BEIJING

RUIZHITIANHONG S&T Co.,Ltd

Engraving machine motion control system

Color Screen

A51:Three-axis mechanical carving

User's manual

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Thank you for choosing the products!

This manual helps you be familiar with the company's products, and get information about systems' components、configuration,etc.

This manual detailed knowledge of the system characteristics、operational processes、installation and commissioning, and safety precautions.please read this manual carefully before using the system and machine, which will help you make use it better.

Cautions:

1. Use of this product is strictly prohibited in the strong interference、 strong magnetic field environment. Operating ambient temperature 0-70 ℃, working environment humidity 0-90% (non-condensing).
2. Insert U disk in the correct direction. Do not pull out 19 pins tenon type socket cable when system run.
3. Perform processing U disk file process, do not pull out the U disk to prevent the interruption of data transmission.
4. Strictly prohibited metal, dust, and other conductive substances enter the controller.
5. The machine shell should connect the ground wire to ensure the safety of the work and to prevent interference.
6. Prohibited unauthorized disassembly, no internal user repairable parts.
7. For long periods of time, please pay attention to the power outage, and retain.
8. Pay attention to water, dust, fire when using it.
9. Do not use the corrosive chemical solvents to clean the equipment.
10. Spindle motor bearing life and its speed is inversely proportional.
11. Graver is very sharp. Do not touch when it is running, in order to avoid injury; Do not use handkerchiefs, scarves contact it to prevent embroiled damage.

Important Notice:

The Company shall not be responsible for any loss caused by improper using or breaking the correct operating procedures.

Beijing RichAuto S&T Co., Ltd owns this manual final interpretation, the company reserves the right to modify all information in this manual, including data, technical details, etc..

Content

✧ Foreword

● System Introduction：

RichAuto is CNC motion control system independently developed by Beijing RichAuto and it can be widely applied to machinery, advertisement, woodworking, mold engraving machine, laser, flame, plasma cutting machine, and so on in the machine control field.

RichAuto make DSP as the core control system， High-speed processing operation is the microcontroller, PLC systems can't match；Use embedded structure，High degree of integration，Strong stability，easy to installation and operation；U disk support，Removable storage card reader，With USB Interface，High speed transfer，Plug and play the full realization of all work offline.

● Characteristics:

1. System deploy standard X, Y, Z axis motion control method ,Support the rotation axis（A axis）control，Enables to switch the processing of surface and processing of rotation ; Up extended to X, Y, Z, A four-axis motion control, Implementation four axis interlocking Control.
2. Multi I / O Point Control，there is 16 input and output signals in every basic I / O signal node， expansion I / O nodes can be expanded to 32 input and output signals.
3. Support the standard G code, PLT format instructions; support domestic and international mainstream CAM software, such as: Type3, Art Cam, UG, Pro / E, Master CAM, Cimatron, Wentai etc.
4. Provide with power-down protection. Instantaneous power processing system to automatically save the current processing of information (file name, current line number processing, processing speed, spindle threshold), when power again machine moves back, the system automatically prompts the user to restore the processing before power down, the processing operations become more humanity.
5. Support breakpoint memory, file selection, processing. Save 8 different

breakpoint processing information.

6. Multi-coordinate memory function. Provide 8 working coordinate system, the user can switch among the 8 coordinates, each coordinate system can save a process origin information.
7. Support online adjust spindle operating frequency. The spindle frequency from 0 to maximum frequency is divided into 8 thresholds; 1 - 8 threshold can be processed directly adjust up and down without suspend processing.
8. Support adjust speed ratio online. Users can adjust the speed ratio, to adjust the processing speed and empty running speed, speed ratio values from 0.1-1, Ascending or descending per 0.1 numerical.
9. Simply manual operate mode. In manual mode, the system provides three kinds of sports concluding continuous, step (crawl), distance, and manual operation became more simple and convenient.
10. Identifies M code, F code and other development commands, can open a special code based on user needs.
11. Built-in 512 M memory.
12. Unique handheld form factor with one hand to hold. Own liquid crystal display and 16 buttons board , operate intuitive and flexible, no longer dependent on the computer, the full realization of full offline operation
13. Comes with USB communications port, file transfer efficiency can be directly read U disk, card reader file, Plug and Play.
14. Self-test function, the system comes with I / O port signal detection capabilities, ease of remote maintenance.
15. Processing with high-speed and smooth, support high subdivide; make sure processing with high accuracy and high speed.
16. Unique in Chinese-English to show double-interface, can be realized in switching Chinese and English show online.
17. Multi-language display. Support for Simplified Chinese, Traditional Chinese, English, Russian, French and other languages, can be customized according to

user needs.

18. System can support automatic dynamic upgrades, convenient to remote operation, remote maintenance.

➢ 1. RichAuto system composition

● 1.1 System composition

RichAuto-A51 contains the following parts：A hand-held motion controller(handle) ,a line adapter board(interface board), a 19-pin HDMI data transmission cable.

RichAuto accessories schematic diagram

Hand- held motion controller

Interface board

19-pin HDMI data transmission cable

● 1.2 Description of Each Component

1.2.1Handle

As shown below， including 4 parts:

1） Color screen： 5-inch color screen，to display the machine motion， system settings and other information.

2） Button board： Contains 20 buttons to input system parameter information and operate the machine.

3） U Disk Interface: The port of U disk（FAT16/32） and the memory card.

4） 19-pin HDMI Data Cable port: The port of 19-pin data cable，it connect the handle with the interface board to realize controlling the machine.

1.2.2 Interface board

As shown below， including 5 parts:

1) 50-pin data cable port：connect handle with interface board.
2) Output control terminal：including spindle On/Off signal,work&alarm led siganl etc..
3) Input control terminal：including machine origin detection switch，toolsetting，driver alarm，hard limit switch，and E-stop signal.
4) Power supply terminal： DC24V,3A
5) Motor driver control terminal

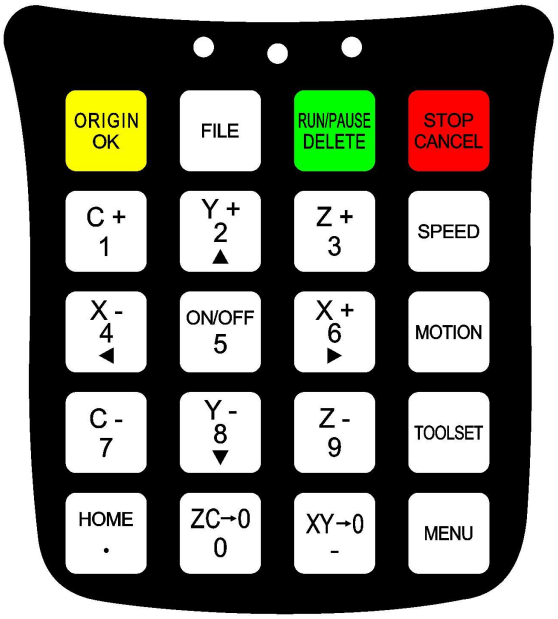
1.2.3 19-pin HDMI data transmission cable

● 1.3 Interface Board Shell Size

➢ 2. Handle buttons introduction

2.1 Buttons introduction

RichAuto motion control system defines 16 buttons according to functional requirements. Each button has one or more functions under different work status：



Buttons picture

2.2 Usage mode

RichAuto motion control system provide two modes of buttons' operations, including one-touch button & Combination button.

One-touch button：Press one button on handle.

Combination button：Press two buttons at the same time to achieve the operation；the operation step: press one main function button and meanwhile press a second accessibility button, and then release the two buttons at the same time to realize the combination button operation.

List of Combination buttons：

	Combination key	Function

1	MENU “ ” + “0—9”	Switch the coordinate system (0 for the mechanical coordinate system , 1 - 9 for the work coordinate system)
2	RUN/PAUSE DELETE “ ” + “1—8”	Start the breakpoints processing (support number 1 - 8)
3	RUN/PAUSE DELETE “ ” + ZC→0 0 “ ”	Start advanced processing
4	MENU “ ” + ORIGIN OK “ ”	System upgrade
6	ORIGIN OK “ ” + STOP CANCEL “ ”	Quit buttons check

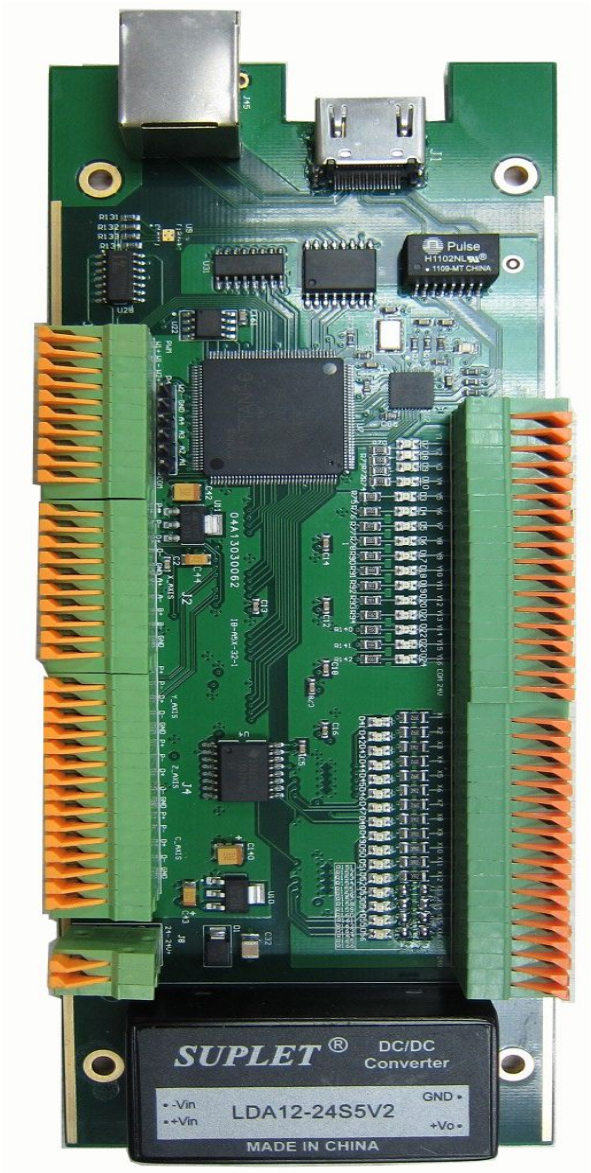
● 2.3 Detail information for buttons function

Button	Function
X+ 6 ▶	Positive movement of X axis、menu right shift、 figure 6 inputting
X- 4 ◀	Negative movement of X axis、menu left shift、 figure 4 inputting
Y+ 2 ▲	Positive movement of Y axis、 speed-up processing speed、 figure 2 inputting、menu up shift
Y- 8 ▼	Positive movement of Y axis、 solw down processing speed、 figure 8 inputting、menu down shift
Z+ 3	Positive movement of Z axis、 figure 3 inputting、 increase spindle speed during processing
Z- 9	Negative movement of Z axis、 figure 9 inputting、 reduce spindle speed during processing

C+ 1	Positive movement of X axis、figure 1 inputting
C- 7	Negative movement of X axis、figure 7 inputting
XY→0 -	Set X axis and Y axis work origin、negative sign inputting
ZC→0 0	Set Z axis and C axis work origin、figure 0 inputting
TOOLSET	Start Z-axis automatic tool setting
HOME .	Machine back home、decimal point inputting
SPEED	High or low speed selection under manual mode
ON/OFF 5	Spindle start/stop、figure 5 inputting
MENU	Enter menu setting、change information of “Machine status area” during processing
ORIGIN OK	Back to work origin,confirm motions /inputting/operating
MOTION	Manual mode-continue/step/distance to select
FILE	Load processing filefrom Udisk or Internal
RUN/PAUSE DELETE	Run or pause processing、delete inputting data、 different property selecting in menu
STOP CANCEL	Quit process stop/selections, inputting and operating cancel、start “The display function list”

➢ 3. Wiring Instructions

● 3.1 RichAuto interface board description



● 3.2 Interface board I / O Description

Port	Pin Definition			Pin functions and parameters	Notes
DC24V ： Power Supply	24V+		Input 24V+	Supply working voltage for handle	Range: DC12V-40V
	24V-		Input 24V GND		
X_AXIS : X OUTPUT SIGNAL Terminal	PULSE	P+	PULSE+ Output		
		P-	PULSE- Output		
		D+	DIR+ Output		
		D-	DIR - Output		
		GND			
	ENCODER	A+			
		A-			
		B+			
		B-			
		GND			
Y_AXIS : Y OUTPUT SIGNAL Terminal	P+		PULSE+ Output		
	P-		PULSE- Output		
	D+		DIR+ Output		
	D-		DIR - Output		
	GND				
Z_AXIS : Z OUTPUT SIGNAL Terminal	P+		PULSE+ Output		
	P-		PULSE- Output		
	D+		DIR+ Output		
	D-		DIR - Output		
	GND				
C_AXIS : C	P+		PULSE+ Output		
	P-		PULSE- Output		

OUTPUT SIGNAL Terminal	D+	DIR+ Output		
	D-	DIR - Output		
	GND			
ANALOG : Analog Quantity Terminal	A4			
	A3			
	A2			
	A1			
	COM			
PWM :PWM OUTPUT SIGNAL Terminal	W1+			
	W1-			
	W2+			
	W2-			
	GND			
OUTPUT SIGNAL: OUTPUT SIGNAL Terminal	Y01	FWD	Logic low	
	Y02	Multi-speed 1	Logic low	
	Y03	Multi-speed 2	Logic low	
	Y04	Multi-speed 3	Logic low	
	Y05	Definable Signal	Logic low	
	Y06	Definable Signal	Logic low	
	Y07	Definable Signal	Logic low	
	Y08	Definable Signal	Logic low	
	Y09	Definable Signal	Logic low	
	Y10	Definable Signal	Logic low	
	Y11	Definable Signal	Logic low	
	Y12	Definable Signal	Logic low	
	Y13	Definable Signal	Logic low	
	Y14	Definable Signal	Logic low	
	Y15	Definable Signal	Logic low	
	Y16	Definable Signal	Logic low	

	COM	Output GND		
	24V			
INPUT SIGNAL：INPUT SIGNAL Terminal	X01	XH:X Home	Logic low	
	X02	YH:Y Home	Logic low	
	X03	ZH:Z Home	Logic low	
	X04	TS:Toolset	Logic low	
	X05	Definable Signal	Logic low	
	X06	Definable Signal	Logic low	
	X07	Definable Signal	Logic low	
	X08	Definable Signal	Logic low	
	X09	Definable Signal	Logic low	
	X10	Definable Signal	Logic low	
	X11	Definable Signal	Logic low	
	X12	Definable Signal	Logic low	
	X13	Definable Signal	PNP（NC）	
	X14	Definable Signal	PNP（NC）	
	X15	Definable Signal	PNP（NC）	
	X16	Definable Signal	PNP（NC）	
	COM	Input GND		
	24V	Sensor power input (Eg: return home sensor)		

● 3.3 Hardware Wiring

Installation Requirements：Power（24V，3A），it is better to add a filter to prevent the electric field interference. If origin detecting switch are different power

supply type, the special testing switching power is needed.（24V origin detecting switch is the best choice）

RichAuto-A58 realizes its control through the connection between the interface board and CNC machine. Interface board terminal can be divided into input terminal and output terminal：

