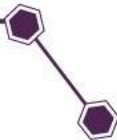# AWC7824 motion controller

User manual

Laser motion controller series

RV1.3

Copyright statement

Shenzhen Trocen Automation Technology Co.Ltd（hereinafter referred to as Trocen）reserves the right to modify the products and product specifications in this manual without prior notice.

Trocen shall not be liable for any direct, indirect, special, incidental or consequential loss or liability arising out of the improper use of this manual or this product .

Trocen owns the patent right, copyright and other intellectual property rights of this product and its software. Without authorization, it shall not directly or indirectly reproduce,manufacture,process or use the product and relevant parts thereof.

⚠	Machines in motion are dangerous. It is the responsibility of the user to design effective error handling and security protection mechanisms during the use of the machine. Trocen shall have no obligation orres ponsibility for any incidental or consequential damages caused thereby.

Contact us

Shenzhen Trocen Automation Technology Co.LTD

Address :1st Floor, Building4, Zhiheng Strategic Industrial Park, Nantou Pass, Nanshan District, Shenzhen city, Guangdong Province, China.

Thephonenumber : 0755-27958262

Fax: 0755-27447913-608

Email: qiancheng@sztrocen.com

Url: www.sztrocen.com/www. awc608.com

Document Version

The version	The revision date
V1.1	2020/07/20
V1.2	2020/08/26
V1.3	2020/08/27

Preface

Thank you for choosing Trocen motion controller! In return for customers, we will be first-class quality motion controller, perfect after-sales service, efficient technical support, to help you complete the production of equipment.

More information about Trocen products

The company's website is www.sztrocen.com/www.awc608.com. You can find out more about our company and products on our website, including: company profile, product introduction, technical support and latest releases, etc.

You can also call 0755-27958262 for more information about the company and its products.

Technical support and after-sales service

You can obtain our technical support and after-sales service through the following ways:

Email: qiancheng@sztrocen.com

The phone number: 0755-27958262

Sent a letter to: 1stFloor, Building4, Zhiheng Strategic Industrial Park, Nantou Pass, Nanshan District, Shenzhen city, Guangdong Province, China.

Shenzhen Trocen Automation Technology Co. Ltd.

Zip code: 518100

Use

By reading this instruction, the user can understand the basic

operation of the AWC7824 control card.

Using the object

This manual is applicable to engineers who have a certain

understanding of mechanical automation operation such as laser

machines.

The main content

The basic operation and use of AWC7813 panel are introduced in

detail. This manual is based on version 1.20.8.12. There are subtle

differences between the versions.

The certification statement

CE certification statement

This product has passed the EU CE (Communate Europpene) safety certification,

has passed the corresponding conformity assessment procedure and the

manufacturer's conformity declaration, and complies with the relevant EU directives.

ROHS certification statement

The product has been certified safe by European Union legislation, the Directive

on Restriction of Certain Hazardous Substances in Electronic And electrical

Equipment, which conforms to the relevant European Union environmental

regulations.

FCC certification statement

The product has been certified by the Federal Communications Commission for safety and complies with U.S. electronic product safety regulations.

The relevant documents

《LaserCAD instructions》

Catalogue

1.Product description

- ➢ **Features**

- ➢ **AWC78XX Series comparison**

- ➢ **Terms/abbreviations**

- ➢ **AWC7824 accessories composition**

- ➢ **Appearance and size of panel**

- ➢ **Appearance and size of wiring**

  board

1. Product Description

1.1 Features

AWC7824 is a general-purpose motion controller used in laser cutting, laser engraving and other fields, suitable for all kinds of small and medium power laser cutting and engraving equipment .AWC7824 motion controller works with LaserCAD software

AWC7824 motion controller has the following features:：

- 5-inch TFT LCD touch screen ,intuitive and simple operation interface

- Two road laser control

- Four-roads motion axis control (X axis, Y axis, Z axis ,U axis)

- Using high-speed DSP main control chip, fast calculation speed,advanced motion algorithm

- All optocouplers isolate external electromagnetic interference, and the system works stably and reliably

- Support U disk, network and USB communication methods

- Support Z-axis autofocus, Y-axis dual drive function

- Support full blowing, work blowing, layer blowing

- Support double-head mutual movement, support over size cutting

- Support Y-axis drum cutting, Y@U-axis synchronous feeding, Y-axis double limit

- Support U-axis automatic feeding or optional U-axis as rotation axis

- Support dispensing function

- Support system startup delay, choose whether to turn off the system sound

1.2   AWC78XX Series Comparison

AWC78XX Series comparison			
	AWC7813	AWC7824	AWC7846
Hardware			
screen	5-inch touch screen	5-inch touch screen	5-inch touch screen
Universal output port	8roads	8roads	8roads
Universal input port	6roads	6roads	6roads
Control axis	3axes	4axes	6axes
Control laser	1road	2road	4roads
Memory size	128M	128M	128M
Data transmission method	Network communication,USB communication,U disk		
Support laser	Various DC lasers,RF lasers,CO2 lasers		
Function			
Input test interface	Yes	Yes	Yes
Output test interface	Yes	Yes	Yes
Button speed and slow movement function	Yes	Yes	Yes
Single axis quick reset operation	Yes	Yes	Yes
Quickly return to the positioning point	Yes	Yes	Yes
Modify power and speed online	Yes	Yes	Yes
Modify layer parameters offline	Yes	Yes	Yes
Modify file processing attributes offline	Yes	Yes	Yes
Modify factory parameters	Yes	Yes	Yes
Counting function	Yes	Yes	Yes
Graphic preview of processing files	Yes	Yes	Yes
Processing file completion progress display	Yes	Yes	Yes
Real-time follow-up display of cutting file graphics	Yes	Yes	Yes
Multi-head shift number	No	2roads	4roads

Dispensing function	No	Yes	Yes
Z-axis auto focus function	Yes	Yes	Yes
Y-axis dual drive function	Yes	Yes	Yes
Continue cutting function	Yes	Yes	Yes
Main board online upgrade	Yes	Yes	Yes
Automatic feeding,Y/U synchronous feeding	No	Yes	Yes
Over-format cutting	No	Yes	Yes
Drum cutting function	No	Yes	Yes
Blow by layer	Yes	Yes	Yes
Dispensing function	No	Yes	Yes
Y-axis double limit	No	Yes	Yes
System startup delay	No	Yes	Yes
Turn off system sound	yes	Yes	Yes
Set the U axis as the rotation axis	No	Yes	Yes

1.3 Term/abbreviation

Table 1-3 Explanation of terms and abbreviations

Term/abbreviation	explain
PC software	Laser CAD software is dedicated software for Trocen laser motion controller.
TFT LCD panel LCD panel Control panel Panel (Mainboard)	Refers to the 5-inch TFT color LCD touch control panel.The panel is used for specific display and control operations and is an important part of the system.
Wiring board(base plate)	The wiring board is a control board that controlling integrated signal input and output and connecting motor driver.
System hardware	The physical objects visible to the

	system,including:panel,wiring board,wires,etc.

1.4　AWC7824 accessories composition

After receiving the product, please confirm whether the product and accessories are

complete. If there is any missing, please contact Shenzhen Trocen Automation

Technology Co.Ltd. after-sales customer service.

1.4.1 AWC7824 all accessories and connection diagram
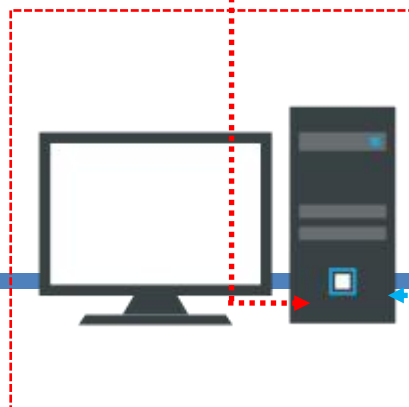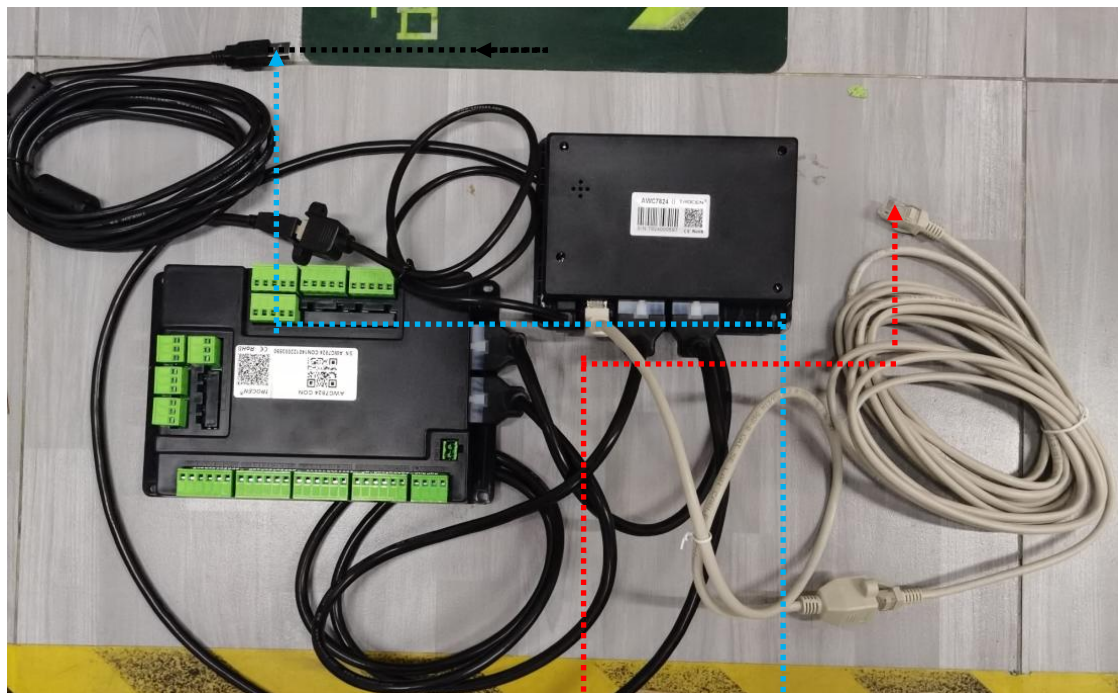
1.4.2 List of accessories

Table 1-4-2 Product list

Name	Appearance	Description
Panel (1piece)		AWC7824　Control panel
Wiring board (1piece)		AWC7824 Wiring board (base plate)
USB cable (1piece/3m)		Used by the computer to load files to the panel
Cable (1piece/5m)		Used by the computer to load files to the panel
CN Cable (1piece/1.6m)		Connect the CN1 port of the panel and wiring board
USB extension cable (1piece/0.5m)		

Network extension cord(1piece/0.5m)		
Screw (2pcs)		Used to fix the panel

1.5 Appearance and size of panel

Figure 1-5-1 Panel appearance display
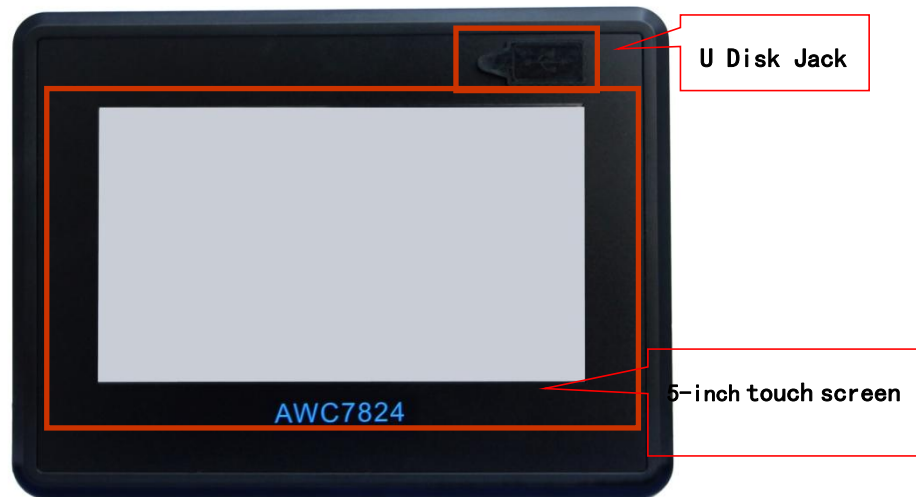
Figure 1-5-2 Panel size diagram

1.6 Appearance and size of wiring board

Figure 1-6-1 Appearance display of wiring board

Figure 1-6-2 Wiring board size diagram

209mm

195mm
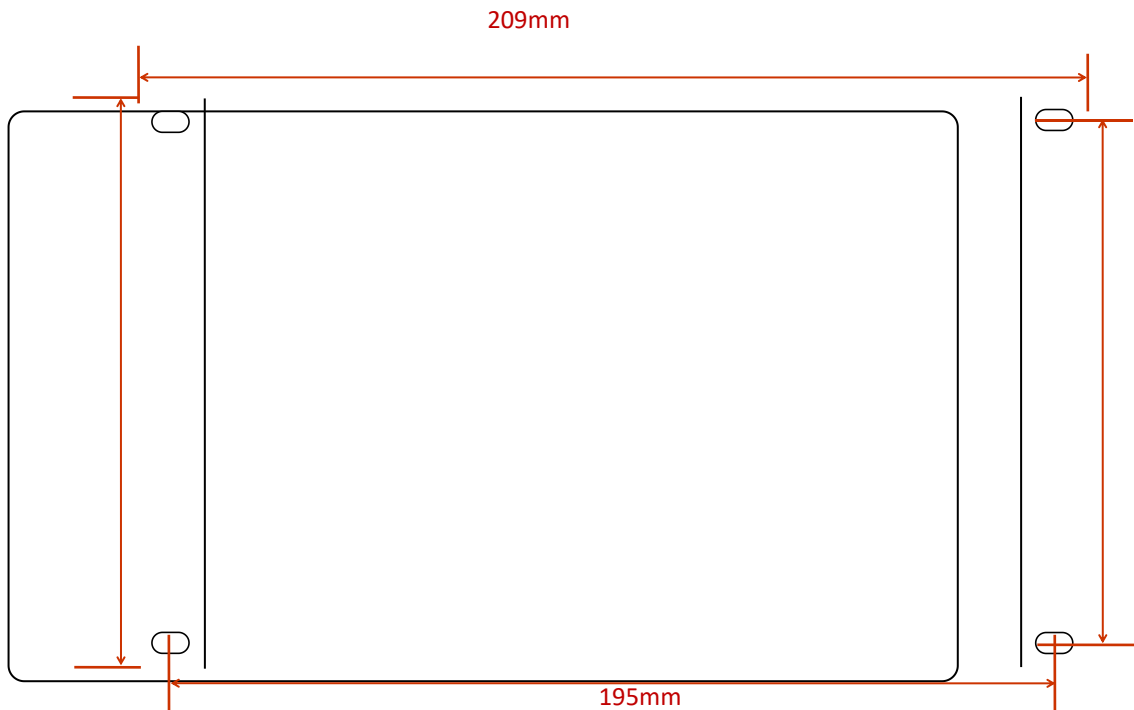
2.Hardware interface introduction

➢ **Control system electrical wiring diagram**

➢ Wiring board unit port description

   and wiring diagram

➢ Mainboard interface description

2. Hardware interface introduction

2.1 Control system electrical wiring diagram
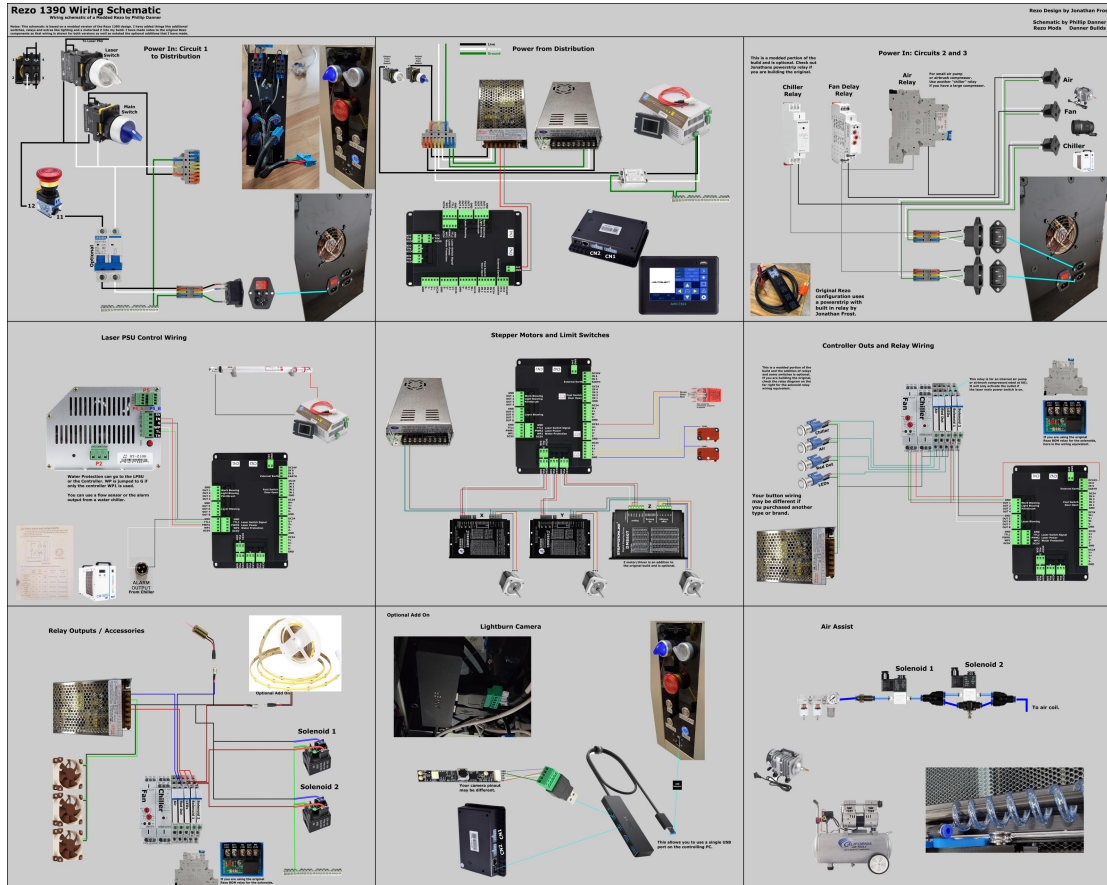
2.2 Control system electrical wiring diagram

2.2.1 Power port

It is used to supply power to the wiring board and the panel. When connecting, be careful to the positive and negative poles. Generally need DC24V 3A switching power supply.

