GRENTSUN
Fly Laser Printing Machine

Operation Manual
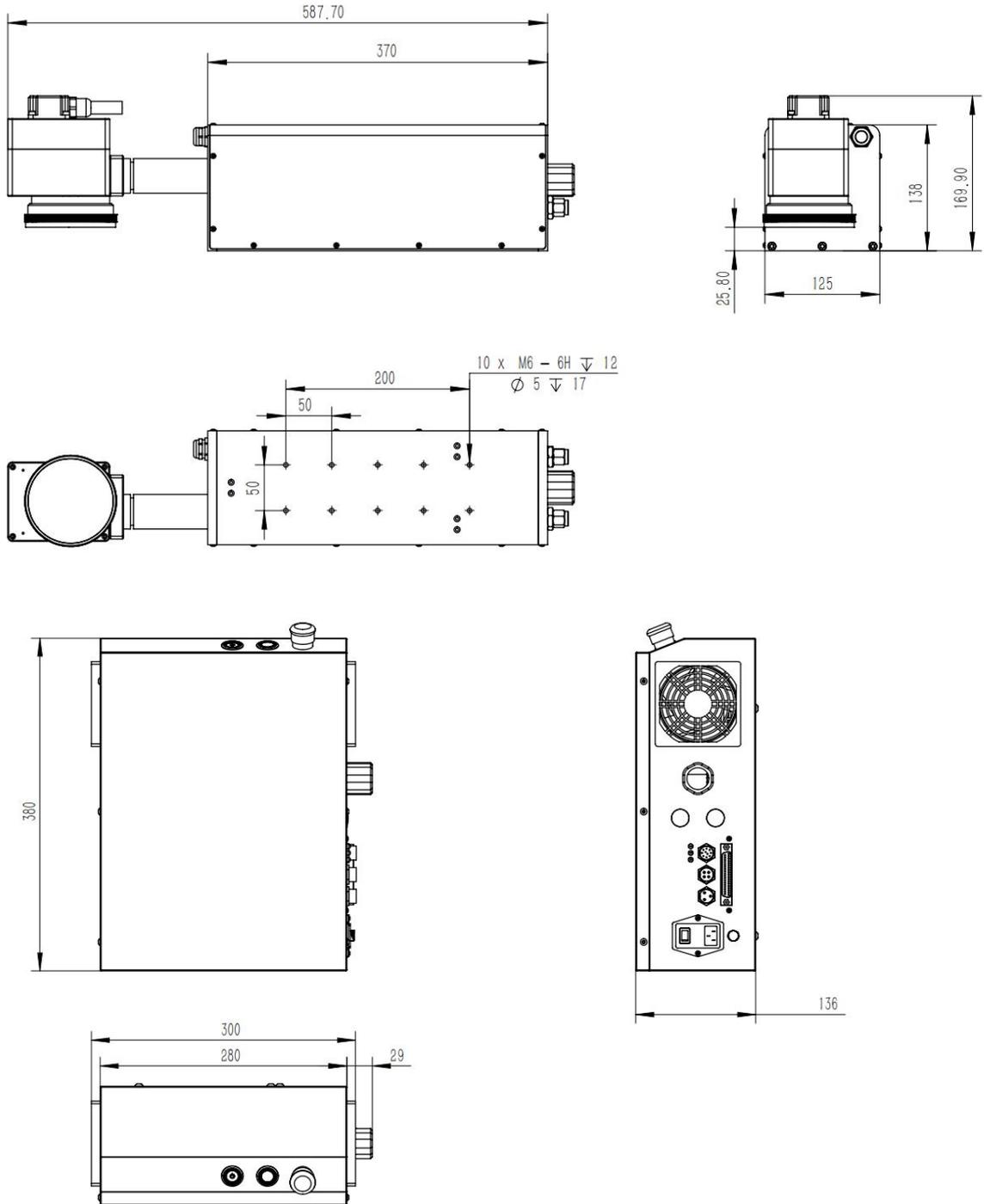
(V5. 16.22)

