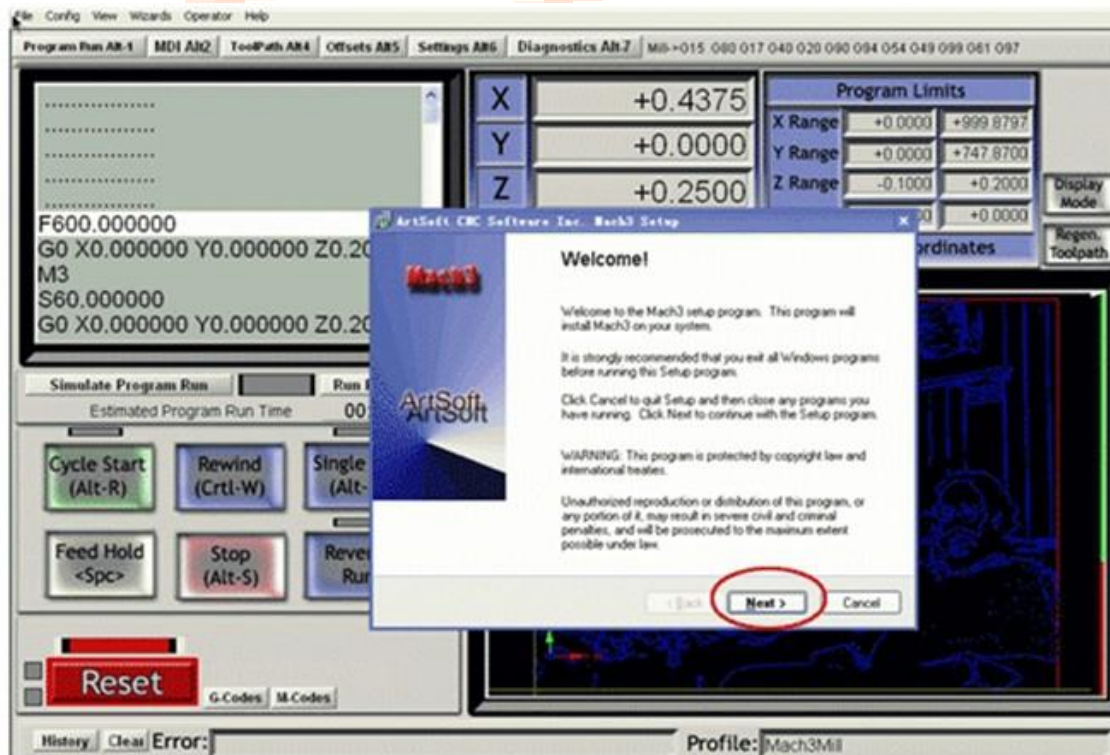
- (1). The machine body connected to the control box,
- (2). The control data line terminal should be connected to the control box.
- (3). Plug the power cord on the 220V / 110V power supply.
- (4). The control box is connected to the computer, plug the data cord into the data signal input port of control box and the other end plugged into the computer.
- (5). Plug the power cord into the control box power supply, and the other end is plugged into a standard 220V / 110V power supply
- (6). Place the drill bits on the lower end of the collet chuck in the spindle. Place the right size collets before placing the drill bits, then placed the drill bits in the hole of collet, use the wrench to fix the slot of spindle, so they can't rotate, then use big wrench to make counter-clockwise rotation of the spindle screw tightening nut, put the tool firmly.

3、Software installation

(1): Open MACH3 folder, double-click the "Mach3XXXXX.Exe" installer file to begin the installation.

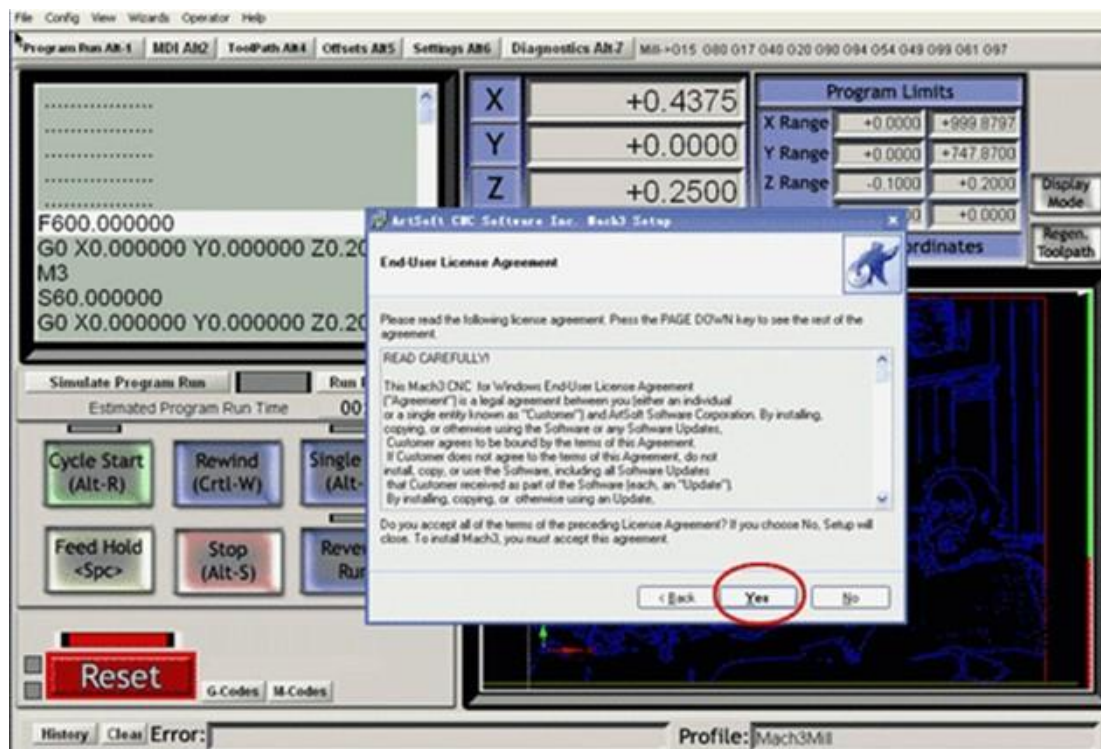


(2): Click "NEXT" shown on picture



(3): clicking "YES".