Terminal number	Terminal name	Description
1	24V	24V power supply positive
2	GND	24V power ground

2.2.2 Universal input port

The wiring board provides two sets of input signal terminals for the collection of input signals. The default value of all input valid signals is 0V,and the default value of waiting signal is 24V when not working.

Terminal group	Silk screen	Description
6P terminals	24V	24V power supply positive output
	IN4	Reserved input signal
	IN3	Reserved input signal
	IN2	Foot switch signal
	IN1	Open protection signal
	GND	Power ground-output signal
4P terminals	24V	24V power supply positive output
	IN6	Reserved input signal
	IN5	Reserved input signal
	⏚	External earth-output signal

The signal input electrical wiring diagram is as follows：

IN1:door open
IN2:foot pedal
close on contact
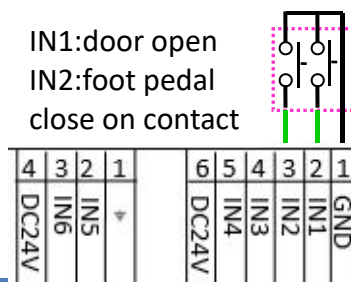
For related content,see <u>3.16.3 IO Parameters</u> 、 <u>3.20 Input test.</u>

2.2.3 Universal output port

The wiring board provides two sets of output ports for supplying external power and controlling signals. When all output signals are working, the output voltage is 24V, and when not working, the output voltage is 0 V. All output ports must connect an external relay before they can be connected to other loads.

Terminal group	Silk screen	Description
5P **terminals**	GND	Power ground, output signal
	OUT1	Work blowing signal (blowing in the whole process of work) Or close after work (for dispensing)
	OUT2	Light blowing signal (blowing when lighting)
	OUT3	Paintbrush signal
	OUT4	Feeding signal (output signal when feeding)
5P **terminals**	GND	Power ground, output signal
	OUT5	YU feeding synchronization signal (usually used as pressing signal)
	OUT6	Layer blowing signal
	OUT7	Work completion signal (output time 1.5S)
	OUT8	Dispense signal

The usual output control signal is used to control the outgassing operation of the laser. The wiring diagram is as follows:
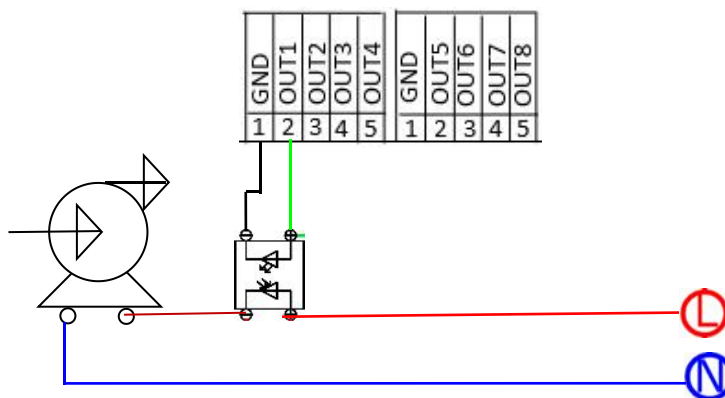
For related content, see 3.15.2 Common Parameters、 3.21 Output Test。

2.2.4 Laser power control port

The wiring board provides 1 laser control output.

Terminal group	Silk screen	Description
5P terminals	5V	5V power supply positive output
	WP1	Water protection input signal
	PWM1	Laser power
	TTL1	Laser switch signal
	GND	Power ground, output signal
Terminal group	**Silk screen**	**Description**
5P terminals	5V	5V power supply positive output
	WP2	Water protection input signal
	PWM2	Laser power
	TTL2	Laser switch signal
	GND	Power ground, output signal

The wiring diagram of the laser power control port is as follows:
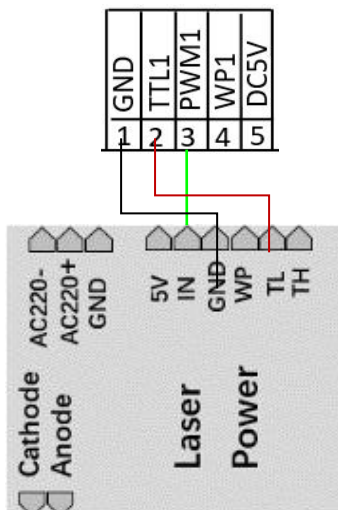
Note: When the laser is a radio frequency tube, there is no need to connect to the TTL port, just connect to the PWM port to control the laser switch and power; when the laser is a CO_2 glass tube, you need to connect the TTL and PWM ports at the same time, which are responsible for the laser switch And power

Please refer to the laser parameter description and settings 3.16.2 Laser parameters.

2.2.5 Motor driver control port

The wiring board can provide the connection of 4 motor drives.

Terminal group	Silk screen	Description
X/Y/Z/U	5V	5V power positive output, connected to the common anode of the driver
	PUL	Pulse signal

	DIR	Direction signal

The wiring diagram is as follows:
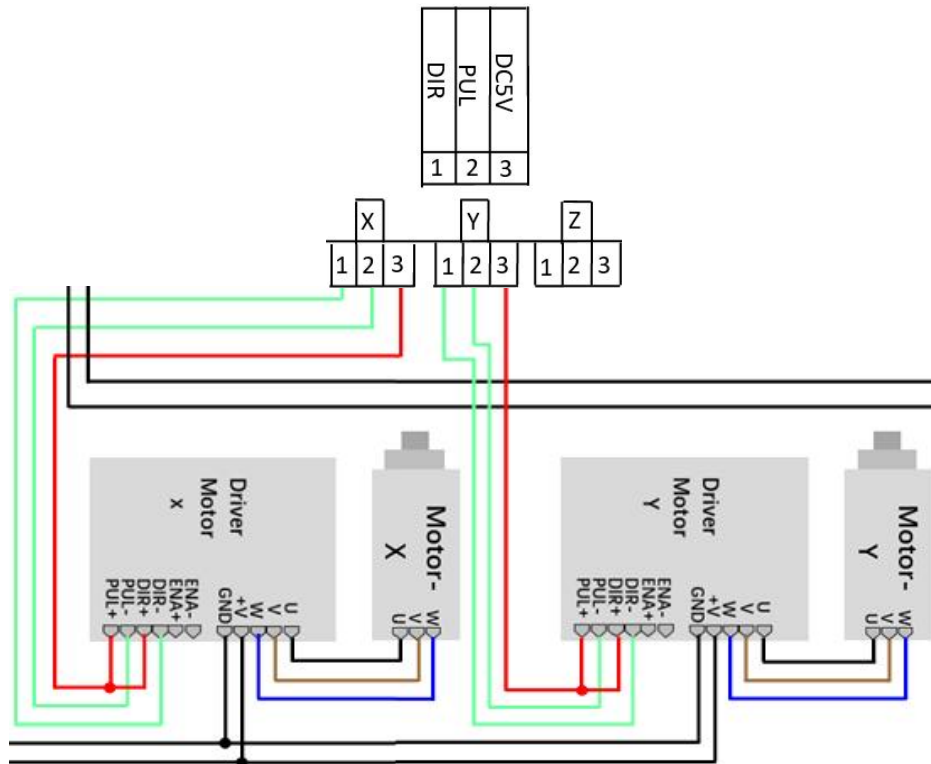
Note: When the Y&Z dual drive control is turned on, the direction signal pin of the Z axis of the main board is suspended, and the direction signal line of the Z axis driver must be connected to the direction signal port of the Y axis, so that the Y&Z dual drive control function is effective. Please refer to 3.16.6.2 Y&Z Dual Drive Control for related content of Y&Z dual drive control.

2.2.6 Limit signal input port

The wiring board can provide the limit signal access of 3 limit sensors.

Each axis can provide two limit signal input of maximum coordinate and

minimum coordinate.

1) X/Y limit signal input

Terminal group	Silk screen	Description
6P **terminals**	GND	Power ground-output signal
	X-	X-axis origin limit-the input signal of the limit sensor at the minimum coordinate
	Y-	Y-axis origin limit-the input signal of the limit sensor at the minimum coordinate
	X+	X-axis hard limit-the input signal of the limit sensor at the maximum coordinate. X+ limit port generally does not need wiring, just setting the format. For related content, see 3.16.1.6 Range(mm).
	Y+	Y-axis hard limit-the input signal of the limit sensor at the maximum coordinate. Y+ limit port generally does not need wiring, just setting the format. For related content, see 3.16.1.6 Range(mm).
	24V	24V power supply positive output

1） **Z limit signal input**

Terminal group	Silk screen	Description
6P terminals	GND	Power ground-output signal
	Z-	Z-axis origin limit-the input signal of the limit sensor at the minimum coordinate.
	U-	U-axis origin limit-the input signal of the limit sensor at the minimum coordinate.
	Z+	Z-axis hard limit-the input signal of the limit sensor at the maximum coordinate.
	U+	U-axis hard limit-the input signal of the limit sensor at the maximum coordinate.
	24V	24V power supply positive output.

3）V/W 限位信号输入

Terminal group	Silk screen	Description
6P terminals	GND	Power ground-output signal
	V-	Reserved input signal
	W-	Reserved input signal
	V+	Reserved input signal
	W+	Reserved input signal
	24V	24V power supply positive output.

T

he wiring diagram is as follows:
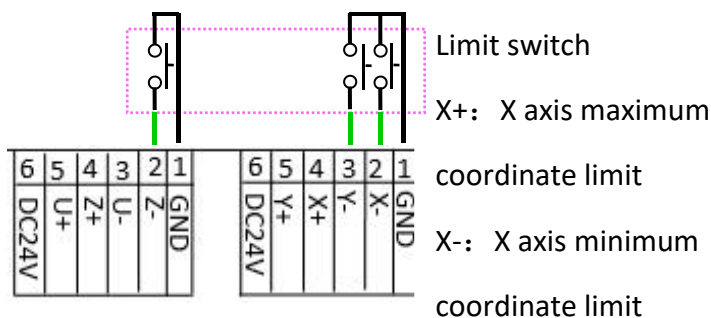
When the selected limit switch is a normally open limit switch, the voltage of the limit signal input port is 24V. After the limit switch is touched, the voltage of the limit signal input port becomes 0V, and limit-switch valid level is low-level. When the selected limit switch is a normally closed switch, the voltage of the limit signal input port is 0V. After the limit switch is touched, the voltage of the limit signal input port is 24V, and limit-switch valid level is high-level.

For setting the content of limit-switch valid level and hardware limit, please refer to 3.16.1.5 Limit-Switch Valid Level、3.16.5 HardLimit Settings.

2.3 Mainboard interface description

2.3.1 U Disk interface

Copy the processing files to the mainboard and upgrade the mainboard via U

disk. For related content, see 3.12 U disk transfer files and mainboard upgrade.

Figure2-3-1 U Disk interface

2.3.2 USB interface

The USB interface is the interface that the mainboard and PC access through the USB cable. The USB cable and USB extension cable for details please refer to 1.4.2 List of accessories.

Figure 2-3-2-1 USB interface (front view)

USB cable
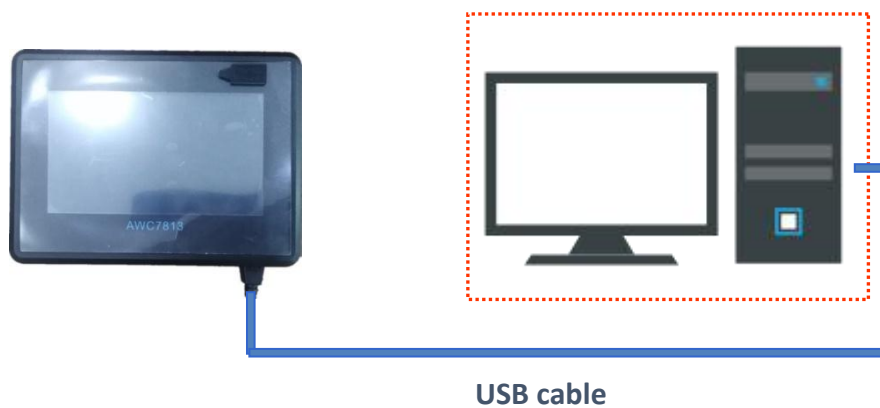
Figure 2-3-2-2 USB interface (side view)

Connect PC
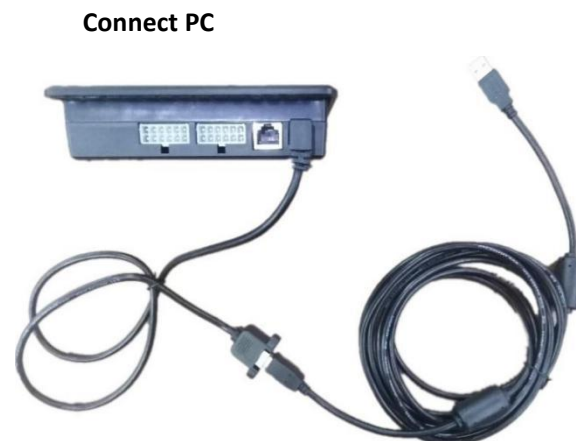
2.3.3 Ethernet interface

Through this interface, the Ethernet communication between the mainboard and the PC can be realized. For details of network cable and network extension cable, see 1.4.2 List of accessories.

Figure 2-3-3-1 Ethernet interface (front view)

cable
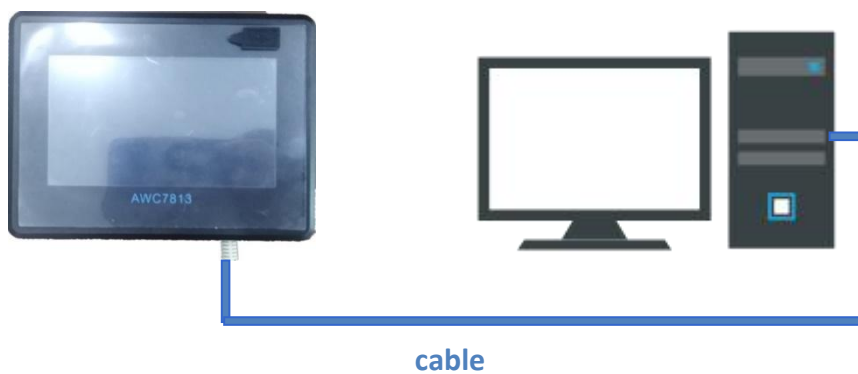
Figure 2-3-3-2 Ethernet interface (side view)

Connect to PC

2.3.4 Panel and terminal board interface

Connect the CN1 port of the mainboard and the wiring board through the CN line.

Figure 2-3-4 Connection port of panel and wiring board

. Human Machine Interface Introduction

3.Human Machine Interface Introduction

- ➢ **Main Interface Preview**
- ➢ **Function key area**
- ➢ **Direction key area**
- ➢ **Processing time display area**
- ➢ **Status display area**
- ➢ **Coordinate display area**
- ➢ **Current processing file name display area**
- ➢ **Count display area**
- ➢ **Speed display area**
- ➢ **Power display area**
- ➢ **File operations**
- ➢ **U disk transfer files and mainboard upgrade**
- ➢ **Origin manage**
- ➢ **Motion parameters settings**
- ➢ **Common Parameters Settings**
- ➢ **Manufacturer parameters settings**
- ➢ **Network settings**
- ➢ **Language**
- ➢ **System Version**
- ➢ **Input test**
- ➢ **Output test**
- ➢ **Cut Box**
- ➢ **Axis reset**
- ➢ **Key moving**
- ➢ **Z autofocus, X＆Y to origin and continue to**

3.1 Main Interface Preview

Figure3-1-1Maininterface1

Figure3-1-2 Main interface 2

Figure3-1-3 Main interface area division

3.2 Function key area

Function key is a key designed to directly realize a specific operation function. It has the characteristics of simple and clear function orientation and simple and intuitive operation.

3.2.1 Reset

Figure 3-2-1 Reset

In the Figure3-1-2Maininterface2, after clicking the【Reset】button, the laser head will move in the X-,Y- direction. When it touches the X-,Y- limit switches, the laser

head will stop and then move back for a certain distance. This distance is zero offset distance. 【Zero offset (mm)】 Please refer to 3.16.1.10 Zero Offset.

This function is to determine the zero position and establish a coordinate system. If you donot reset, you may not return to the zero position or mistakenly believe that the non-zero position is the zero point, and the cutting or engraving graphic swill exceed the 【Range(mm)】. Please refer to the definition of 【Range(mm)】 3.16.1.6Range(mm). No matter what state the system is in, press this key to return to the standby state and restart operation.

3.2.2 File

Figure 3-2-2 File

In the Figure 3-1-2 Maininterface2, Click the 【File】button to enter the file operation interface. This interface can browse the files stored in the board, and perform operations, such as【Select】【Data Check】,【Copy to U Disk】,and【Delete】 on the files. For related content, please refer to 3.11 File operations.

3.2.3 Menu

Figure 3-2-3 Menu

In the Figure 3-1-2 Main interface 2 interface, click the【Menu】button to enter the Menu interface, which includes【U Disk Files】,【Origin manage】,【Motion Parameters Settings】,【Common parameters Settings】,【Manufacturer Parameters Settings】,【Network Settings】,【Language】,【System Version】eight functions. For details, please refer to3.12-3.19.

3.2.4 More

Figure 3-2-4 More

In the Figure 3-1-2 Main interface 2, click the【More】button, Can enter【Ins, Outs】,【Cut Box】【Reset】,【Move】【,Other】interface. For details, please refer to 3.20-3.25.

3.2.5 Laser

Figure 3-2-5 Laser

In the Figure3-1-1 Main interface 1 , press and hold【Laser】to turn on laser, release this key to turn off the laser. For the content of laser power, please refer to 3.10.1 Modify Laser power.

3.2.6 Box

Figure 3-2-6 Box

In the Figure3-1-1 Main interface 1, click the【box】button, the laser head starts from the positioning point（the meaning of【Origin】, please refer to 3.2.7 Origin）, walking a rectangular around the outer frame of the graph at【Run Box' Speed】(For the definition of【Run Box ' Speed】,please refer to 3.15.2.3 Run Box' Speed), and it is a rectangular graph.

