# 6090 mini Numerical Control Carving Machine manual -Mach3 version

Shenzhen Scotle Technology Group Limited

Chinacncnzone

Address: 038-068 2F Handmade Culture Street, Phase III, Shuike Road, Bantian, Longgang, Shenzhen, China

Website: www.chinacnczone.com

www.scotle.en.alibaba.com

Email: sales@scotle.com

sales@chinacnczone.com

Tel: 0755-89378482

# Content

# Outline

Chinacncnzone 6090 mini CNC is a kind of small-size product mainly applied in the processing and manufacture of woodworking, advertising, modeling and art ware, particularly appropriate to the carving of the materials such as wood, plastics, acrylic and soft metal as aluminum and copper.

Mach3 CNC control software is an numerical control system developed by ArtSoft based on the Windows as its platform. The new-type of numerical control system which is characterized by simple operation and maintenance, openness, stable performance and low price is a full-functional CNC controller transformed from the standard PC. With its max. 6-axis interlock CNC, it supports input of various file formats such as DXF, BMP, JPG, and HPGL and immediately generates G code displayed by the sight G code. It is controlled by spindle-speed control with multiple relay through hand-held pulse including large quantities of machining strategies and video display. With its digitized touch screen, with full-screen display, the tracking, automatic tool-setting and the routine light-flooding execution (break-point memory) can be achieved.

The system has the functions such as thread pitch error compensation, backlash compensation, length compensation and tool nose radius compensation and wear compensation.

The axial motion acceleration and speed adjustment interface can be adjusted according to the demand to adapt to the high-speed and high-precision processing.

# PC selection and port installation

1. You must have a desktop with parallel port.
2. The desktop should meet the following requirements: CPU/1GB, internal storage of 512, hard disk capacity of more than 20G, parallel port, Win XP.
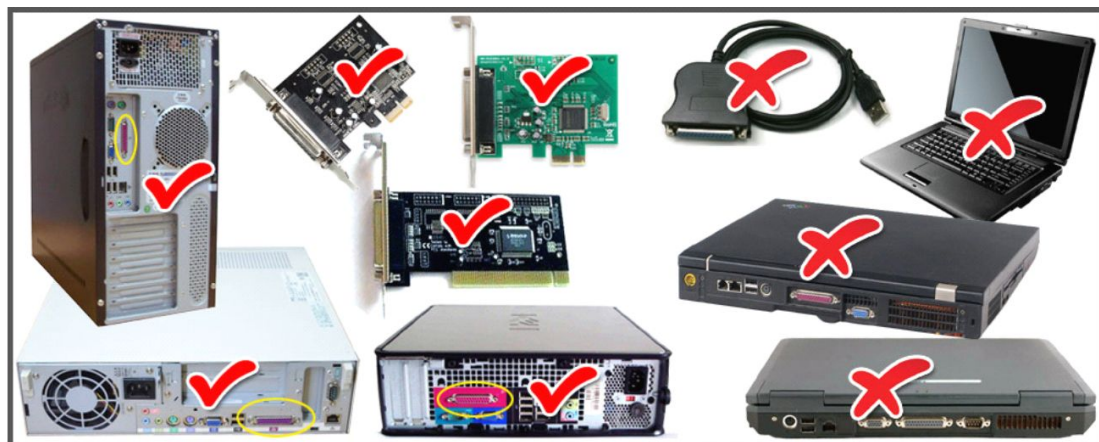
# Machine's parameters
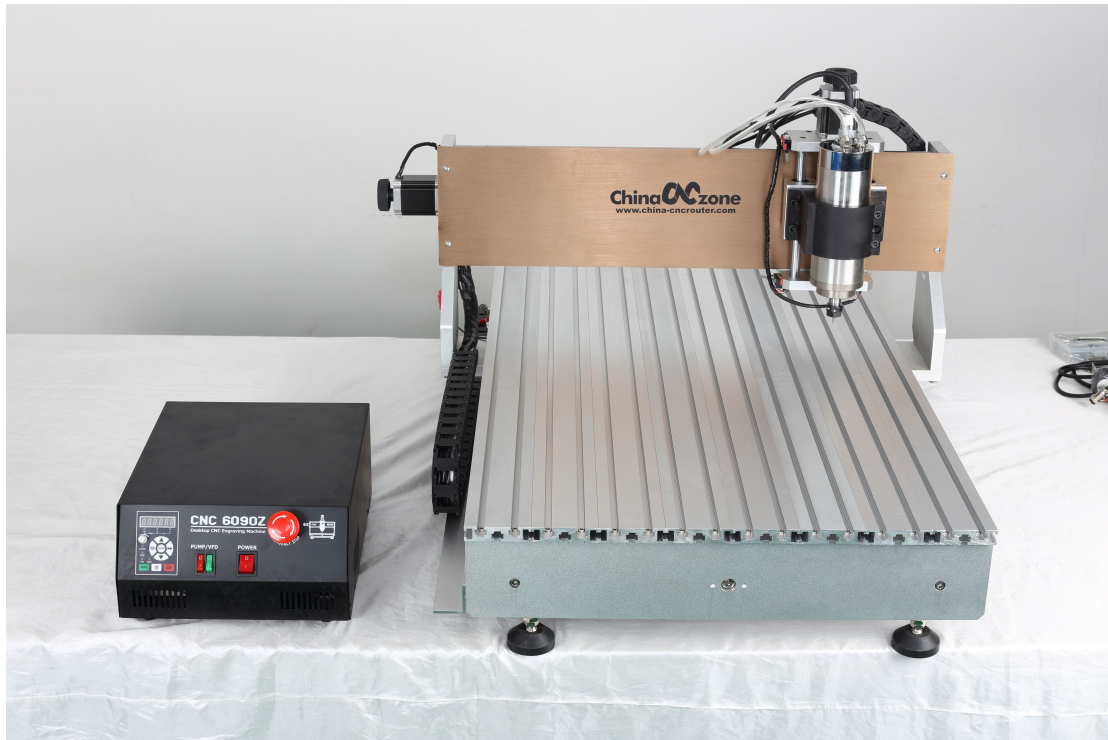