Input terminal：

INPUT SIGNAL （Input signal terminal）

DC24V（Power supply terminal）

Output terminal：

X_AXIS（X pulse output terminal & encoder output terminal）

Y_AXIS（Y pulse output terminal）

Z_AXIS（Z pulse output terminal）

C_AXIS（C pulse output terminal）

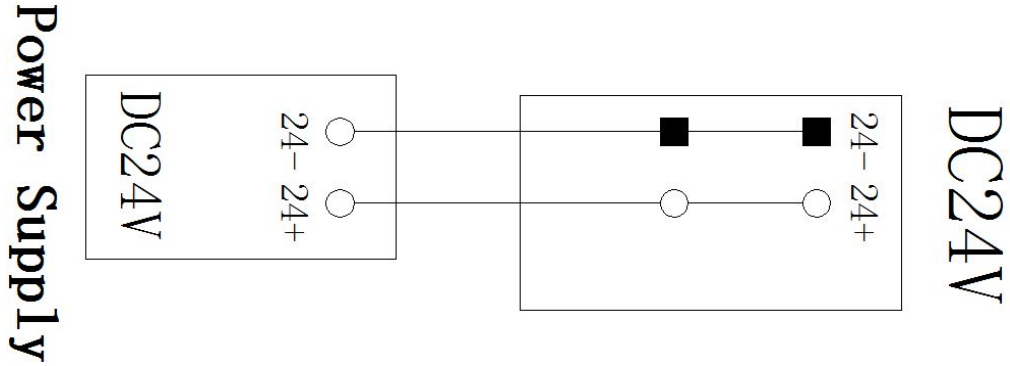
OUTPUT SIGNAL（Output signal terminal）

ANALOG（Analog quantity output terminal）

PWM（PWM output terminal）

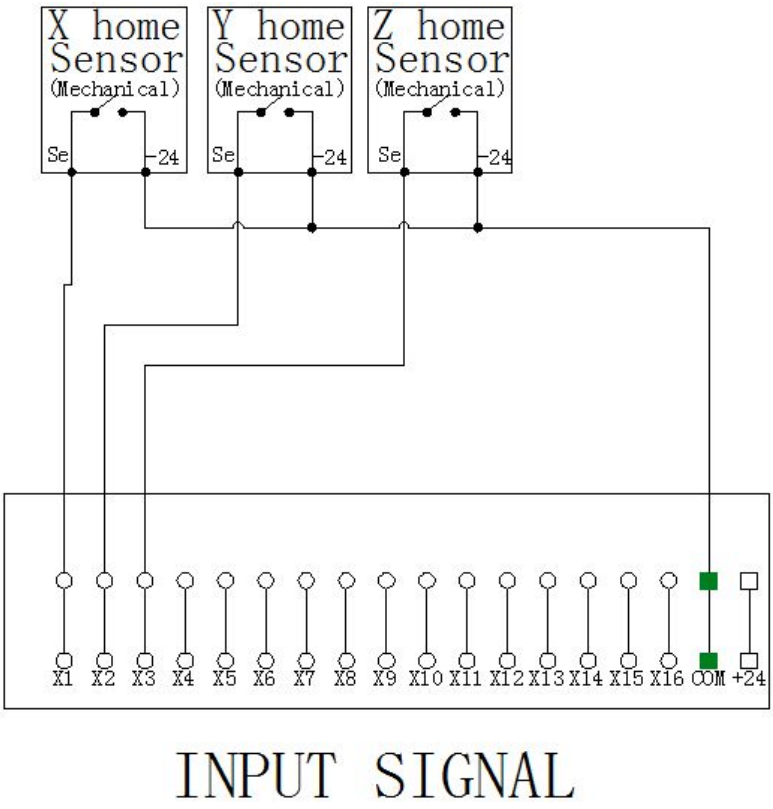
INPUT SIGNAL Terminal

DC24V Power supply wiring

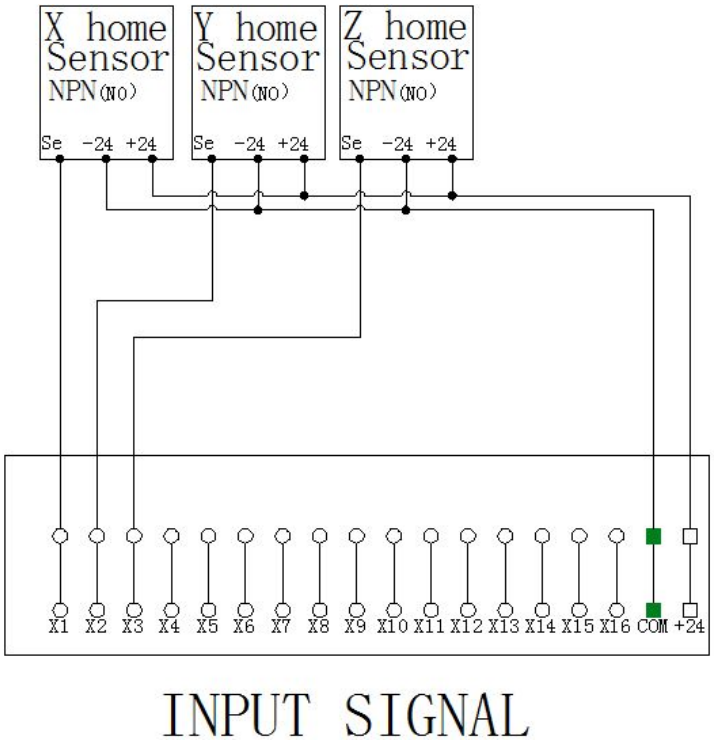


INPUT SIGNAL Wiring

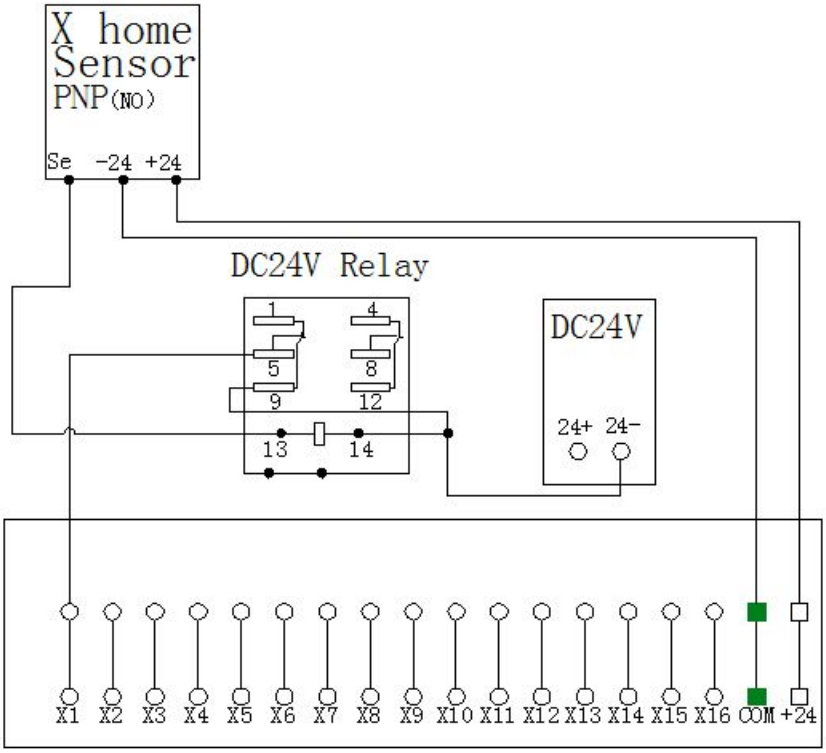
1. **Home signal ports：a)**Mechanical home switch wiring



b) NPN (NO) home switch wiring

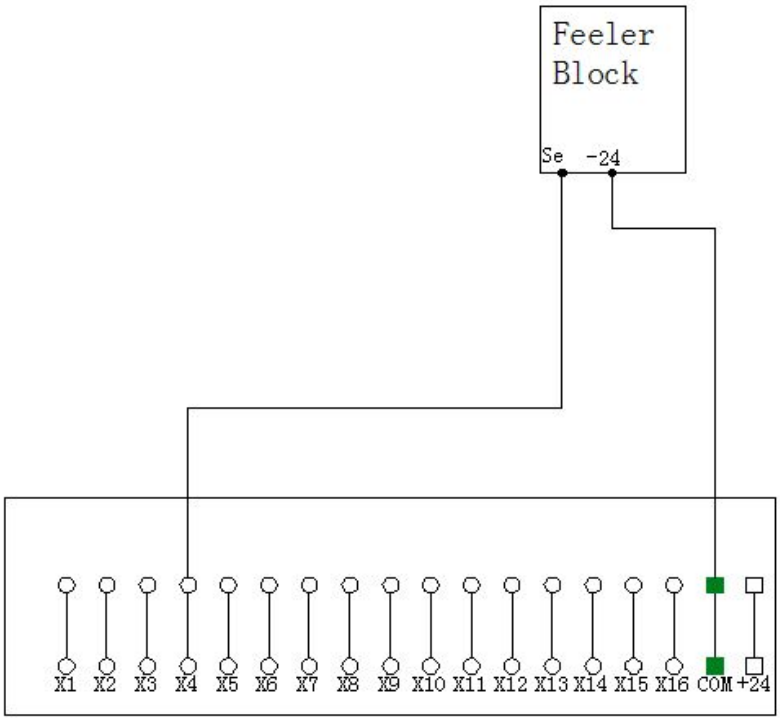


c) PNP(NO) home switch wiring（Y、Zsame as X）



INPUT SIGNAL

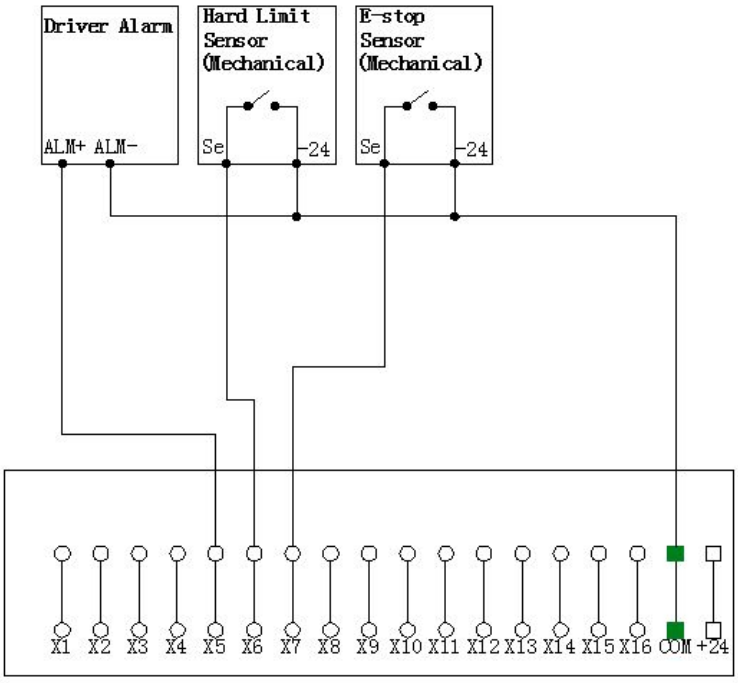
2. **Toolset terminal**：Simple feeler block wiring



INPUT SIGNAL

3. **Definable terminal wiring**：

eg：X5-Driver Alarm signal & X6-Hard Limit signal& X7-E-stop switch signal

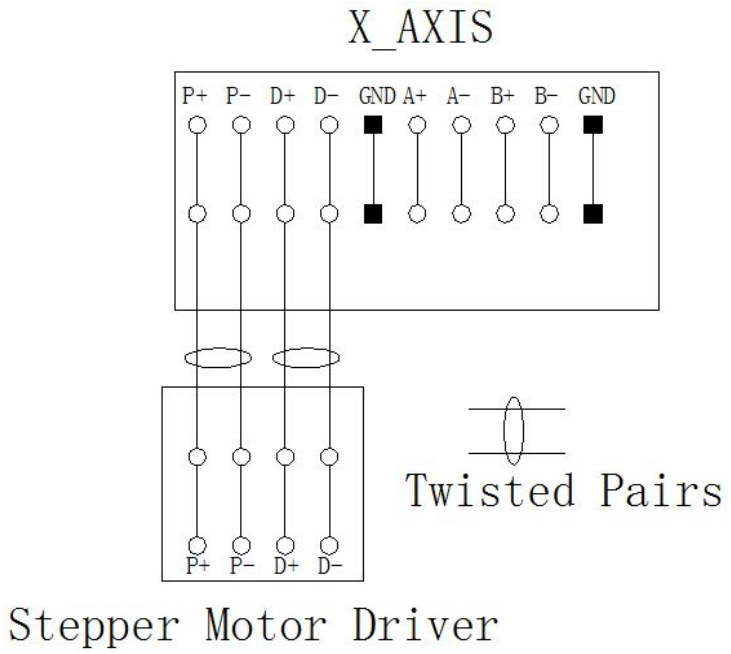


INPUT SIGNAL

Output Terminal

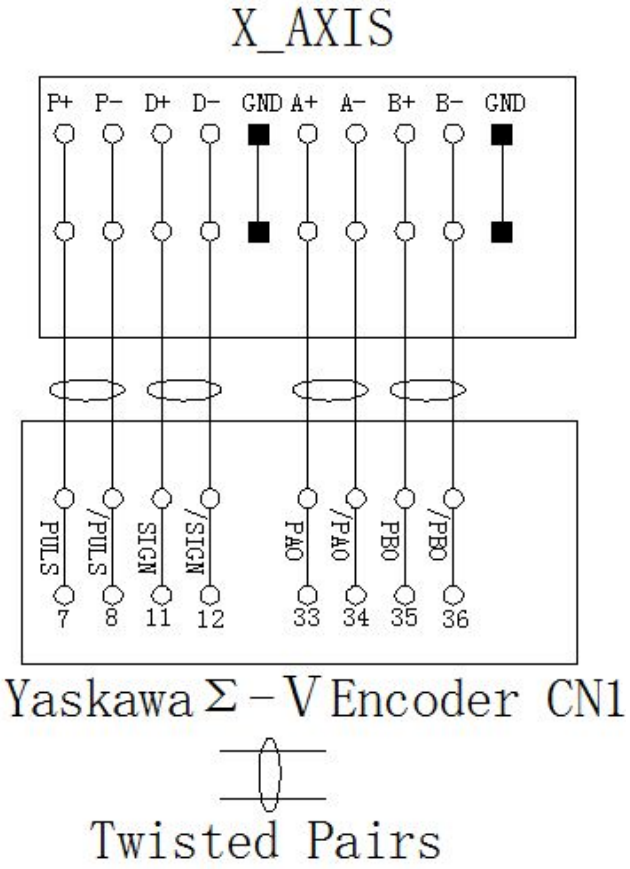
X_AXIS： X pulse signal wiring（Y、Z、A same as X）

Step drive：



Stepper Motor Driver

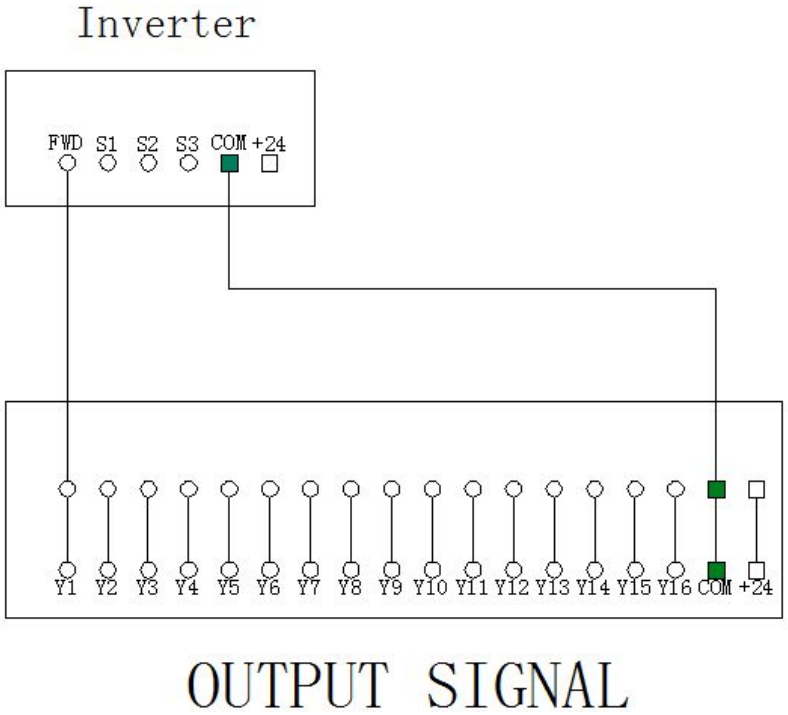
Servo drive：



OUTPUT SIGNAL: Spindle output

2-state：spindle start-ON / spindle start-OFF

ON、OFF：



Spindle State：

Setting：Enter "**Spindle State**"，screen shows：

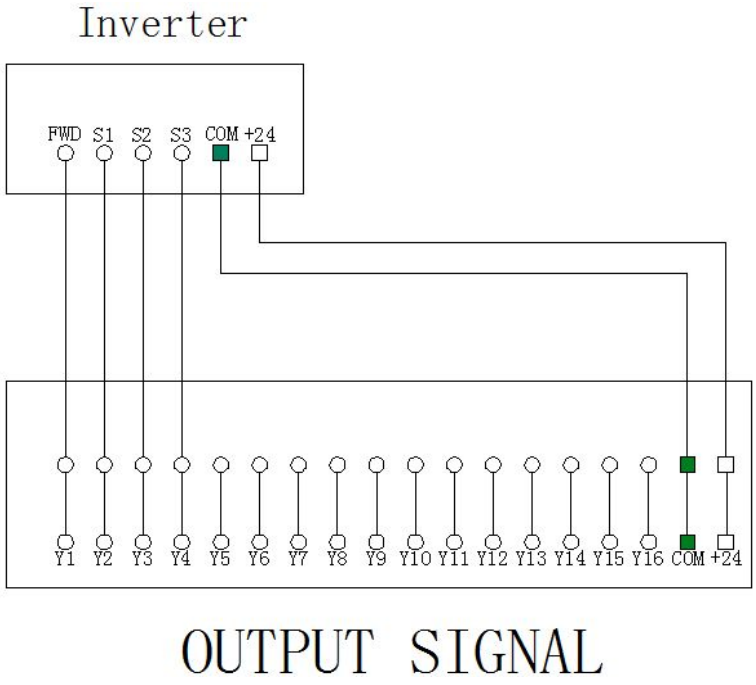
SpdlCnt=Spindle Count

Press "RUN/PAUSE DELETE"， input the number 1， change Spindle Count to 1， and then press "ORIGIN OK"， screen shows：

Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor up and down，press "RUN/PAUSE DELETE"，you can change the indicator light color，like above picture.

8-state： spindle start---S1—speed 1， S2—speed 2…Sn—speed n； spindle stop---screen shows Fn—the speed number.

3-line、8-state：

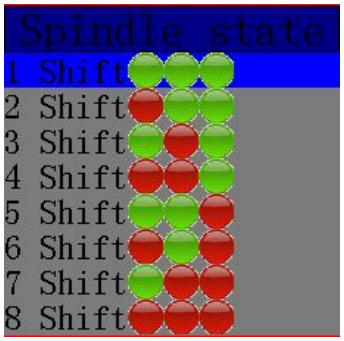


Spindle State：

Setting：Enter “**Spindle State**”，screen shows：

SpdlCnt=Spindle Count

Press “RUN/PAUSE DELETE”， input the number 3， change Spindle Count to 3， and then press “ORIGIN OK”， screen shows：

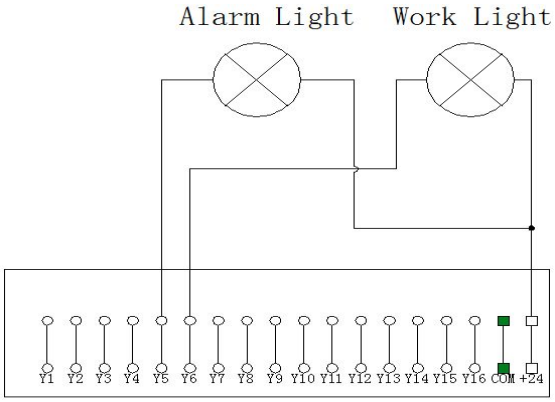


Press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor up and down，press “RUN/PAUSE DELETE”，you can change the indicator light color，like above picture.

NOTE：FWD and DCM has Connected in Parallel in some inverters, plesae do not need to connect Y1 (S0) in such situations, you only need to connect DCM with GND of interface board, without having to reset the spindle gear.