WUHAN GRENTSUN INDUSTRIAL SYSTEM CO., LTD
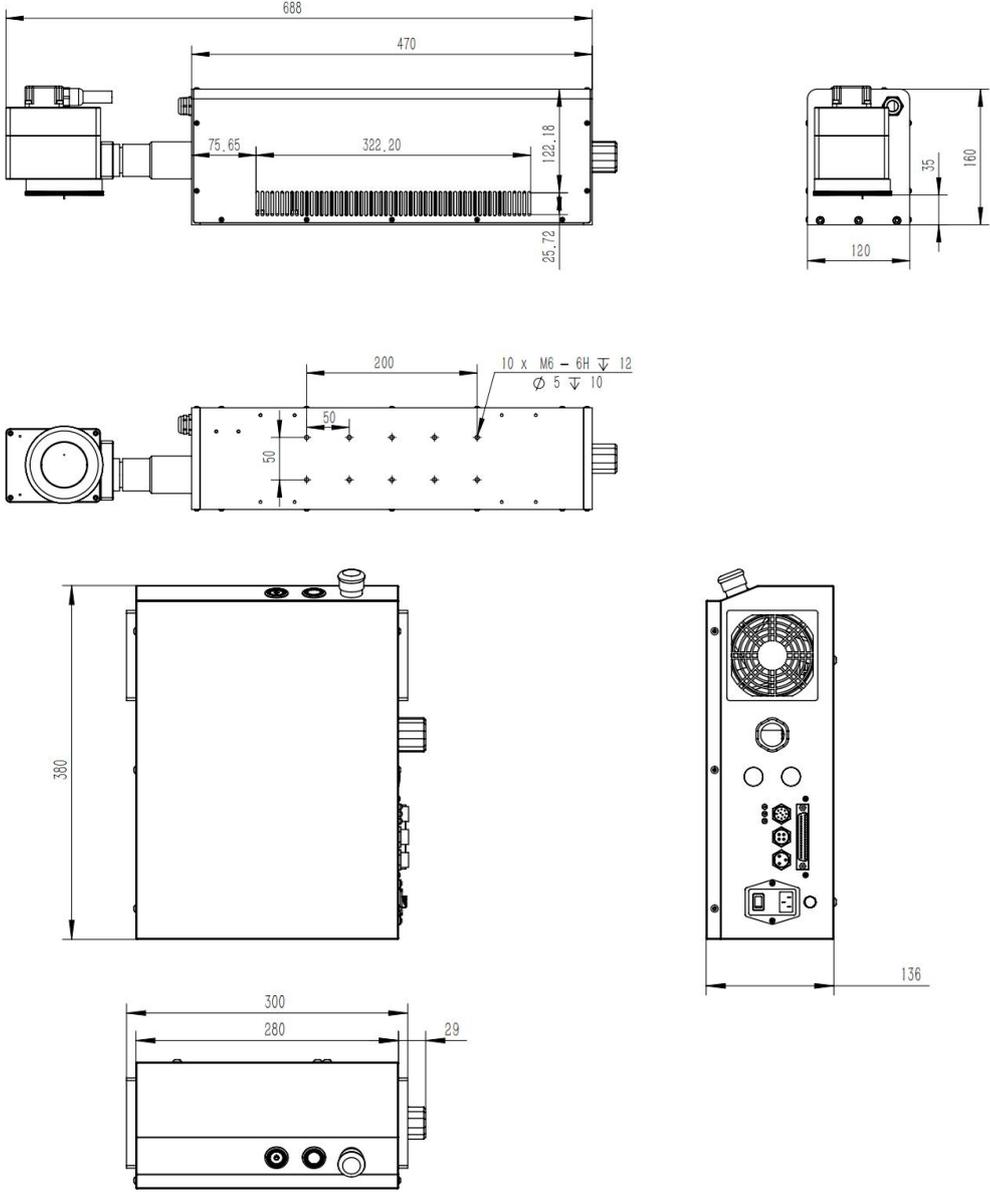
Part I