| Effective working travel | | 580(X)mm*880(Y)mm*85(Z)mm |
|---|---|---|
| Work table dimension | | 600mm*900 mm |
| Frame materials | | aluminum alloy 6063 and 6061 the unique and dedicated mold extrusion profiles. let   counterfeiters dwarfs |
| acceptable material thickness | | ≤100mm |
| Driving units | X/Y/Z axis | 1605 ballscrew |
| Sliding units | X axis | Dia.16mm chrome plate shafts |
| | Y axis | Dia.20mm chrome plate shafts |
| | Z axis | Dia.13mm chrome plate shafts |
| Stepping motor type | | 57 two-phase 3A 150N.cm |
| Spindle motor | | Brand new 1500W water cooling spindle, 24000RPM |
| Principal axis collet | | ER20/3.175 mm/6mm |
| Repeat accuracy | | 0.05mm |
| Spindle precision | | radial beat acuities 0.03 mm |
| Software environment | | Windows xp, Windows 7 |
| Maximum speed | | 0-4000mm/min |
| Control unit | | Toroidal transformer + PWM power supply module + TB6560 3axis drive board |
| Computer connection | | 25 pins parallel port |
| Command code and software | | G code |
| Protection | | Emergency stop button |
| Operating Voltage | | AC220V AC110V will provide voltage changer |

# Highlights for this CNC 6090

1. 2200W Water Cooled Spindle
2. With live video support
3. Ball screw high precision
4. Independent power supply for main board, prolong using life
5. Mach 3 software is simple and intelligent, can be connected    with computer
6. Limited switch added
7. Auto-Checking function
8. With 4 axis, can engrave cylinder object

This 4 Axis CNC 6090 can be widely used
A. Widely used not only for Aluminum but also acrylic, brass, wood, PVC, PCB and so on
B. Ideal for milling, engraving, drilling & routing.
C.For Industry, Technology Research, Advertising Design, Arts Creation, Teaching, Student Project and Hobby Purposes, Building Model Making, Advertising Signs, Artwork, Crafts, Aircraft Models, RC Model parts.

# Mach3 controller introduction



the buttum for adjust the spindle speed.

the panel of spindle inverter, the main function is adjust the speed of spindle.

Emergency stop, when X,Y,Z axis move beyong the working area, the machine will stop work, in the time users need turn left this buttum.

the green buutum is the POWER ON buttum for spindle inverter. the red one is the POWER OFF buttum for spidnle inverter.

the power buttum of PUMP and Spindle, press the buttum to O shape, machine's water pump and spindle power on.