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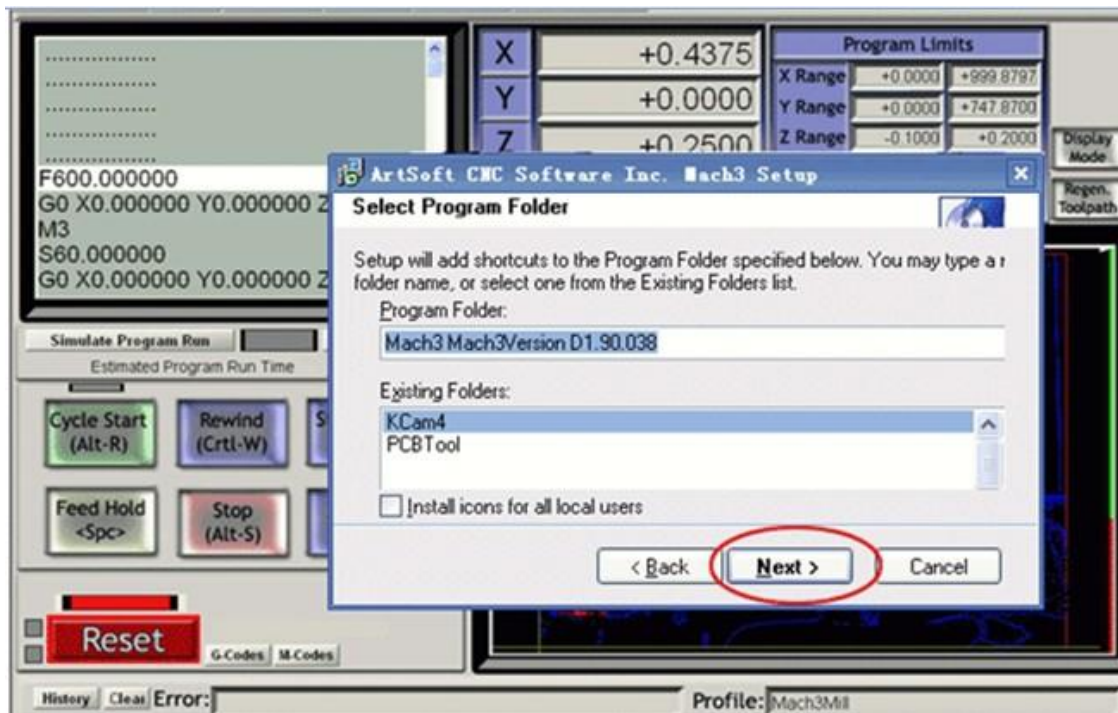


(4): Click "Next", or you can also choose the install path

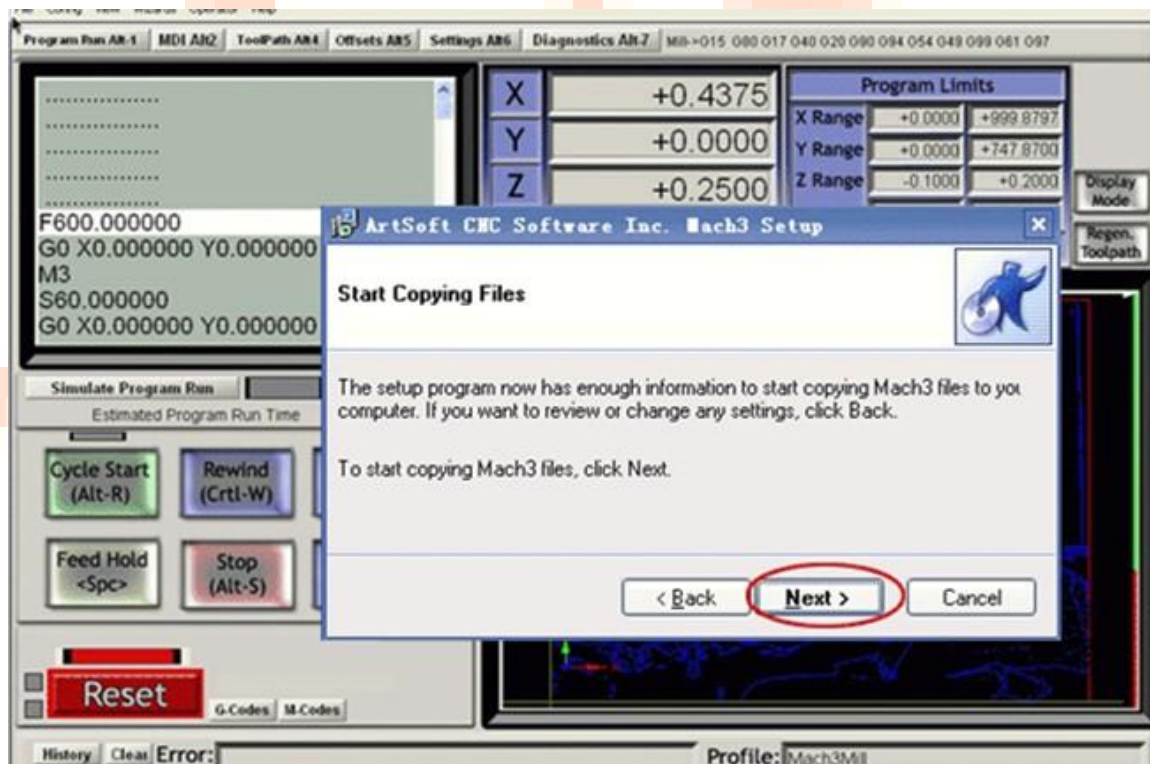


(5): click "next"

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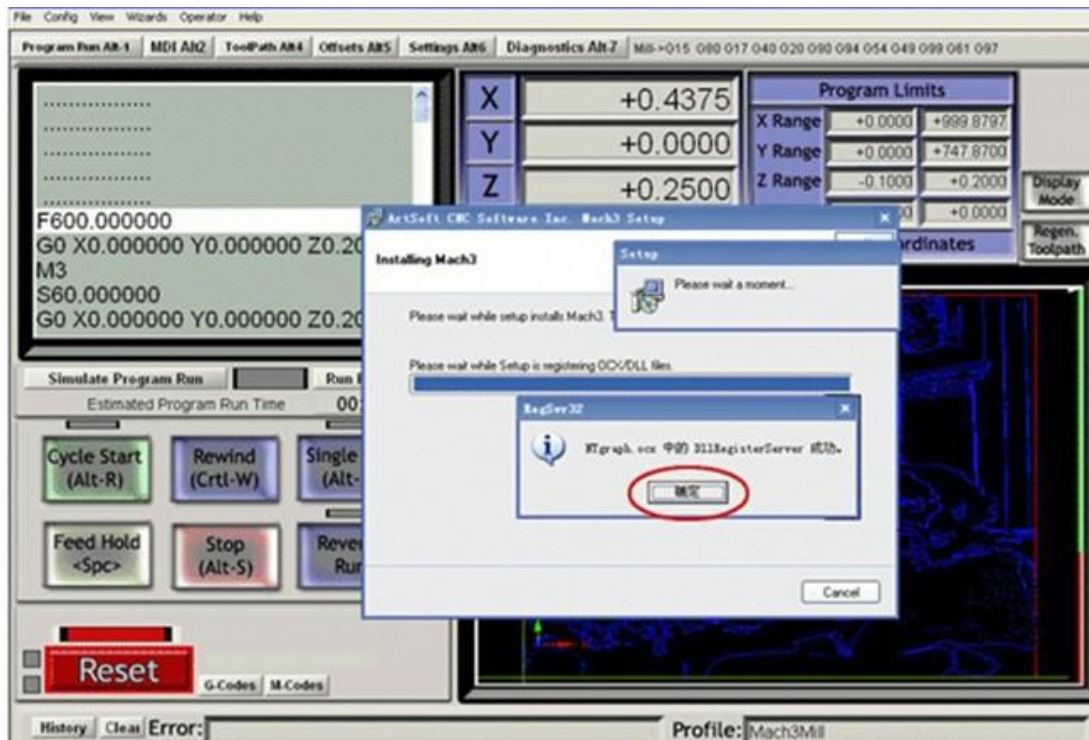


(6): click “next”