User's Guide for the Machinery

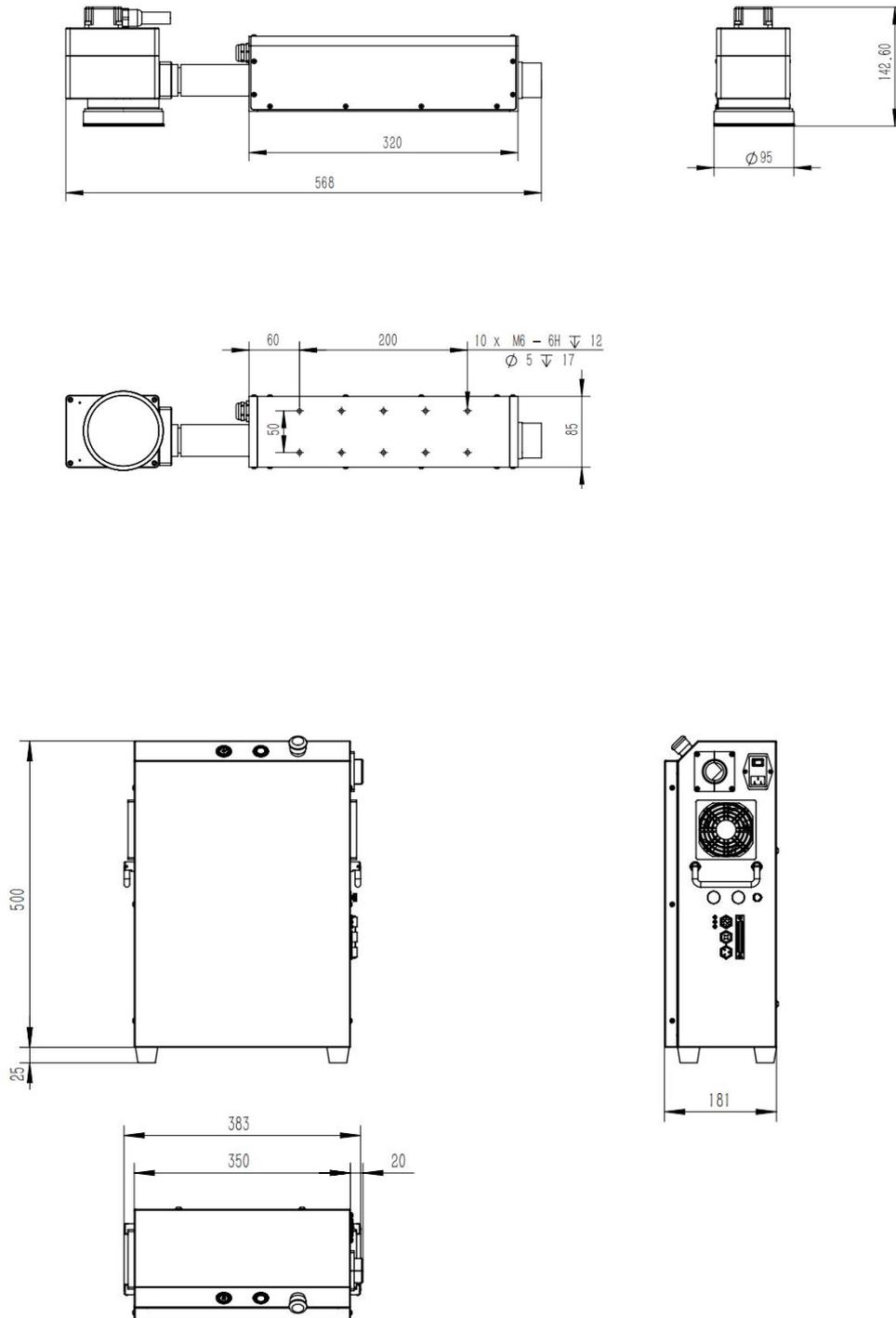![GRENTSUN logo - Think Along Your Lines 吉瑞祥]

Please take time to read and understand this User's Guide and familiarize yourself with the

information that we have compiled for you before you use the product. This User's Guide should stay with the product to provide you and all future users and owners of the product with important

operating, safety and other information

Pic1. External View of UV laser

Pic2. External View of CO2 laser

Pic3. External View of Fiber laser

Notices

The information contained in this document is subject to change without notice. GRENTSUN Laser believes that the information provided is accurate and reliable, however GRENTSUN makes no warranty of any kind as to the information contained in this document, including without

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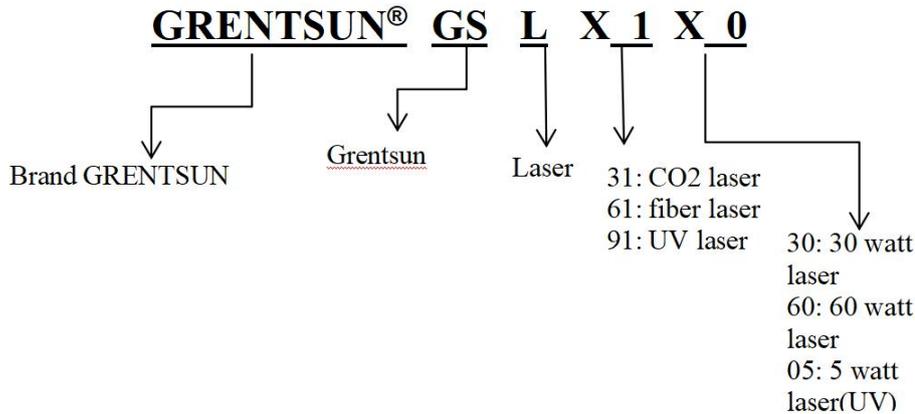
incidental or

consequential damages in connection with the furnishing, performance or use of this material.

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I. System Naming Conventions:

GRENTSUN® GS L X 1 X 0

Brand GRENTSUN   Grentsun   Laser

31: CO2 laser
61: fiber laser
91: UV laser

30: 30 watt laser
60: 60 watt laser
05: 5 watt laser(UV)

II. Installation & Commissioning:

1. Machine Setup Warning:

a. Printer's power supply or electricity socket must be independent & Electricity must be have earth wire.

b. Printer must be connect earth wire before working.

2. Guidelines of Daily Maintenance:

Prohibit touching or knocking against the workbench when the machine is working.

The laser and the Optical Lenses are fragile, and need to be very careful and escape shocking when moving.