the power buttom, the O shape means power on, I shape means power off

## How to install the step motors in 6090 mini CNC?

Below video link in You-tube show you the correct way and steps of install the step motors in Chinacncnzone 6090 mini CNC.
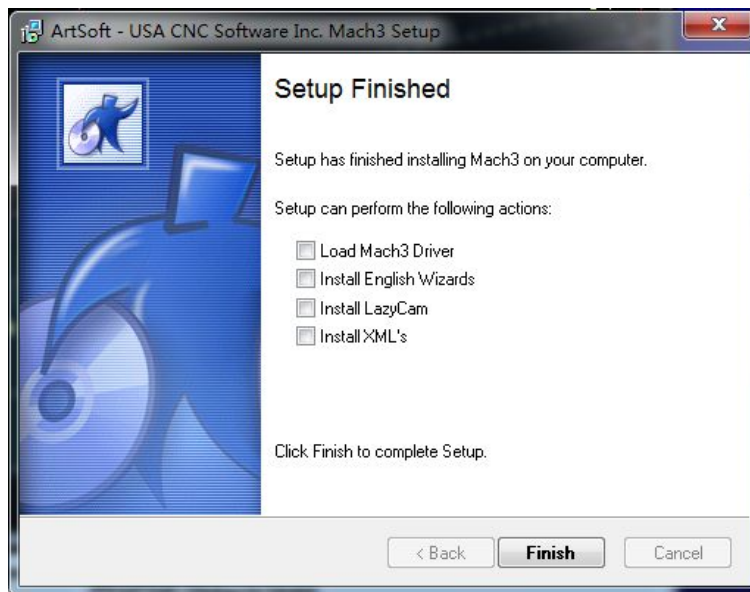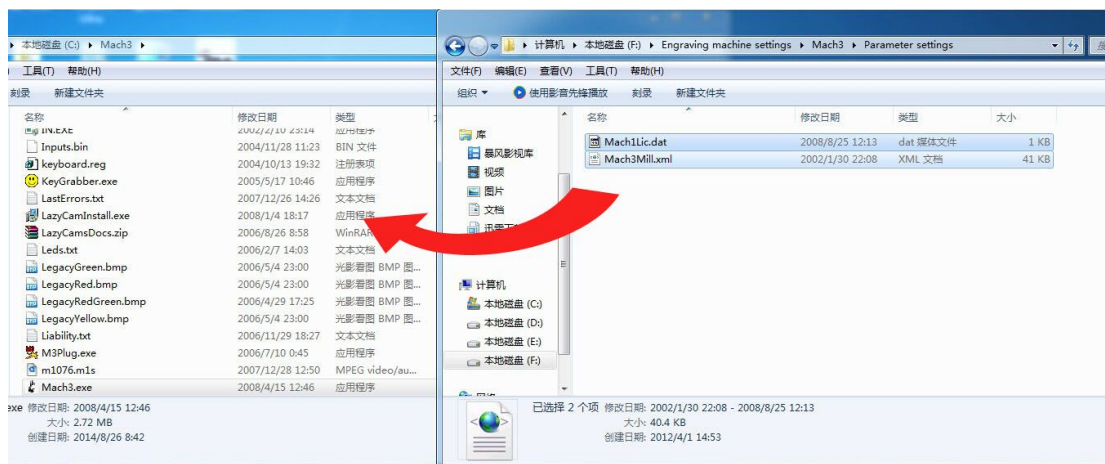
https://youtu.be/2r3mgSo3UoQ

## Software Instillation

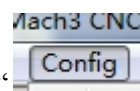Firstly, open the disk and find Mach3versionR3.041.exe in the file of mach3, open it and install it.
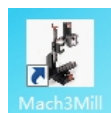
After installation, click on "Finish' to complete the setup.
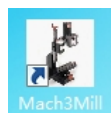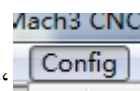


Open the "Parameter settings" file folder, and copy the files in it under the installation directory of Mach3.
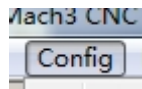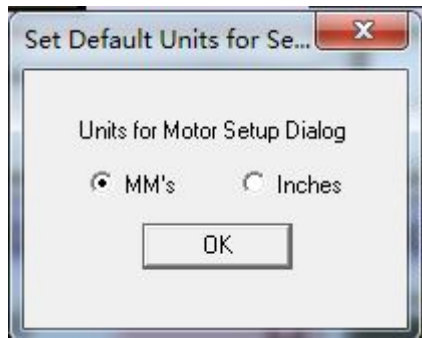


## Software Data Setup
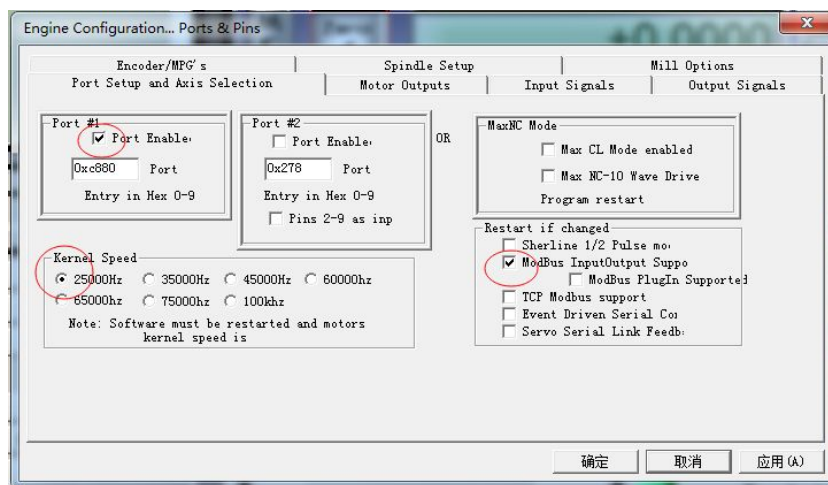
Open the MACH3 installed , click on "" in the menu and select successively metric/English system and click on "确定"to confirm your selection.
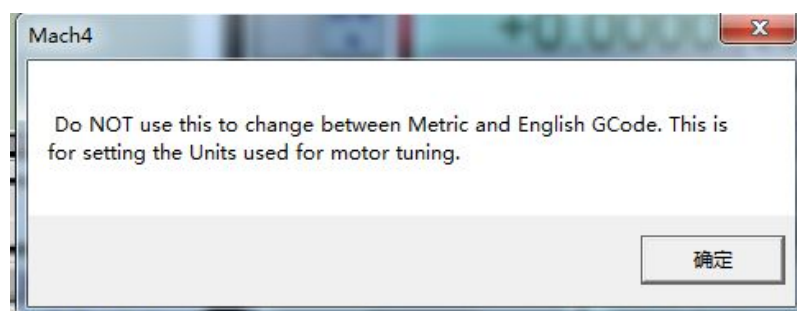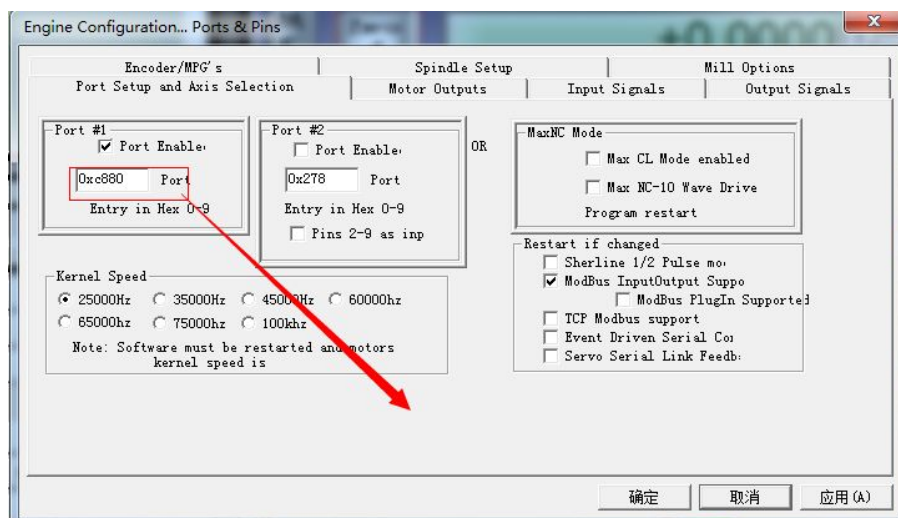
Enter "set default unit" and select MM's or Inches. In most cases, MM's.