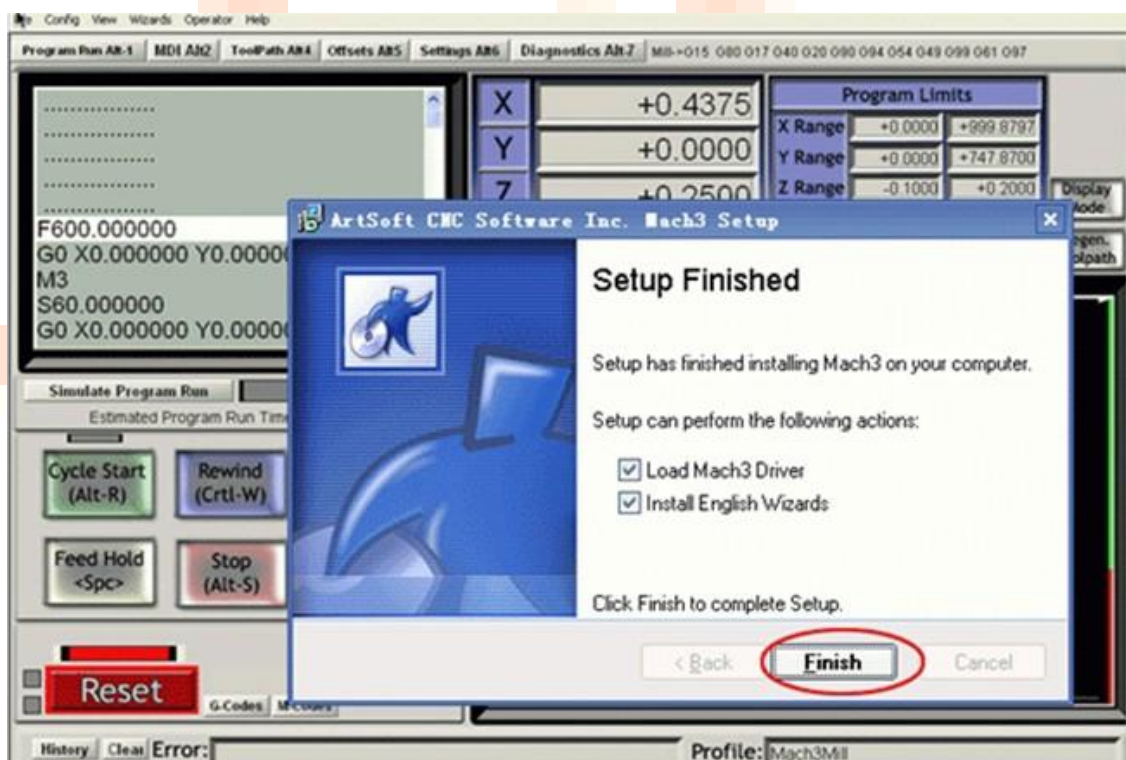


(7): click“确定”

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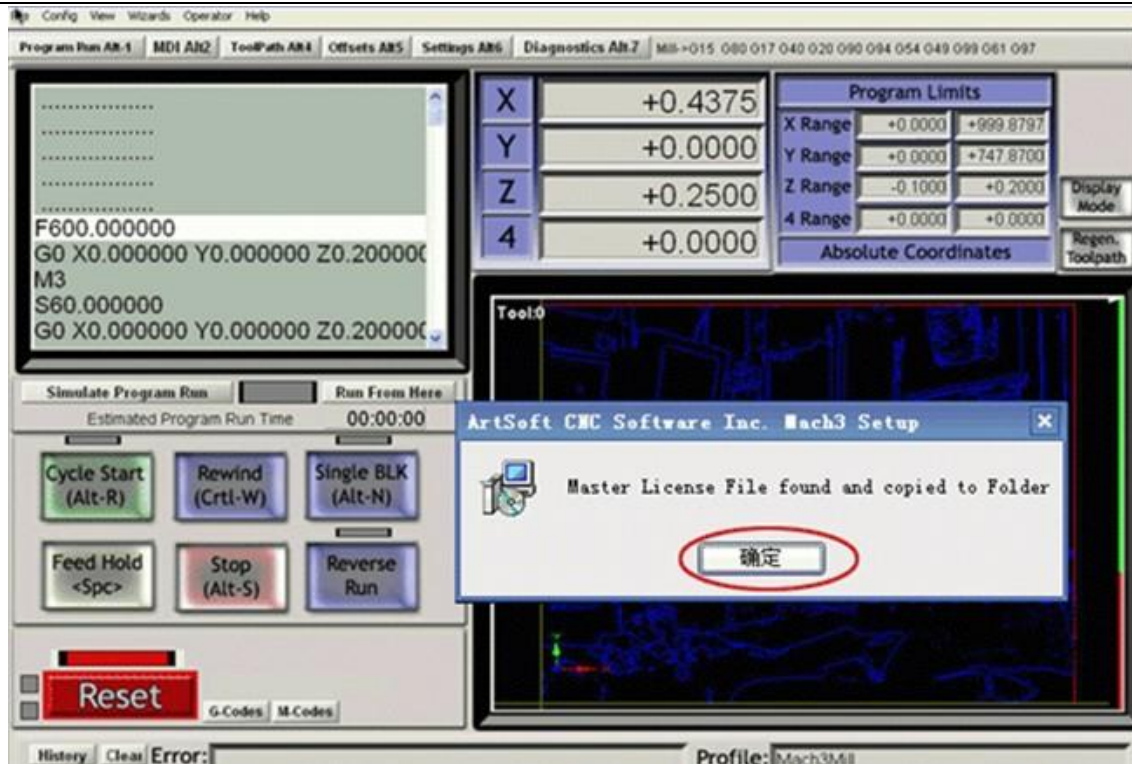


(8): click ‘finish’