You must stop the machine when anything wrong with it, and ask the professionals to deal with.

Please notice the way of turning on and off the machine.

Keep the workshop and machine surface clean.

3. Working Environment:

Temperature: 0 -45℃; Relative Humidity： 10～89% (non-condensing)

Ventilation device is required, no strong shocking and hot body around.　And workshop needs to be clean.

4. Details of Maintenance The Whole Printer:

Keep the workbench clean. and regular remove dust on machine body, fans & electronic part

Wipe the transmitting mirror with carton fabric and alcohol regularly.

Lock the machine cabinet well, in case some metal drop into it to damage the circuit.

The scanning workbench is precise instrument, and the working environment must be clean.

Don't be close to the laser when it working. If anything wrong, please ask the professionals to deal with.

If the laser decay and weaken, please turn off the machine first, then re-plugged the USB line between the PC and control card testing.

5. Normal Fault Checking:
a. If the workbench doesn't move, please check the following in sequence:

If the power supply is in good connection; If the power line is in good connection

b. If there is no laser output from the laser, please check the following in sequence:

If the power supply is in good connection; If the power of the software is too low (the best in 50%---90%)

If the optical system was broken; Re-plugged the USB line between the PC and control card

c. There is laser outputting, but shallowly carving even the power is normal, please

check:
Check the focal length

If the optical system skewing

If any dirt on the transmitting mirror surface

Re-plugged the USB line between the PC and control card

d. If the carving lines are out-off-straight, please check:

If the marking head loosening

If the machine doesn't connect the earth wire

If there is any external electromagnetic interference

III. Safety Instruction:

The GRENTSUN Laser Model G S L Series is a Class IV laser product.

This series laser emits 3/5/10/15/20/30/50 watt invisible laser radiation in wavelength 10.6um, 10.2um, 10.6um, 1064nm and 355nm.

Avoid eye or skin exposure to direct or scattered radiation emitted from the optical output.

Do not open the device. There are no user serviceable parts, equipment or assemblies associated with this product. All service and maintenance will be performed only at the factory.

Safety Conventions

We use various words and symbols that are designed to call your attention to hazards or important information.   These include:

WARNING

Refers to a potential personal hazard. It requires a procedure that, if not correctly followed, may result in bodily harm to you and/or others. Do not proceed beyond the WARNING sign until you completely understand and meet the required conditions.

CAUTION

Refers to a potential product hazard. It requires a procedure that, if not correctly followed, may result in damage or destruction to the product or components. Do not proceed beyond the CAUTION sign until you completely understand and meet the required conditions.

IMPORTANT

Refers to any information regarding the operation of the product. Please do not overlook this information.

CAUTION

CLASS 4 LASER RADIATION
WHEN OPEN
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
4级激光辐射，避免眼或皮肤受到直射和散射照射

LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
CLASS 4 LASER PRODUCT

This symbol indicates laser radiation. We place this symbol on products which have a laser output.

General Safety Instructions

In order to ensure the safe operation and optimal performance of the product, please follow these warnings and cautions in addition to the other information contained elsewhere in this document.

WARNING: Always use your laser device in conjunction with a properly grounded power source.

CAUTION: Before supplying the power to the instrument, make sure that the correct voltage of the DC power source is used (24 VDC). Failure to use the correct voltage could cause damage to the instrument.

WARNING: No operator serviceable parts inside. Refer all servicing to qualified GRENTSUN personnel. To prevent electrical shock, do not remove covers. Any tampering with the product will void the warranty.

WARNING: This device has an output optical head connected to the laser by a fiber cable. Please, be careful dealing with the output head.

WARNING: If this instrument is used in a manner not specified in this document, the protection provided by the instrument may be impaired. This product must be used only in normal conditions.

Laser Classification

This device is classified as a high power Class IV laser instrument under IEC 60825 [and under 21 CFR 1040. 10]

This level of light may cause damage to the eye and skin. Despite the radiation being invisible, the beam may cause irreversible damage to the cornea.

Laser safety eyewear is not provided with this instrument, but must be worn at all times while the laser is operational.

WARNING: Do not install the collimator when the laser is active.

WARNING: NEVER look directly into the output head and make sure that you wear appropriate laser safety glasses at all times while operating the product.

CAUTION: Use of controls or adjustments or performance of procedures other than those set forth in this Guide may result in hazardous radiation exposure.

IV. Installation of Laser Machine

1. Open the package, take out all the parts.
2. Unpack the support base and prepare to mount the base.

3. Place the nuts into the aluminum profile and begin mounting the base.   4.Base Installed.

4. Install the bracket on the base, adjust the nut position according to the screw hole position, and put the bracket whole onto the base then make some adjustment.

5. Take out the bracket horizontal bar, remove the nuts and put into the longitudinal slide and install the bracket horizontally.