Click on "config"  in the menu and select successively port/kernel speed, port setting and axis selection.
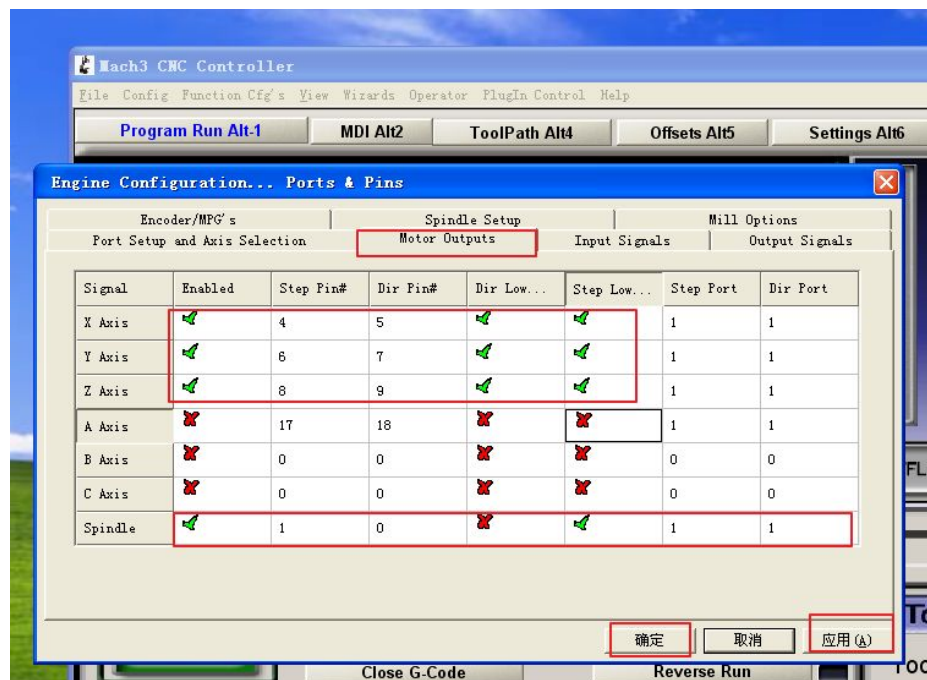


Pay attention that each PC has a different PortAddress. You need to modify it to your own address of the PCI.