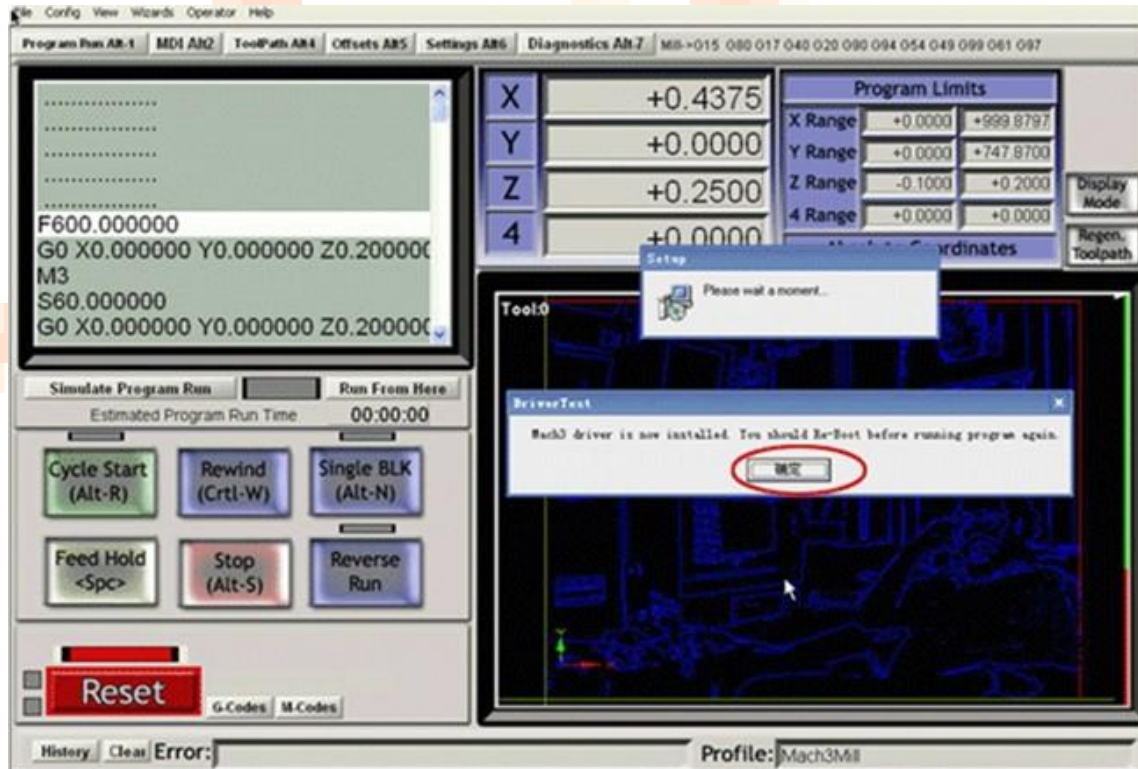


(9): click “确定”

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(10): click “确定”



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At this time, the desktop will generate four icons:



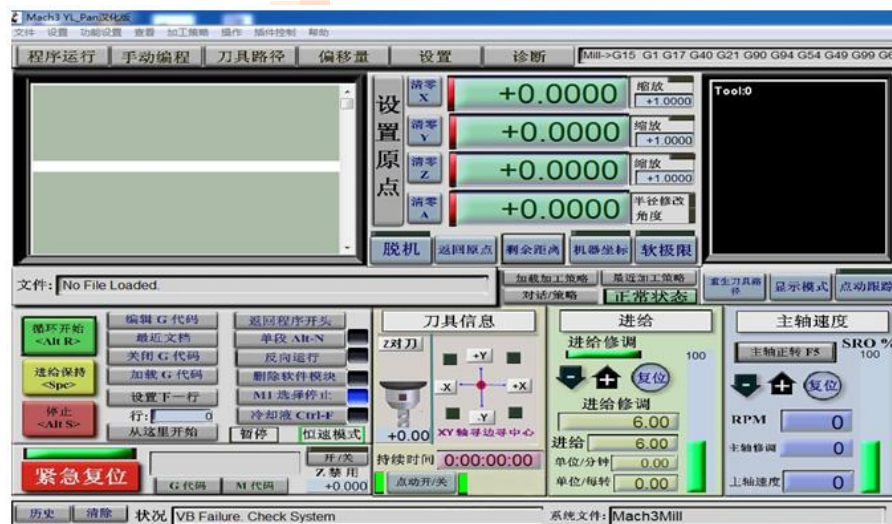
Note: Do not open any one icon ,at first ,immediately restart your computer.

(If you do not restart your computer and open the software, you will need to completely uninstall and reinstall the software)

★After restarting the computer, select Copy corresponding models folder files to mach3 installation directory.see picture below :



★At this point the software installation is complete. Software interface is shown as below:



Normal installation does not require software settings (skip Number 4 -Control software settings)

Remarks:

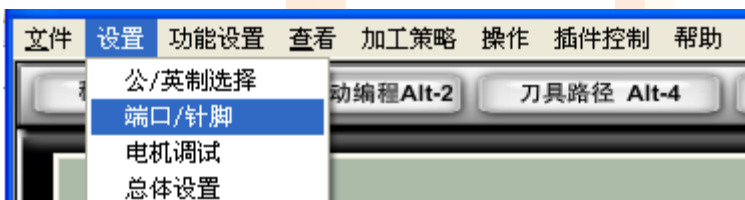
If the computer motherboard does not have parallel port:

- (1) for laptop, can choose card for PCMCIA to LPT
- (2) for desktop pc, optional PCI or ISA transfer LPT card (recommended for parallel desktop pc)

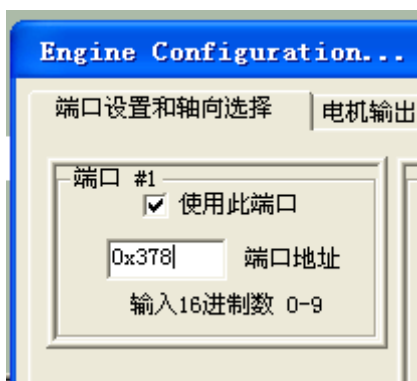
Note: LPT port (turn out by USB) can not be used for engraving machine control

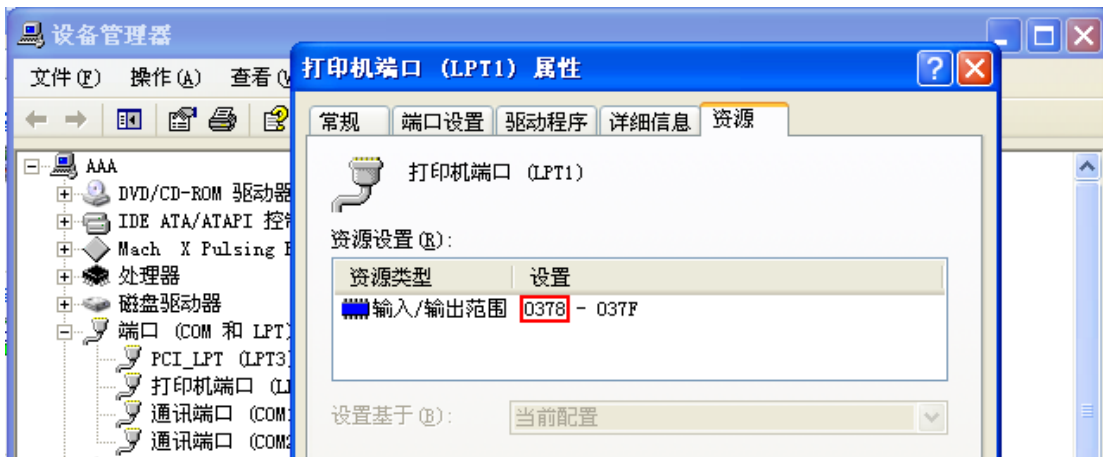
In most cases, are Port1,0x378, special models or PCI parallel port card, please look in the Device Manager and set the port address related properties in mach3 software.