Definable ports wiring：

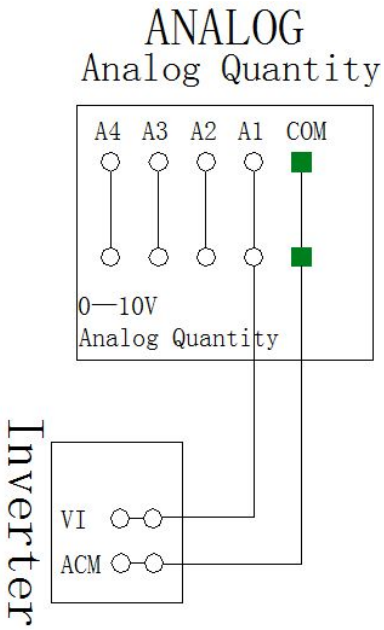
eg：Y5-Alarm Light signal & Y6-Work Light signal



OUTPUT SIGNAL

ANALOG：

Analog quantity output wiring：



Setting procedure：enter “MENU”- “Menu function user interface”- “MACHINE SETUP”-“Spindle Setup”- “Spindle MAX Spd”(Spd=speed)

You can connect the machine with the control system when the above setting is over.

● 3.4 Commissioning of the Machine and Control System

1. After turn on the power, users can manually move each axis and confirm the direction. If the movement direction and definition direction are opposite, users can change the motor phase sequence.
2. According to the original location of the machine coordinates, users can enter menu-menu function user interface-machine setup-home setup- home direction to reset it.
3. Enter menu-menu function user interface-machine setup-voltage setup，to check whether the home switch is working（Manual trigger， signal lamp lights up({green to red}).

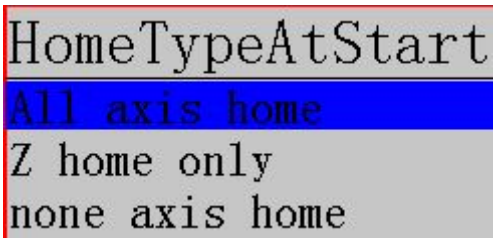
The machine is in good connection if all the above setting is ok.

➢ 4. User interface

RichAuto-A58 contains five user interfaces：**Manual control user interface、Manual function user interface、Remote control user interface、Input outputcontrol user interface、View toolpath user interface**.

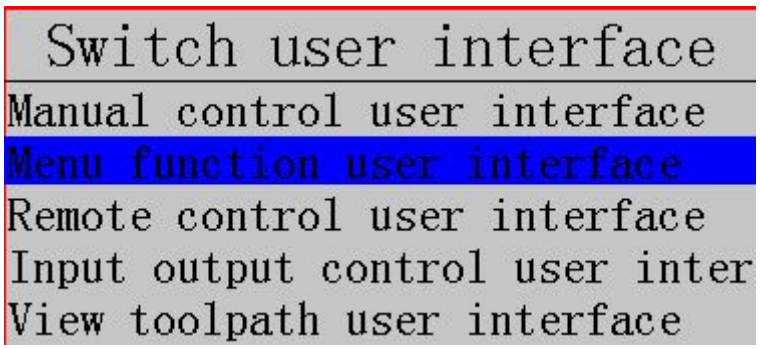
● 4.1 Manual control user interface

After the system is powered on，the system prompts the user to back home after the boot process，system enter the interface “Home Type At Start”：



Press “Y+ 2 ▲/Y- 8 ▼” to move cursor to choose your type，and then press “ORIGIN OK” to confirm.

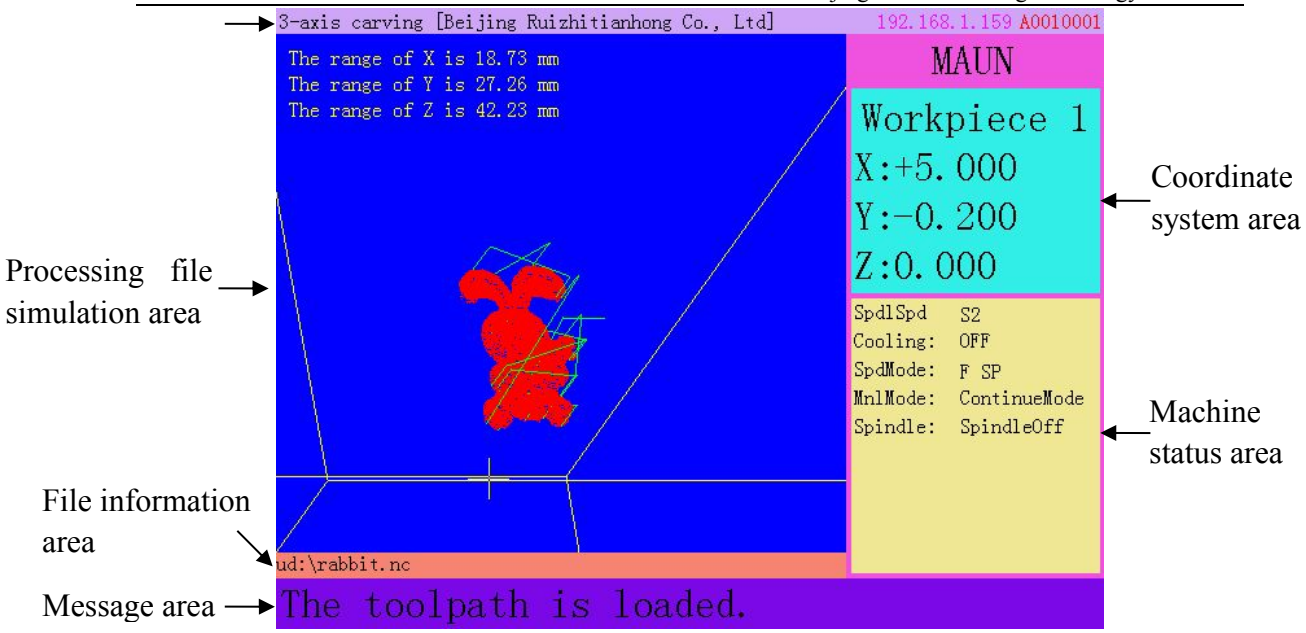
Press “MENU”,screen shows：



Press “Y+ 2 ▲/Y- 8 ▼” to move cursor to choose your interface，and then press “ORIGIN OK” to confirm.

Manual control user interface：

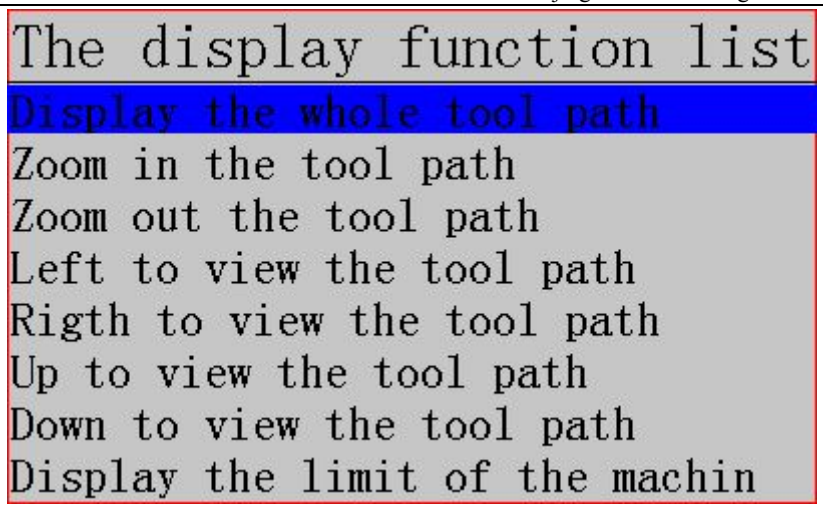
Title bar



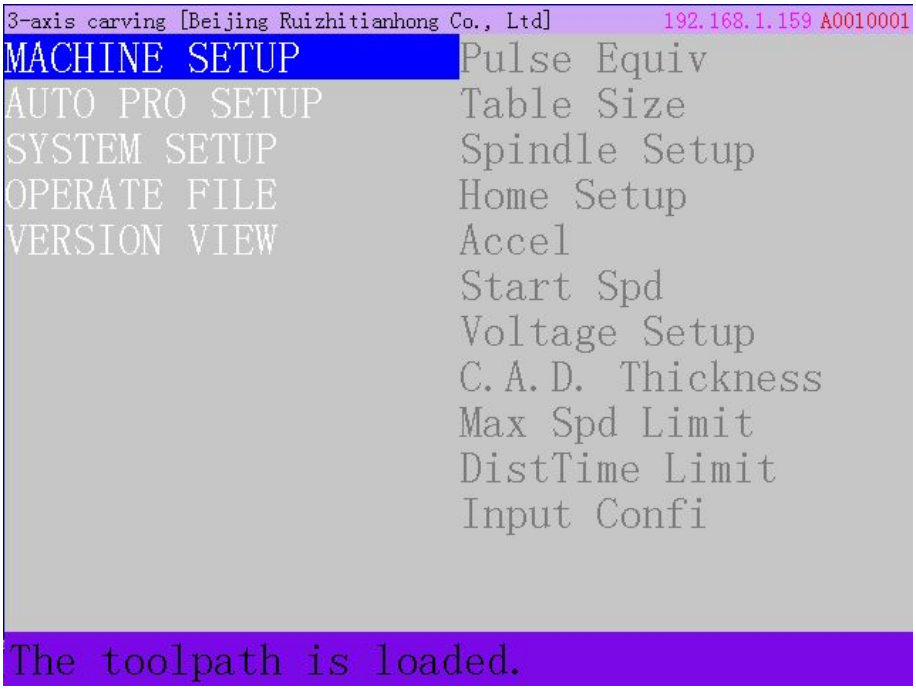
1. **Title bar**：Display system software type（3-axis carving）and company information.
2. **Processing file simulation area**：Display processing file emulational image、tool path、file size,etc.
3. **File information area**：Display filename（including filename extension）、record location.
4. **Message area**：Display file loading process information.
5. **Coordinate system area**：Display the current coordinate system，including machine coordinate system and work coordinate system， there are eight work coordinates system.
6. **Machine status area**：Display spindle state、speed mode、motion mode、cooling unit state,etc.

Under the manual control interface，press " 

", screen shows "**The display function list**"，it is convenient for the customer different ways to view processing file emulational image.Function list as shown below：



● 4.2 Menu function user interface



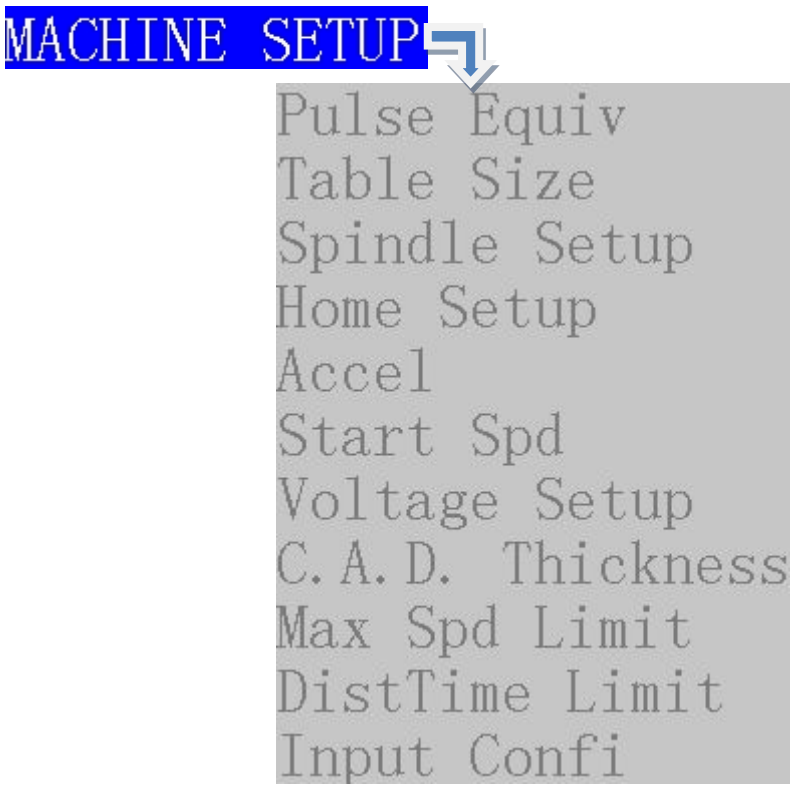
Menu details： Including 5 main menus: MACHINE SETUP、 AUTO PRO SETUP、SYSTEM SETUP、OPERATE FILE、VERSION VIEW，and there are other in every main menu.

4.2.1 Machine Setup

Users can set the parameters about machine hardware under"Machine Setup". It is set by machine producer according to device type. If machine hardware parameter is not changed,this parameter should also not change. If machine users need to

change，please consult machine producer.

Machine setup chart



1. Pulse Equiv(Pulse Equivalent)

The number of pulses of the system needs to send when machine moves every 1mm.Unit：pulse/mm.

1) stepper driver

Formula = pulses per revolution / distance per revolution

Pulses per revolution formula: (360 °/stepper angle)* Driver subdivision

Some stepper drivers mark pulse number directly.

Distance/r formula：

Screw drive machine = screw pitch * mechanical transmission ratio

Rack drive machine = rack module * gear teeth number*π* mechanical transmission ratio

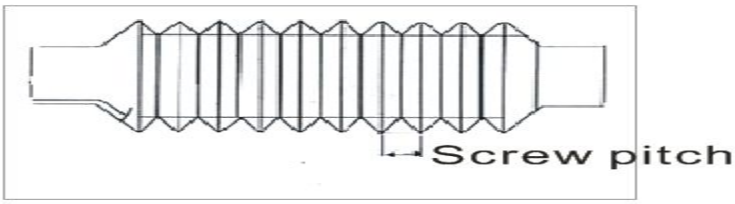
So stepper motor system formula:

✓ Screw drive:

$$pulse = \frac{\frac{360°}{Stepper\ angle} * Driver\ subdivision}{Screw\ pitch * transmission\ ratio}$$

Formula Description: step angle is the angle of the motor parameters, motor rotation step walk.

Driver subdivison is the parameter set by the driver.



Screw pitch(above picture): The distance that the nut moves when the ball screw makes one rotation.

Transmission ratio: The speed ratio or angular velocity ratio of the capstan and the driven wheel.

✓ Rack drive:

$$pulse = \frac{\frac{360°}{stepper\ angle} * Driver\ subdivision}{rack\ module * gear\ teeth\ number * \pi * transmission\ ratio}$$

Formula Description: step angle is the angle of the motor parameters, motor rotation step walk.

Driver subdivison is the parameter set by the driver.

Rack module and gear teeth number are gear parameters. rack module * gear teeth number*πequals the perimeter of the reference circle.

Transmission ratio: The speed ratio or angular velocity ratio of the capstan and

the driven wheel.

Setting: Enter "**Pulse Equiv**", cursor is in the X-axis pulse equivalent position, press "Y+ 2 ▲", "Y- 8 ▼" to move cursor to where users want to modify.Press "RUN/PAUSE DELETE", input the new number, and press "ORIGIN OK" to save.After modifying X、Y、Z、A pulse equiv, press "ORIGIN OK" to confirm.

2) servo driver

The pulse equivalent factory default X,Y,Z,A are 400, and set the electronic gear ratio in the servo drive according to the pulse equivalent.

The numerator of the electronic gear ratio represents encoder pulse number,users can search it in servo driver manual.

The denominator of the electronic gear ratio:

- ✓ screw drive: Handle pulse equivalent(400)* screw pitch * mechanical transmission ratio
- ✓ rack drive: Handle pulse equivalent(400)*rack module * gear teeth number*π* mechanical transmission ratio

2. Table Size:

RichAuto system make the table size as the soft limit values, in order to prevent machine move over travel, machine size must be less than or equal to the value of the actual motion displacement machine

Setting: Enter "**Table Size**", press "Y+ 2 ▲", "Y- 8 ▼" to move cursor to where users want to modify. Press "RUN/PAUSE DELETE", input the new number, press "ORIGIN OK" to

save. After modifying X、Y、Z、A pulse equiv，press “ORIGIN OK” to confirm.

3. Spindle Setup：

Spindle delay：Unit：ms;including start delay and stop delay.

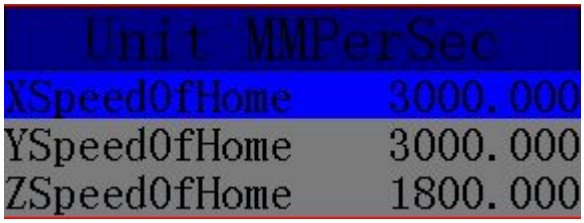
corresponding system parameters. System default “3-line 8-state”, if users need “1-line 2-state(On/Off)”, users can change the number of lines is 1; See detailed settings at spindle output wiring.

Spindle Max Spd：User should set this menu if choosing 10V analog quantitiy to control the spindle speed,the number is the maximum speed of the spindle.Unit:r/minute.User do not need modify this menu if choosing “muti-step”mode.

4. Home Setup：

Home speed：Every axis movement speed when back home,system default speed X，Y: 3000 MM/Minute, Z: 1800 MM/Minute.

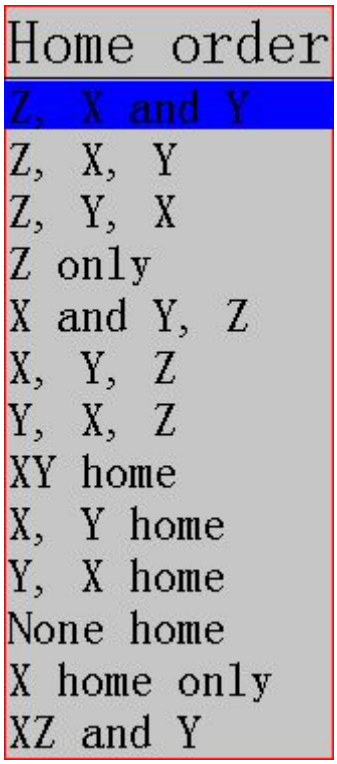
Setting：Enter “**Home speed**”，screen shows：



Press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor to where users want to modify, press “RUN/PAUSE DELETE”， input the new number，press “ORIGIN OK” to save. After modifying X、Y、Z home speed，press “ORIGIN OK” to confirm.

Home order：Every axis movement order when back home.