To check the port address, click the right-hand button of "my computer" and select "manage". Then enter device manager, find your port of PCI, click the right-hand button of "properties" and enter "resource" to check.
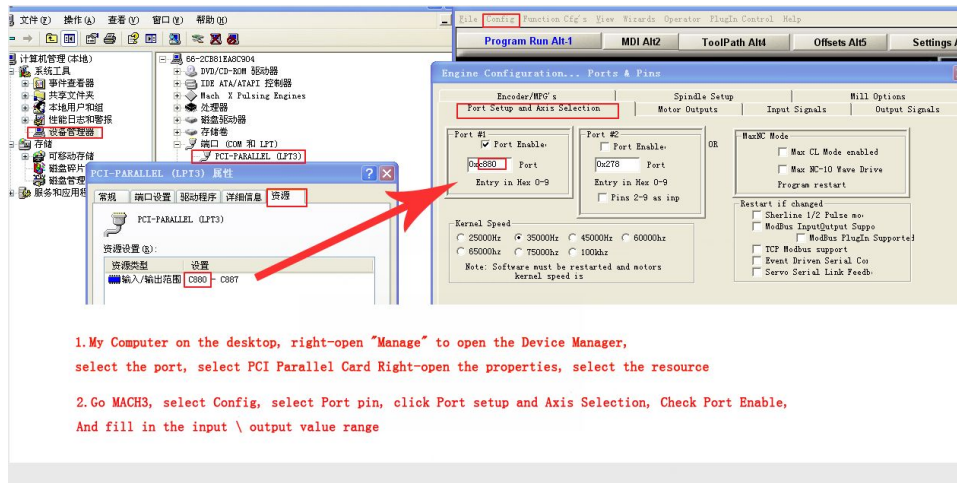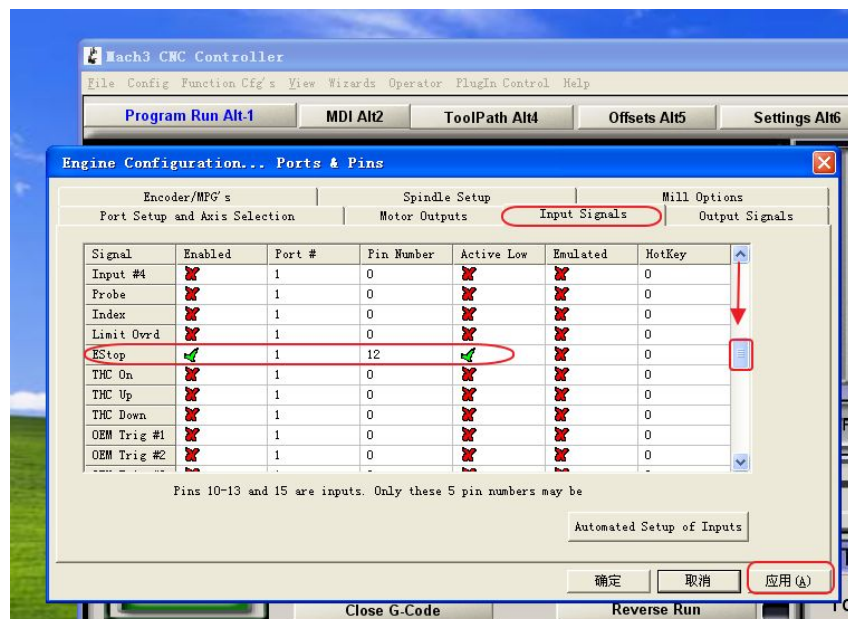


Click on "motor outputs" again. And the setup process is as follows. Pay attention if you haveAxisA, you should select AAxis. If no, leave it there.
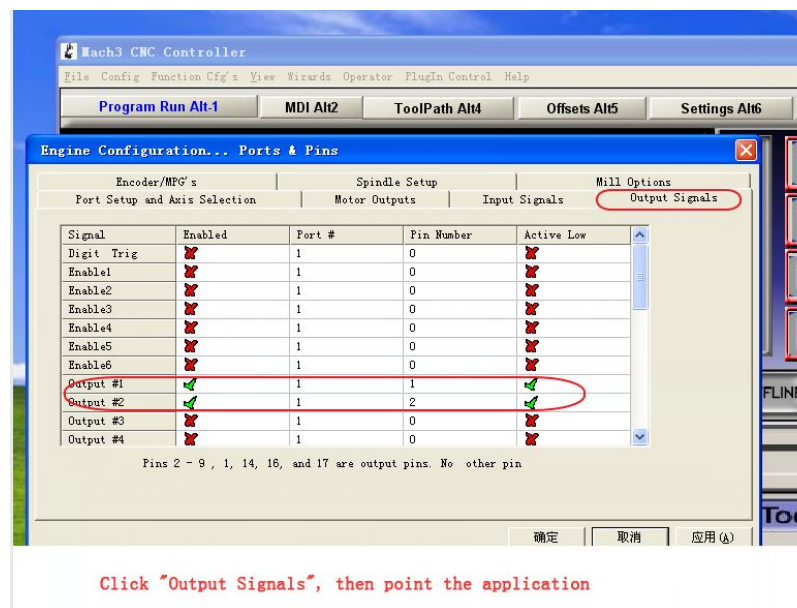
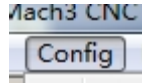Click "input Signals" and the setup process is as follows.



Click on "Input Signals" by setting the figure shows,
Then point the application

Click "output Signals" again and the setup process is as follows.



Click "Output Signals", then point the application

When the setup is over, click "确定" to confirm the operation.

Click "config" Config in the menu again, and enter "Motor turning" and execute the setup. Pay attention that the setup of X and y axis is the same. After the setup, click on "SaveAxis Settings".