This button is to test the size of the processed graphics and the currently selected positioning point, that is, you can view the approximate position and range of the graphics on the material by walking the box.

3.2.7 Origin

Figure3-2-7 origin

In the **Figure3-1-1 Main interface 1**, click the【Origin】button, set the starting point of the laser head, the laser head moves to X+, Y+ direction to cut with this point as

the base point. Setting the position point is to determine the position of the graphic on the material. Position point coordinate combination【X size】、【Y size】can judge whether the graphics are out of bounds （ For details, please refer to Table3-7-1 Description of property interface、4.3 Why does the prompt "Beyond border limit! Continue?" appear）.

If you use this key function, need to set 【Origin Mode】 to【Key Origin】, For details, please refer to 3.15.1.2 Origin Mode.

3.2.8 Stop

Figure3-2-8 Stop

This icon will only be displayed when the machine is working. When the machine stops, this icon will automatically switch to【Box】icon. In the **Figure3-1-1 Main interface 1**, click the【Stop】button to stop the running machine, back to position point.

If you want to continue processing after stopped file, can click【Continue to Previous Work】. For details, please refer to 3.25.3 Continue to Previous Work.

3.2.9 Start

Figure3-2-9 Start

In the Figure3-1-1 Main interface 1, click the【Start】button, the machine starts to work. The icon will be displayed when the machine is idle, and it will become the 【Pause】icon after pressing the key.

3.2.10 Pause

Figure3-2-10 Pause

The icon is displayed when the machine is working. In the Figure 3-1-1 Main interface 1, click 【Pause】 button, the machine pauses and maintains its current state. After pressing this button, except for the 【Stop】key, all the other keys cannot be used. Press this key to set the speed and power of the file being processed. For details, please refer to 3.9.2 Modify the speed of the file being processed、3.10.2 Modify the power of the file being processed

3.2.11 Interface switching

Figure3-2-11 Interface switching icon

In the main interface, press this key to switch Figure 3-1-1 Main interface 1 and Figure 3-1-2 Main interface 2.

3.3 Direction key area

It is mainly used to control the up and down movement of X-axis, Y-axis and Z-axis, and switch between fast and slow movement. For details, please refer to Figure3-1-3Maininterfaceareadivision

3.3.1 X,Y axis movement keys

In the Figure3-1-1 Main interface1, press X,Y axis movement key to move X,Y axis.

1) Y axis up move key, control Y axis to move up.

Figure 3-3-1-1 Y-axis up key
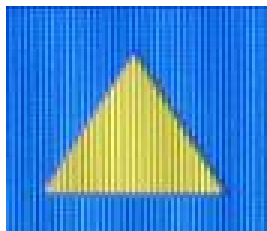
2) Y-axis down key, control the Y-axis to move down.

Figure3-3-1-2 Y-axis down key
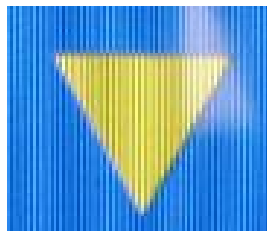
3) X axis left key, control the X axis to move left

Figure 3-3-1-3 X axis left move key

4) X axis right key, control the X axis to move right.

Figure 3-3-1-4 X axis right move key

3.3.2 Fast and slow movement switch key

Switch between fast movement and slow movement. Click the icon in the main interface, if the Figure3-3-2-1 Slow movement changed to Figure3-3-2-2 Fast moving, at this time the【Key Move'Speed】is changed from slow to fast, the opposite is the

same.

　When moving the X/Y axis, the slow moving speed defaults to the【start speed】 in the 【motion parameters】, the default fast moving speed is【Key Move'　Speed】.

　When moving the Z axis, the slow moving speed defaults to the 【jumping speed in the 【Z axis parameters】, the fast moving speed is【Key Move'　Speed】. For details, please refer to 3.14.1.6 Start Speed、3.15.2.2 Key Move'　Speed.

Figure3-3-2-1 Slow movement

Figure 3-3-2-2 Fast moving

3.3.3 Z axis Movement Button

In the Figure3-1-2 Main interface 2, press the Z axis movement key to move the Z axis.

1) Z axis up move key, control Z axis to move up

Figure 3-3-3-1 Z axis up key

2) Z axis down move key, control Z axis to move down.

Figure 3-3-3-2 Z axis down key

3.3.4 U axis Movement Button

In the Figure3-1-2 Main interface 2, press the U axis movement key to move the U axis.

3) U axis up move key, control U axis to move up

Figure 3-3-3-1 U axis up key
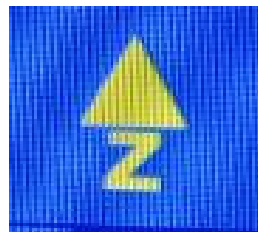
4) U axis down move key, control U axis to move down.

Figure 3-3-3-2 U axis down key

3.4 Processing time display area

Mainly shows the working time of the current file, for details, please refer to

Figure 3-1-3 Main interface area division.

3.5 Status display area

When working, the status display area shows the proportion of the current file completed; when not working, it shows as idle; when the current work is paused , it shows as pause. For details, please refer to Figure3-1-3 Main interface area division.

3.5.1 Lock screen,unlock screen

To prevent misoperation, the screen can be locked if necessary. In the Figure3-1-3 Main interface area division interface, click any where in the time and status area in the lower left corner, a lock screen will appear, and all buttons on the screen will be invalid; click the lock screen again to unlock.

Figure3-5-1 Setting the lock screen

3.6 Coordinate display area

You can view the coordinate position of the laser head in the coordinate display area, click this area to switch between the X Y axis coordinates and the Z U axis coordinates, for details, please refer to [Figure3-1-3 Main inter face area division](#). The position of the machine zero is different, and the coordinate system is also different. There are four coordinate system switch the machine zero at the upper left corner, upper right corner, lower left corner, and lower right corner. According to different coordinate systems to determine whether the graph is beyond the interface. For details, please refer to [4.3 Why does the prompt" Beyond border limit! Continue?" appear.](#)

3.6.1 The coordinate system with the machine zero in the upper left corner

When the machine zero (the machine limit position) is in the upper left corner, the X-axis coordinate increases when the laser head moves to the right, and the Y-axis coordinate increases when the laser head moves down, as shown in the following figure:

（X.Max，0）

（0，0）

（0，Y.Max）
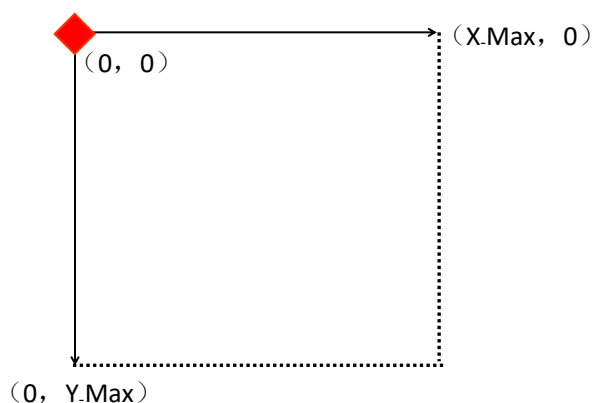
3.6.2 The coordinate system with the machine zero in the upper right corner

When the machine zero (the machine limit position) is in the upper right corner, the X-axis coordinate increases when the laser head moves to the left, and the Y-axis coordinate increases when the laser head moves down, as shown in the following figure:

（X.Max，0）　　　　　　　　　　　　　　　　　　
　　　　　　　　　　　　　　　　（0，0）

　　　　　　　　　　　　　　　　　　　（0，Y.Max）
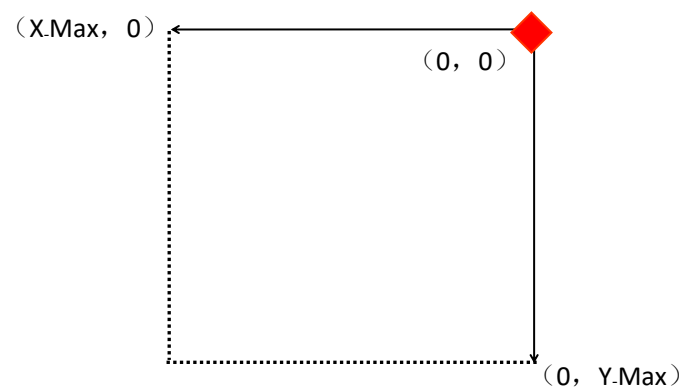
3.6.3 The coordinate system with the machine zero in the lower left corner

When the machine zero (the machine limit position) is at the lower left corner, the X-axis coordinate increases when the laser head moves to the right, and the Y-axis coordinate increases when the laser head moves up, as shown in the following figure:

（0，Y.Max）

（0，0）

（X.Max，0）
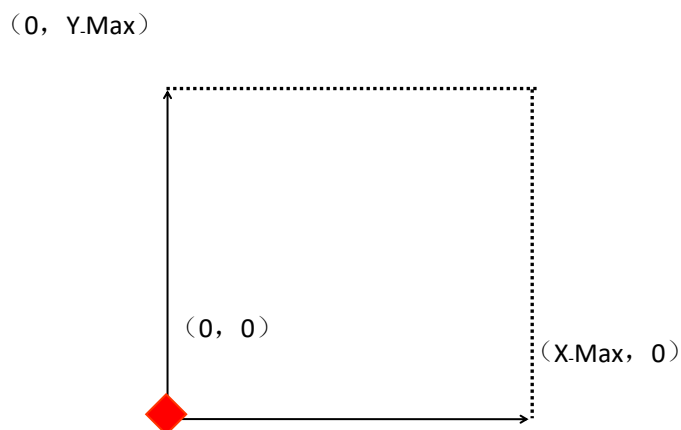
3.6.4 The coordinate system with the machine zero in the lower right corner

When the machine zero (the machine limit position) is in the lower right corner, the X-axis coordinate increases when the laser head moves to the left, and the Y-axis coordinate increases when the laser head moves up, as shown in the following figure:

（0，Y.Max）

（X.Max，0）

（0，0）
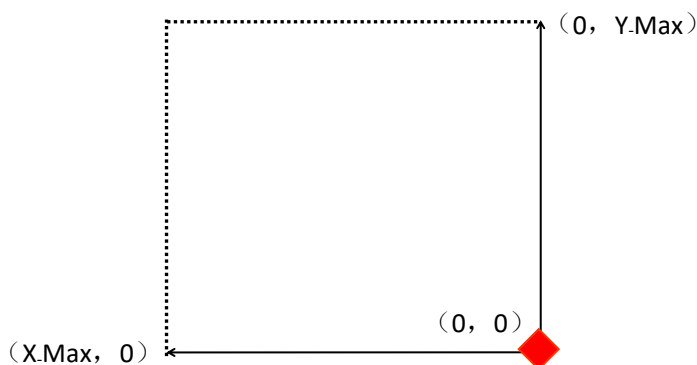
3.7 Current processing file name display area

3.7.1 The properties of the processing file

In the Figure3-1-3 Main interface area division interface, click【File Name】→【Property】enter the property interface to modify【Repeat Count】/【Repeat

delay(s)】,and you can check the graphics size of the current processing file through

【X size(mm)】and【Y size(mm)】.

Figure3-7-1 Property graph

Table3-7-1 Description of property interface

Name	Function Description
Target number	The number of processes that the customer needs to process , beyond which the target value will be stooped , set to "0" is infinite
Repeat Count	The number of repeated processing files. If the 【Repeat Count】 is set to 2, the file will be processed twice.
Repeat delay/(s)	The waiting time from the end of file processing to the next repeated processing of the file.
Feed Distance(mm)	That is the length of the file in the Y-axis direction. This control panel has no feeding function.

X Count	The number of arrays on the X axis.
Y Count	The number of arrays on the Y axis.
X Size(mm)	The horizontal length of the graphic.
Y Size(mm)	The longitudinal length of the graph.【X size】and【Y size】indicate the size of the graphic. Combining the two with the coordinates of the anchor point can determine whether the graphic is beyond the interface. For details, please refer to <u>4.3 Why does the prompt" Beyond border limit! Continue?" appear.</u>

3.7.2 Layer parameters of processing files

In the Figure3-1-3 Main interface area division interface, click the numeric key after【Filename】→【Layer1】→【Speed】/【Power1】to modify the speed and power of the processing file.

Figure3-7-2 Layer parameters graph
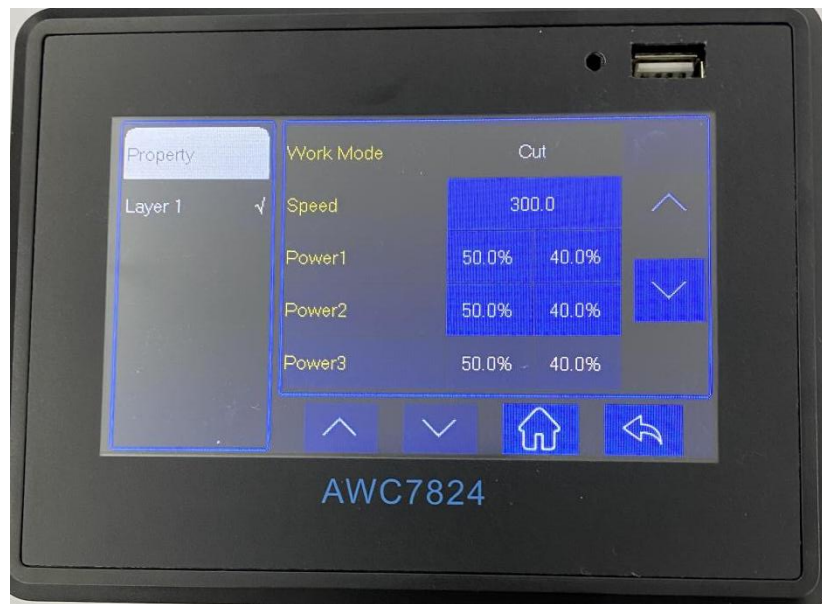
Table 3-7- 2 Description of layer parameters

Name	Function Description
Work Mode	Set on the Laser CAD software, it can be divided into【Cut】,【Engrave】,【Punch】,【Pen】.
Speed	The working speed of processing of this layer. When the file is being processed, the speed area of the main interface displays the speed of the processing file. The maximum speed of actual work cannot exceed the small value of【Max Speed】of【X,Y axis parameters】in【manufacturer parameters】.If the【Max Speed】of【X Axis Parameters】is600,and the【Max Speed】of【Y Axis Parameters】is 800, the layer speed is<=600.For related content, please refer to 3.16.1.9 Max Speed.
Power 1	The former is the maximum power, and the latter is the minimum power. When the file is being processed, the power area of the main

interface displays the power of the processing file. The maximum

power of the processing file cannot exceed the【Max Power】in

【Laser Parameters】, for related content , please refer to 3.16.2.4

Max power(%). Speed and power jointly determine the depth of the

cutting file and whether it can be cut through. When the document

cannot be cut through, increase the power and slow down the

speed; when the document is cut too deep, reduce the power and

increase the speed.

3.8 Count display area

In this area, you can check the number of file processing times, the former is

【current counts】,and the latter is【cumulative counts】 .In the Figure3-1-3 Main

interface area division interface, click the corresponding numeric key after【count】

to clear it. The panel can be counted in three modes:【Count per work】,【Count per

Light】,【Single of Array】.For details, please refer to 3.15.1.4 Count Mode.

Figure 3-8-1 To Clear Current Counts

Figure 3-8-2 To Clear Cumulative Counts

3.9 Speed display area

3.9.1 Quickly modify the key move speed in standby mode

When the machine is idle,the speed area displays【Key Move 'Speed】in Figure 3-1-3 Main interface area division interface, at this time, you can click the numeric key after【Speed】to modify. After the speed is modified in this interface,the【Key Move' Speed】in【Common Parameters】will also change accordingly. For details, please refer to 3.15.2.2 Key Move' Speed.

Figure 3-9-1 Quickly modify the key move speed

3.9.2 Modify the speed of the file being processed

When the machine is working, the speed area displays the working speed of the laser head in <u>Figure 3-1-3 Main interface area division</u> interface, that is the speed of processing files. After clicking the【Pause】button, this value can be modified. The modified value is only valid in the current job, and it will be restored to the value before modification when the work of this file is completed.

Figure 3-9-2 Modify the speed of the file being processed

3.10 Power display area

3.10.1 Modify Laser power

When the machine is idle, the power are a displays the laser power in Figure

3-1-3 Main interface area division interface, the former is the maximum power, and

the latter is the minimum power.At this time, you can click the numeric key after

【Power】to modify.

Figure 3-10-1-1 Modify the max laser power

Figure 3-10-1-2 Modify the mini laser power

3.10.2 Modify the power of the file being processed

When the machine is working, the power are a displays the working power of
the laser head in <u>Figure 3-1-3 Main interface area division</u> interface, that is, the
power of the processing file. After clicking the【Pause】button, this value can be
modified. The modified value is only valid in the current job, and it will be restored to
the value before modification when the work of this file is completed.

Figure 3-10-2-1 Modify the max power of the file being processed

Figure 3-10-2-2 Modify the mini power of the file being processed

3.11 File operations

The files displayed on the file operation interface are all files stored in the main board. When files need to be added, they can be transferred to the main board via U disk, network, or USB communication.

Click the【File】button in Figure 3-1-2 Main interface 2 interface to enter the file operation interface. Browse the file name on the left, and click on the【Select】/【Data Check】/【Copy】/【Delete】/【All Delete】button on the right.