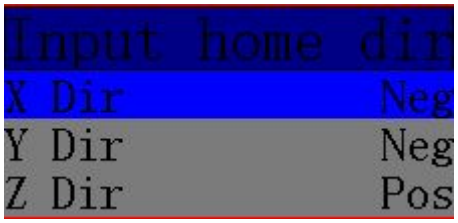
Including：



Setting：Enter “**Home speed**”，press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor to choose home order，press “ORIGIN OK” to confirm.

Home direction：Every axis movement direction when back home,this dirction depends on the position where home switch is on the machine.If home switch installed in the positive direction,so home direction should be “positive” ,and vice versa.

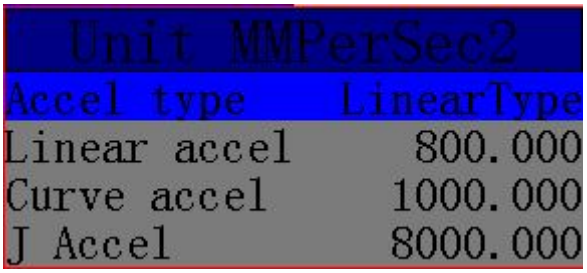
Setting：Enter “**Home direction**”，screen shows：



Press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor to where users want to modify，press “RUN/PAUSE DELETE” to change home direction，and then press “ORIGIN OK” to confirm.

5. Accel（Acceleration）：Unit：mm/s²

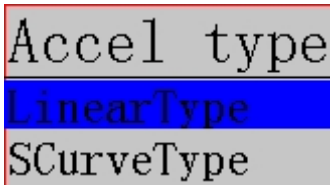
The maximum acceleration value during acceleration and deceleration movement, improve (including straight and curved motion) processing capabilities. If acceleration is too large, it may cause the motor losing steps, jitter and even whistle, if too small, it will lead to accelerated slowly and reduce the operating speed of the entire graph.



Suggest curve acceleration 1-1.5 times linear acceleration.

Jerk refers to the growth rate of acceleration,and moderate adverse impact caused by a sudden deceleration.

Setting：Enter "**Accel**"，press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor to where users want to modify，press "RUN/PAUSE DELETE"，screen shows:



Choose your type，press"ORIGIN OK"to confirm,and then press"Y+ 2 ▲"、"Y- 8 ▼" to move cursor to each axis "**Accel**" and "**JAccel**"，press "RUN/PAUSE DELETE" and input the new number，press "ORIGIN OK" to save.Same operations to modify other options.

6. Start Speed：Unit：mm/minute

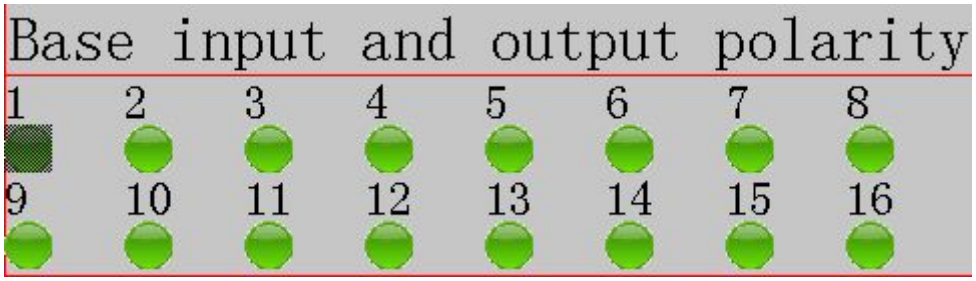
The speed of axis started directly from standstill. Not starting from zero speed, but starting directly from a certain speed,so it can shorten the overall processing time,but do not set this speed too high. Set too high, it will cause the motor losing steps, jitter and even whistle;Set too small, it will reduce the operating speed of the entire graph. If the inertia of motion axes (axis heavier), users can set a smaller start speed, if the inertia of motion axes smaller (lighter shaft), users can set it bigger.

Setting：Enter "**Start Speed**"，screen shows:

Press "RUN/PAUSE DELETE" and input the new number，press "ORIGIN OK" to save.

7. Voltage Setup：

Set input and output signal terminal status，lights green indicate normally open state, lights red indicate normally closed state.Including the two rows of light:



The upper lights indicate the input level：Set input voltage signal terminal status.The top four: 0、1、2、3 positions correspond X axis back home、Y axis back home、Z axis back home、toolsetting signal.

The under lights indicate the input level：Set output voltage signal terminal status. The top four: 0、1、2、3 positions correspond spindleOn/Off、multi-speed 1、multi-speed 2、multi-speed 3 siganl.

Setting: Press"X- 4 ◀","X+ 6 ▶" to move cursor right and left, press"Y+ 2 ▲"、"Y- 8 ▼" to move cursor up and down，press "RUN/PAUSE DELETE"to change light red or green.

8. C.A.D. Thickness：Unit：mm

This thickness should input by actual，if it is bigger than the actual theckness ,Z axis may cut too much;if smaller, Z axis can't touch workpiece. This parameter can only take effect when user use auto toolsetting function.

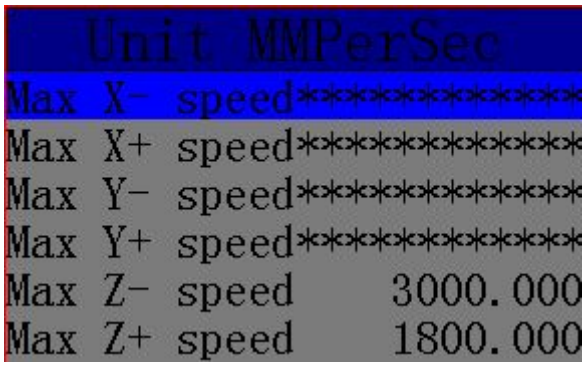
Setting：Enter "**C.A.D.Thickness**"，screen shows:

Press "RUN/PAUSE DELETE" and input the new number，press "ORIGIN OK" to save.

9. Max Spd Limit（Max Speed Limit）：Unit：mm/minute

Set machine top speed, it only take effect during processing.

Setting：Enter "**Max Spd Limit**"，screen shows:



Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor to where users want to modify. Press "RUN/PAUSE DELETE" and input the new number， press "ORIGIN OK" to save. After modifying all options，press "ORIGIN OK" to confirm.

10.DistTime Limit：Unit：second

Users select diatance mode,and if the machine does not move in a certain period of time(system default is 30 seconds),the system will go back to continuous mode to

prevent Z-axis collision risk because of the customer forgot to switch back to continuous mode and set a large distance value.

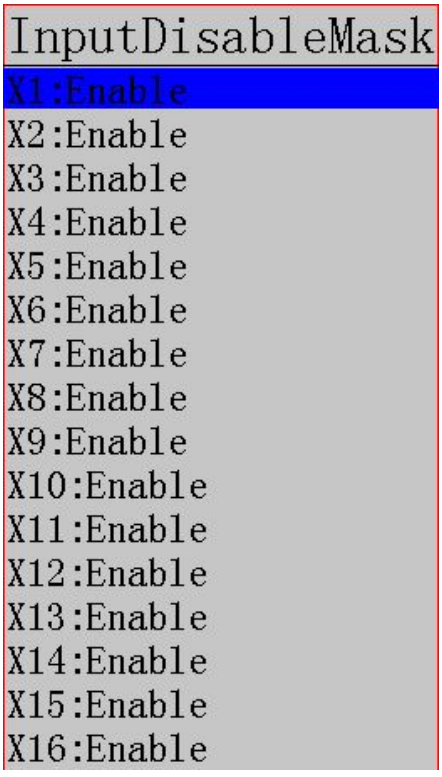
Setting：Enter “**DistTime Limit**”，screen shows：

Press “RUN/PAUSE DELETE” and input the new number，press “ORIGIN OK” to save.

11. InputConfi（Input Port Configuration）:

To open or prohibit input signal，if the interface board does not connect X6-X16 signals,users can prohibit X6-X16 signals.

Setting：Enter “**InputConfi**”，screen shows：

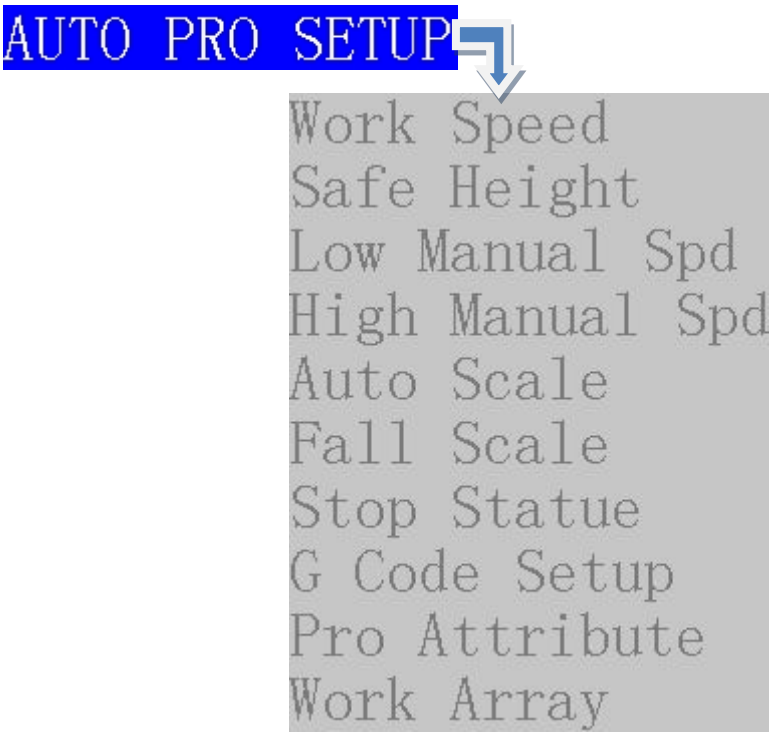


Press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor to where users want to modify，press “RUN/PAUSE DELETE” to change the ports enable or disable，and then press “ORIGIN OK” to confirm.

4.2.2 Auto Pro Setup

Users can set processing parameters,G code attributes etc.under this menu.

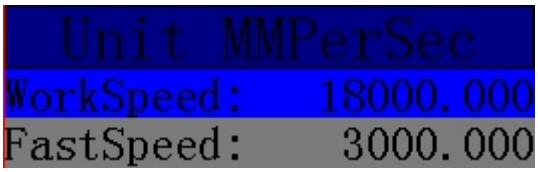
Auto Pro Setup chart



1. Work Speed：Unit：mm/minute

ncluding work speed and fast speed.

Setting：Enter “**Work Speed**”，screen shows：



Press “RUN/PAUSE DELETE” and input the new number，press “ORIGIN OK” to save，and then press “Y- 8 ▼” to choose “**Fast Speed**”，press “RUN/PAUSE DELETE” and input the new number，press “ORIGIN OK” to save.

2. Safe Height：Unit：mm

The height of Z axid rise during processing. system default is 250.000 mm.

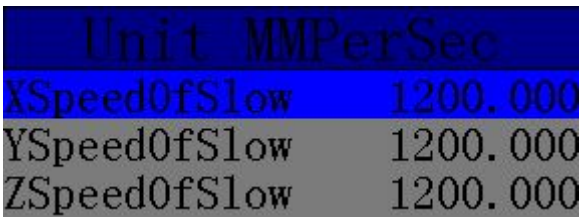
Setting：Enter “**Safe Height**”，screen shows：

Press "RUN/PAUSE DELETE" and input the new number，press "ORIGIN OK" to save.

3. Low Manual Spd(speed)：Unit：mm/minute

Under "**Low Manual Spd**" mode，the speed of manually to move each axis.

Setting：Enter "**Low Manual Spd**"，screen shows：



Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor to where users want to modify，press "RUN/PAUSE DELETE" and input the new number，press "ORIGIN OK" to save.

4. High Manual Spd(speed)：Unit：mm/minute

Under "**High Manual Spd**" mode，the speed of manually to move each axis.

Setting：Same operations as "**Low Manual Spd**".

5. Auto Scale：

Actual processing speed=work speed*auto scale，it does not affect fast speed.

Setting：Enter "**Auto Scale**"，screen shows：

Press "RUN/PAUSE DELETE" and input the new number，press "ORIGIN OK" to save.

6. Fall Scale：

Fall scale， system default is 0.200.fall speed=fast speed*fall scale， the maximum fall speed is Z axis negative limit speed*fall scale.

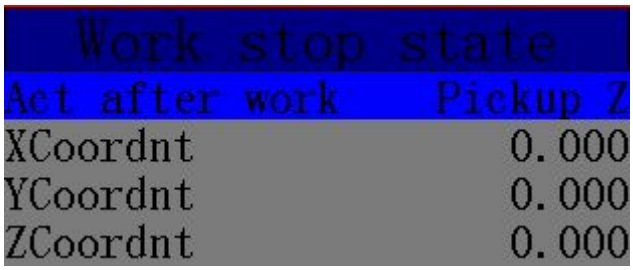
Fall height，system default is 5.000mm，fall down scale takes effect when the spindle falls to the fall height.

Setting：Enter “**Fall Scale**”，screen shows：

Same operations as “**Low Manual Spd**”.

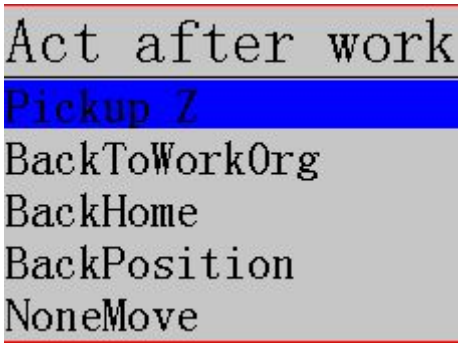
7. Stop Statue：

Setup stop position after auto processing.， User can set special position and specified position.



Set stop position：Press “Y+ 2 ▲”、“Y- 8 ▼” move cursor to where users want to modify，press “RUN/PAUSE DELETE” and input the new number，press “ORIGIN OK” to save.

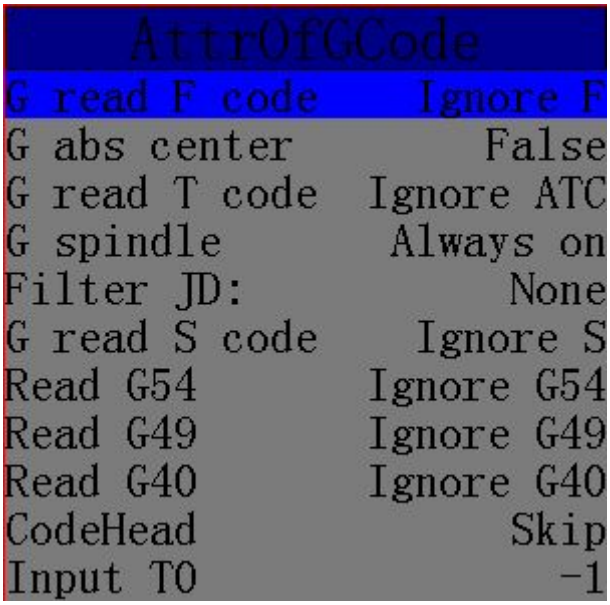
Press “RUN/PAUSE DELETE”，user can enter stop statue list：



Press“Y+ 2 ▲”、“Y- 8 ▼” move cursor to the statue users want，press “RUN/PAUSE DELETE” to confirm.

8. G Code Setup：

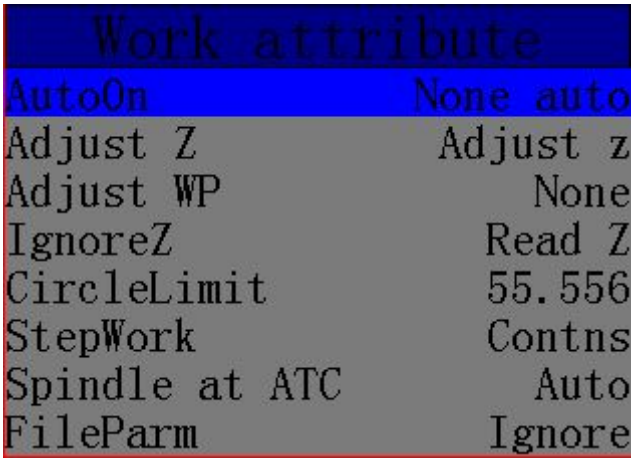
Set special G code attribute, according to the actual need to make changes.



Setting：Press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor to where users want to modify，press “RUN/PAUSE DELETE” to select the attribute users want，press “ORIGIN OK” to save.

9. Pro Attribute：

Set special Pro attribute, according to the actual need to make changes.



Setting：Press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor to where users want to modify，press “RUN/PAUSE DELETE” to select the attribute users want，press “ORIGIN OK” to save.

10. Work Array：

Set array parameter, including column count、Row count、Column space、Row space、Interval（unit：ms）

Column space：File spacing of X direction

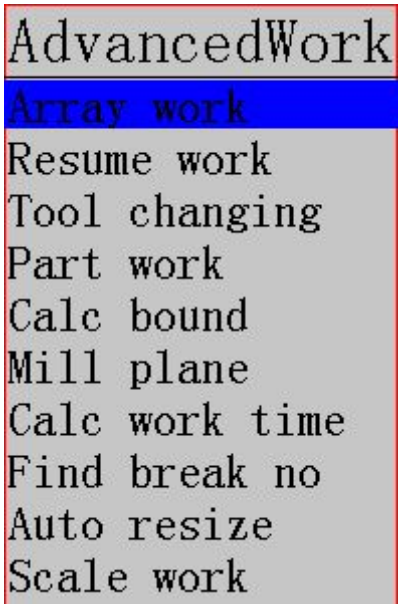
Row space：File spacing of Y direction

Total Processing times= column count* Row count

Interval：System default 0，it means no wait.