The click on Z Axis and the setup process is as follows.
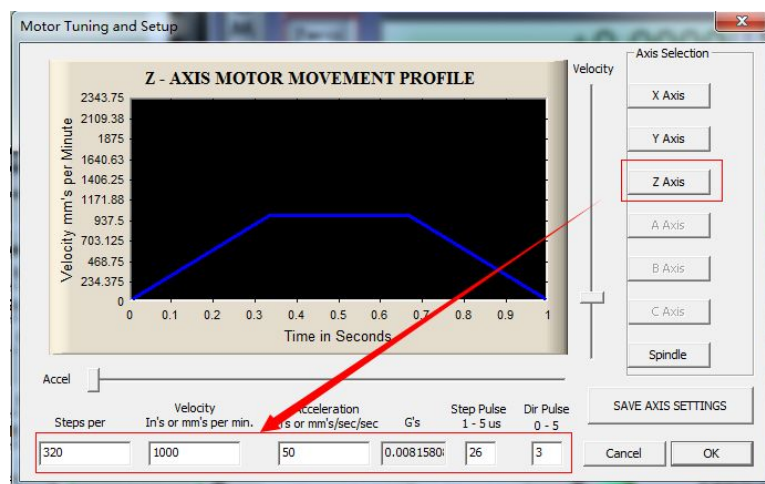


The click on the principal axis and the setup process is as follows.After the setups are over, click on "OK".
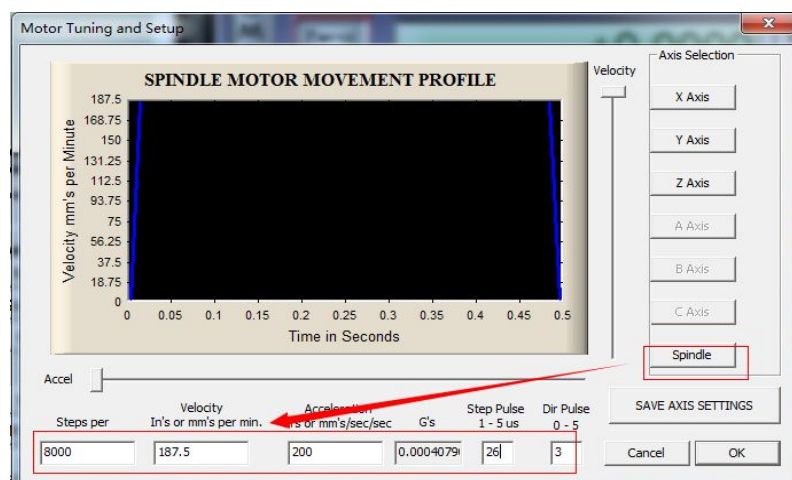
Click "config"  in the menu again and enter successively "general config" and the setup process is as follows.
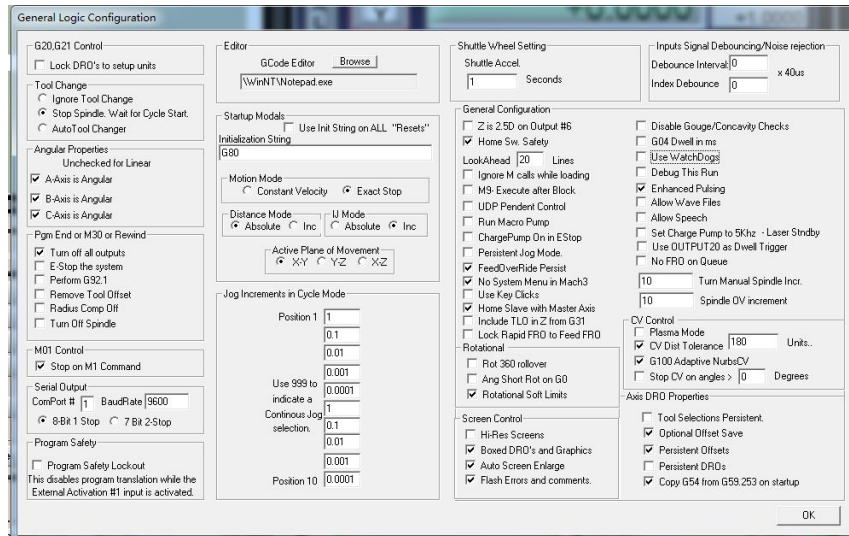


Click again on "config"  in the menu and enter successively "Safe_Z Setup" . The setup process is as follows.
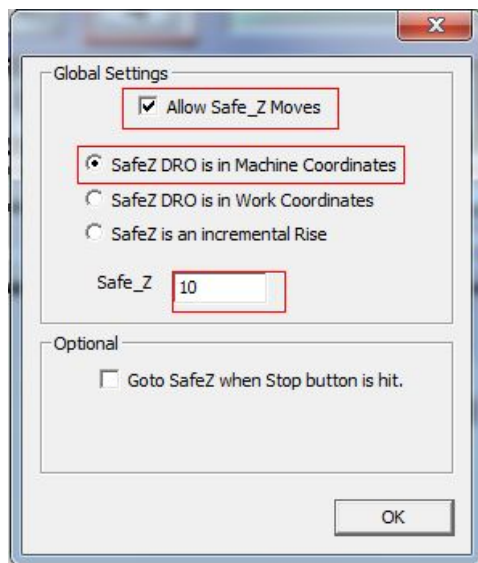


The setup is completed…

## Testing

pgup Key{Axis Z turn forward to +} pgdn Key{Axis Z turn reversely to -}
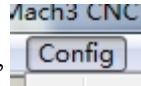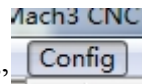
After the setup, test if each direction is correct and the motion directions ofAxis X,Y, and Z. Click on "arrow up" on the keyboard {Axis turn forward to Y +}, "arrow down" {Axis Y turn reversely to -}, "arrow left" {Axis X turn forward to +} and "arrow right" {Axis turn reversely to -}.