Figure 3-11 File operation
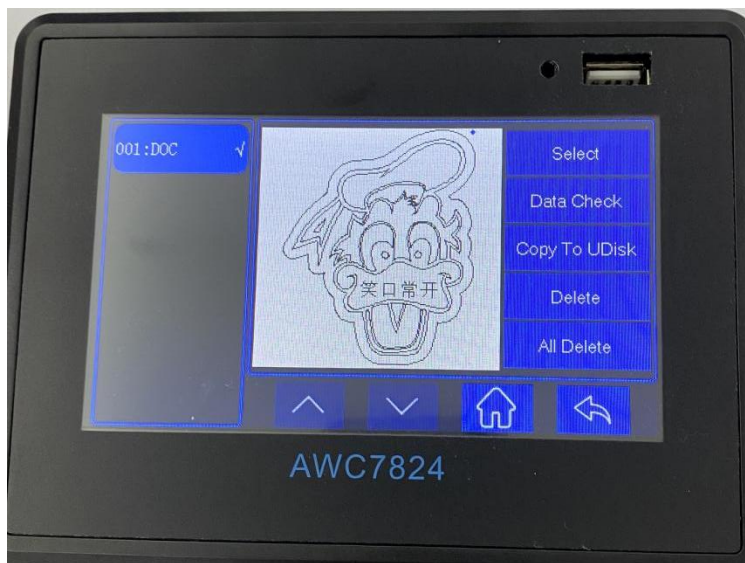
Table 3-11 Description of file operation functions

Name	Function Description
Select	Click the file sequence name on the left, and then click【Select】to select the file, and the screen immediately jumps to the main interface. The file displayed on the main interface is the file just selected, and it can be processed at this time. If there are many files, use the page switch key to select. The main board can store up to 256 files.
Data check	Click【Data Check】the system will automatically detect this file, if the data is correct, the system will prompt that the file data is correct, other wise it will prompt that the file data is wrong.
Copy to U Disk	Click【[Copy to U Disk】,and the file will be copied to the U disk.
Delete	Click【Delete】,and the selected file will be deleted.
All Delete	Click【All Delete】,all files in the main board will be deleted.

3.12 U disk transfer files and main board upgrade

Please refer to the USB flash drive interface content 2.3.1 U Disk interface.

Figure 3-12 U disk transfer files and main board upgrade

3.12.1 Use U disk to transfer files to main board

1）Choose a USB flash drive that meets the requirements, please refer to the details 4.1 what kind of U disk can the system read ?

2）Import the file to be processed in the software and set all the parameters.Click【Load】,and then click【Save the current file as an offline file】to generate a file with an extension of.UD5;

3）Copy the generated files to the root directory of the Udisk

4）In the <u>Figure 3-1-2 Main interface 2</u> interface , click【Menu】→【U Disk Files】

→【Work' Files】→【Copy to System】to process the file.

Figure 3-12-1 Copy U disk files to the system

3.12.2 Upgrade the main board

1) Choose a USB flash drive that meets the requirements, please refer to <u>4.1 what kind of U disk can the system read?;</u>

2) Download the latest upgrade file of the corresponding model on the company's official website;

3) Unzip the upgrade file and copy it to the root directory of the U disk;

4) In the <u>Figure 3-1-2 Main interface 2 interface</u>, click【Menu】→【U Disk Files】→【Upgrade 'Files】→【Update System】, the system will be automatically upgraded. After the upgrade, the system will automatically reset. Be careful not to power off or reset during the upgrade process. The upgrade will be

completed within 20 seconds.

Figure 3-12-2 Upgrade the main board

3.13 Origin Manage

The origin coordinates are mainly used to accurately and quickly switch between different laser head positions.

Figure 3-13 Origin manage

3.13.1 Set origin coordinates

1) In the Figure 3-1-2 Main interface 2 interface, click【Menu】→【origin

   manage】→【origin1】;

2) If you know the coordinate value of a certain origin, directly enter the value

   key after X Y, and then click【Set Current position as the origin】to set it;

3) If the coordinate value of the origin is not clear, click the right direction

   button to move the laser head to the desired origin and then click【Move

   head to the origin】to set it, and the other three origin are the same.

3.13.2 Move the laser head to the set origin

When the laser head position is not atthe required origin, in the Figure 3-1-2

Main interface 2 interface, click【Menu】→【origin manage】→【origin1】→【Move head to the origin】to set it.

3.14 Motion Parameters Settings

【Motion parameters】are restricted by【Axis Parameters】in【Manufacturer Parameters Settings】.If the user encounters a situation where the【Motion Parameters】cannot be adjusted, you need to adjust the【Axis Parameters】first,such as【Start Speed】,【Max Speed】,【Max Acc】.

In the Figure 3-1-2 Main interface 2 interface, click【Menu】→【Motion parameters Settings】then enter the motion parameters settings interface.

Figure 3-14 Motion parameters settings

3.14.1 Description of each parameter

3.14.1.1 Space Speed

（1）**Definition**

The moving speed of the laser head when the laser tube does not emit light under working conditions. The unit is mm/s.

（2）**Value Ranges**

Depending on the machine's endurance speed, the value increases or decreases in units of 50. The maximum value is the smaller value of【Max Speed】of X and Y axis parameters. For example, the【Max Speed】in【X Axis Parameters】is500, and the【Max Speed】in【Y Axis Parameters】is 600.At this time,the maximum value of【Space Speed】is 500.【Space Speed】cannot be set too small, otherwise the efficiency of processing files will be too low.【Max speed】of axis parameters please refer to 3.16.1.9MaxSpeed.

3.14.1.2 Cut Jerk

（1）**Definition**

The amount of change in acceleration during cutting. The larger the setting of【Cut jerk】, the faster the overall cutting speed, and the larger the machine jitter, the worse the cutting effect. The unit is mm/s3.

（2）**Value Ranges**

The value range is 1-20, and the default value is 8. The value increases or decreases in units of 1.

3.14.1.3 Space Jerk

（1）**Definition**

When the laser head does not emit light, the amount of change in acceleration

during movement.the greater【Space Jerk】, the faster the idling speed of the machine. At the same time, it may cause: Jitter occurs when a machine finishes cutting a graph and starts cutting the next graph. The unit is mm/s3.

（2）Value Ranges

The value range is 1-20, and the default value is 10. The value increases or decreases in units of 1.

3.14.1.4 Min Acc

（1）Definition

The minimum amount of change in the speed of the laser head during the movement, that is, the acceleration of the laser head when it starts or turns. The unit is mm/s2.

（2）Value Ranges

The value range is 100~800, and the default value is 300. Generally, you can keep the default value. The value increases or decreases in units of 100. It cannot be set too large, otherwise it is easy to shake when it starts or turns.

3.14.1.5 Engrave Acc

（1）Definition

The amount of change from the speed when the machine starts moving to the speed when the engraving is starting to keep the engraving speed constant, which is only useful for engraving. The unit is mm/s2.

（2）Value Ranges

The value increases or decreases in units of 1000. When engraving on which axis, the maximum value cannot exceed the【Max Acc】of that axis. If the laser head is engraving in the X axis direction, the【Engrave Acc】cannot exceed the【Max Acc】

of【X Axis Parameters】(please refer to 3.16.1.8 Max Acc).【Engrave Acc】cannot be set too small, otherwise the distance of the laser head space move on the outside will be too long, which will easily lead to over stepping during engraving. For details, see 4.2 Why "Engraving is out of bounds, Work stopped!" prompt

3.14.1.6 Start Speed

（1）**Definition**

The initial speed of laser head from rest to motion,the unit is mm/s.

（2）**Value Ranges**

The value range is 5~20, and the value is increased or decreased in units of 1. Generally set to 10. The bigger machine, the smaller setting of【Start Speed】. If the setting is too large, the machine is easy to shake when starting. The maximum value of【Start Speed】is the smaller value of【Start Speed】of X and Y axis parameters. If the【Start speed】in 【X Axis Parameters】 is 8,and the【Start speed】in【Y Axis Parameters】is10, the maximum value of【Start speed】is 8.

3.14.1.7 Circular Speed Factor

（1）**Definition**

【Circular Speed Factor】is a parameter that affects the arc cutting effect (arc includes small circles and arcs at corners). If the cutting effect is not good, such as the graphics have jitters and are not smooth enough, you can lower the 【Circular Speed Factor】at this time. For details, please refer to 3.14.2.1 Wavy lines appear when cutting arcs.

（2）**Value Ranges**

The value range is 0.1~5.0, and the default value is 3. The larger the 【Circular Speed Factor】,the faster the curve cutting speed.
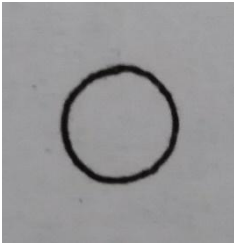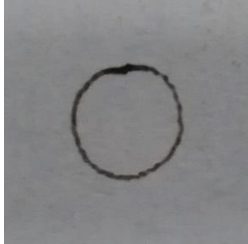
3.14.2 Example analysis

3.14.2.1 Wavy lines appear when cutting arcs

When cutting small circles and small arcs (the arcs at the corners of non-circular shapes), the laser head jitters ,resulting in poor cutting results. This is because 【Circular Speed Factor】is too large.If the 【Circular Speed Factor】is reduced, the small circles and arcs to be cut will be smoother and more regular

The example is shown in the figure below：

Other parameters are the same, only change the Circular speed factor.	
【Circular Speed Factor】set1, the graphic are smoother and more regular.	【Circular Speed Factor】set5, the graphic are not smooth and have wavy lines.

3.14.2.2 Wavy lines appear at the beginning and corners of the cutting

1) The machine jitters at the starting position, it maybe that the 【Min Acc】setting is too large. At this time, it is necessary to reduce the 【Min Acc】.

2) When cutting squares, the laser head jitters at the corners, resulting in poor cutting results. This is because the 【Min Acc】or 【Cut Jerk】is set too large, and you need to reduce the 【Min Acc】or 【Cut Jerk】at this time.

Solution: First adjust the【Min Acc to the minimum value of 100 . If the Wavy lines does not appear at this time, there is no need to adjust the【Cut Jerk】; if the wavy lines still appears, reduce the【Cut Jerk】.

3.15 Common Parameters Settings

3.15.1 Work Mode

In the Figure3-1-2 Main interface 2 interface, click【Menu】→【Common Parameters Settings】→【Work Mode】enter the interface.

Figure 3-15-1 Work Mode

3.15.1.1 Go Origin After Reset

If this function is enabled, the laser head will stop at the origin after

【Reset】,other wise the laser head will stop at the machine zero.

3.15.1.2 Origin Mode

【Origin】Please refer to 3.2.7 Origin.

【Current Position】: Set the current position of the laser head as the origin, wherever the laser head stops, it will be the origin, no key operation required;

【Key Origin】:After selecting【Origin】, return to the main interface, move the laser head to the chosen position, and click【Origin】;

【Soft Origin】:set the origin point when drawing a graph on LaserCAD software.

【Machine Zero As Origin】：set the machine zero point as origin.

3.15.1.3 Go Back Position

【Current Position】:laser head will stay at where task finished;

【Current Origin】:go back to Origin point after finishing work;

【Zero Coord】:laser head goes back to machine zero point since all finished.

3.15.1.4 Count Mode

【Count per work】:Count plus one after processing all graphics in one format;

【Count per Light】:When the laser head emits light, it counts plus one;

【Single of Array】: The count of a solid line figure in the array is increased by one after processing.

3.15.1.5 Feeding method

【 Full-page feeding 】: After processing all the graphics of a format, the feeding is performed once;

【Array multi-line feeding】: After cutting multi-line graphics, feeding once, generally used in multi-head mutual movement, such as: a machine with double-head mutual movement, when this function is turned on, the number of counts is 2 times of "import cutting graphics";

【Array single line feeding】: After cutting a line of graphics, feed once

3.15.1.6 Feeding delay method

【Delay before feeding】: After cutting a version of the material, delay feeding for a period of time;

【Delay after feeding】: Delay for a period of time after feeding before cutting; after the feeding function is turned on, the parameter value of [Repeat Delay] is the feeding delay time

3.15.1.7 Automatic positioning when out of bounds

The user can turn on or off the automatic positioning function when the boundary is exceeded. When this function is turned off, if the graphic exceeds the size, the system will prompt "The picture is out of bounds! Do you want to continue working?", press the [OK] key, the system will continue to cut, and the part of the graphic that exceeds the size will not be cut, as shown in Figure 6-7- 3. Shown in 6-7-4. Press【Cancel】to cancel cutting.

Figure 6-7-2 Engraving is out of bounds prompt
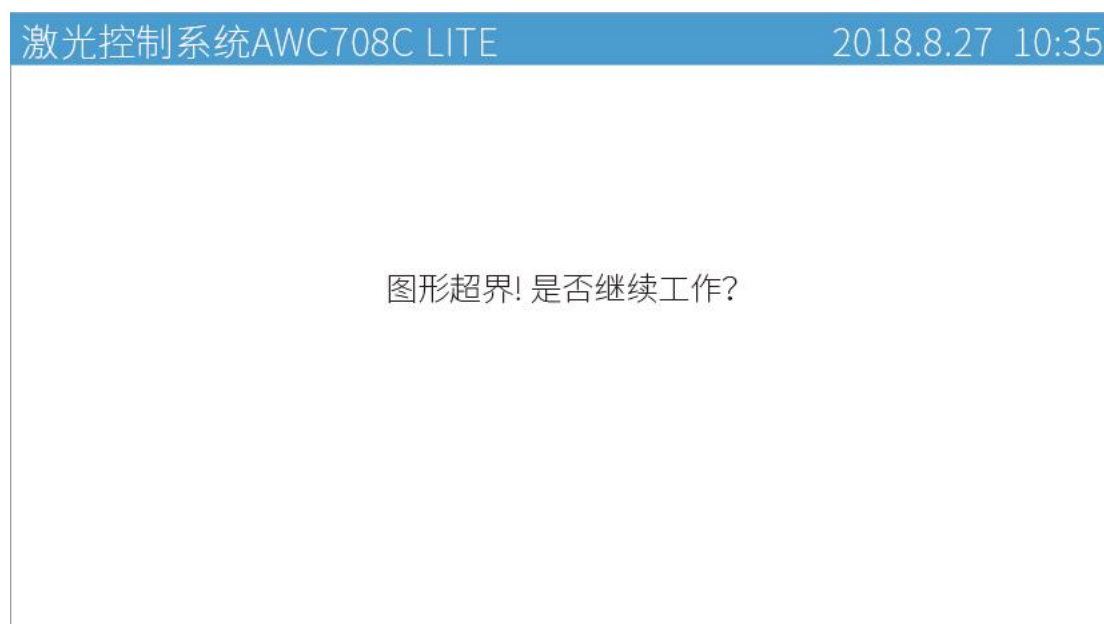
Figure 6-7-3 **Partially cut panel display when out of bounds**

激光控制系统AWC708C LITE 2018.8.27 10:35

| 文件 | TROCE |
| 计数 | 4|22 |

速度(mm/s)	100.0
最大功率1(%)	80.0
最小功率1(%)	60.0
最大功率2(%)	50.0
最小功率2(%)	40.0

| 时间 | 00:00:20 |
| 位置X | 169.3 | 位置Y | 250.4 | 状态 | 工作(49%) |

Figure 6-7-4 **Partially cut when out of bounds**
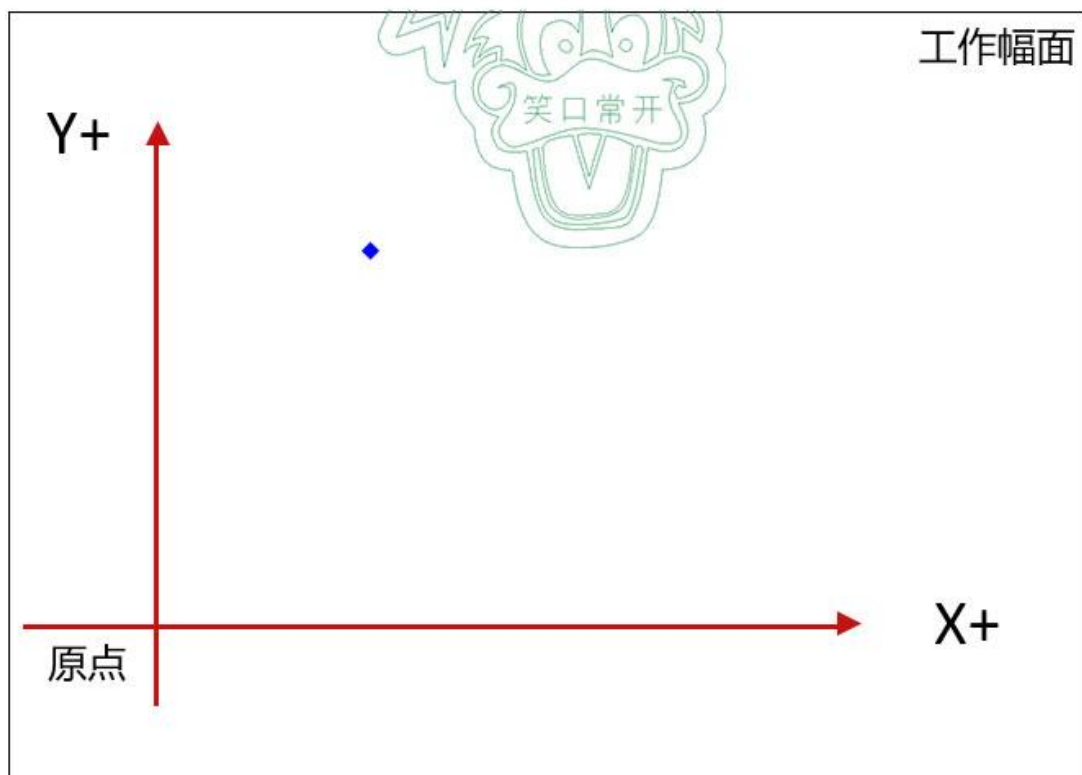
Turn on the function of【Automatically locate when out of bounds】, if the

graphic file exceeds the working size at the current positioning point,

the laser head will automatically adjust the positioning point to the position where

the graphic can be completely cut. If the size still exceeds the size after adjustment,

the system will prompt "The picture is out of bounds! Do you want to continue

working?", press the 【OK】 key, the system will continue to cut beyond the size. Part

of the graphics will not be cut; press the 【Cancel】 key to cancel the cutting.

　　As shown in Figure 6-7-5, the green graphic exceeds the current working size. If

the function of 【Automatic positioning when exceeding the limit】 is enabled, the

machine will automatically move to the position of the red graphic for cutting;

【Automatic positioning when out of bounds】 function, the graphics will only be

able to cut the graphics within the working format, as shown in Figure 6-7-4.