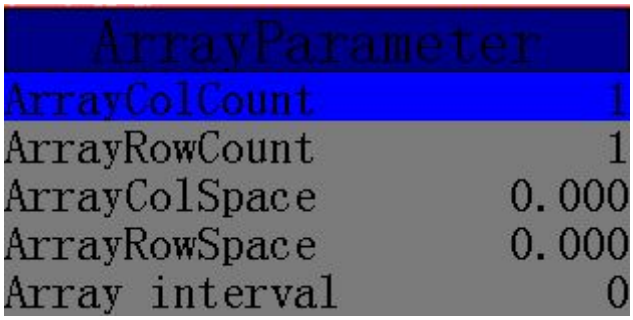
During processing， if users need to change processing materials after completion of each processing，you need set time interval a negative number. When the first time processing is completed, the screen prompt: waiting for the next array processing, press any key to start the next array processing at this time, if not press，system keep waiting.

Press “RUN/PAUSE DELETE” + “ZC→0 0”，screen shows：



Press “ORIGIN OK” to choose Array work.

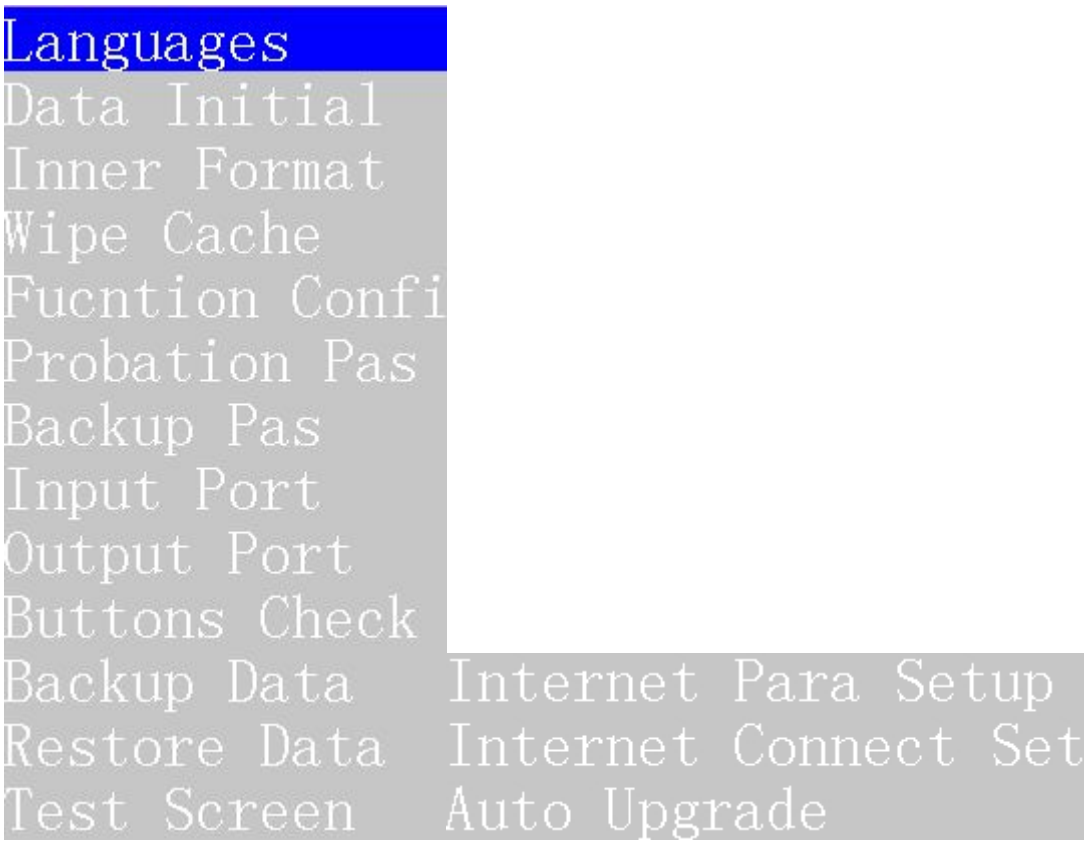
Setting：Enter “**Work Array**”，screen shows：



Press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor to where users want to modify. Press “RUN/PAUSE DELETE” and input the new number， press “ORIGIN OK” to save. After modifying all options，press “ORIGIN OK” to confirm.

4.2.3 System Setup

System Setup Chart



1. **Languages**:

Change system display language，users can choose Chinese and English.

2. **Data Initial**:

After data initial system parameters will restore to factory setting.

3. **Inner Format**:

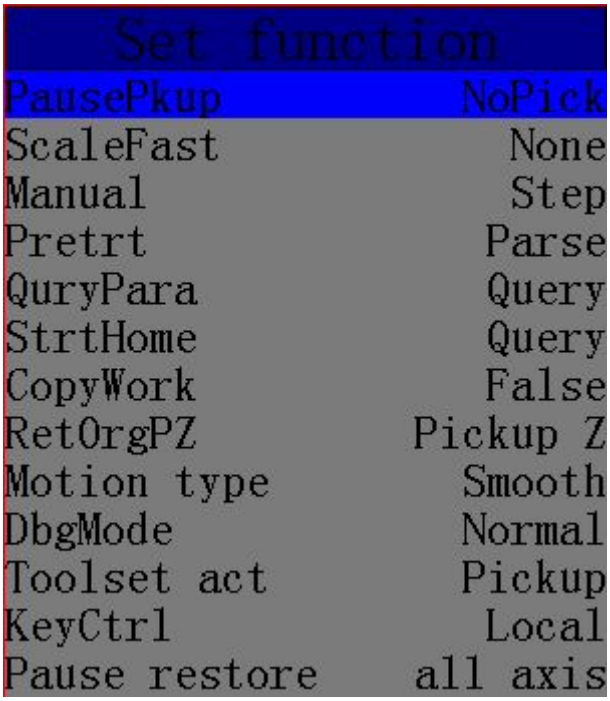
Wipe the internal files,it will not damage the system parameters.

4. **Wipe Cache**:

Users need to do this after functional upgrade, such as change four-axis program to three-axis program,users must do this operation.After this operation ,users need to restart the system.

5. **Function Confi（Function Configuration）**:

Set whether the system retain a function or not, change it according to the actual application in accordance with the practical application of changes.After the operation users need to restart the system.



Setting：Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor to where users want to modify，press "RUN/PAUSE DELETE" to select the function users want，press "ORIGIN OK" to save.

6. Probation Pas（Probation Password）:

Engraving machine manufacturers supply 20-digit initial passwords and limit time（processing time，Unit：hour），our company will send 20-digit new passwords that contain limit time.

Setting：Press "ORIGIN OK" to enter "**Probation Pas**"，screen shows：

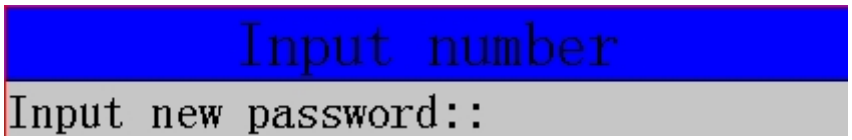
```
Please input new time password:
02264815477061270461
```
→ initial passwords

input new passwords directly，press "ORIGIN OK" to confirm.

7. Backup Pas（Backup Password）:

Prevent users overwritten the original correct parameters in the parameter backup disorder or misuse case.

Setting：Press "ORIGIN OK" to enter "**Work Array**", screen shows：

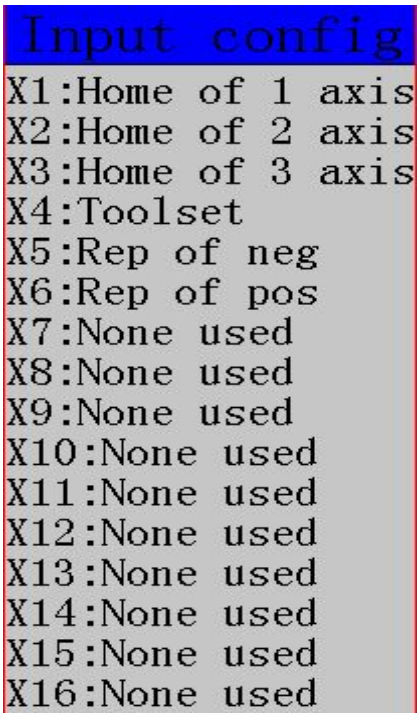


Input new passwork，and then press "ORIGIN OK" to save.

If user want to cancel it，do not input any number，press "ORIGIN OK" to confirm.

8. Input Port(Input Port List)：

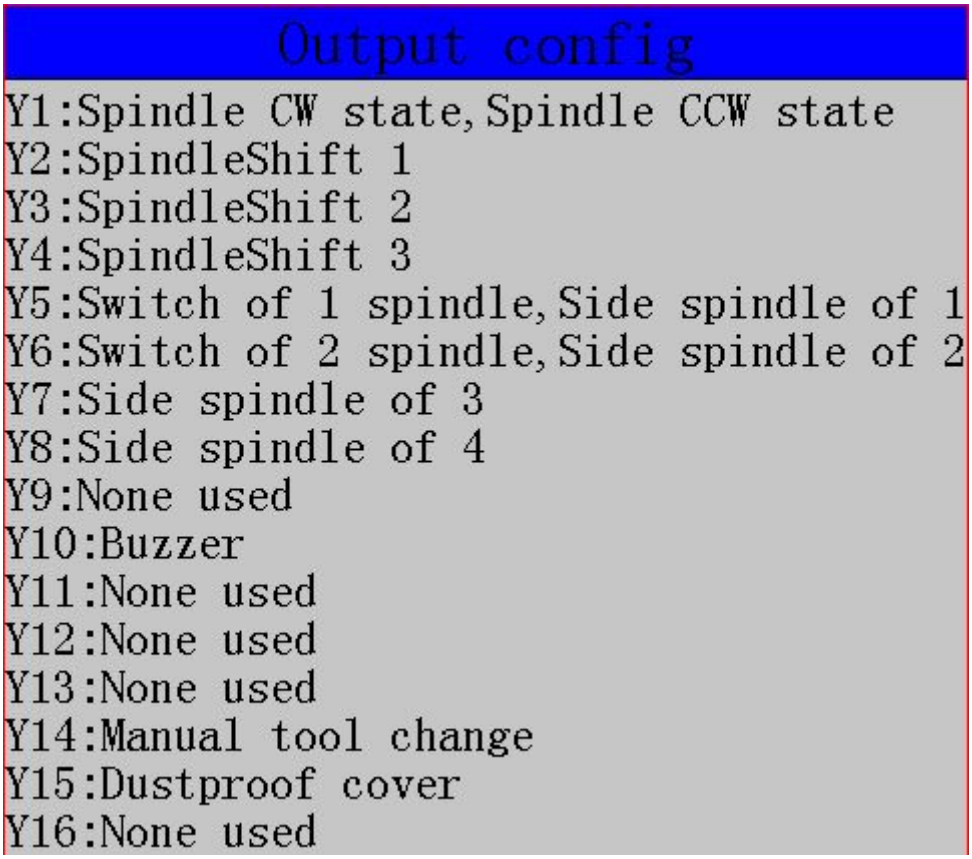
Check X01-X16 input signal function.



NOTE：None used ports are definable.

9. Output Port(Output Port List)：

Check Y01-Y16 output signal function.



NOTE：None used ports are definable.

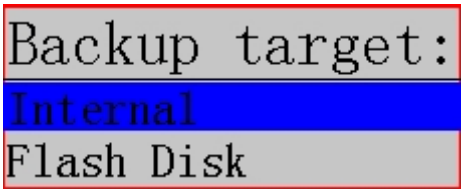
10. Buttons Check：

Users can check buttons are valid or not under this menu. Enter “Buttons Check”， press erery button， if it is valid， the screen will highlight.Exit “Buttons Check”， press “ORIGIN OK” + “STOP CANCEL”。

11. Backup Data：

Backup system parameters to U disk or inner， format system can’t effect this.File format：**data.bak**.

Setting：Press “ORIGIN OK” to enter “**Backup Data**”，screen shows：

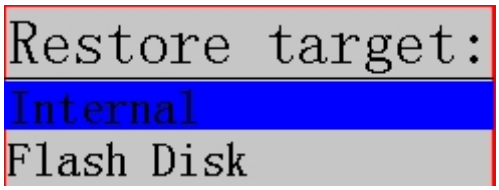


Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor to choose where to backup，press "ORIGIN OK" to confirm.

12. Restore Data：

Restore backup data from U disk or inner to system.

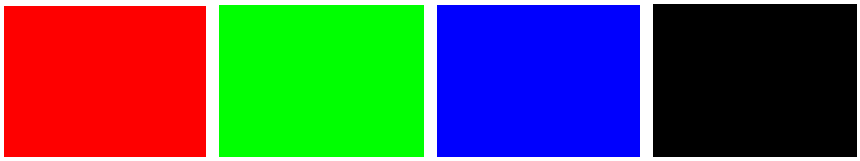
Setting：Press "ORIGIN OK" to enter "**Restore Data**"，screen shows：



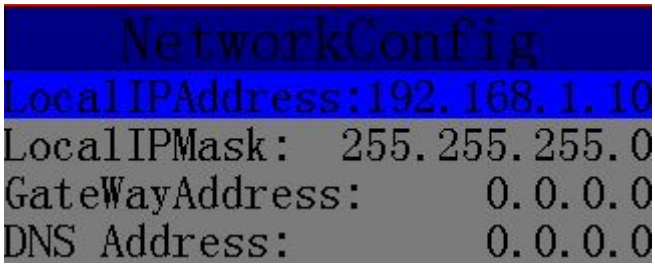
Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor to choose where to restore，press "ORIGIN OK" to confirm.

13. Test Screen：

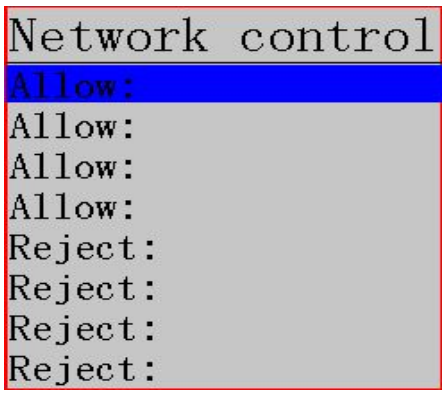
Check weather the screen can work normally. Enter the interface， press each button,if it is monochrome ，then it is OK；if not，user need to send our company the handle to repair.



14. Internet Para Setup：



15. Internet Connect Set(setup):



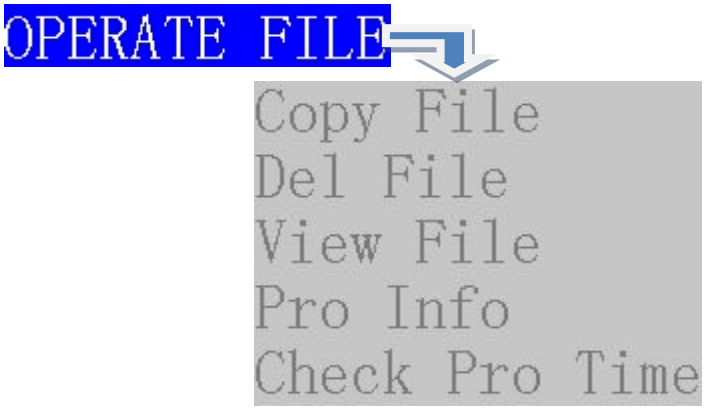
16. Auto Upgrade:

If the system has new function， our company will provide upgrade file（extension ******. PKG & shown as rz-xxxx), users can upgrade through the U disk, specific steps in Appendix 1. It will not damage the original parameters.

File fomat: A51普通三轴雕刻[5寸彩屏][USB1](q9-194).pkg.

4.2.4 Operate File

Operate File Chart



1. Copy File:

Copy files from U disk to Inner.

2. Del File（Delete File）:

Delete files of inner.

3. View File:

View the files and G codes of U disk or inner.

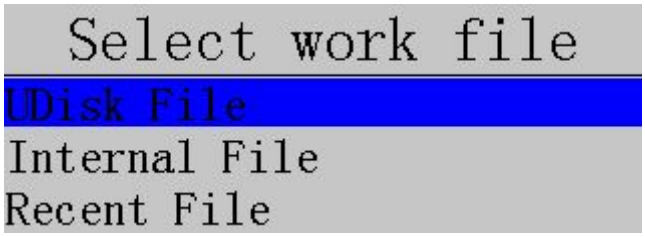
4. Pro Info（Processing Information）:

System power on， it will statistical the times of successful processing by file name， if system power off， the data will disappear.

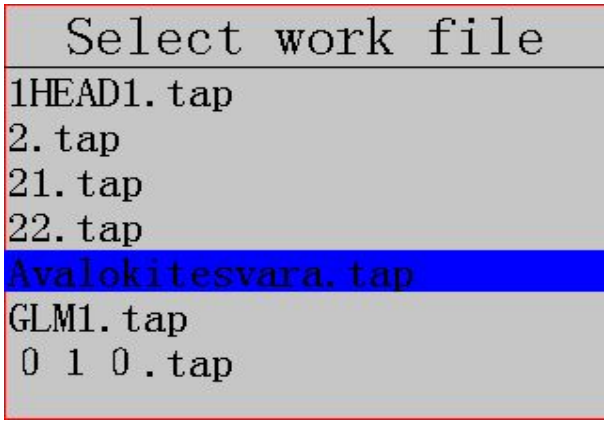
5. Check Pro Time（Check Processing Time）:

Calculate processing time by system work speed，after reading G code，the screen will display the processing time， different work speed corresponding to different processing time.

Operating mode: Press "ORIGIN OK" to enter "**Check Pro Time**", screen shows:

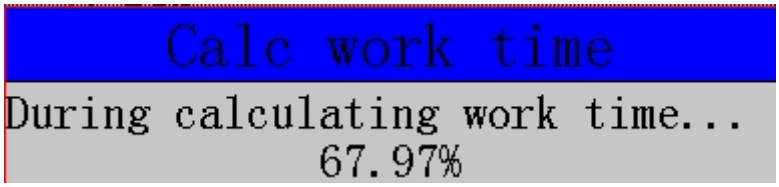


Press "Y+ 2 ▲"、"Y- 8 ▼" to choose "UDisk" / "Internal/RecentFile":

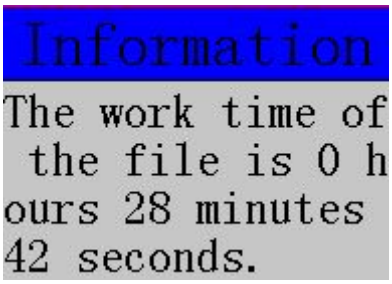


Press "ORIGIN OK" to enter， choose processing file，and then press "ORIGIN OK", after

calculation：



Screen will show processing time ：



NOTE:Plesae pull out the U disk correctly after copying files from computer,if not,the controller may not recognize the U disk.