And click on "pgup" {Axis Z turn forward to +} and "pgdn" {Axis Z turn to -}
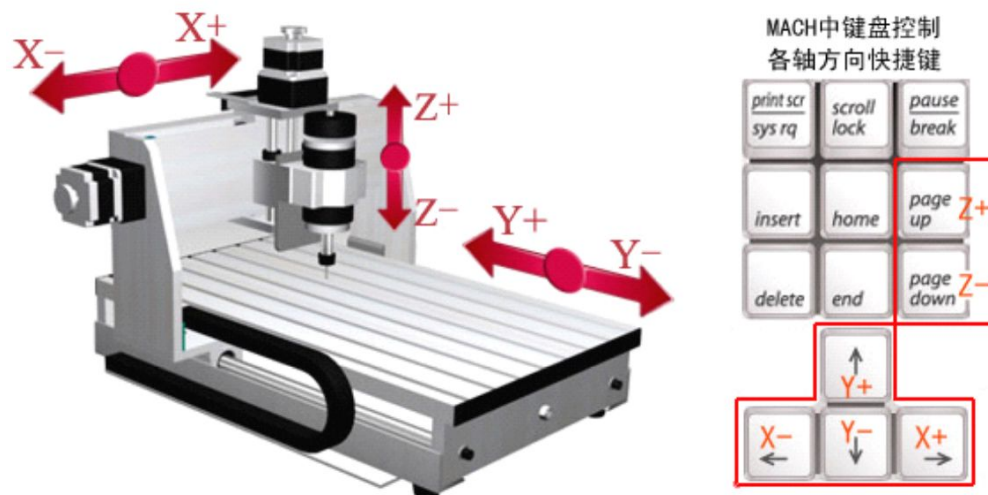


Test the operation of the spindle and input a spindle speed and click on "enter" and then click on "spindle CW F5".
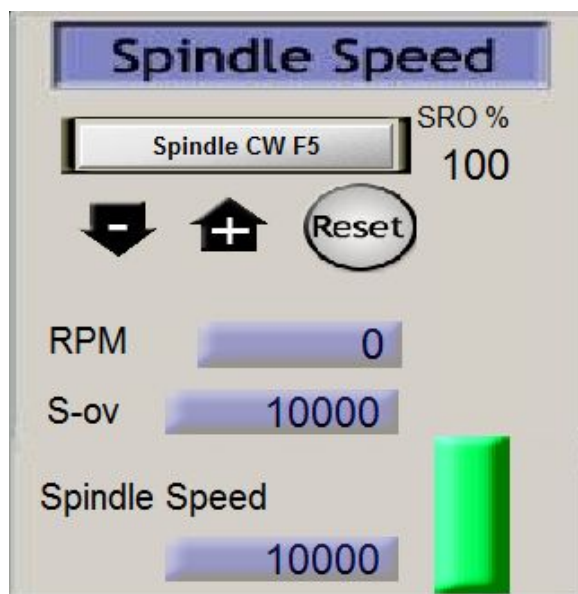
# Work-piece Placement and Tool-setting Method

Work-piece placement



Installation instruction of the pressing plate

In the chart below, each of the axis should be zero clearing, then make the spindle touch X+ first and then X-. Calculate the distance between X+ and X-, divided by 2 and the result is the central point of X. Input the result inAxis X.



Pay attention that Axis Y is the same operation and Axis Z will be zero clearing when touching the surface of the workpiece. If you have any questions about the too-setting, watch the video for the instructions.