Figure 6-7-5 Automatic positioning when out of bounds
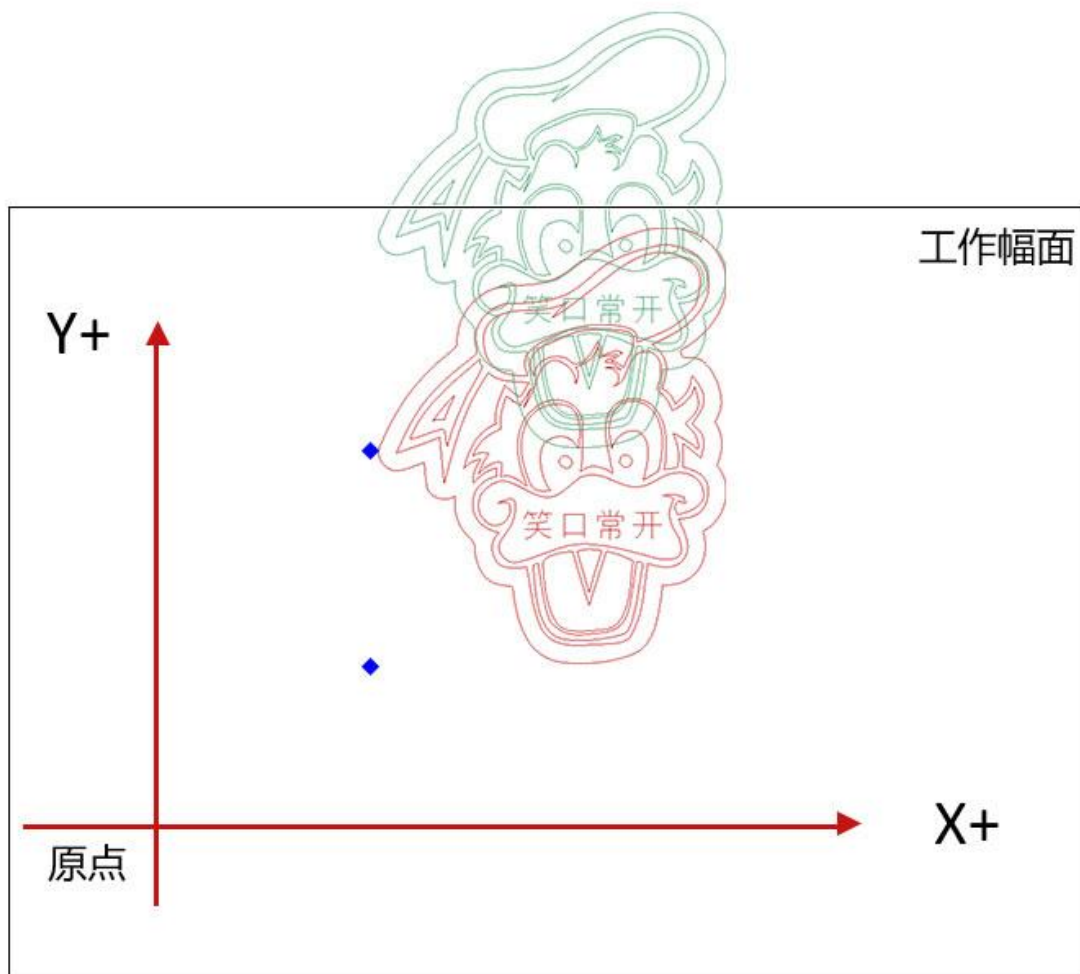
3.15.1.8 Return to anchor point when repeating work

After it is turned on, it will return to the positioning point of the laser head after cutting once, and then continue to the next cutting.

3.15.2 Common Parameters

In the **Figure3-1-2 Main interface 2** interface, click 【 Menu 】 → 【 Common Parameters Settings】→【Common Parameters】 enter the interface.

Figure3-15-2 common Parameters

3.15.2.1　Auto Focus Distance(mm)

It refers to the distance between the laser head and the surface of the material. The wrong focus distance will affect the cutting and engraving effect. After setting, turn on the 【Z-axis for Autofocus】 function, and then click 【More】→【Others】 →【Z Autofocus】 to complete focusing. For details, please refer to 3.16.6 Function Configuration、3.25.1 Run Z AutoFocus function.

3.15.2.2 Key Move' Speed(mm/s)

Except in the standby state, you can directly modify the 【KeyMove'Speed(mm/s)】 in the speed area in the Figure3-1-3 Main interface area division, and you can also enter the Menu interface to modify. After 【 Key Move' Speed(mm/s) 】 is modified in 【Common parameters】 interface, the key movement speed of the main interface

will change accordingly

【Key Move' Speed(mm/s)】refers to the axis movement speed when pressing the arrow key on the panel. The maximum value of 【Key Move 'Speed(mm/s)】 cannot exceed the smaller value of 【Max Speed】of X and Y axis parameters. If the 【Max Speed】 of the X axis is 500 and the 【Max Speed】of the Y axis is 600, then the 【 Key Move' Speed(mm/s) 】 <=500. For related content, please refer to 3.9 Speed Display Area.

3.15.2.3 Run Box' Speed (mm/s)

The speed at which the laser head makes a circle around the outer frame of the graph when it does not laser. The maximum value cannot exceed the small value of 【Max Speed】of X and Y axis parameters. If the 【Max Speed】 of the X-axis is 500 and the【Max Speed】of the Y-axis is 600, the【Run Box' Speed(mm/s)】<=500. Please refer to the definition of Run Box' Speed(mm/s) 3.2.6 Box.

3.15.2.4 Cut Box' Speed(mm/s)

The speed at which the laser head emits light and cuts the frame of the figure. The maximum value cannot exceed the small value of 【Max Speed】of X and Y axis parameters. If the【Max Speed】of the X-axis is 500, and the【Max Speed】of the Y-axis is 600, then the 【CutBox'Speed(mm/s)】<=500. For related content, please refer to 3.22 Cut Box.

3.15.2.5 Blow Open Delay(s)

The time interval from when the machine starts to blow air until the laser head

emits light. Setting too large will affect the cutting efficiency, and it will pause for a while before cutting.

3.15.2.6 Blow Close Delay(s)

The time interval from when the laser stop to when the blowing stops. Setting too large will affect the cutting efficiency.

3.15.3 Axis Speed Parameters

In the **Figure3-1-2 Main interface 2** interface, click 【 Menu 】 → 【 Common Parameters Settings】→【Axis Speed Parameters】 enter the interface.

Figure3-15-3 Axis Speed Parameters

3.15.3.1　Z Work Speed(mm/s)

The speed of the laser head when it is working on the Z axis. The maximum value cannot exceed the 【Max Speed】 of【Z axis parameters】. The unit is mm/s. For details, please refer to 3.16.1.9 Max Speed. The unit is mm/s.

3.15.3.2　U Work Speed(mm/s)

The speed of the laser head when it is working on the U axis. The maximum value cannot exceed the 【Max Speed】 of【U axis parameters】. The unit is mm/s. For details, please refer to 3.16.1.9 Max Speed. The unit is mm/s.

3.15.3.3　XY Home Speed(mm/s)

The reset speed of XY axis. The maximum value of【 XY Home Speed(mm/s)】 cannot exceed 200. The unit is mm/s.

3.15.3.4　Z Home Speed(mm/s)

The reset speed of Z axis, the maximum speed cannot exceed 200.【Z-Axis for Autofocus】on the reset speed. For the definition of【Z-Axis for Autofocus】, please refer to 3.25.1 Run Z Auto Focus function. The unit is mm/s.

3.15.3.5　U Home Speed(mm/s)

The reset speed of Z axis, the maximum speed cannot exceed 200.　For the definition of【Z-Axis for Autofocus】, please refer to 3.25.1 Run Z Auto Focus function. The unit is mm/s.

3.15.4 Rotate Engraving & Cutting

Figure3-15-4-1 Rotate Engraving & Cutting

Table3-15-4 Rotate Engraving & Cutting Instruction

Name	Instruction

Rotary	【 Rotate Engraving & Cutting 】 enable switch. When the 【Rotate Engraving & Cutting】 is turned on, set【Pulse Count Per Rotate】 and 【Current Diameter(mm)】(【Distance Per Pulse】=Circumference Length/【Pulse Count Per Rotate】), the pulse equivalent value will change at this time, so when the direction key is pressed, the axis movement becomes slower.
Rotary Axis	The axis which rotary engraving uses.
Pulse Count Per Rotate	The pulse counts for the motor to make the rotary axis rotate one circle.
Current Diameter (mm)	The diameter of the material being processed.

Operation process description：

1) In the Figure3-1-2 Main interface 2 interface, click【Menu】→【Common Parameters Settings】→【Rotate Engraving & Cutting】→【Rotary】 right button, select【Enable】and set【Rotary Axis】【Pulse Count Per Rotate】【Current Diameter (mm)】 Please refer to Figure3-15-4-1 Rotate Engraving &Cutting.

2) After enable the【Rotary】function, reset the machine, the panel prompts "Rotary is Enabled!". If the current machine does not support the rotate engraving function, the distance per pulse of rotary axis will change, and the machine cannot cut the graphics normally. After turning off the function, reset the machine again, users do not need to set axis parameters (like distance per pulse), the machine can work normally.

★Note: For machines that do not support the 【Rotate Engraving & Cutting】 function, please do not turn on the【Rotate Engraving & Cutting】 function, otherwise the【KeyMove'Speed】 will become very slow. For details, please refer to **Table3-15-4 Rotate Engraving & Cutting Instruction.**

Figure3-15-4-2 system is being reset

3) 【Rotate Engraving & Cutting】 includes fixture type and roller type, as shown in figure 3-15-4-3, 3-15-4-4. The fixture rotate engraving cutting only needs to input the 【 Pulse Count Per Rotate 】 and 【 Current Diameter(mm)】. The calculation formula of pulse count per rotate is as follows: Pulse Count per Rotate = Pulse Number of Motor * (Number of Gears in Gear1 / Number of Gears in Gear2)

Figure3-15-4-3 Fixture Rotate Engraving

当前雕刻物体直径=80mm

周脉冲数 ＝　　电机周脉冲数　＊（　齿轮1的齿轮数)　／　齿轮2的齿轮数　）
　　　　＝　　6400　　　　＊　3　＝19200

4)Roller Rotate Engraving & Cutting no need to turn on【Rotate Engraving & Cutting】, and directly adjust　【Rotary Axis】　【Distance Per Pulse(um)】(【Pulse Count Per Rotate】　is invalid). Take the X axis as the rotation axis as an example:

i. Wrap a layer of paper around the roller.

ii. In the computer software LaserCAD, draw a straight line section with fixed length as　"A"　(less than the current cutting object girth).

iii. Click　【Start】　key to cut the line on the paper.

iv. Take the same length of the cut trace along the roller with one wool or other convenient object, and measure the length of this wool segment as　"B"　accurately with a ruler.

v. Enter the【X Axis Parameters】interface, move the cursor to【Distance per Pulse】, press【Enter】key to enter the to calculate the pulse distance interface, fill A into 【Expected Length】option, fill B into the【Actual Length】option, and click【Enter】key to calculate the distance per pulse of X axis (rotary axis).

Figure 3-15-4-4 Roller Rotate Engraving & Cutting

3.16 Manufacturer Parameters Settings

3.16.1 Axis Parameters(take X axis as an example)

In **Figure3-1-2 Main interface 2** interface, click 【 Menu 】 → 【 Manufacturer Parameters Setting】→【Axis Parameters】→【X Axis Parameters】 to enter the axis parameters setting interface.

Figure3-16-1 X axis parameters settings
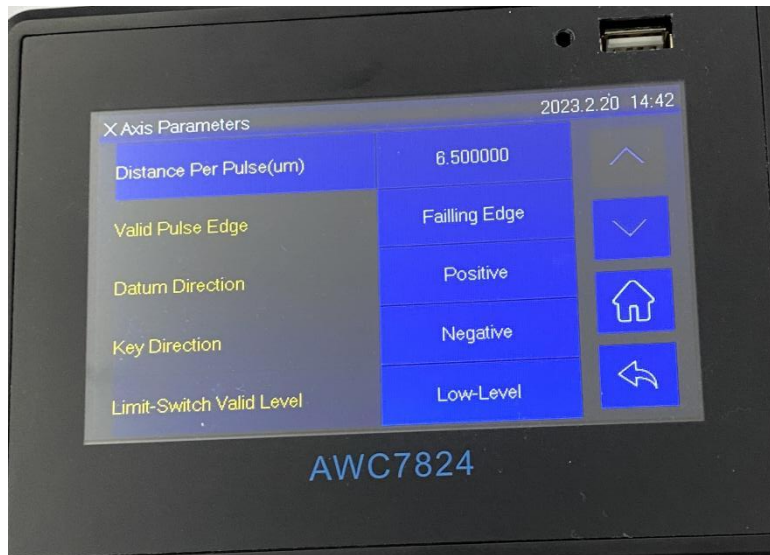
3.16.1.1 Distance Per Pulse(um)

【Distance Per Pulse】 refers to the displacement or rotation angle of a single step of the motor when the controller sends a pulse signal. If the setting is wrong, the graphics will be deformed and the size will be wrong. 【Distance Per Pulse】is set too small, the machine is easy to jam, and the response is slow; if the 【Distance Per Pulse】 is set too large, it will cause insufficient cutting accuracy. The unit is um.

1) The steps to modify 【Distance Per Pulse】 are as follows:

In **Figure3-1-2 Main interface 2** interface, click 【Menu】→【Manufacturer Parameters Settings】→【Axis Parameters】→【X Axis Parameters】→【Distance Per Pulse】;

2) Click the【Axis Move】button on the upper right to move the laser head to a certain position, click the laser button, then close the axis movement screen, and then click the 【Step 1: Set As Begin Position】 button, and set this to point A；

Figure3-16-1-1-1 Set starting point

3) Click the 【Axis Movement】 button to move the laser head to a certain position, click the laser button, then close the axis movement screen, and then click the【Step 2: Set As End Position】button, and set this as point B;

Figure3-16-1-1-2 Set end point

4) Measure the actual distance between points AB with a measuring scale, and click the value after【Step 3: Input the Measured Distance(mm)】, enter the actual measurement value, and click enter (if the value after 【Step 2: Set As End Position 】 is the same as the actual measurement, no need to modify 【Distance Per Pulse】);

Figure3-16-1-1-3 Measured distance

5)Click the 【Step 4: Change the Pulse Value】 button, click " √ " to set the

【Distance Per Pulse】;

Figure3-16-1-1-4 Modify distance per pulse
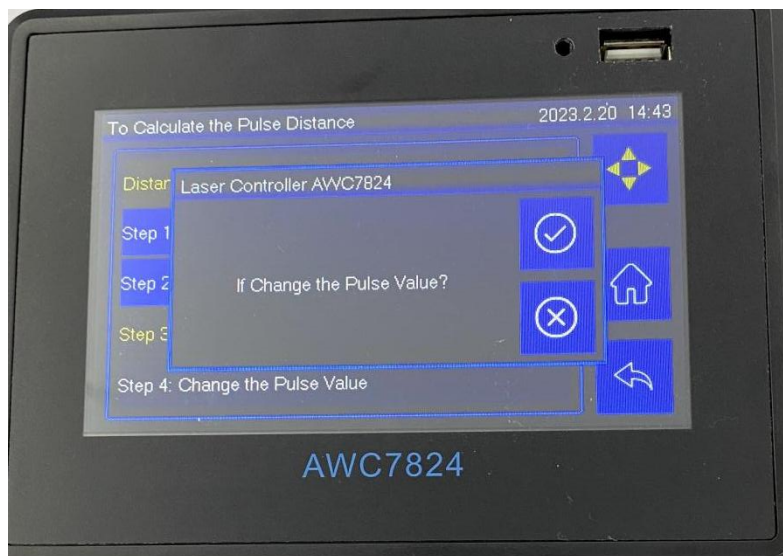
6)【Distance Per Pulse】 needs to check whether it is correct after

setting.AWC7813 motion controller user manual Click 【Axis Movement】, and

click the front button of 【Jog Distance】, select " √ ", then click the value

button after 【Jog Distance】, enter the value you need to move, and click the

left or right moving button to measure the actual movement the distance. If

the actual moving distance is the same as the jog distance, the distance per

pulse is correct, otherwise repeat 3-6 actions.

3.16 1.2 **Valid Pulse Edge**

【Valid Pulse Edge】 refers to the effective value of the driver level change. The

user can set it to 【Rising edge】 or 【Falling edge】 as required. If the setting is

wrong, there will be a misalignment phenomenon, that is, when returning to the

positioning point at the end of each repeated cutting, it will shift in one direction and

when cutting a large figure, the figure will shift in one direction.

3.16.1.3 Datum Direction

【Datum Direction】 refers to the direction in which the motion axis moves when the machine is reset. When the setting is wrong, the axis will reset in the opposite direction.

When you click the 【Reset】 button, or click 【More】→【Reset】→【X&Y Reset】, the laser head does not move in the direction of the origin, but in the opposite direction, the 【Datum Direction】 needs to be modified.

Note: It may need to modify a certain axis parameter of X, Y axis or both X and Y axis parameters, depending on the actual situation.

3.16.1.4 Key Direction

【Key Direction】 refers to the direction in which the axis moves when the arrow keys are pressed on the panel. If the setting is wrong, when you press the arrow keys, the axis will move in the opposite direction.

When you move the left and right keys, the X axis moves in the opposite direction, or when you move the up and down keys, and the Y axis moves in the opposite direction, you need to modify the direction of the button movement.

3.16.1.5 Limit-Switch Valid Level

【Limit-Switch Valid Level】 refers to the control level transmitted by the limit switch to the control board. If the setting is wrong, the machine will stop without touching the limit switch. If the limit switch is normally open, the machine will receive a signal of 0 when it touches the limit switch; when it does not touch the limit switch, it will receive a signal of 1. If the panel is set to 【High-Level】 at this time, the machine will stop if it does not touch the limit switch when it is running.

The limit sensor is of NPN type, and the 【Limit-Switch Valid Level】 is set to

【Low-Level】; the limit sensor is of PNP type, and the 【Limit-Switch Valid Level】 is set to 【High-Level】.

For related wiring content, see 2.2.6 Limit signal input port.

3.16.1.6 Range(mm)

【 Range 】 refers to the working area of the machine, which limits the movement range of the laser head, that is, limits the maximum coordinate of the X Y axis movement. The range must be set under the premise that the 【Distance Per pulse】 and 【Datum Direction】 are correct.

3.16.1.7 Start Speed

In order to protect the machine, the user cannot increase the value of the motion parameters unlimitedly, and the 【motion parameters】 is restricted by the 【manufacturer parameters】. If it is unable to increase the 【Motion Parameters】,please increase the 【manufacturer parameters】 first, including 【Start Speed】, 【Max Acc】, and 【Max Speed】.