6. Find the corresponding screws of bracket and start mounting the laser bracket.

7. Mount the machine case, the optical path, the computer and the bracket.

8. Connect all the cables to the machine case

9. Connect the device power cable, and turn on water chiller(for UV laser only), then power button, then screen button then laser button.

10. Take off the cover of the lens and adjust the distance between the item and the lens (adjust the height till two red light dots coincided).

11. Use the equipment according to the software operation instructions provided.

12. Working finished. Turn off the laser source key, then screen, then power, last chiller(for UV laser only).

V. Connection of Water Chiller(for UV laser only)

1. Connect the power supply

2. Connect inlet and outlet water pipes

3. Add distilled or purified water to the water tank and make sure the waterline between two red arrows in the picture.

*Maintenance of water chiller:

1. Please fill with distilled or purified water. Never use mineral or tap water.

2. Replace cooling water every 15 days.

3. If you encounter a water chiller alarm, please turn off the laser button immediately and contact your supplier

VI. Wiring diagram and definition

1.UV laser source:

Pic 4. DB15 female connector

Seal-355-3SE&5SE DB15 interface definition description

Pin	Type	Definition	Description	Remarks
1、4、5	reserve	N /A	N /A	Do not use,not connected with internal signal of board card
2、10	ground, digital	GND	Provide a reference site for the PIN 3	Internally
3	Output, Digit	ALARM _OUT	Output the alarm signal	High level: abnormal; low level: normal. TTL level output; driving current ≤ 25mA.
6	Input,Digit	GATE	Signal for switching on/off the light	External marking card is provided. High level: indicating light; low level: pulse light. TTL level input.
7	Input,Digit	TRIGGER	Modulation signal by external control	External marking card is provided. TTL level input. Return circuit for PIN14/PIN15
8	Input,Digit	FPS	Signal for first pulse control	External marking card is provided. TTL level input, Return circuit for PIN14/PIN15.
9	Output, Digit	TX _OUT	Serial port data output	gorge line. The reference site is PIN 12.
11	Input, Digit	RX _ IN	Serial port data input	gorge line. The reference site is PIN 12.
12	Serial ground, Digit	GND_ ISO	The reference site is PIN 9/PIN11	String outlet isolation
13	Reserve	N/A	N/A	Internal suspension, not connected with internal signal of board card
14	Ground, Digit	EX_GND	Return circuit for PIN6/PIN7/PIN8	External isolation ground
15	Ground,	EX_GND	Return circuit for PIN6/PIN7/PIN8	External isolation ground

2. CO2 laser source:

2.1 Signal wiring:

Connector	Wiring instruction	Signal instruction
8	Correspond marking or cutting card of PWM positive signal	RF Enabled
6	2 and 6 short circuit	Laser status output TTL Logical output:0=Laser ok,1=Laser fault
2		Control enabled TTL Logical input:0=laser control enabled,1=Laser control off
1、3、4	Correspond marking or cutting card of PWM signal ground	GND

Notice：

1) 48V 30A power supply required grounding
2) Note the dust protection of the laser output window. Prevent the lens from burning due to dust particles. Especially the way laser output window faces up.
3) Be careful to prevent backward reflection, any backward reflection can cause laser damage.
4) We suggest that the front and back end of the laser shouldn't be all fixed at the same time, avoid the deformation of the cavity of the laser cavity due to the stress caused by the heat expansion and shrinkage of the material
5) The fan is inhaled, there must be enough space (greater than 3CM) around the radiator to heat the air, clean the fan in time to ensure good ventilation.

If there are any problems during the usage of the laser, please contact us for your timely solution.

2.2 Signal interface wiring:

PIN NO.	
1	RF Enable TTL logic input; 1=RF ON, 0=RF OFF; 1 kΩ impedance This input turns on the laser. See also Pin 7, Control Enable, below
2	+15 VDC ±.5 VDC, .25 Amps Max output for customer use
3	LASER OK TTL logic output; 1=LASER OK, 0=LASER Fault; I =-0.4 mA, I =8 mA Output is asserted when no faults (SWR, Temp. Or Volt.) are detected
4	Temperature OK TTL logic output; 1=Temp OK, 0=Temp Fault; I =-0.4 mA, I =8 mA Output is asserted when temperature is below maximum value
5	Voltage OK TTL logic output; 1=Voltage OK, 0=Voltage Fault; I =-0.4 mA, I =8 mA Output is asserted when DC supply voltage (V) is below max. value
6	Must be connected to GND
7	Control Enable TTL logic input; 1=Laser Control Enabled, 0=Laser Control Disabled This input must be asserted before RF enable can used to turn on laser
8	GND

Notes:
1) Connector used is RJ-45 type.
2) These specifications are subject to change.