# Common Faults and Maintenance of NC Carving machine

## Common faults

I. Uncontrollable Axis Z
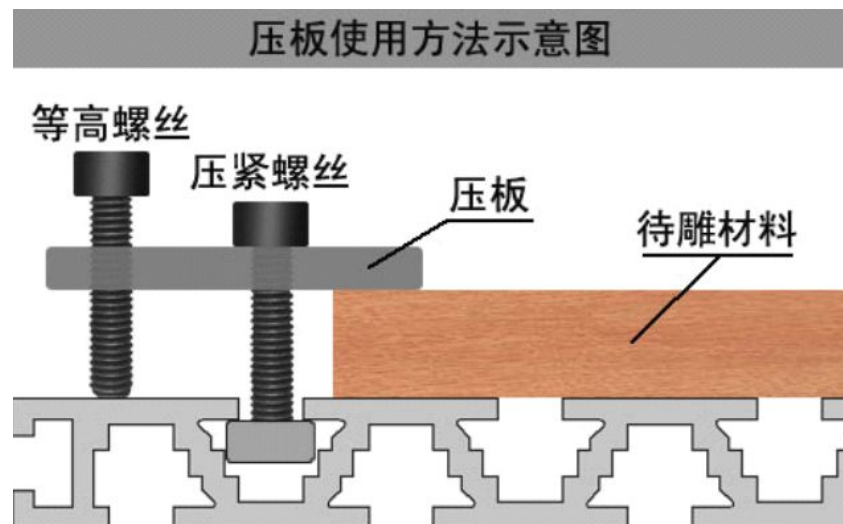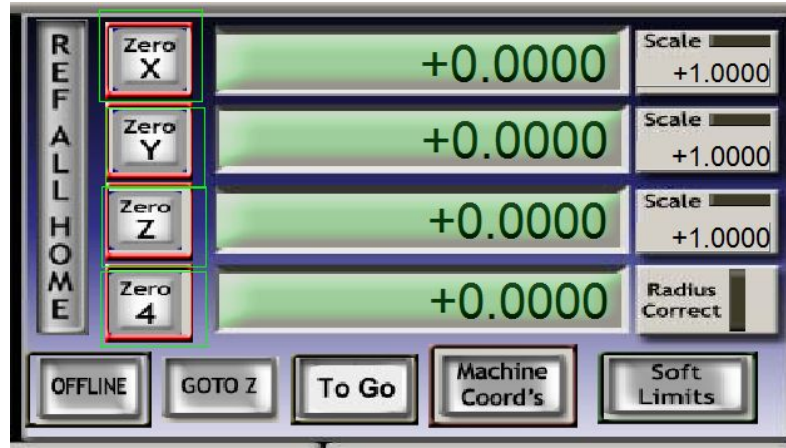    1. Loose control card or fault in the control card;
    2. Electrostatic interference;
    3. Failure in the motor wire of axis Z;
    4. Wrong file path;
    5. Converter interference;
    6. Problem or virus in the computer system;
    7. Mis-operation
II. Errors
    1. Loose control card or fault in the control card;
    2. Failure in the driver;
    3. Failure in the stepping motor;
    4. Electrostatic interference;
    5. Failure in the motor wire;
    6. Failure in the data line;
    7. Wrong path;
    8. Loose coupling or rupture in the coupling;
    9. Too rapid processing speed; 10. Problem or virus in the computer system
III. Regular carving
    1. Loose control card or fault in the control card
    2. Failure in the stepping motor

3. Failure in the driver or inconsistent settings of electricity subdivision and software

    4. Failure in the motor wire of Axis Z;

    5. Motor fault of spindle

    6. Converter interference or wrong data setting

    7. Electrostatic interference;

    8. Problem or virus in the computer system

IV . Uncontrollable carving machine

    1. Fault in the control card;

    2. Converter interference;

    3. Wrong file path

    4. Electrostatic interference;

    5. Problem in the software setup;

    6. Failure in the driver or wrong electricity subdivision setup;

    7. Failure in data line;

    8. Problem or virus in the computer system

V. Uneven milling bottom

    1. Out of plumb of the spindle and the table-board;

    2. Problem in the tool;

    3. Problem in the control card;

    4. Problem in the driver of Axis Z

VI. Spindle off

    1. Internal short of the spindle;

    2. Electricity shielding;

    3. Wrong setting of the parameter of the frequency converter;

    4. Fault in the control card;

    5. Spindle short or data line short

VII . Abnormal sound of the spindle

    1. Fault in the setting of the frequency converter;

    2. Spindle off;

    3. The problem of the spindle

VIII . Opposite Direction of Motion or Back to Mechanical Origin

    1.Alter the file in the wordpad;

    2.Alteration of the connection method of the frequency converter;

    3. The direction of roll out in the software

IX . Unable to Return to Mechanical origin

    1. Opposite direction;

    2. Loose control card or fault in the control card;

    3. Fault in the limit switch or data line;

    4. Failure in the driver;

    5. Failure in the stepping motor

X . Incontrollable Spindle

    1. Fault in the control card;

    2. Failure in the frequency converter

XI . Error Prompt of "Failure in Read the Card, Please Check"

    1. Check if the driver of the board card is installed correctly or change a PCI slot for the board card;

    2. Re install the two data connecting lines and check if the needle is broken;

    3. Replace the board card if it is its problem.

## Daily maintenance

    1. The machine should be placed in a dry and well-ventilated place (avoid long time exposure in the sun)

    2. The machine must be configured with a reliable voltage stabilizer to ensure safe earthing of the ground electrode.

    3. Try to avoid using the PC with internet access to output the file to the carving machine.

    4. Maintain the machine once every month (paint appropriate amount of lubricating oil on the lead screw)

    5. The control cabinet should be placed in a well-ventilated place and avoid the operation in the high-temperature area.

    6. Check if the circuit of the carving machine is loose regularly.

    7. Don't place stuffs (like magnetic materials, dead weight cargo and liquid) on the drilling crew or nose of the carving machine.

    8. Don't keep the machine working in the same corner in a long time (to avoid the unsuccessful lubrication due to the failure of contacting of the lead screw and guide rail with the cross member for a long time)

    9. Keep the lubrication in the good state by regular checking, cleaning the lead screw, and adding or changing the grease or oil in order to remain the moving parts such as the lead screw and cross member lubricated and thus reduce the rate of wear of the machine.