【Start speed】 refers to the starting speed of the laser head from stationary to starting to move. It limits the 【Start Speed】 in 【Motion Parameters】 .【Start speed】 can't be too large, otherwise it is easy to shake when starting processing.

3.16.1.8 Max Acc

【Max Acc】 refers to the maximum speed change of the motion axis during acceleration and deceleration. The 【Max Acc】 of the laser head defaults to the smaller value of the X axis and Y axis 【Max Acc】. For example, the 【Max Acc】 of the X axis is 500 and the 【Max Acc】of the Y axis is 600. So 【Max Acc】 is 500. This

value limits the maximum value of 【Engrave Acc】 in 【Motion Parameters】. For details, please see 3.14.1.5 Engrave Acc.

3.16.1.9Max Speed

【Max Speed】 refers to the highest limit speed that the motion axis can bear. The maximum value of 【Max Speed】=【Distance per pulse】*180, when it exceeds this value, it will default to distance per pulse*180. This value limits the maximum value of 【Space Speed】. For details, please see 3.14.1.1 Space Speed.

3.16.1.10 Zero Offset

The limit switch is not necessarily in the range, so it is necessary to adjust the zero position. That is, the machine zero moves an off set distance along the X+ direction. When the machine is being reset, the laser head stops when it touches the X-,Y- limit switches ,and then walks back a certain distance, which is zero offset distance.

3.16.2 Laser Parameters

In Figure3-1-2 Main interface 2 interface, click 【 Menu 】 → 【 Manufacturer Parameters Settings】 → 【Laser Parameters】 to enter the laser parameters setting interface. Please refer to the description and wiring of the laser power control port of the wiring board 2.2.4 Laser power control port.

Figure3-16-2 Laser parameters setting

3.16.2.1 Laser Mode

As for laser mode, CO2 glass tube and radio frequency tube are optional. Please

refer to the wiring differences between the two lasers [2.2.4 Laser power control port](#).

3.16.2.2 TTL Valid Level

【TTL Valid level】 refers to the control level of the laser tube, which can be set to 【low-level】 (the TTL pin of the wiring board is connected to the L pin of the laser power supply) or 【high-level】(the TTL pin of the wiring board is connected to the H pin of the laser power supply). If the setting is wrong, the laser head emits light during idling, but not during processing.

When the laser head always emits light during idling, but does not emit light during cutting, it can be inferred that the setting of 【TTL Valid level】 is wrong, and then select the opposite effective level.

3.16.2.3 PWM Frequency(hz)

【PWM frequency】 refers to the pulse frequency used to set the control signal used by the laser (refer to the laser tube manual), the higher the frequency, the faster the work. Generally, the laser frequency of CO2 glass tube is 20000, and the laser frequency of RF tube is 5000.

3.16.2.4 Max Power(%)

【Max power】 refers to the limit power of the laser tube. The laser power and the power of the processing file cannot be higher than the maximum power. The laser power is displayed as a percentage, generally set to 98% to prevent damage to the machine due to excessive power. For the laser power and processing file power, please refer to [3.10.1 Modify Laser power](#)、[Table3-7-2 description of layer parameters](#).

3.16.2.5 RF Min Power(%)

In order to prevent the radio frequency tube from leaking light in the standby state, the minimum power of the radio frequency tube needs to be set. The minimum power of the laser tube (refer to the laser tube manual) is generally set between 6%-10%.

3.16.2.6 Laser 1 Water Protect

【Laser 1 Water Protect】 refers to the switch of laser 1 water protection, if you use water protection, you need to turn it on here. When the laser tube emits light, if the temperature is too high, the laser tube will burst, so water needs to be discharged to cool the laser tube. When this function is turned on, when the machine detects a water stop signal, a "water protect!" prompt will appear, and the machine will stop working to protect the laser tube.

【Laser 2 Water Protect】 refers to the switch of laser 2 water protection, if you use water protection, you need to turn it on here. When the laser tube emits light, if the temperature is too high, the laser tube will burst, so water needs to be discharged to cool the laser tube. When this function is turned on, when the machine detects a water stop signal, a "water protect!" prompt will appear, and the machine will stop working to protect the laser tube.

3.16.3 IO Parameters

In **Figure3-1-2 Main interface 2** interface, click 【 Menu 】 → 【 Manufacturer Parameters Settings】 → 【IO parameters】 to enter the corresponding interface.

Figure3-16-3 IO Parameters

3.16.3.1 Foot Switch

Use the foot pedal to control the operation of the machine, step on the machine to start running, and then step on the machine to stop running, and enable this function when needed. The modification steps are as follows:

1) Connect the corresponding hardware, the signal pin of the foot switch corresponding to the main board is IN2, please refer to the relevant wiring content 2.2.2 Universal input port；

2) In Figure3-1-2 Main interface 2 interface, click the button behind 【Menu】

→【Manufacturer Parameters Settings】→【IO Parameters】→【Foot Switch】

to select 【Enable】.

3.16.3.2 Open Protection

During the working period of the laser cutting machine, in order to prevent the deflection of the laser beam from hurting people, the upper protective cover of the laser machine needs to be lowered. When the lid of the laser is not closed, and the function of 【Open Protection】 is turned on at this time, it will prompt "Opened Protected!" and the machine stops working. Ensure that the effective level when the hardware is connected to work is the same as the corresponding 【input IO effective level】 configuration in the panel, otherwise the " Opened Protected!" prompt will appear. The modification steps are as follows:

1) Connect the corresponding hardware, the signal pin of the mainboard corresponding to the open protection is IN1, please refer to the relevant wiring content 2.2.2 Universal input port;

2) Ensure that the effective level when the hardware is connected to work is the same as the configuration of the [input IO effective level] in the panel. For details, see 3.20 Input Test;

3) In **Figure3-1-2 Main interface 2** interface, click the button after 【Menu】→ 【 Manufacturer Parameters Settings 】 → 【 IO Parameters】 → 【 Open Protection】 to select 【Enable】.

3.16.3.3 Input Valid Level

【Input valid level】 means to set input IO to 【Low-level】 or 【High-level】. Ensure that the effective level when the hardware is connected to work is the same as the corresponding 【input valid level】 configuration in the panel.

1) Connect the corresponding hardware, the signal pin of the main board corresponding to the feed switch is IN3, please refer to 2.2.2 Universal input port for related wiring content;

2) In the main interface 2 display interface of Figure 3-1-2, click the button after [Menu]→[Manufacturer Parameters]→[IO Signal Configuration]→ [Feed Switch] to select ON.

3.16.4 Auto Reset Settings

When you click the【Reset】button and the laser head does not move, you need to turn on the power -on reset function. Procedure as follows:

In Figure3-1-2 Main interface 2 interface, click【Menu】→【Manufacturer Parameters Settings】→【Auto Reset Settings】to turn it on.

Figure 3-16-4 Auto reset settings

Table 3-16-4 Power -on reset setting instructions

Name	Function Description
XY Auto Reset	Generally it is on. The process of power-on reset is actually the process of finding the zero point. The X and Y axes drive the laser head to move in the X- and Y- directions, stop when it touches the X- and Y- limit switches, and then walk back for a while Distance, that is, the offset distance of the origin (see 3.16.1.10 Zero Offset ）. If you do not enable the function of 【Go Origin After reset】(for details, please refer to 3.15.1.1Go Origin After reset）, it will stop at the origin position after reset. If it is not reset, the zero position will not be found, and the machine may exceed the format when working.
Z Auto Reset	If the Z-axis automatic reset is required when poweris on, it needs to be turned on. After it is turned on, the Z-axis drives the laser

	head to move down and stops when it hits the Z-limit switch.
U Auto Reset	If the U-axis needs to be automatically reset when powered on, it needs to be turned on. Generally, it is not necessary to turn on the power-on reset of the U-axis

3.16.5 Hard Limit Settings

Please refer to the description and wiring of the limit signal input port 2.2.6 Limit signal input port.

Generally, setting the format size can control the operating range of the laser head. If you need to turn on the hardware limit, the steps areas follows:

In Figure3-1-2 Main interface 2 interface, click【Menu】→【Manufacturer Parameters Settings】→【Hard Limit Settings】too pen.

Figure 3-16-5 Hard limit settings

Table 3-16-5 Hard Limit settings instructions

Name	Function Description
X Hard Limit	Generally, it is closed and the range of motion of the laser head can be limited by setting the format. This function is to prevent the laser head from hitting the edge and going beyond the interface. If this function is turned on, the laser head will stop operating when it touches the limit switch, and prompts" Trigger limit!"
Y Hard Limit	Same as above.
Z Hard Limit	Same as above.
U Hard Limit	Same as above.

3.16.6 Multi-head mutual shift setting

Name	Function Description
Mutual axis number	Set the number of mutual shift axes, up to 2
Double head mutual shift type	choose single belt and double belt to move each other.
ZX axis spacing (mm)	Distance between ZX axes.

AWC7824 Double-head mutual-moving cutting is supported. When single-head work, the number of mutual-moving axes is set to "1", and when double-head mutual-moving cutting is performed, the number of mutual-moving axes is set to "2".

Users can set single belt or double belt to move each other according to their needs. When the two belts are moved to each other, if one of the belts becomes loose, the cutting effect of the laser head will become worse, and the cutting effect of the other laser head will not be affected.

When users use the double-head mutual shift cutting, they need to follow the following steps

1. Enable the function of [Z-axis power-on reset], and set the [Number of mutual shift axes] to "2".
2. Reset the machine, make the laser heads 1 and 2 shot respectively, mark the two shot positions, and manually measure the distance between the two marked points, which is the ZX axis distance.
3. Enter the axis parameter setting interface and set the Z-axis pulse equivalent. Please refer to Chapter 3.5 of this document for the specific setting method.

When the two heads are moved to each other for cutting, the graph in the host computer software should be a dotted line. If it is a solid line, the default laser head 1 (main laser head) is used for cutting. In the case of double-head mutual shift cutting,

if the number of graphics in a single line is odd, the system defaults to laser head 1 to

cut even-numbered graphics, and laser head 2 to cut odd-numbered graphics, as

shown in Figure 7-6-4, laser head 1 cutting diagram The figure marked with "1" in the

laser head 2 cuts the figure marked with "2". If there is an even number of single-line

graphics, the system defaults to laser heads 1 and 2 to cut the same number of

graphics respectively, as shown in Figure 7-6-5.

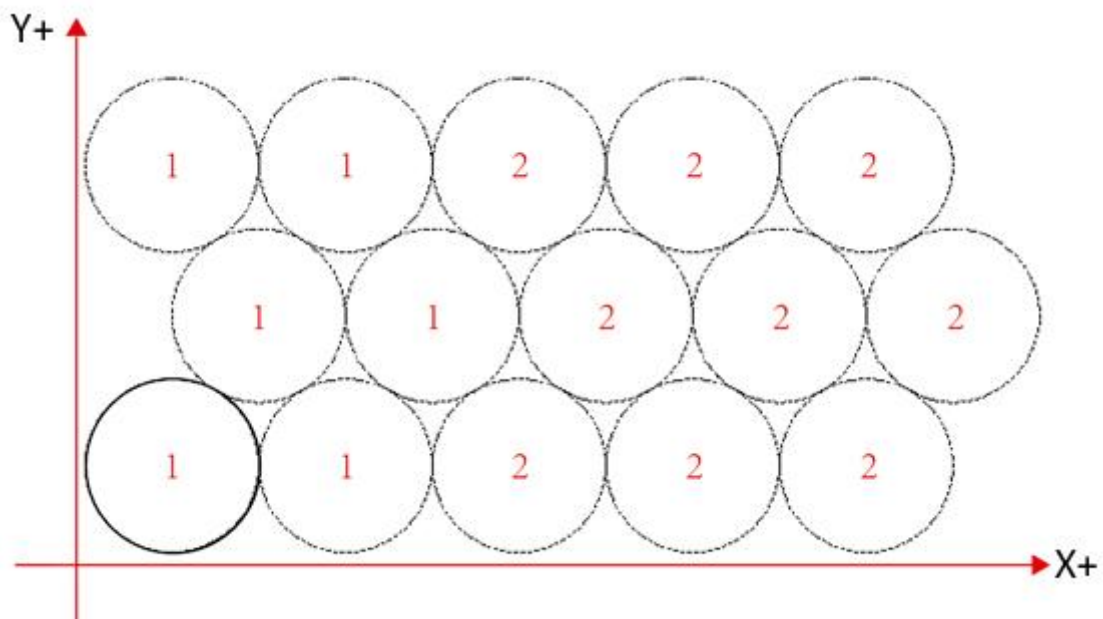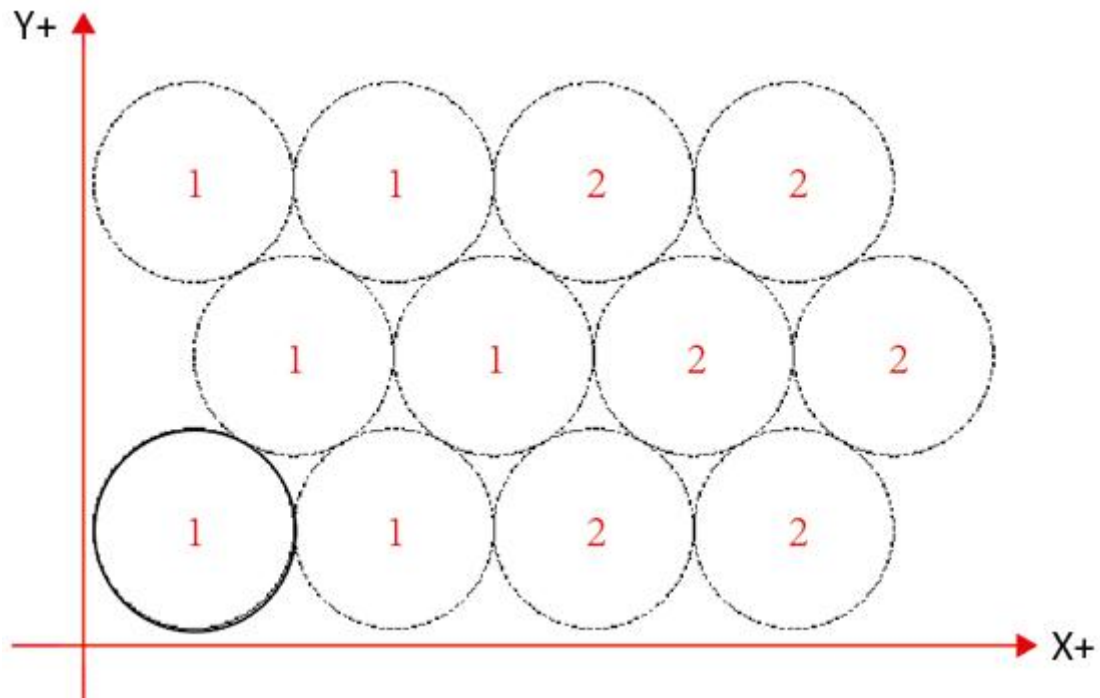Figure 7-6-4 Example 1 of Multi-head Mutual Move File

Figure 7-6-4 Example 1 of Multi-head Mutual Move File

3.16.7 Dispensing function

This function is suitable for shoe material line drawing and clothing dispensing industry; the signal output port is OUT8, which is a high-frequency pulse signal; when using this signal port, an external signal amplifying board should be connected (mos tube field effect tube PWM adjustment power output voltage is 24V PWM module)

Name	Function Description
Dispensing function	If you need to use the [dispensing function], you need to open it here

open time（ms）	The time the high-frequency valve has been open
spacing（mm）	The distance of closing the valve, that is, the distance between two adjacent points without glue
Z-axis drop distance（mm）	When working, the distance that the nozzle descends from the Z-axis origin (the positioning point of the Z-axis), when the machine is reset or in the waiting state, the nozzle is stopped at the Z-axis origin position
Z-axis idle lift distance（mm）	When working, when the Z axis moves to another map after cutting one picture, the height of the Z axis rising from the positioning point
Turn off after OUT1 works	When the machine completes the work, in order to prevent the nozzle from being blocked, the cleaning nozzle is started at this time.

In the laser cad software, the layer needs to select the brush function. If the parameters of point time and point distance are set in the software, the opening time and distance on the side panel are invalid.
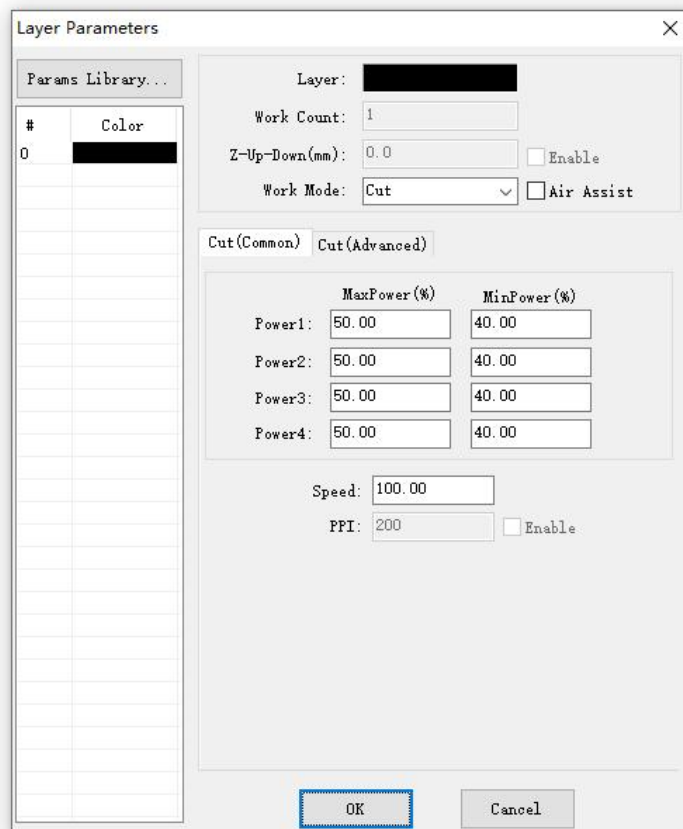
3.16.8 Function Configuration

In <u>Figure3-1-2 Main interface 2</u> interface, click 【 Menu 】 → 【 Manufacturer Parameters Settings】→ 【Function Configuration】 to enter the corresponding interface.