3. Fiber laser source:

Pic 5. DB25 connect port of controller

PIN No.	Name	Description
1-8 (D0-D7)	Power Setting	8 bits parallel port, D0 is minimum bit and D7 is maximum bit; Range: 0-255 (hexadecimal: 0x00-0xFF).
10,13-15,24-25	Ground	Digital GND.
11,12,16,21	Laser alarms status	See alarm codes in Table 5.
17	VCC	+5 VDC power supply input, providing power for inside chips of DB25 to ensure that the input and output signals are valid. Input current >20 mA.
18	EE	Emission Enable (EE) signal. HIGH: Emission Enable. LOW or disconnected: Emission Disable.
19	EM	Emission Modulation (EM) input. HIGH (>3 V): Emission ON;LOW or disconnected (<1 V): Emission OFF.
20	Sync	Pulse Repetition Rate (Synchronization) input, square wave.
22	Guide Laser signal	Guide Laser (red diode) ON/OFF input.
9,23	Obligate PIN	Reserved.

GRENTSUN Laser User's Guide

April 1, 2024

List

1. Home

The main interface is shown in Figure 1-1:

Figure 1-1

1.1. Login

Click the login button, a password input interface pops up, login password: 123 (administrator, you can log in to the system with different permissions)

1.2. System status bar

As shown in Figure 1-2

Figure 1-2

System status prompt: Prompt that the coding system is ready, marking, or some error alarm information, etc.

Refresh: During the flight marking process, the information can be updated online. There are two situations for online update. One is to update the marking after performing the system cache twice, that is, after clicking online update, the system will perform another marking and update on the content once. The modified content is marked, a real-time update, that is, after clicking online update, the system's next marking is the modified content (for high-speed production lines, real-time update will cause missed marking)

Focus light: This function can be used when a red light focusing red light tube is connected to the system, that is, two red lights are connected.

Guide light: The red light guides the light and previews the data marking area.

Test：Test the marking time of the currently selected data, the marking time can be seen in the status bar after marking.

Marking info: Click the button, the pop-up interface as shown in Figure 1-3.

图 1- 3

View content: View the current marking content.

File name: Display the file currently being marked.

Marking time(S): Current file marking time.

Current times: Count the number of markings after clicking start coding.

Speed(m/min): The current encoder obtains the real-time speed of the pipeline or the simulated speed set by the system.

Refresh view: During the marking process, the interface content display is refreshed in real time.

Clear cache: When using the online update function, whether to clear the

previous state of the marked content in real time. When it is not checked, the system will update the marking after 2 caches. The system will mark the content twice and update the modified content for marking. When checked, it will be updated in real time, that is, after clicking online update, The next marking of the system is the content after modification (for high-speed production lines, real-time update will cause missed printing)

Clear alarm: Clear alarm information.

Reset serial number ： The serial number can be reset without stopping production.

Clear count： Clear current or total times.

Edit: Online editing function, during the marking process, click to return to editing, after the data is modified, click the online update function.

Start/pause marking button

1.3. Edit bar

| New | Open | Save | Save as | Undo | Redo | Copy | Delete | Tool |

Precision: Up, down, left or right, or the distance or angle traveled by each point of the rotary button (unit: mm/deg).

Add object

Add materials that need to be marked, including text, points, lines, circles, rectangles, barcodes, QR codes, graphics, delayer.

1.3.1. Add text

Click the text button to enter the content editing interface, as shown in Figure 2-2.

Up: Adjust the data order, the data moves forward.

Down: Adjust the data order, the data moves backward.

Edit: Edit fixed text, serial number, date and time, file reading, shift code, system variable or random code.

Delete: Delete added content.

New line: Branch add information

Manage： Management variables

Figure 2- 1

1.3.1.1. Add text

After entering the content editing interface, the system will

automatically produce a fixed text with empty text. Click Edit to pop up the text box, click the blank area, and pop up the keyboard. To add new fixed text, click the fixed text button to add the default content as TEXT Fixed text.

Edit text

Select the text TEXT, as shown in Figure 2-2, click the edit button to enter the editing interface, click the content box, and the keyboard pops up, as shown in Figure 2-3.

Figure 2- 2

Figure 2-3

Font： Select text font, optional dot matrix font, single line font or double

line font, as shown in Figure 2-4.

Figure 2-4

Char height: Character height.

Width scale: The default value is 1, change the font width.

Spacing: Distance between characters.

Monospaced: Set each character to the same placeholder width

Line space: The distance between each line and each line in the same text.

Alignment: Alignment between multiple lines in the same book.

Save to file,Time stamp, Save file: Record role, record usage.

1.3.1.2. Add serial number

Click the serial number button to add a serial number with a default content of 0000, as shown in Figure 2-5.