Select: Settings - Port / Pin Menu



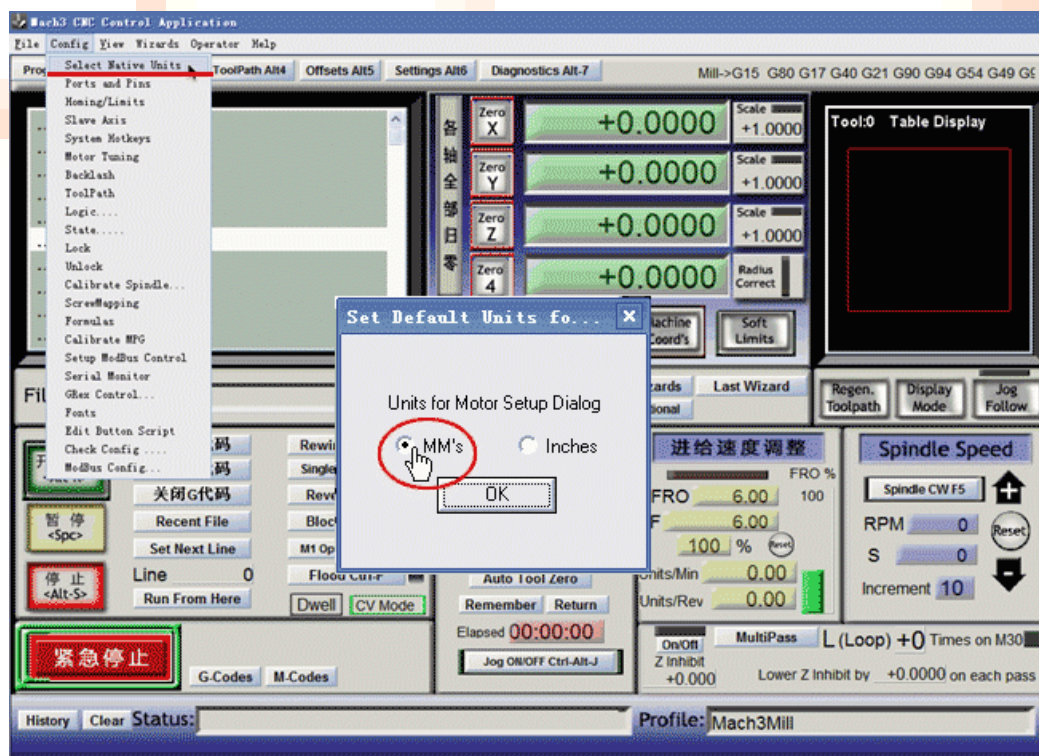
- (3) Select the printer port for engraving machine



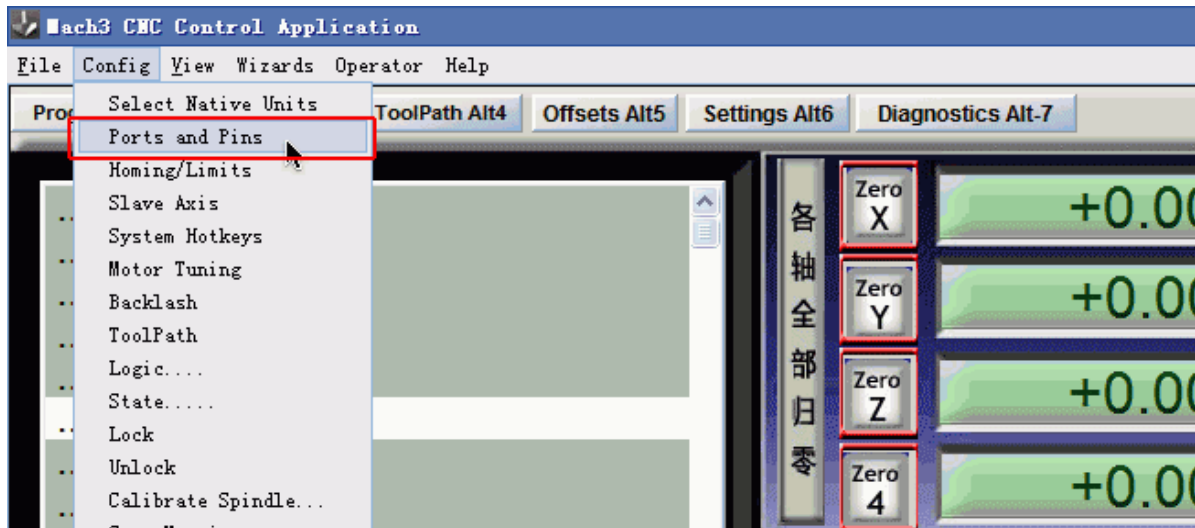


4、Control software settings

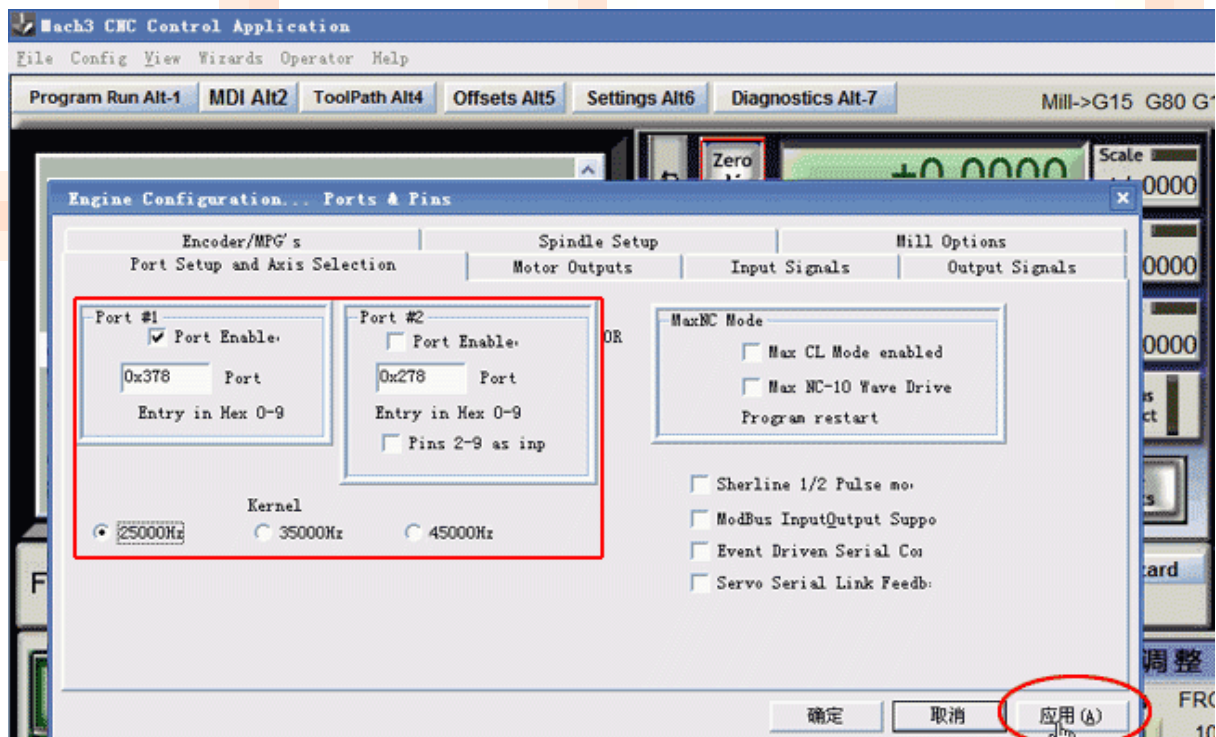
- (1): Restart your computer, double-click the desktop icon Mach3mill start MACH3 software.
- (2): Open the menu bar Config - Select Native Units, set the size of the unit is shown in "MM's.