1． Win7(32 bit) system：after copying files,please press“  ”,and then the display will show “ 

”,choose the device to be shut down.when the display show

“ 

”,the U disk pull out from computer successfully.

2． Win XP system：after copying files,please press“  ”,and then the display will show “ 

”,choose the device to be shut down.when the display show “ 

”,the U disk pull out from computer successfully.

4.2.5 Version View

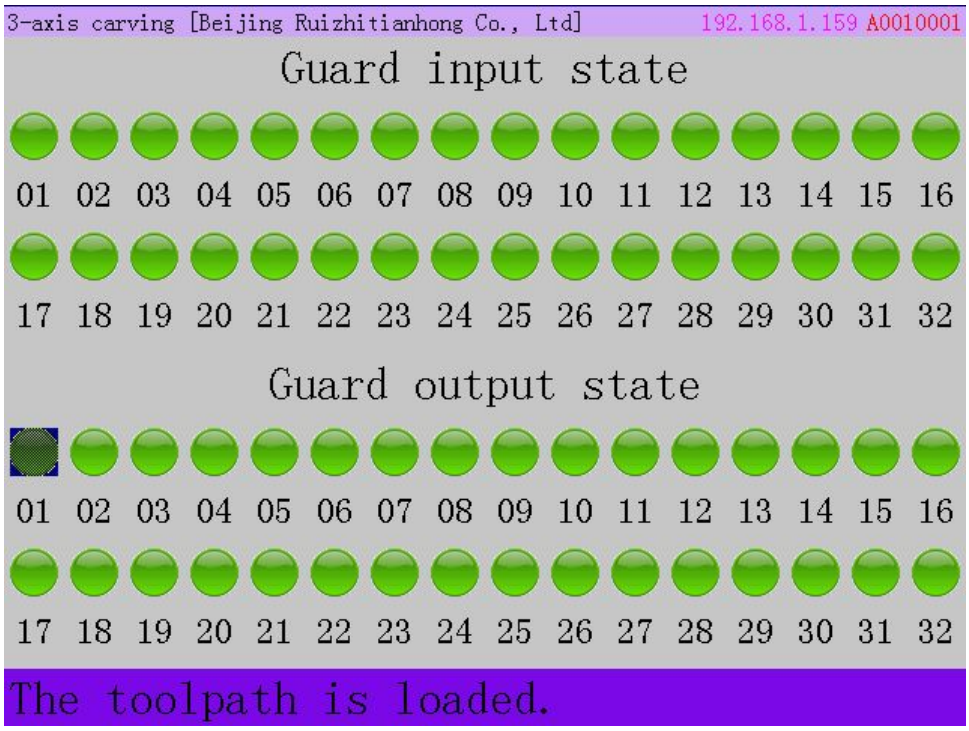
Users can view information about the system hardware and software，including：

✧ Update Version： eg：P1.409/rz-xxxx/q10-82

- ✧ Product ID eg：A0020112
- ✧ Soft Version eg：A1.1936
- ✧ Emergency Version eg：A1.1920
- ✧ Soft type：4-axis carving
- ✧ Hardware type：4-axis carving　Support 3-inch screen Flash Disk Mode

● 4.3Remote control user interface

● 4.4 Input outputcontrol user interface



1. Guard input state：

INPUT SIGNAL terminal has 01-32, total of 32 status indicator lamps, and the interface board INPUT SIGNAL terminal X01 - X16 one-to-one correspond to the indicator lamps.Indicator lamp01- INPUT SIGNAL X01(X back home signal), indicator lamp02- INPUT SIGNAL X02(Y back home signal)， indicator lamp03- INPUT SIGNAL X03(Z back home signal)， indicator lamp04- INPUT SIGNAL X04(Toolset signal)，and other lamps correspond to other definable signal.

If indicator lamp is green（not light），it signifies that no signal triggers，if signal

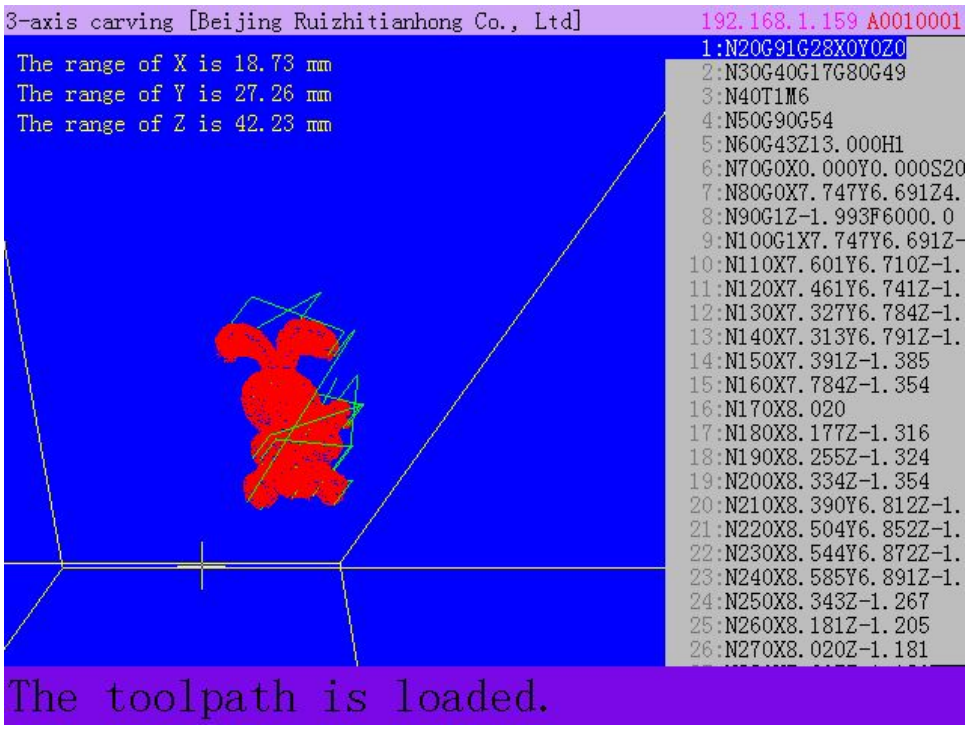
triggers，indicator lamp will be red（light）.it signifies that signal triggers. If signal triggers， indicator lamp not light，you should check the corresponding signal sensor、circuit and interface board.

2. Guard output state：

OUTPUT SIGNAL terminal has 01-32, total of 32 status indicator lamps, and the interface board OUTPUT SIGNAL terminal Y01 - Y16 one-to-one correspond to the indicator lamps.Indicator lamp01- OUTPUT SIGNAL Y01(Spindle CW state，Spindle CCW state), indicator lamp02- OUTPUT SIGNAL Y02(Spindle Shift 1)，indicator lamp03- OUTPUT SIGNAL Y03(Spindle Shift 2)， indicator lamp04-OUTPUT SIGNAL Y04(Spindle Shift 3),and other lamps correspond to other definable signal.

User can change indicator lamp state by pressing “RUN/PAUSE DELETE”，to realize manually control output signal.Press “X- 4 ◄”、“X+ 6 ►” to move cursor left and right，and then press “RUN/PAUSE DELETE” to change indicator lamp state. For instance：If cursor stop at indicator lamp 01，press “RUN/PAUSE DELETE”，indicator lamp lights（get red），spindle on.

● 4.5 View toolpath user interface



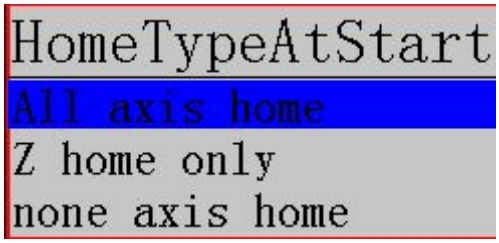
1. In the "View toolpath user interface", user can view the simulation picture of the processing file、processing scope and G code of the file.

2. In G code display area，press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor up and down，check G code line-by-line，press "X+ 6 ▶"、"X- 4 ◀" to realize that first line of G code directly jump to the end line or end line of G code directly jump to the first line.

➢ 5. Machine Operation

● 5.1 Return home

After starting up and system loading，screen shows：:



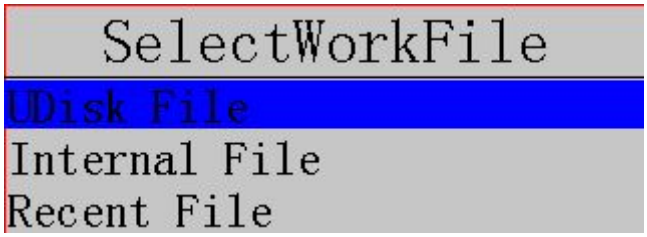
Select and confirm, machine will automatic return to mechanical origin, and also check system coordinates.

In some case, such as normal power off during processing, reboot and continue last operation, user should not home again, just choose "**none axis home**". That is because system auto save coordinate value when system in normal exit.

● 5.2 Loading processing file

Before processing, generally we should import files. RichAuto system has 2 ways: U disk import, inner file import.

1. Import file directly from U disk, then press "FILE" button, screen shows:

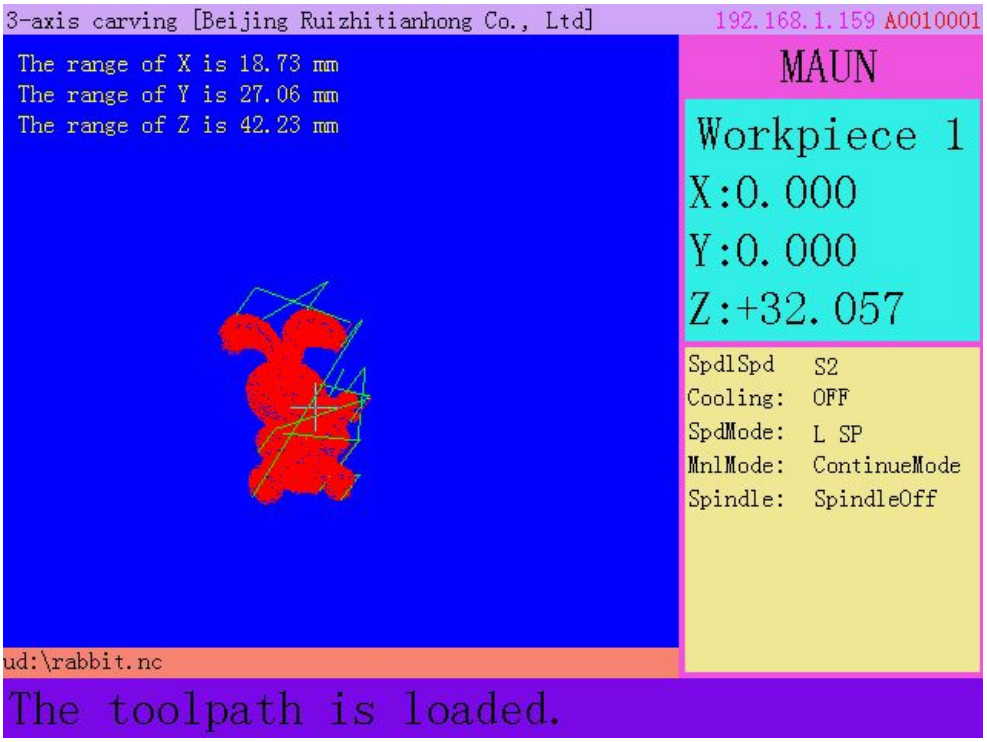


Choose required file, press "ORIGIN OK".

2. Copy processing file to inner memory space from U disk.Same operations as above.

● 5.3 Manual processing Operation

Manual Processing Operation refers to controlling of the machine tool by pressing 3 axes direction keys. User can change the speed and set the grid under manual processing operation. System will enter Manual Operation state after returned home, and the screen displays as follow：



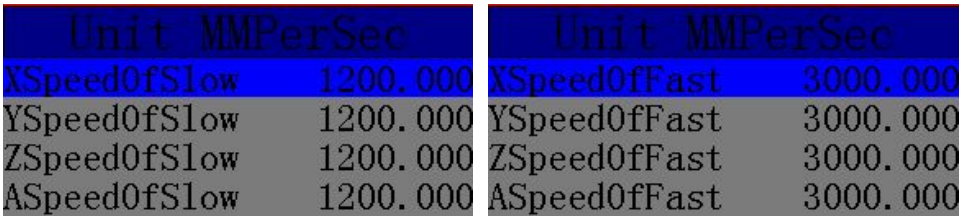
5.3.1 Manual operation speed switching and adjusting

1) Speed mode switching

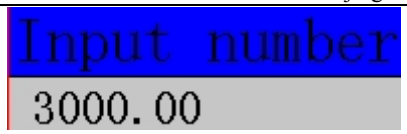
User can switchover between High speed and low speed by pressing "SPEED". The speed mode you choose will decide processing speed.

2) Speed adjusting

Firstly, go to "MENU"-"Manual function user interface"-"AUTO PRO SETUP" to find out "low manual speed" and "high manual speed", the screen shows as follow:



When cursor is in the low speed manual mode, press "Y+ 2 ▲"、"Y- 8 ▼" to move the cursor, then press "RUN/PAUSE DELETE" the screen shows as follow:



Input the required value, then press “ORIGIN OK” to save it, or press “STOP CANCEL” to quit.

In order to ensure the accuracy of processing and debugging, the system introduces the concept of “grid” which also called “minimum feed”. It range is 0.05mm-1.0mm.When user change mode to “step”, push each axis button, machine will move by grid distance.

High speed manual mode setting is the same as low speed manual mode.

5.3.2 Manual motion mode

In order to meet different situation of manual movement, the system provide 3 kinds of motion modes: Continuous, step, distance. We can change mode by pressing “MOTION”, and machine status area will display the current manual motion mode.

1) Continuous motion mode

In this mode, it has no value control. Machine move after user pressing motion direction key（X+ 6 ▶、X- 4 ◀、Y+ 2 ▲、Y- 8 ▼、Z+ 3、Z- 9）Its motion speed is decided by current speed mode.

2) Step motion mode

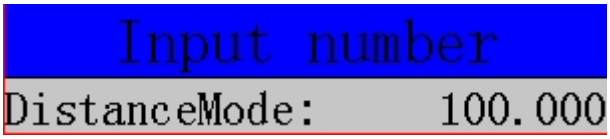
This mode is always move in low speed, move 1 grid per 0.5 second. The grid distance is decided by current speed mode. This motion mode is suitable for tool adjusting or precise adjustment of the location of the mechanical coordinates.

3) Distance motion mode

In this mode, it runs according to the setting of distance. Machine will move by the set distance when user press direction button（X+ 6 ▶、X- 4 ◀、Y+ 2 ▲、Y- 8 ▼）

Z+ 3 、 Z- 9) .

Setting：Press “MOTION” to swtich to distance motion mode：



Input required distance value，press “ORIGIN OK” to confirm the changing.

Note: Grid unable to affect the distance motion mode. Machine will move by set distance, can’t move to grid point. If user wants to change distance, please press “MOTION” for three times to change to distance mode and re-enter the distance value.

● 5.4 Automatic processing operation

Auto processing refers to the system runs the file in U disk or inner storage space according to the instruction, it also called file processing. Before auto processing, user must set the machine tool parameters and all of the system parameters correctly.

Auto processing steps:

5.4.1 Determine the origin of the workpiece

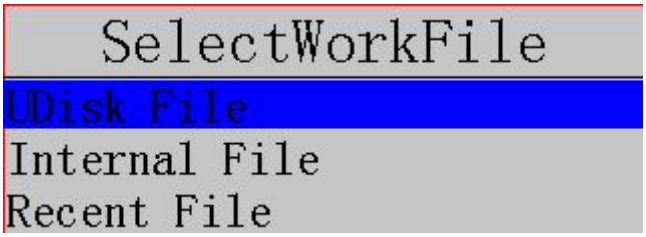
The origin coordinates of X, Y and Z in the processing program is the workpiece origin. Before operating, we should pay attention to this position as well as the real position. Operation as follow：

Move X, Y and Z to the position which needs start to process the file on workpiece. Afterwards, press zero clearing “XY→0 4” can set X and Y axis origin.

Press zero clearing “ZC→0 0” to set Z axis origin. It should be noted, if user has already used the automatic tool setting function, he will no need to press “ZC→0 0” for clearing. Only press “TOOLSET” will start tool setting function.

5.4.2 Load processing file

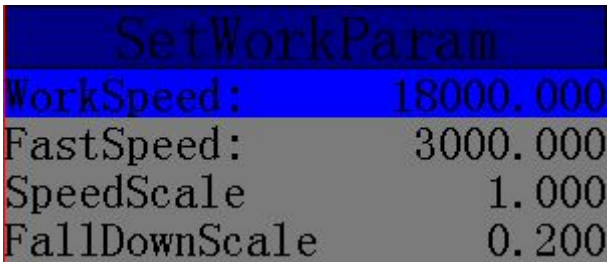
Insert Udisk(containing processing files)，press “FILE”，screen shows：



Choosing required file, and then press “ORIGIN OK” to confirm.

5.4.3 Set processing parameters

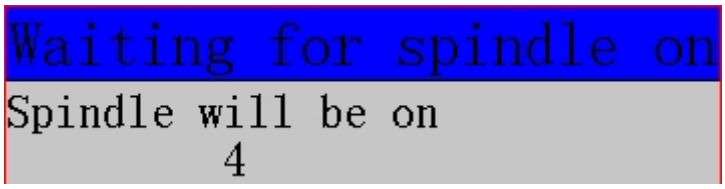
After the completion of loading processing file, press “RUN/PAUSE DELETE”, it will popup processing parameters list：



User can modify the parameters which include: Work speed, Fast speed, Speed

ratio and Falling down speed ratio.