Figure 2-5

Edit serial number

Select the serial number and click the edit button to pop up the serial number modification interface, as shown in Figure 2-6

Figure 2-6

Start value	Starting value	Final value	Final value
Current value	Serial number to be marked	**Step value**	Accumulated value for each marking
Number of digits	Number of characters	**Leading symbol**	Character expression symbol
Marking times	Number of repetitions of a single serial number	**Current times**	Repeated serial number has been marked times

Cycle	Whether the serial number is cyclically marked	**Reset serial number in production**	After ticking, the reset serial number function will take effect

Control signal output: Serial number signal output.

ADVOUT：Output several serial numbers in advance.

DELOUT：Delay distance output, unit mm, the value can not be set too much, otherwise it will alarm.

1.3.1.3. Add date and time

Click the date /time button, the added date and time is the system date and time, as shown in Figure 2-7.

Figure 2-7

Edit Date/ time

Select the Date/ time and click the edit button to pop up the time/date modification interface, as shown in Figure 2-8.

Figure 2-8

Select format： The system has its own time and date format, which can be used directly.

Modify the format: Modify the time/date format, you can modify the delimiter, and the order of year, month, day, etc.

Time offset: You can change days, hours, and minutes, that is, increase or decrease the set value on the basis of the current time, accumulate one day and change the value after the day to 1, and decrease the day and change the value after the day to -1. The same is true for hours and minutes.

1.3.1.4. File read

Click the file read button to add a blank file, as shown in Figure 2-9.

Figure 2-9

Edit File read

Select the file to read and click the edit button to pop up the file reading and modification interface, as shown in Figure 2-10.

Figure 2- 10

Select a document

Click the selection button behind the file path to pop up the file path (inside the system or USB), select the file to be loaded, as shown in Figure 2-11.

Figure 2-11

Line number: The line number of the text to be marked currently.

Cycle: Whether to mark the text file cyclically.

1.3.1.5. Add Plan

Click the Plan button, as shown in Figure 2-12, click the edit button, you can edit the code skip information, as shown in Figure 2-13.

Add: Add the code hopping list, as shown in Figure 2-14.

Delete： Delete skip code list.

Edit： Edit timing code hopping information, for example:

Click the edit button in Figure 2-12 to enter the code skipping content editing interface, as shown in Figure 2-15, modify the code skipping information and start time. Figure 2-14 represents the meaning of 00:00:00-12:00:00 Code shift information A, code jump code information B from 12:00:00-00:00:00.

Figure 2- 12

Figure 2- 13

Figure 2- 14

Figure 2- 15

1.3.1.6. Add variable

Communication function, please contact the engineer when using.

1.3.1.7. Add random code

The system randomly generates data for marking.

1.3.2. Draw

Drawing functions include straight lines, dashed lines, points, circles,

rectangles, etc.

1.3.2.1. Add Dot

Click the dot button in the drawing function, as shown in Figure 2-16, you can modify the dot pulse number or dot time in the setting---spraying parameters (when √ is selected, it is dot time output, when it is not selected, it is dot pulse output).

Figure 2- 16

Figure 2- 17

1.3.3. Add Line

Click the center line button of the drawing function to add ordinary straight line, tear line--dotted line, tear line--circle, tear line--point. As shown in Figure 2-18.

Figure 2- 18

1.3.3.1. Add normal straight line

The line type is selected as a straight line, and the line length can be set, as shown in Figure 2-19 and Figure 2-20.

Figure 2- 19

Figure 2- 20

1.3.3.2. Add Tear line

The tear line type includes dotted lines, circles, or dots, as shown in

Figure 2-21, and the diameter or spacing of each unit can be set.

Figure 2- 21

1.3.3.3. Add Circle

Click the circle button in the drawing, as shown in Figure 2-22.

Figure 2- 22

1.3.3.4. Add rectangle

Click the rectangular button in the drawing, as shown in Figure 2-23.

Figure 2- 23

1.3.4. Add graph

Click the graph button, and the add interface pops up, as shown in Figure 2-24. Supported formats: dxf, plt, jpg, png, bmp, etc.

Figure 2- 24

1.3.5. Add barcode

Click the barcode button to pop up the content editing interface. The default content is a QR code of 123, as shown in Figure 2-25.

Code

Reverse: After checking, the bar code becomes reverse code, and the bar code border should be set at this time, as shown in the figure below.

（Forward）　　　　　　　　　　　（Reverse border）

Type: Select barcode type, Code128, Code39, Code93 are optional

Height: Barcode height.

Blank: When there is a border, the distance between the barcode and the border.

Text

Display text: After checking, the barcode content will be displayed.

Font: Text content font

Char height: Character height

Char space: Character spacing

Horizontal offset: The horizontal offset of the text content

Vertical offset: The vertical offset of the text content

Save to file, Timestamp, Save the file as a record, usually not used

Modified content: Click the content box behind the text to enter the content addition interface, as shown in Figure 2-26. After setting, click OK to finish adding the barcode. , As shown in Figure 2-27.