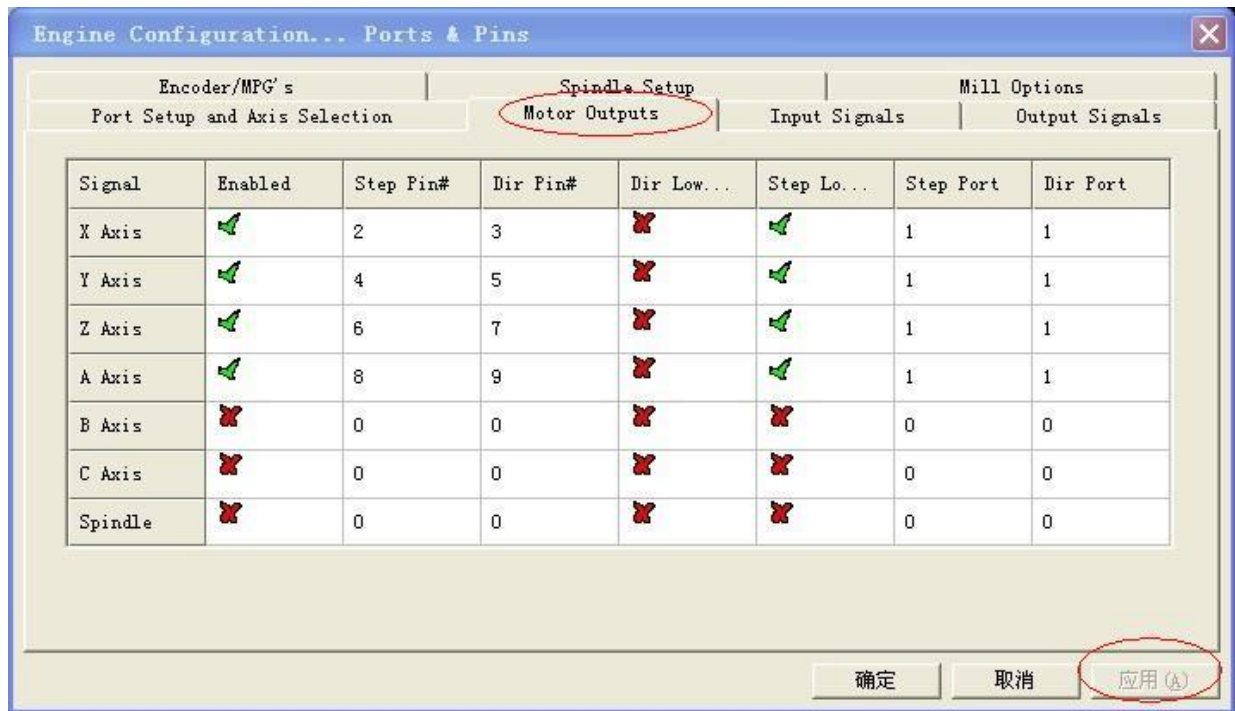
(3): As shown below, open menu bar to open the second Config-- Ports and Pins, enter the settings



(4): Check the following red box data is consistent with the computer parallel port address, and then click "Apply"



(5): the same window, click the "Motor Outputs" item, set the port pin of stepper motor, as shown below:

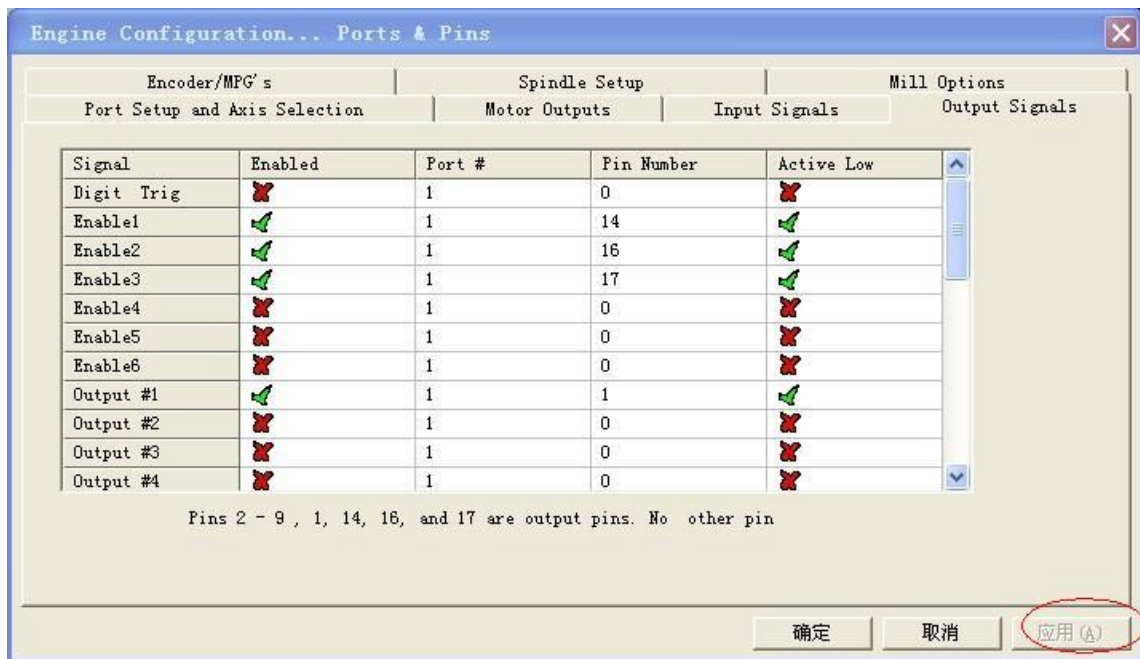


This setting is very important, please carefully read the steps shown on pictures to set the data, any error will lead to engraving machine not operating normally, or even an accident / failure during testing machine!

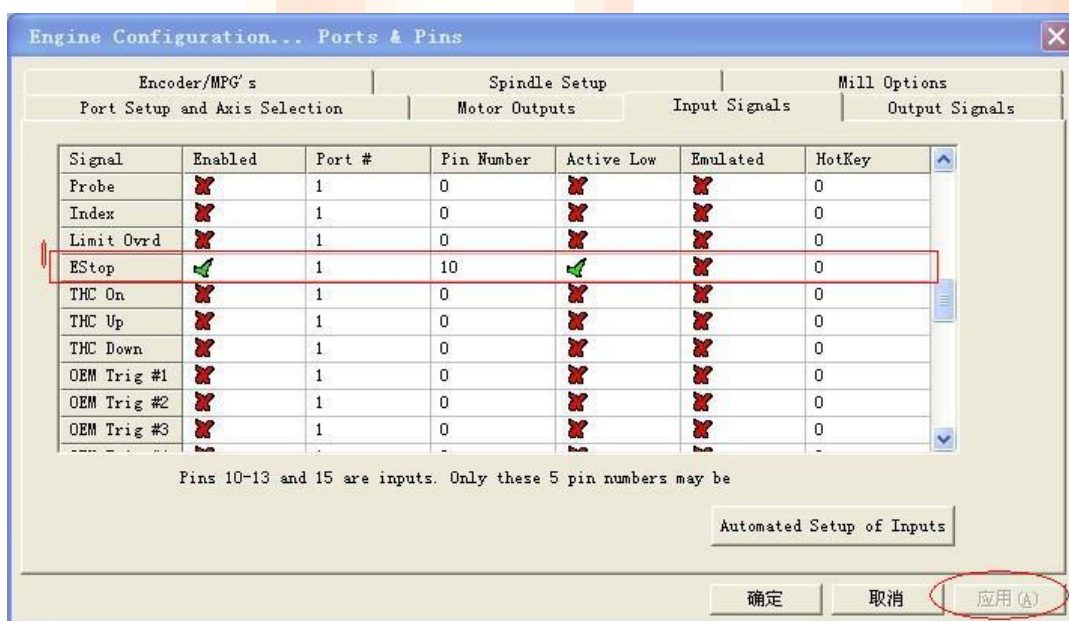
After setting , click "Apply" to save the settings.