Setting：Press “Y+ 2 ▲”、“Y- 8 ▼” to move the cursor to choose different setting item, press “RUN/PAUSE DELETE” to modify the value (next value setting is the same as this one). After finished setting all values press “ORIGIN OK” to confirm. Waiting for spindle on.



System will start processing after spindle on. During processing, user can check processing status at machine status area.The processing status including real-time processing speed, processing time, file line number, G code etc. Press “MENU” to switchover the content of machine status area.

● 5.5 During processing operation

5.5.1 Speed ratio & spindle speed Adjusting

1) Adjust speed ratio

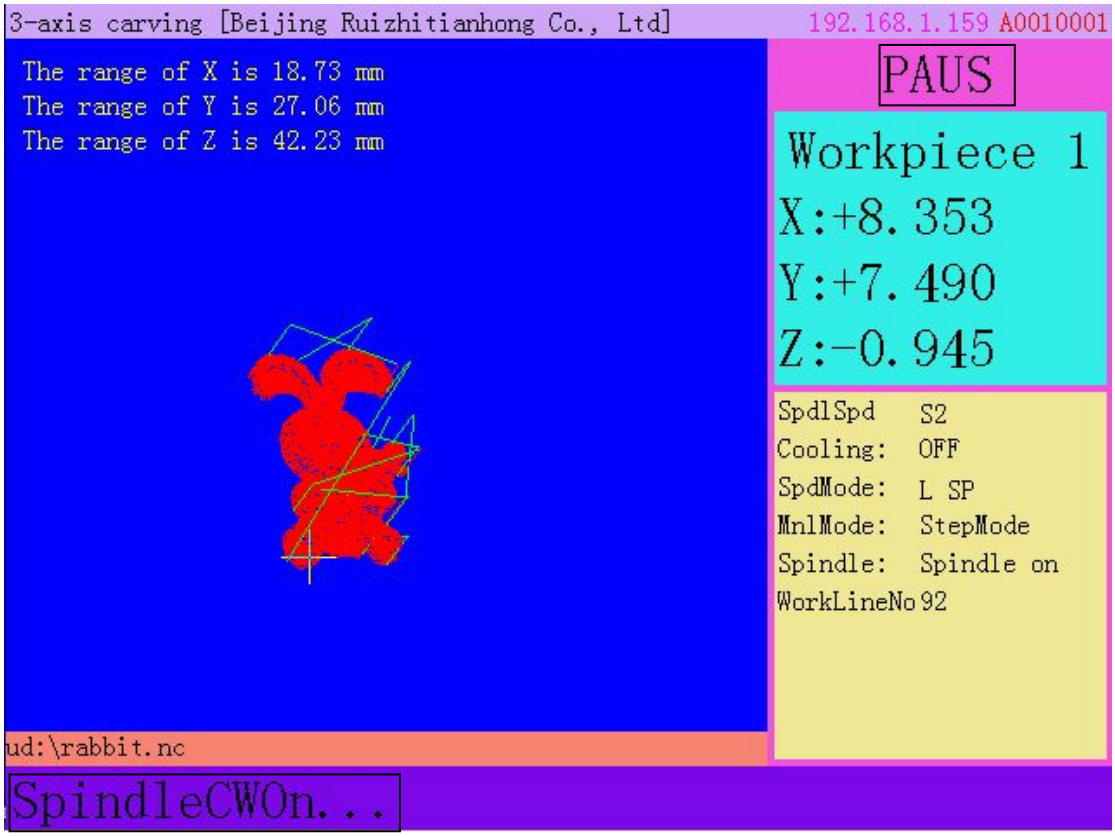
In process of processing, During processing, press “Y+ 2 ▲”、“Y- 8 ▼” can change speed ratio, each time press “Y- 8 ▼” / “Y- 8 ▼” , the ratio will increase/ decrease 0.1.The processing speed ratio max 1.0, min 0.1, speed value will change while you change speed ratio, but time value can not be changed. current speed= work speed *speed ratio.

2) Adjust spindle grade

User can adjust spindle speed when there is set a multi-step speed. Press "[Z+ 3]" turn up for 1 grade untill S8，press "[Z- 9]"turn down for 1 grade untill S1.

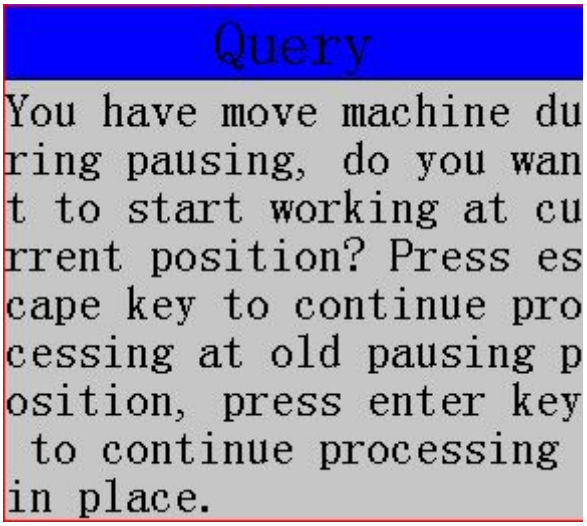
5.5.2 Pause processing & adjust position

Press "[RUN/PAUSE DELETE]" to pause processing，the right upwards of screen will change from"RUN" to "PAUS", and machine stop processing except the rotating of spindle. Shown below：



Now user can adjust position of each axis. System default motion mode is STEP, so that user can fine adjust each axis. That is to say, every click, machine axis moves 1 high/ low speed grid distance（A axis：angle）.

When the adjustment is finished, press "[RUN/PAUSE DELETE]"， screen shows：

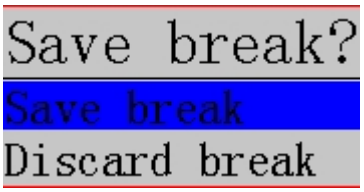


System ask user whether save the modified position. Press “ ORIGIN OK ” or “ RUN/PAUSE DELETE ” ,it will start at the modified position; Press “ STOP CANCEL ” , system will back to previous position and continue processing.

5.5.3 Breakpoint processing & power down protection

1) Breakpoint processing

If user wants to stop during processing, please press “ STOP CANCEL ” , then screen shows as below：



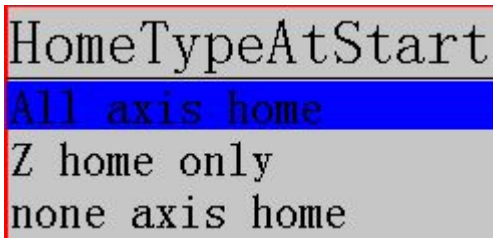
If we want to save current processing position, press “ ORIGIN OK ” , then screen shows break lis：

Totally 8 breakpoints, press "Y+ 2 ▲"、"Y- 8 ▼", choose a breakpoint position by moving cursor, and then press "ORIGIN OK" to save, system automatic return to zero. If we want to continue processing from the breakpoint, we can choose the combination key "RUN/PAUSE DELETE" + "1-8". First press "RUN/PAUSE DELETE" not release it, at the same time press number key(1-8), then release together, the system will start processing from the breakpoint.

For example: You want to start processing from the breakpoint 1, then you should use the combination key "RUN/PAUSE DELETE" + "1", system will restore processing from breakpoint 1. If user doesn't want to save current breakpoint, pres"RUN/PAUSE DELETE"next input the line number which is required return back, and then press "ORIGIN OK" the system will start processing from the new line number.

2) Power off protection

When there is a sudden power failure during processing, system will save current coordinate and parameters, while power restart, process continue. Before that, system must have a home motion. Shown as below：

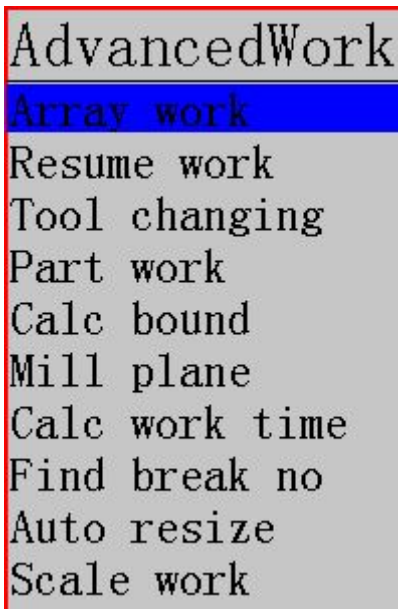


Last power off during working, because of inertia the machine position may be error, do you want to restore coordinate? It's recommends not to restore. Press CANCEL to HOME, OK to restore.

Press "ORIGIN OK" to continue unfinished processing, it will display stop line No., and the line number can be chosen. Press"STOP CANCEL" cancel the power off protection

● 5.6 Advanced Processing

Advanced processing is to meet the special requirements of operation. It contains: Array work, resume work, manual tool change, Part work, Calculate bound etc. The combination key is "RUN/PAUSE DELETE" + "ZC→0 0", shown below:



1. Array work

Steps as below:

1) Press "Y+ 2 ▲","Y- 8 ▼" to move cursor to the Array work, press "ORIGIN OK"

to enter，and then press “Y+ 2 ▲”、“Y- 8 ▼” to select different listed files；

2) Press “ORIGIN OK” to enter file list, then press “Y+ 2 ▲”、“Y- 8 ▼” to move the cursor to choose target file；

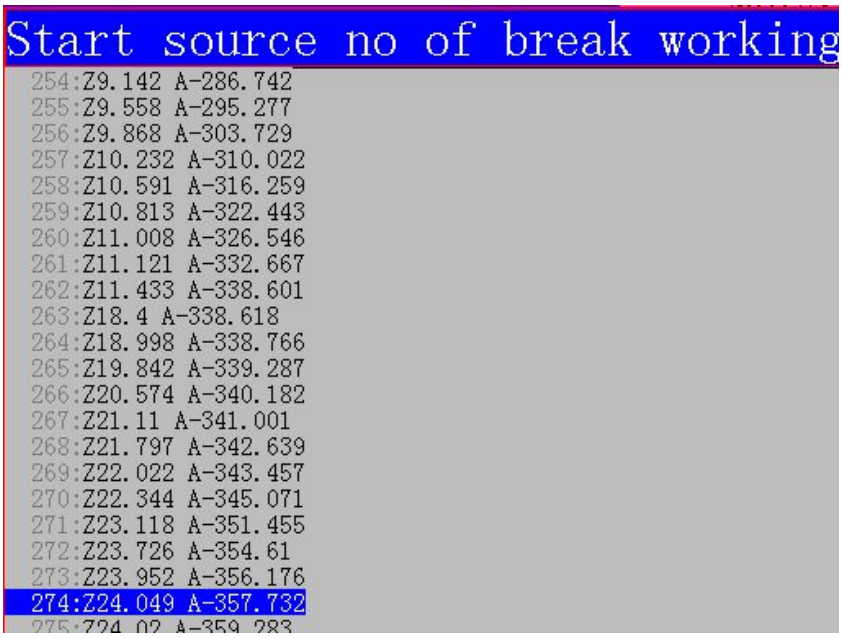
3) Set processing parameters, also can modify the array parameters in this step, or you can go to “MENU”-“Menu function user interface”-“AUTO PRO SETUP”, choose “Work Array” and modify the array parameters. The rest steps are similar to the normal processing. In this way, system will start to work according to the user’s setting.

4) During array work, press “MENU” could view real-time row number, column number and other processing information.

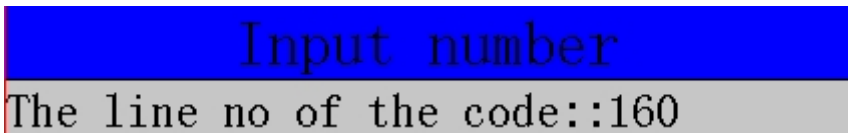
2. Resume work

Steps as below：

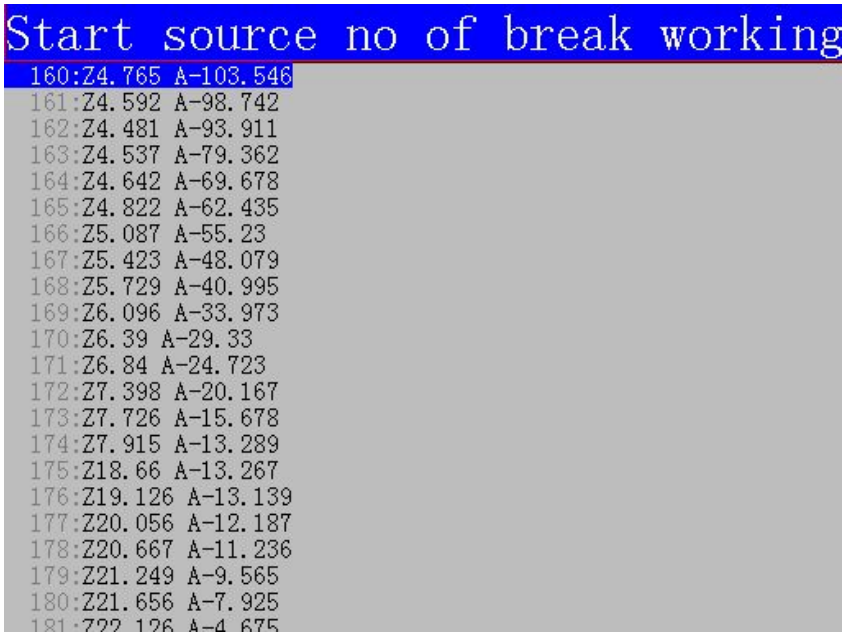
Press “Y+ 2 ▲”、“Y- 8 ▼” to move cursor to resume work, press “ORIGIN OK” to enter the list：



Press “ORIGIN OK” system will resume working from the choosed breakpoint. If you want to return back,should press “RUN/PAUSE DELETE”, the screen prompt：



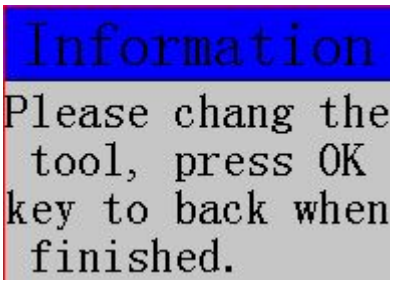
Input the line number which needs return to, and then press“ORIGIN OK”,the cursor will goto new line：



Press “ORIGIN OK” system will start from new line.

3. Manual tool changing

It means manually loading and unloading the cutting tool in a certain position of machine tool, and the position also can be set. Press “ORIGIN OK” enter into setting：

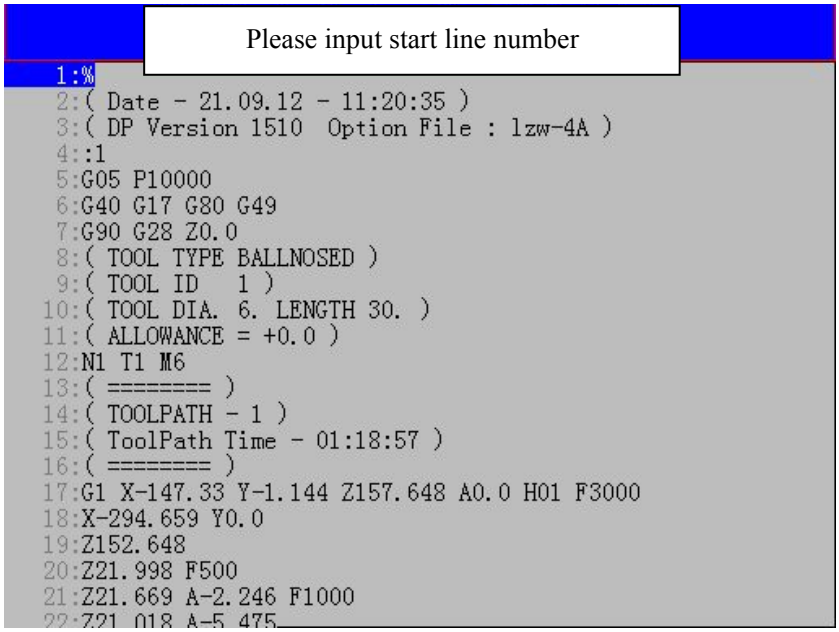


While new cutting tool has been changed, press “ ORIGIN OK ” system will go to workpiece origin.