Figure3-16-6 Function configuration

3.16.6.1　Z-Axis For Autofocus

If you use 【Z-Axis For Autofocus】, you need to turn it on here. 【Autofocus Distance】 and 【Z Autofocus】 operation. Please refer to <u>3.15.2.1 AutoFocus Distance(mm)</u>、<u>3.25.1 Run Z Auto Focus function</u>.

3.16.6.2   U-axis feeding

If you use [U-axis feeding], you need to open it here

3.16.6.3   Feed back to the positioning point

If you use [return to positioning point feed], you need to open it here

3.16.6.4   Y-axis drum cutting

If you use [Y-axis drum cutting], you need to turn it on here

Y-axis drum cutting: The fixed position of the laser head does not move, the feeding

shaft moves once [feeding length], and the laser head performs one cut.

Steps for usage:

1: Turn on the function of [Y-axis drum cutting],

2: Turn on [U-axis feeding]

3: The software needs to turn on the [feeding switch], and set the parameters such as [feeding length], [feeding method], and [feeding delay method] as needed

4: Set the lower right corner of the zero position of the machine in the software

5: Set the lower right corner of the relative position of the graphics

6: The cutting path is set from bottom to top

7: It is best to set the height of the block to be less than the height of a single graphic

8: Make sure to let the tape go backwards from the direction of the laser head when resetting, so that when cutting normally, the material will be placed in the forward direction

3.16.6.5 Y&U axis synchronous feeding

Turn this feature on or off. If you use Y, U axis synchronous feeding, you need to turn it on here

3.16.6.6 Y&U Axis synchronization feed direction

Set the direction of Y, U axis synchronous feeding

3.16.6.7　Y&Z Double-Driver Control

For related wiring content, see 2.2.5 Motor driver control port.

When 【Y&Z Double-Driver Control】 is activated, the AWC7813 control board drives two motors to control the movement of the laser head on the Y axis. When resetting, the machine will touch the two limit switches Y- and Z-, the order of which depends on the tilt angle of the cross beam. If you tilt to the Y-limit switch, the machine will first touch the Y-limit switch and then touch the Z-limit switch, and vice versa. After turning on 【 Y&Z Double-Driver Control 】, the Z axis direction key becomes invalid and turns gray, as shown in the following figure:

3-16-6-2　Z axis direction key is invalid

AWC7824

3.16.6.8 Y-axis double limit

This function is mainly to solve the problem that the reset of the large-format machine is too slow ,Just turn it on when you need this feature

At this time, the Y-axis needs two limit switches, among which Y- is the origin limit switch, and Y+ is the near-end limit switch. The whole reset process is: the machine moves from the far end to the origin at high speed, and the Y+ limit switch is detected. After that, it immediately becomes a slow motion, and continues to complete the reset process until the signal of the Y-limit switch is detected, and the machine completes the reset.

3.16.6.9 System start up delay（S）

This function mainly solves the problem that when the machine is reset, the servo

drive has not completed initialization, resulting in lost steps and stuck when the machine is reset.

3.16.6.10 Turn off system sound

This function mainly closes the sound of the keys. When you do not want to hear the sound of the keys, you can turn this function on.
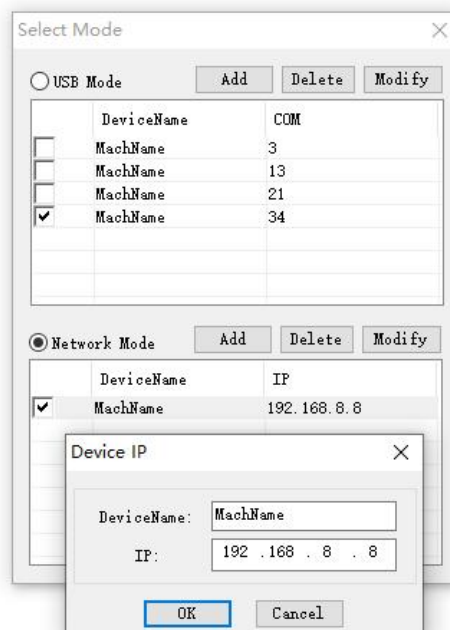
3.17 Network Settings

There are two situations:

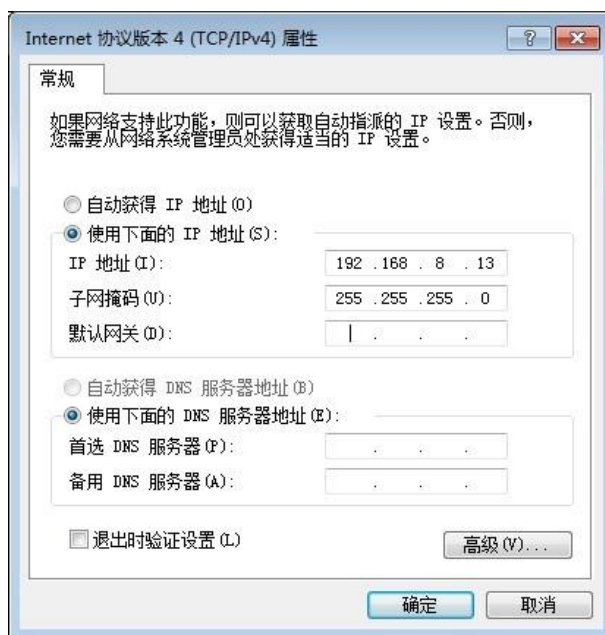● **Direct connection between AWC7813 control panel and computer**

1) Set the software IP address, select network communication in the software;

Figure 3-17-1 Set software IP address

3) Set the computer network card IP address;

Figure3-17-2 Set the computer network card IP address

3) Set the control card IP address.

In Figure3-1-2 Main interface 2 interface, click 【Menu】→【Network Settings】

to set.

The IP address of the control card is the same as the software IP address; the

first three digits of the computer network card IP address are the same as the

software, and the last digit cannot be the same.

Figure3-17-3 Set the control card IP address

● **The data is transmitted by the switch as the transfer station**

   1) Click on the lower right corner of the computer to determine the IP address of the computer by viewing the network status;

   2) Set the software IP address. The first three digits are the same as the computer, and the last digit is different from the computer. The software selects network communication;

   3) Set the control card IP address to be consistent with the software IP address;

   4) If there are multiple machines, please refer to steps 1-3 to set, each IP corresponds to one machine, which machine needs to be sent data, manually select the IP address of that machine in the software, and then click 【Load】 to send the data .

3.18 Language

Figure3-18 language selection

In <u>Figure3-1-2 Main interface 2</u> interface, click 【Menu】→【Language】to select.

AWC7824 motion controller user manual

3.19 System Version

Figure3-19 system message

1) In <u>Figure3-1-2 Main interface 2</u> interface, click 【Menu】→【Page Turning Key】→【System Version】 to learn about this system version;

2) Check 【Version】, if the version is relatively old, you can download the latest version upgrade from our company website.

3.20 Input Test

Figure3-20 Input test

,

Mainly test whether all input signals are normal.

1) In Figure3-1-2 Main interface 2 interface, click 【More】→【Ins】;

2) When the peripheral is not connected normally, the input port and limit signal port voltage is 24V, and the water protection port signal is 5V;

3) Short-circuit the corresponding input ports respectively. If the display changes, the input ports are good. If there is no change, it may be that the input port is broken. The specific change is from 1 to 0 or from 0 to 1;

For related wiring content, see 2.2.2 Universal input port.

3.21 Output Test

Figure 3-21 Output test

Mainly test whether all output signals are normal。

1) In Figure3-1-2 Main interface 2 interface, click 【More】→【Outs】；

2) When the peripheral is not connected normally, the idle state of the system

is 0V, and it is 24V when working；

3) Click each individual OUT port to open or close. Click the OUT port to

display 1, output 24V; click the OUT port to display 0, output 0V. A

Multi meter can be used to test whether there is 24V output. If there is no 24V

output, it indicates that the OUT port is broken.

For related wiring content, see 2.2.3 Universal output port.

3.22 Cut Box

The main thing is to cut the outer frame of the graph to be processed, and the

cut is a rectangular graph.

In Figure3-1-2 Main interface 2 interface, click 【More】→【Cut Box】→【Blank

Distance】→【Start cutting box】 to operate.

　　Note: If you cannot cut through, you can increase the laser power or decrease the speed of the frame.
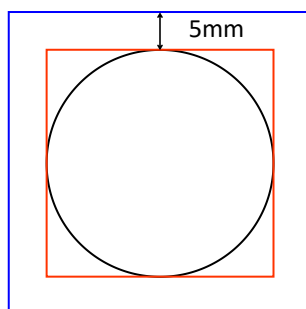
Figure3-22-1 Cut Box

Table3-22 Cut border parameter description

Name	Function Description
blank distance	The distance between the position of the graphic border and the actual cutting border

Figure3-22-2 blank distance

Assuming that the cutting graphic is a circle, the cutting frame graphic is a red rectangle. If the 【Blanks Distance】 is set to 5mm, the cutting frame graphic is a blue rectangle, that is, the distance from the actual cutting frame position is 5mm.

Supplement: The difference between Run box and cut box

Same: Both follow the same path.

Difference: The former laser head does not emit light, while the latter laser head emits light. The main purpose of walking the frame is to test the position and size of the graphic on the material, and the purpose of cutting the frame is to cut off the outer frame of the graphic.

3.23 Axis Reset

During debugging, a certain axis can be reset separately to make the laser head return to the X-, Y-, or Z-limit switch positions. Procedure as follows:

In <u>Figure3-1-2 Main interface 2</u> interface, click【More】→【Reset】→【X&Y Reset】 /【Z Reset】 to operate.

Figure3-23 Axis reset

3.24 Key Moving

Figure3-24 Key moving

1) In Figure3-1-2 Main interface 2 interface, click 【More】→【Move】→【Jog distance】 the selection box in front, when it becomes "√", you can jog control;

2) Move the direction axis, the set value can be accurately moved once; AWC7813 motion controller user manual

3) If the selection box in front of 【Jog distance】 becomes "×", only each axis can be moved, and the value of movement is uncertain;

4) Click the selection box in front of 【Laser】, when it becomes "√", the light will continue to be emitted when you move the direction key

3.25　AutoFocus, X＆Y to Origin and Continue to Previous Work

Figure3-25 Z Autofocus, X＆Y to origin and continue to previous work
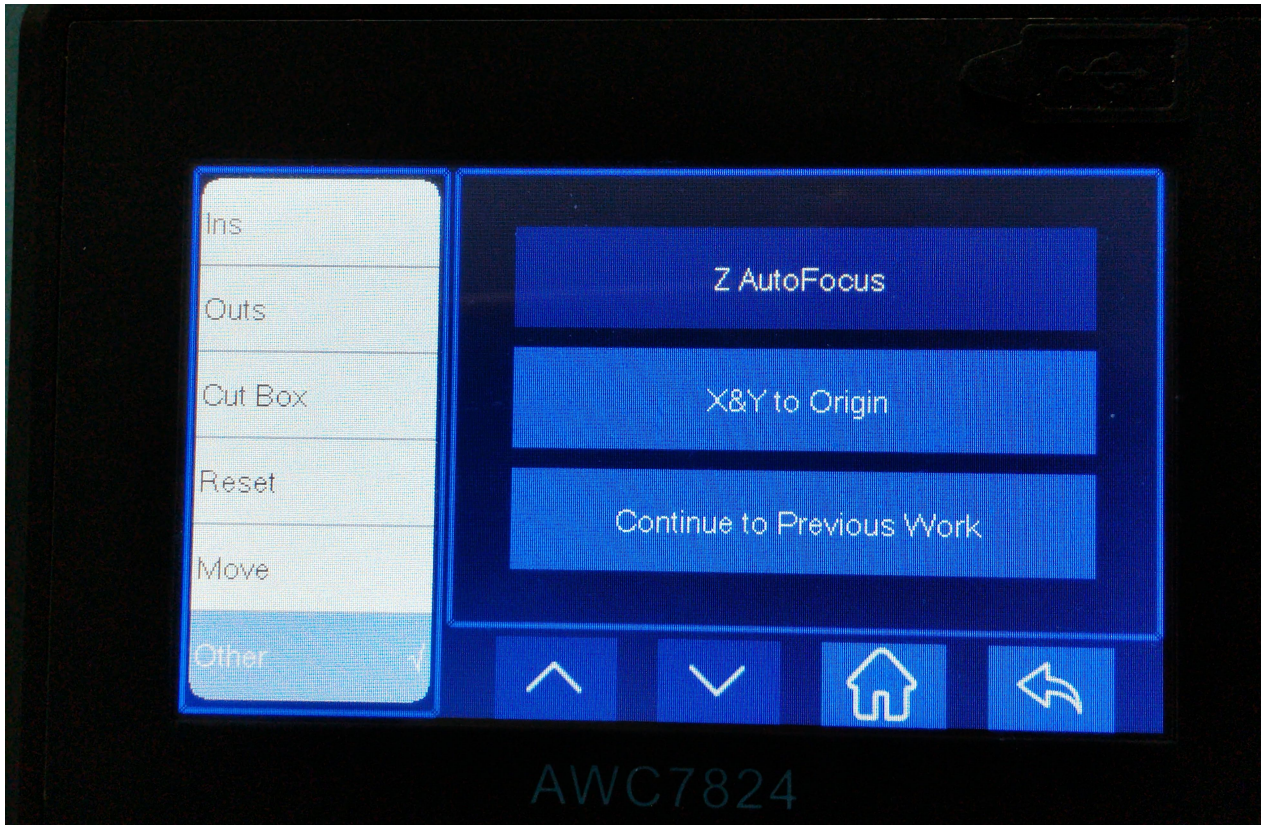
3.25.1 Run Z AutoFocus function

In Figure3-1-2 Main interface 2 interface, click 【More】→【Others】→【Z AutoFocus】 to automatically complete focusing.

● During Z-axis auto-focusing, the Z-axis drive workbench moves down at 【Z-axis reset speed】

Z Home Speed】please refer to3.15.3.3 Z Home Speed(mm/s)）

stop after touching the Z-limit switch, and then move up a certain distance. This distance is the 【AutoFocus distance】.

● This function is to adjust the distance between the laser head and the surface of the material, so that all laser beams are concentrated at one point, where the power density is the largest and the cutting effect is the best. When you press 【Z AutoFocus】 and the machine moves upward, you need to set 【Datum direction】 of Z-axis, please refer to 3.16.1.3 Datum direction.

● After the auto focus function is turned on, set the 【AutoFocus distance】, and then click this button to start auto focus. For details, see 3.15.2.1 AutoFocus Distance(mm)、3.16.6.1 Z-Axis For AutoFocus.

● Only after the 【Z-axis for autofocus】 function is turned on, the 【Z AutoFocus】 function in the 【Other】 interface is valid; when it is turned off, the function is invalid and turns gray. As shown below:

**Figure3-25-1 Z axis auto focus is invalid**

3.25.2 Set X&Y to
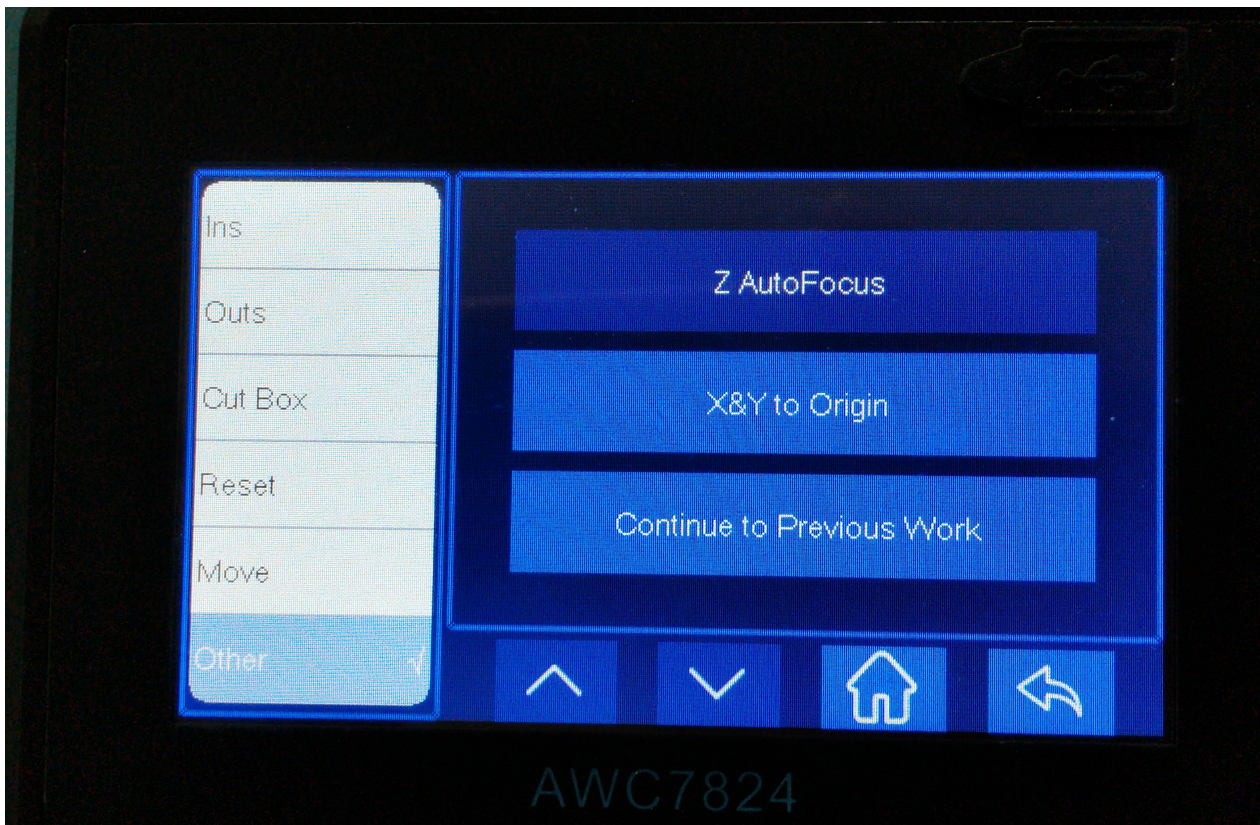
Origin

In Figure3-1-2 Main interface 2 interface, click 【More】→【Others】→【X&Y to origin】, the laser head will quickly return to the positioning point.