- Note: Dir LowActive is used for stepper motor reversing entry set, and if you find any axis working direction is reversed , you can tick in this one, you can change the axis direction. After setting Remember to click "Apply."

(6): Find OUTPUT Signals to set triaxial , control spindle signal in the same window as shown below



(7): For the customer who purchase a complete electronic control box of the machine, also need to set the emergency stop signal. In the Ports and Pins setup, Input Signals entry point ,find "EStop" setting item in the following figure. After setting first click "Apply" and then click "OK" (Note: All settings must point "Apply" to save)



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(8): stepper motor parameter settings: Config - Motor Tuning,

First click on the right side X Axis button, set the parameters as shown in the figure, remember to click the bottom "SAVE AXIS SETTINGS" to save the settings;

Then click Y Axis Y-axis motor torque setting parameters and save

Then set the Z-axis and saved, and finally click "OK" to leave the set.

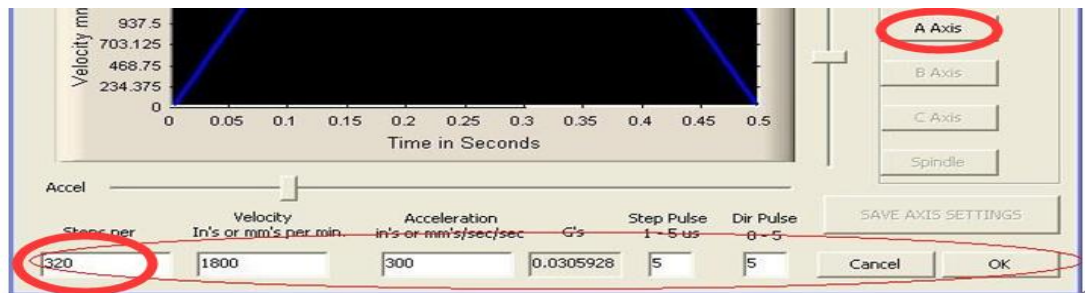


About A-axis settings:

1: Expand a path in accordance with the rectangular parallelepiped done, the parameter A is equal to 4800 in addition to the circumference

2: The path to follow to do a 360-degree angle, the parameter A is 13.33333

following figure:

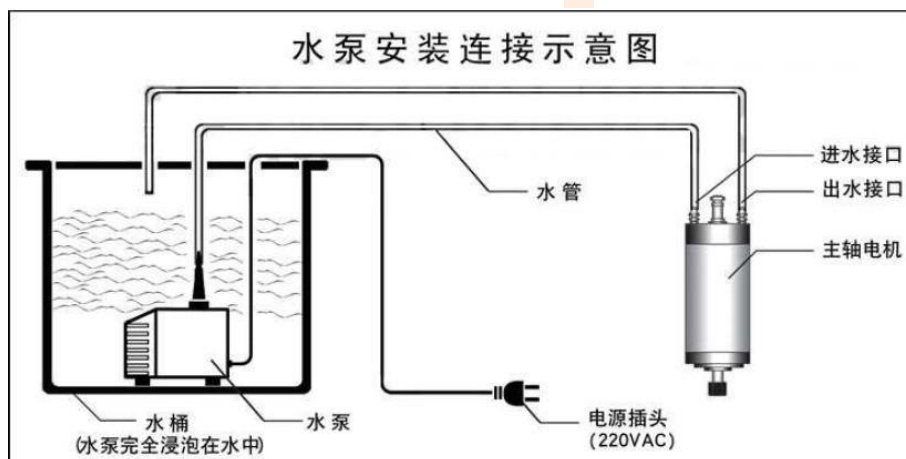


Then, settings is complete.

Now, turn off the MACH software, just save all the settings to take effect.

Then start MACH3mill again, just check to see if the settings are correct, carefully examine each option and the parameters are correct, anything wrong will lead to engraving machine not running properly.

Pump connection diagram below : (If you choose water-cooled spindle)



5、 Engraving machine operating procedures

1. Use CAM software, edit G code.
2. Run mach3mill software.
3. The material should be fixed on the table firmly
4. Install the suitable drill bits
5. Confirm the starting point depending on the material and the G code.
6. Load the G code
7. Start the spindle to begin carving.
8. After finishing carving, machine will automatically stop.

6、 know your engraving machine

(1).let's know more about your engraving machine, the next figure is the main components name of 3040Z-VFD1.5KW axis engraving machine. Contains a full set of engraving machine, electric control box one, accessories, as shown below:

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a. Please put your engraving machine in strong, steady, horizontal working table, thin desktop will lead reincarnation greater noise during the engraving machine is running.

b. Please place the control box in a horizontal position, can not have Electromagnetic interference around t 10 m range to the control box.

(2): Trial run and manual control test for the machine

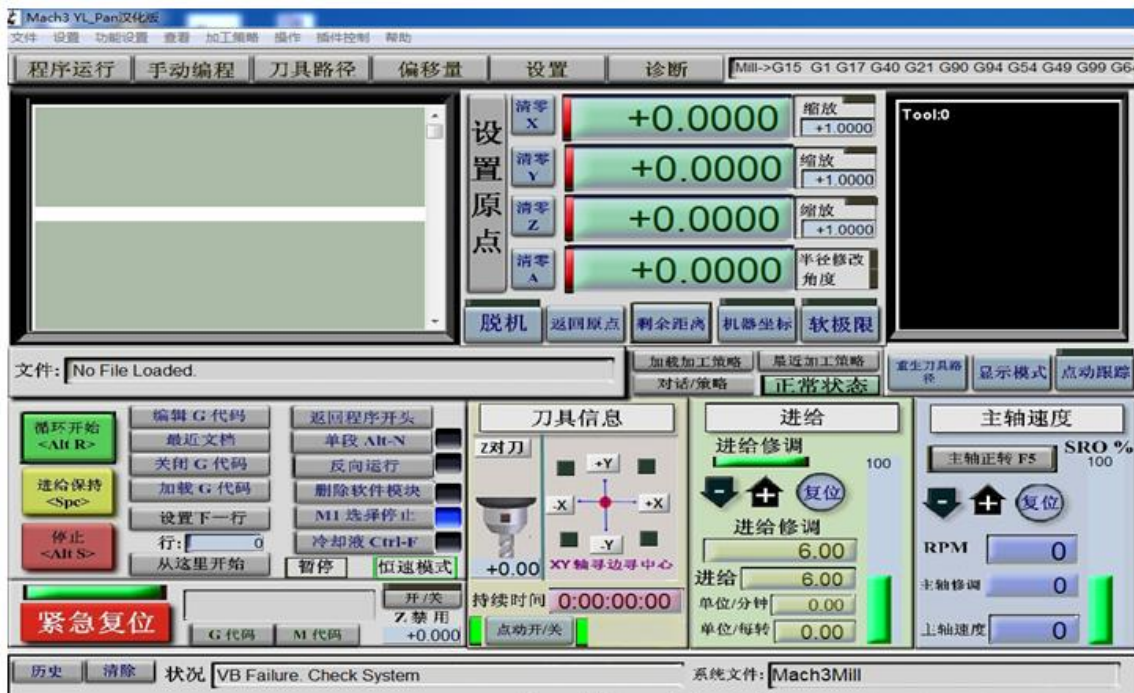
a. Check and confirm: whether the connection among computer→control box → engraving machine is correct; whether the software installation and parameter setting are correct;