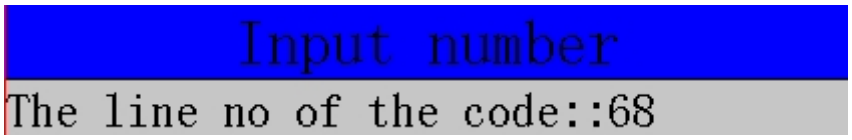
4. Part work

Park work means user can select a start line and stop line from G code, so that realize the part working. The steps are as follows：

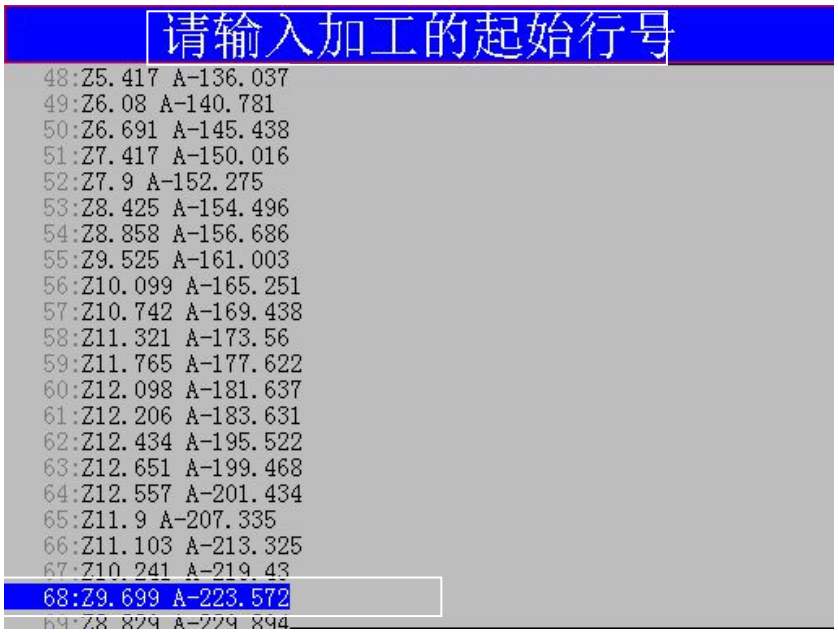
1）Press “ ORIGIN OK ” to enter the setting：



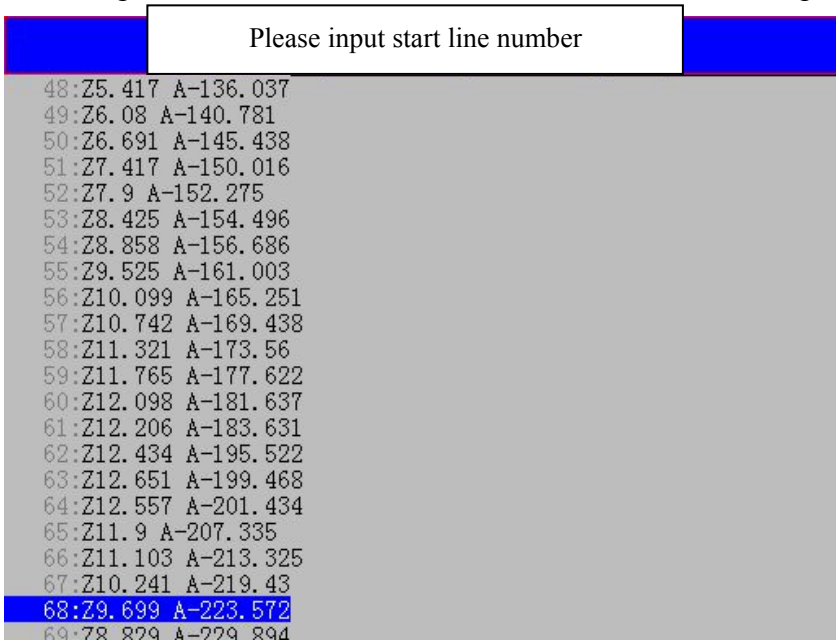
2）Press “ RUN/PAUSE DELETE ” will prompt a message：



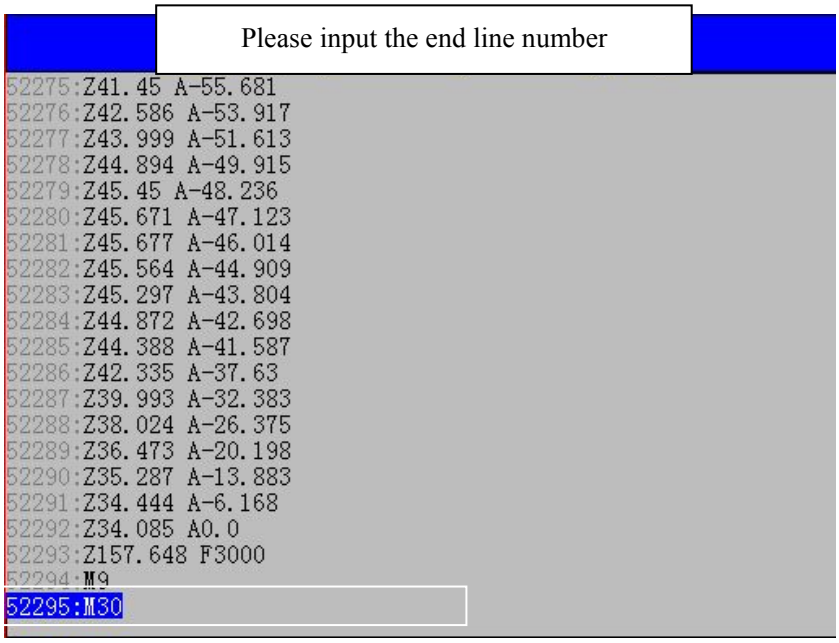
3) Input new line number, press "ORIGIN OK" to confirm, the cursor will goto new G code line:



4) Once more press "ORIGIN OK" to set the end line number, it will prompt:



5) Press "ORIGIN OK" the cursor will goto the end line, or press "运行/暂停 RUN/PAUSE 删 除 DELETE" to input the number of the end line:



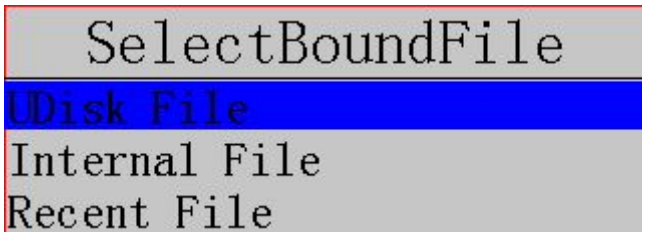
Press "ORIGIN OK" to confirm, and start to processing.

6) Set processing parameters. The rest operation is as same as normal procesing.

5. Calculate bound

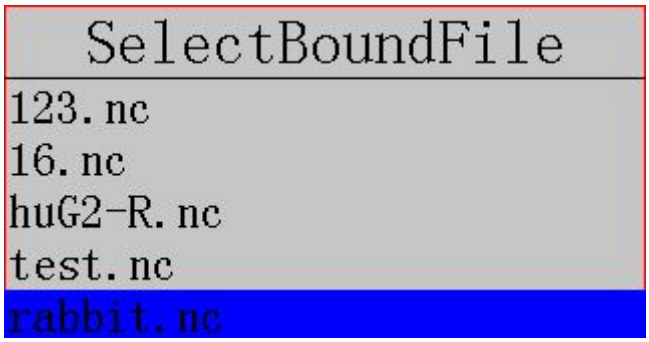
Calculate bound means user can check the size of processing, So as to avoid unnecessary waste of materials and processing errors. The steps are as below:

1) Press "Y+ 2 ▲"、"Y- 8 ▼" to move the cursor to "calculate bound", press "ORIGIN OK" to enter:

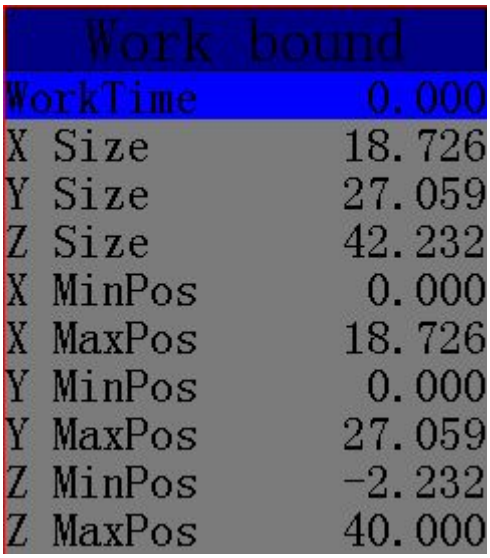


Then press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor to choose different file list;

2) Press "ORIGIN OK" to enter the file list, and then press "Y+ 2 ▲"、"Y- 8 ▼" to choose target file:

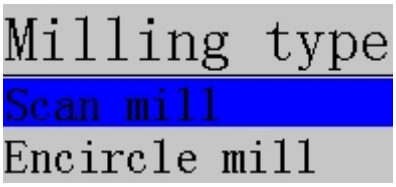


3) Press "ORIGIN OK" , system start to read the file, after that, the system will calculate the area:



6. Milling plane

Include two types: scan mill and encircle mill

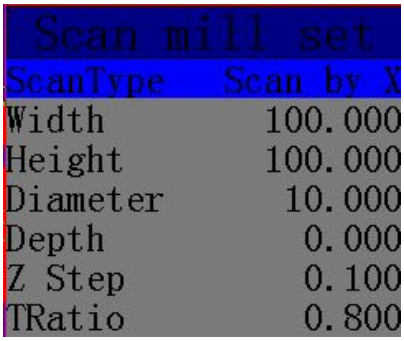


Steps are as follows:

1. Scan mill

1) Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursr to choose the mill type.

2) Press "ORIGIN OK" to enter the scan mill settings, it includes: Scan type, Scan Width, Scan Height, Tool Diameter, Scan Depth, Z Step T Ratio.

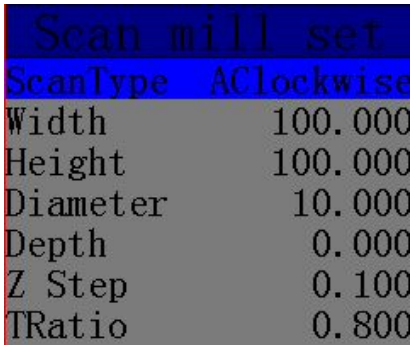


3) Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor on the option which need modify, press "RUN/PAUSE DELETE" to choose mill type (X Scan or Y Scan), also press this button to modify the parameters. Press "ORIGIN OK" to save them.

2. Encircle mill

1) Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursr to choose the mill type.

2) Press "ORIGIN OK" to enter the scan mill settings, it includes: Scan type, Scan Width, Scan Height, Tool Diameter, Scan Depth, Z Step T Ratio.

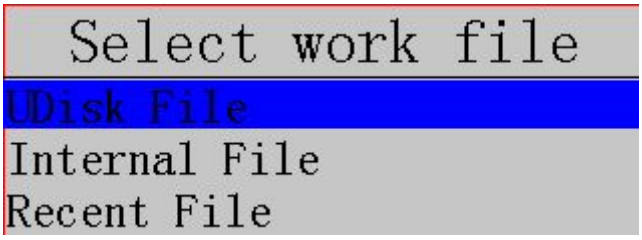


3) Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor on the option which need modify, press "RUN/PAUSE DELETE" to choose mill type (X Scan or Y Scan), also press this button to modify the parameters. Press "ORIGIN OK" to save them.

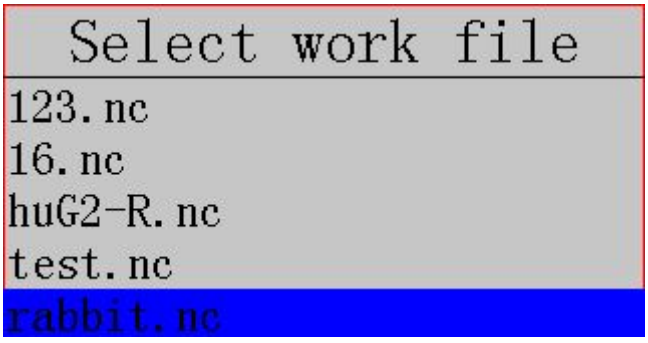
7. Calculate work time：

Calculate the processing time according to the system processing speed：

1) Press "Y+ 2 ▲"、"Y- 8 ▼"to move the cursor to "calculate work time", press "ORIGIN OK" to enter：

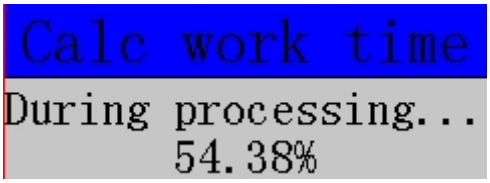


2) Press "Y+ 2 ▲"、"Y- 8 ▼" to move the cursor to select the file store position, then press "ORIGIN OK" to enter：

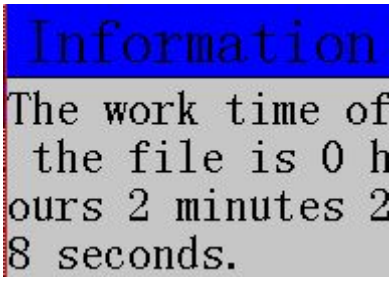


3) Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor and choose the processing file, press "ORIGIN OK" ，system start to read the file, after that, the system will

calculate the processing time：：

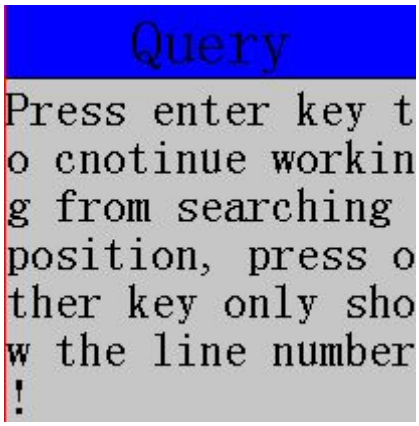


After calculating， the screen will display file processing time(different work speed will show different processing time):



8. Find break no.：

During processing, if accidentally tool damaged and user hasn't saved the break point, stop working and replace tool. After that, user can manually move X, Y axis to the nearest point where the cutter was broken (recommend to move a little further), press "RUN/PAUSE DELETE" + "ZC→0 0" to start advanced work, move cursor to "Find break no.", then press "ORIGIN OK" to enter, system will prompt：



Press "ORIGIN OK" to start working.

9. Auto resize：

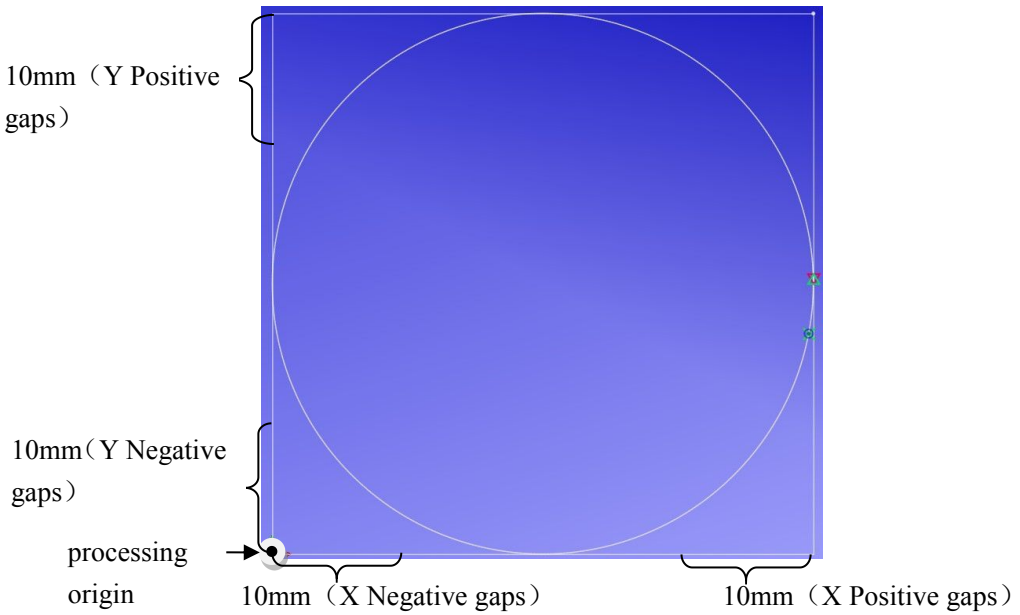
1) Press "Y+ 2 ▲"、"Y- 8 ▼" to move cursor to "**Auto resize**", and then press "ORIGIN OK" to enter.

2) Press "Y+ 2 ▲"、"Y- 8 ▼" to move to the option witch needs to modified, then press "RUN/PAUSE DELETE" to input new value, press "ORIGIN OK" save the modification.

InputTargetSize	
X start	0.000
Y start	0.000
X size	10.000
Y size	10.000
X- Space	10.000
X+ Space	10.000
Y- Space	10.000
Y+ Space	10.000

3) After modified all the options, press "ORIGIN OK" to start processing.

200mm X 200mm Circle



X、Y axis origin：Offset value of the new workpiece origin which is relative

to the original workpiece origin.

X、Y axis size: New processing file size.

X negative gaps: See the bottom mark, in X direction, processing origin is moved back for 10mm.

X positive gaps: See the bottom mark, in X direction, processing origin is moved ahead for 10mm.

Y negative gaps: See the bottom mark, in X direction, processing origin is moved back for 10mm.

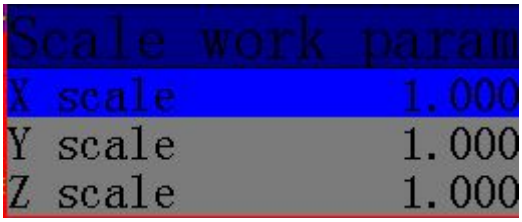
Y positive gaps: See the bottom mark, in X direction, processing origin is moved ahead for 10mm.

10.Scale work：

If user needs to view different sizes processing file, he can use ZOOM. Input the zoom ratio to process.

Operate steps：

1) Press “Y+ 2 ▲”、“Y- 8 ▼” and move cursor to “calculate work time”, then press “ORIGIN OK” to enter：



2) Press “Y+ 2 ▲”、“Y- 8 ▼” and move cursor on axis ratio, press “RUN/PAUSE DELETE” to modify a new value,then press “ORIGIN OK” to confirm.

3) When finished the modifications press “ORIGIN OK” to start processing.

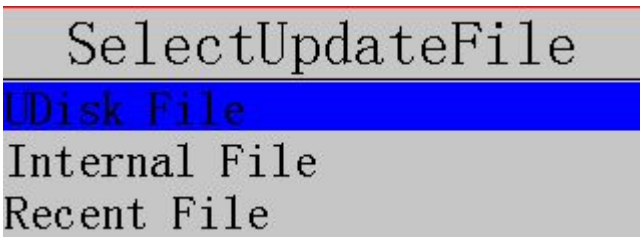
● PS1. System upgrade

Copy upgrade file to U disk， and insert U disk into handle， file format：extension ******. PKG & shown as rz-xxxx.Operate as follow：

U Disk Upgrad Method 1

1、Press “MENU” to enter “**Switch user interface**”，choose “**Menu function user interface**”, and then press“ORIGIN OK”to enter，press“Y+ 2 ▲”、“Y- 8 ▼”to choose “System Setup”， press “ORIGIN OK” to enter.

2、Press “Y+ 2 ▲”、“Y- 8 ▼”to choose “**Auto Upgrade**”, press “ORIGIN OK” to enter，screen shows:



3、Press “ORIGIN OK”to enter，chosse“**Udisk file**”, enter Udisk to choose upgrade file，press “ORIGIN OK”， system will automatically upgrade.

4、After upgrade completed，restart the handle.

U Disk Upgrad Method 2

1、Copy upgrade file to Udisk，and insert Udisk into handle.

2、Press “MENU” + “ORIGIN OK”， and then repeat Method 1 operation 3&4.