3.25.3 Continue to Previous Work

In Figure3-1-2 Main interface 2 interface, click【More】→【Others】→【Continue

to previous work 】 , you can continue processing at the file position where you

stopped last time, which can avoid the problem that you want to continue

processing due to sudden power failure or interruption of the last file being

processed. When the file has been processed, the 【Continue to previous work】

function is invalid, and the 【Continue to previous work】 button becomes gray, as

shown in the figure

below:

Figure3-25-3 continue to previous work is invalid
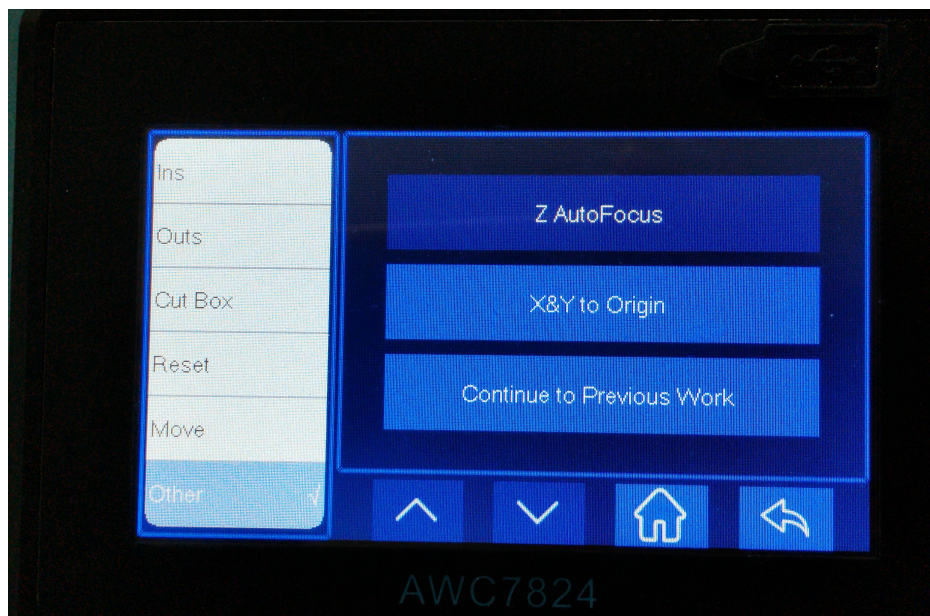
4.Frequently Asked Questions

➢ **What kind of U disk can the system read?**

➢ **Why does the prompt "Engrave beyond border limit!"**

appear

➢ **Why does the prompt "Beyond border limit! continue?"**

appear

➢ **Why does the prompt " Beyond border limit!" prompt**

appear

➢ **Why does the prompt "Trigger limit!" appear**

➢ **Why does the prompt "No file!" appear**

➢ **Why does the prompt "To select the file!" appear**

➢ **Why does the prompt "Continue to work?" appears**

➢ **Why does the button movement speed becomes slow**

after turning on the rotary engraving function?

➢ **Why does the prompt "water protect!" prompt appear**

➢ **Why does the prompt "opened protected!" prompt appear**

4. Frequently Asked Questions

4.1 What kind of U disk can the system read?

When the problem shown in the figure below occurs after inserting the U disk, please pay attention to the following points:

Figure4-1 "No Udisk!"

1) U disk must be formatted as FAT32 file system in advance, please do not select quick format when formatting U disk, other file formats cannot be read;
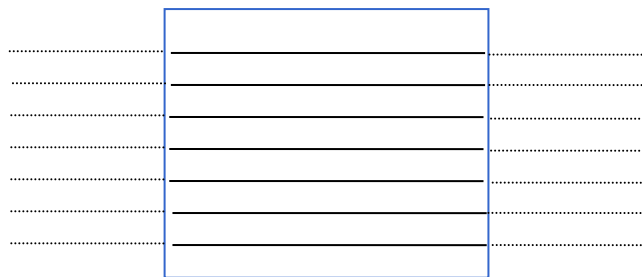
2) Due to the different quality of the USB flash drives, some USB flash drives

may not be able to read, please try to use a regular USB flash drive, when

the USB flash drive is still unable to read, please replace other USB flash

drives;

3) U disk memory is best to choose below 8G;

4) U disk cannot be used as system disk.

4.2 Why does the prompt "Engrave beyond border

limit!" appear   A   B

Assuming that the blue rectangle is an engraving file, the engraving track of the

laser head is as shown in the figure above. To distinguish the speed, set the

trajectory of the laser head idling on the outside as a dotted line, and set the

trajectory of the laser head during engraving as a solid line. In order to achieve a

certain engraving speed, the distance from the laser head to point A must be

increased, and after reaching point B, it will be decelerated.

If the positioning point is set too far, it will easily cause the laser head to go

beyond the boundary during idling on the outside. Once the boundary is exceeded, it will prompt "Engrave beyond the border limit!" and the machine will stop operating. At this time, you need to adjust the positioning point in time, taking into account the distance that the laser head travels outside. Please refer to the definition of anchor point 3.2.7 Origin.

At the same time, when the 【Engrave Acc】 is too small, the distance of the laser head travels too long, which will easily lead to out of bounds. At this time, 【Engrave Acc】 should be increased. Please refer to the definition of 【Engrave Acc】 3.14.1.5 Engrave Acc

4.3 Why does the prompt "Beyond border limit! Continue?" appear

When the following situations occur, it will prompt "Beyond border limit! Continue ?"

1) When the positioning point is set too biased, the size of the graphics may exceed the format (for the definition of the positioning point, please refer to 3.2.7 Origin）；

2) The size of the graphic itself is too large, which leads to the oversize;

3) The "relative graphic position of the laser head" (the "small blue dot" in the display screen, see Figure4-3-1 the location of the little blue dot）, If the "small blue dot" is at the upper right of the picture, and the anchor point is set at the far left, the file will definitely exceed the boundary;

Once the boundary is exceeded, the prompt "Beyond the border limit! Continue?" will appear. When you click "√", the machine will continue to work

outside the format, and when you click "×", the machine will stop working.（see Figure4-3-2 "Beyond border limit! Continue?"）

Therefore, when setting the anchor point, you can combine 【X size】 with 【Y size】 and the position of the "small blue dot" to estimate whether the graphics are out of bounds. When the positioning key is pressed, the X and Y coordinates of the coordinate area display the coordinates of the positioning point （ see Figure4-3-3 Graphic size and anchor point coordinates）. Take the machine origin at the upper left corner as an example. Only when the following conditions are met, can the graphics be cut without oversize:

a) When the machine origin is at the upper left corner and the "small blue dot" is at the upper left, X coordinate value + X size <= X axis format and Y coordinate value + Y size <= Y axis format;

b) When the machine origin is at the upper left corner and the "small blue dot" is at the upper right, X coordinate value-X size >=0 and Y coordinate value + Y size <= Y axis format;

c) When the machine origin is at the upper left corner and the "small blue dot" is at the lower left, X coordinate value + X size <= X axis format and Y coordinate value-Y size >=0;

d) When the machine origin is at the upper left corner and the "small blue dot" is at the lower right, X coordinate value-X size>=0 and Y coordinate value-Y size>=0;

【X size】 and 【Y size】 see details Figure3-7-1 Property graph, see the format 3.16.1.6 Range(mm), coordinate system please see 3.6 coordinate display area.

At the same time, you must refer to "the small blue dot" on the display screen when setting the anchor point, and not too biased. You can walk the border advanced to check whether the position of the anchor point and the size of the processed graphics are out of bounds. Please refer to the border content 3.2.6 Box.

Figure4-3-1 The location of the little blue dot
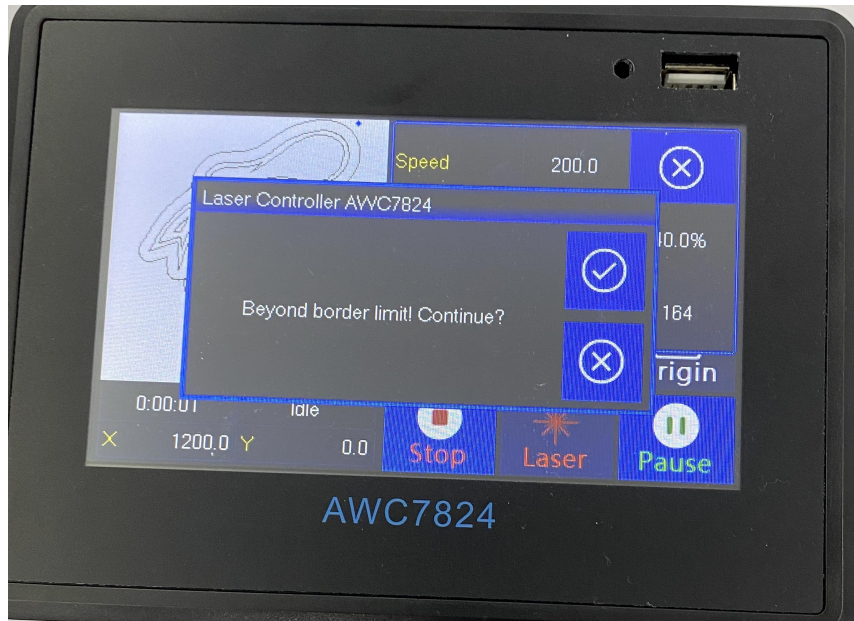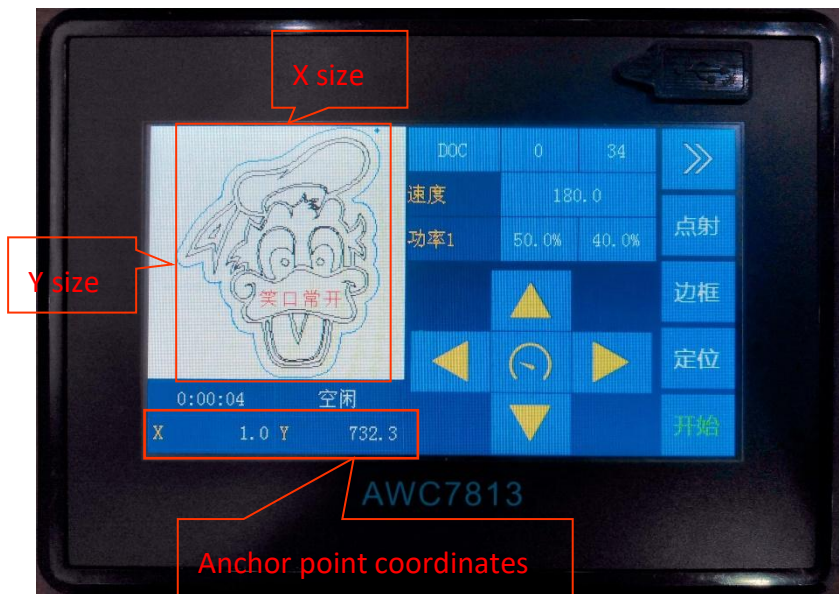

Figure4-3-2 "Beyond border limit! Continue?

Figure4-3-3 Graphic size and anchor point coordinates

4.4 Why does the prompt " Beyond border limit!" appear

When the positioning point is too deviated and the size of the processed graphics exceeds the format, press the 【Box】 key at this time, and the prompt will appear. At this time, the positioning point position should be adjusted. Please refer to the definition of anchor point 3.2.7 Origin.

Figure4-4 "Beyond border limit!"
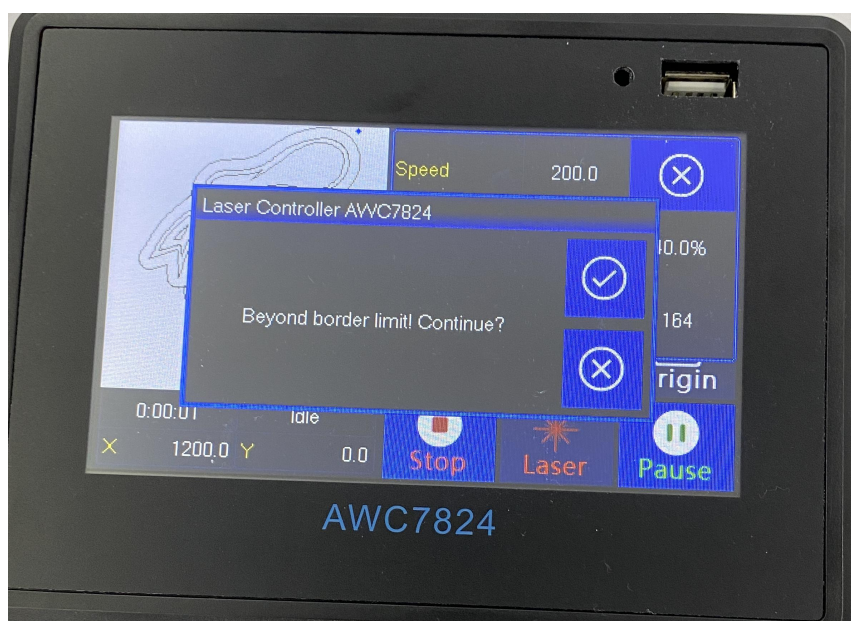
4.5 Why does the prompt "Trigger limit!" appear

After opening the axis hardware limit, if the laser head touches the limit switch during operation, the prompt "Motion axis has touched the limit switch!" will appear and the machine will stop operating.

Or the 【Limit-switch valid level】 setting is wrong, press the direction key to

Figure 4-6 "No file!"

4.7 Why does the prompt "To select the file!" appear

When all the files in the motherboard are deleted, thsat is, when there are no files in the main board, click the 【Start】 【Box】 button in Figure3-1-2 Main interface 2 interface, this prompt will appear. At this time, files can be transferred to the main board via U disk, network, or USB communication.

Figure 4-7 "To select the file!"

4.8 Why does the prompt "Continue to work?" appear

When the machine suddenly cuts off power while the file is being processed, the machine will pop up the prompt "Continue to work?" after it is powered on. Click "V" to continue cutting the remaining part, and click "   " to stop cutting. For related content, see

Figure4-8 "Continue to work?"

4.9 Why does the button movement speed slow down after turning on the rotary engraving function?

For details, see Table3-15-4 Rotate Engraving & Cutting Instruction

4.10 Why does the prompt "water protect!" appear

When the 【Laser 1 water protect】 function is turned on, the mainboard detects the WP1 signal during the operation of the machine, and it will prompt "Water protect!", then please check the water protection switch. For details, see 3.16.2.6 Laser 1 Water Protect.

Figure4-10 "Water protect!"

4.11 Why does the prompt "opened protected!" appear

When the function of【Open Protection】is turned on and the machine detects the 【Open Protection】 signal, the machine stops operating and prompts the words "Opened Protected!". It is also possible that when the 【input valid level】 is wrong, it will also cause the words "opened protected!" to appear. At this time, please check the related equipment and functions. Please refer to the definition and settings of 【Open Protection】 [3.16.3.2 Open Protection](#).

Figure4-11 "Opened protected!"

5.Operation process description

➢ **Machine installation and debugging process**

➢ **Basic steps of using a laser machine to cut graphs**

5. Operation process description

5.1 Machine installation and debugging process

1) Hardware installation, shaft terminal is connected to the driver, see details

2.2.5 Motor driver control port；

2) Connect the limit switch, select the appropriate limit switch, we

recommend the normally open DC24 NPN type, see 2.2.6 Limit signal input

port；

3) Install the laser power supply, if you don't need the mainboard to control

the water protection, directly connect the laser power water protection to

the water tank or short circuit the laser power water protection, see details

2.2.4 Laser power control port；

4) Turn on the required axis power-on reset, please refer to 3.16.4 AutoReset

Settings；

5) Set 【Limit-switch valid level】, 【Limit-switch valid level】 default is

【Low-level】, please refer to 3.16.1.5 Limit-Switch Valid Level；

6) Set 【Datum direction】, please refer to 3.16.1.3 Datum direction；

7) Set 【Key Direction】, please refer to 3.16.1.4 Key direction；

8) Debug 【 Distance per pulse 】, please refer to 3.16.1.1 distance per

pulse(mm)；

9) Set 【Range】 size, please refer to 3.16.1.6 Range(mm)；

10) Set 【start Speed】, 【Max Acc】, 【Max Speed】, 【Origin Offset】, etc.

as required, please refer to 3.16.1.7 Start Speed, 3.16.1.8 Max Acc, 3.16.1.9 Max speed;

11) Load the file and try to cut, debug out the light, and test whether the machine runs smoothly.

5.2 Basic steps of using the laser machine to cut graphs

1) Install the LaserCAD software, see the software operation manual for details;

2) According to the existing machine, set the machine zero position, page zero position, and relative graphic position of the laser head in the software, please refer to the software operation manual for details;

3) Draw the picture in the software or import the picture into the software;

4) Set the working mode, power and speed in the software layer parameters;

5) Turn on the machine normally, turn on the water tank, fan, etc.;

6) Select the communication method and transfer the file to the control card;

7) Move the laser head to estimate the approximate position of the cut image, and press the 【Origin】 key on the panel;

8) Press the 【Box】 key to check the size and position of the figure, and place the material;

9) Press the 【Start】 key and the machine will start cutting. If you find that the cutting effect is not good, press the 【Pause】 key to adjust the power and speed on the panel, please refer to 3.9.2 Modify the speed of the file being processed、3.10.2 Modify the power of the file being processed; Or press the【Stop】key, click the file name, and adjust the【layer parameters】of the processing file. For details, see3.7.2 layer parameters of processing files; Or adjust【Motion Parameters】and【Axis Parameters】, please refer

to

Concluding remarks

Customer satisfaction is the only criterion for testing the company and products. In order to live up to your trust and support, the company will continue to work hard to design more high-quality and efficient products.

All parts of this manual, the copyright property rights belong to Shenzhen Trocen Automation Technology Co., Ltd. Without the permission of Trocen, no unit or individual shall arbitrarily imitate, copy, reprint or distribute the relevant content of this manual. The contents of this manual are subject to update without notice.

If you encounter some problems during use, or use difficulties, please contact us in time.

Add: First Floor, Building 4, Zhiheng Industrial Park , Nantou Pass Road ,Nanshan District , Shenzhen City , Guangdong Province ,China.

Shenzhen Trocen Automation Technology Co.,Ltd.

Tel: 0755-27958262

Fax: 0755-27447913-608

Email: qiancheng@sztrocen.com

Website：www.sztrocen.com/www. awc608.com