b. First, do not electrify the control box, and turn the hand wheel of three step motors by hand now, you will feel that under the condition without electricity, they may be easily turned by hand; Then, plug in the electricity supply, and turn on the "POWER" switch, three step motors will be self locked at this time. Turn the hand wheel by hand again, you may feel that it is Slightly tight than the moment without electricity. This states that the machine can be controlled now, and you can send out an order to control it now.

c. Start up MACH3 software. If the "RESET" button at the bottom left corner is flashing, then click it with mouse, and begin to operate when it is static and not flashing; (attention that for a part of the machine types, you must first turn on the "POWER" switch of the control box, and not press the "EMERGENCY STOP" button).

d. Now press the direction key on the keyboard, there may be some response actions from the X or Y axis, and the digital coordinate of corresponding axis on the screen may be changed. The left and right keys control the X axis, while the up and down keys control the Y axis, the Page-UP and Page-DOWN keys control the Z axis; We can also control the running of each axis by the control panel of MACH3;Press

the "Tab" key on the keyboard, to call out the manual control panel of MACH3;
Click the button of X, Y, and Z by mouse respectively, to see whether three axis of the engraving machine operate or not.(If it is abnormal, please contact with your dealer to deal with it.)



In addition to manually use the arrow keys on the PC keyboard control, such as three-axis engraving machine, but you can also use MACH3 manual control panel comes with a mouse to control each axis, and can accurately jog control, such as per point look, just run 0.01mm. Let's take a look at its use.

Click on the PC keyboard (left) of the "Tab" key, MACH manual control interface will pop up. As shown below.



Now, communications test of engraving machine and control software end.

If you are still not able to control engraving machine manually, pls do as the following programs:

1. Uninstall MACH software, replace other versions of the MACH3 for test 2, consider verify your parallel port is intact correctly, the replacement of desktop computers tested.
2. Check the parallel port ok or not, change a desktop computers to test
- 3, as long as the engraving machine and electric control box self-check (self-locking) is ok , then consider the problem of software compatibility or parallel.
4. After installing Mach ,do not restart the computer before open the Mach software, then all of the above work is futile.

7、 Failure Analysis and solutions

(1). turn on the power, the power light does not shine;

- a. Check that the power cord is in good contact
- b. the fuse is normal (fuse located under the controller power seat)

(2). can not control the engraving machine

- a. the control box turn on power or not →turn on the power
- b. engraving machine in the emergency stop state →cancel the emergency stop (the control box and software)
- c. is connected to the computer properly →connected to the computer correctly
- d. the software is installed correctly re →install the software
- e. the software is set up properly →reset software

(3). carving issue

- a. sculpture and design size are too different →Check the motor tuning parameters correct or not
- b. carved out of travel design drawings →Starting point is set incorrectly
→Design size is too big
- c. Engraving machine out of step →feed rate is too fast
→Eat too big knife
→placement instability
→interference

8、 Notice for maintenance of the machine

(1) Each time after engraving, you should first close the principal axis and power switch, and then clean the scraps produced by engraving in time;

(2) Lubricate the guide way, bearing, and screw mandrel of the machine per time every month; Use clean cotton fabric with white oil (sewing-machine oil) to clean the guide way, smear some white lubricating grease on the screw mandrel, and then turn on the machine to operate for several times. Then, lubricate all these parts again. Please attention that consistent grease is avoided.

(3) Check the cable line of the drag chain at least one time per month, and loose the tight cable line in time, so as to ensure that each line in the drag chain is loose. At the time of engraving, these cable lines need to do flexure operations repeatedly, so if the line is tight, it may easily lead to the broken of internal copper wire, thus causing poor contact. In this way, it may further let the electric motor out of control.

(4) Check all the screws every month, and tight the screws in time if they are loose.

(5) The spindle motor belongs to consumable supply, and its application cost is very low, so that if any abnormal sound or foreign taste occurred during the process of using, it means you need to change for another one. The spindle motor also needs to be changed after 600 hours' regular use, so as to ensure good performance of engraving.

(6) If the machine remains not being used for a long time, you should oil it for maintenance, and then storage it in the dry place with the covering of plastic film.

Attachment: Common sense carving knives

Let me give you a brief introduction of engraving machine drilling tools, please consult a professional reseller when choosing carving knives.

1, acrylic cutting, it is recommended to use a single blade spiral milling, features are smokeless, odorless, fast, efficient, non-stick scraps, fine knife pattern, the surface is smooth; of course, if the acrylic sheet (For example twenty-three mm thick, with a double-edged knife cutter or column are also ok).

2, aluminum cutting, it is recommended to use special single blade aluminum cutter ., fast and efficient. Demanding higher or aluminum cutting surface hardness (less sticky knife aluminum) can also use a double-edged metal cutter.

3, do precision small relief on non-metallic materials, it is recommended to use round graver.

4, cork, MDF, native wood, PVC, acrylic large deep relief processing, it is recommended to use single or double-edged blade screw ball end mill.

5, metal engraving, pls use special metal tungsten steel coated single or double-edged blade milling cutters, special flat knife.

6, MDF, solid wood, plywood, plywood recommend using straight groove cutter, you also can use the double-edged big chip cutter.

7, for metal mold, needs tungsten steel cutter, purple plated hardened titanium.



平底尖刀

用途：精密雕刻、划线
注意：平底尖刀还分普通尖刀，铜、铝、钢铁等专用尖刀、PCB 专用尖刀等。



双刃铣刀

用途：切割和勾槽
注意：双刃铣刀也分普通非金属用铣刀、金属专用钨钢铣刀、微小径铣刀等。



单刃铣刀

用途：切割和勾槽
注意：普通单刃铣刀主要用于 PVC，密度板，芙蓉板。也有铝用刀，排屑效果好。



单刃直刀

用途：切割和大面积雕刻
注意：非金属用刀，大面积雕刻时节省时间，排屑好可用于切割或清洗平面。



直槽铣刀

用途：雕刻及切断
注意：主要用于多层板、密度板，夹板等木质板材的雕刻切割。



三棱尖刀

用途：精细雕刻及切断
注意：可在铜、铝、铁玉石等硬物质上雕刻及切断。但刀具材质不同性能差别大。



圆底刻刀

用途：专用来精细浮雕
注意：分金属用和非金属用二种，大面积浮雕建议先开精再用圆底刻刀精加工。



球头铣刀

用途：浮雕加工或开粗用
注意：分金属用和非金属用二种，加工面积较大的浮雕或精细浮雕开粗用。