Figure 2- 25

Figure 2- 26

Figure 2- 27

Fill type modification: Click Fill to enter the fill type modification interface. Fill types include points, lines, circles, and normal. As shown in Figure 2-28.

Figure 2- 28

Line fill

Fill type selection line, you can modify the line spacing or indent.

Normal fill

Select the normal filling type, as shown in Figure 2-29, click Enable Filling, you can modify the filling angle, fill line spacing, and whether to enable the border.

Filling type:

Optimize line filling: line filling is zigzag

Ordinary line filling: fill the line and move the pen up and down

Other parameters: Modify the filling details, as shown in Figure 2-30.

Figure 2- 29

Figure 2- 30

Margin: Distance between filled line and enabled frame.

Straight indent: Distance between straight line and enabled frame.

Boundary ring number: Number of borders

Ring spacing: Distance between frame and frame

Multiple fills: Filling times

Every offset: The previous and next offset angle

1.3.6. Add QR code

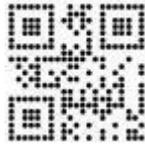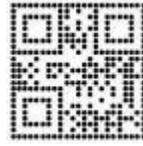Click the QR code button on the homepage to enter the QR code editing interface. The default content is 123 QR code, as shown in Figure 2-31.

Figure 2- 31

Code

Reverse: After ticking, the QR code will be reversed. After the reverse, the surrounding borders are generally added, that is, the upper and lower borders, and the left and right borders are changed to 1. The

comparison is as follows:

（Forward）　　　　（Reverse border）

If the contrast is not enough, you need to reverse the barcode and add a frame. Example: White cover hits black ,The QR code does not need to be reversed, and the brown-yellow cover needs to be reversed and framed, as shown below.
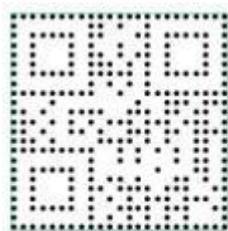

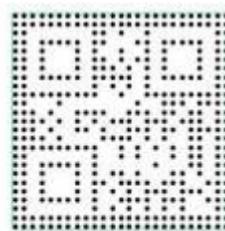**Type:**Available types: QRCODE, PDF417, DATAMATRIX

Version:QR code version size

Grade:QR code error correction level

Frame: The width of the filled border. Example: 1 is 1 unit border, 2 is 2 unit borders, as shown below

1 unit border　　　　2 unit border

Text

Display text: Show QR code content

Font: Select QR code content font

Char height: Character height

Char space: Character space

Horizontal offset: The horizontal offset of the text content

Vertical offset: The vertical offset of the text content

Save to file, timestamp, save the file as a record, usually not used

Modified content: Click the content box behind the text to enter the content addition interface, as shown in 2-32. After setting, click OK to complete the addition of QR code, as shown in Figure 2-33

Figure 2- 32

Figure 2- 33

QR code filling

Click Fill, select the barcode filling method, as shown in Figure 2-34

Figure 2- 34

Fill type: Choose the filling method of the barcode, you can choose

points, lines, circles or ordinary.

Point fill:

Add a QR code with the content (ABCDEFG1234567980), and select

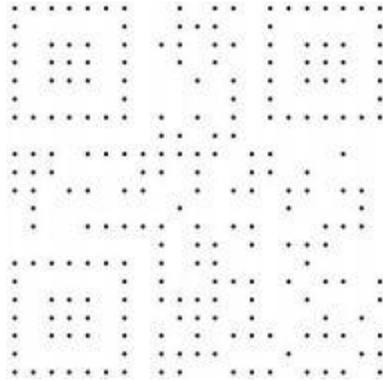single point filling in the filling type, as shown in 2-35

Figure 2- 35

Line fill:

Add a QR code with the content (ABCDEFG1234567980) (line spacing:

0.2mm, indent: 0.1mm), select line filling in the fill type, as shown in

Figure 2-36, change the spacing or margin (line spacing: 1mm , Indent by
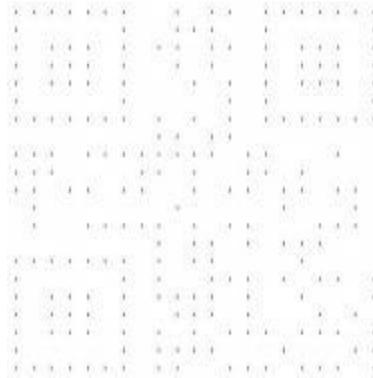
0.2mm), as shown in Figure 2-37.

Figure 2- 36

Figure 2- 37

Circle fill:

Add a QR code with the content (ABCDEFG1234567980) (line spacing: 0.1, indent: 0), select the circle fill in the fill type, as shown in Figure 2-38, change the spacing or margin (line spacing: 0.5mm, Indent: 0.05mm), as shown in Figure 2-39.
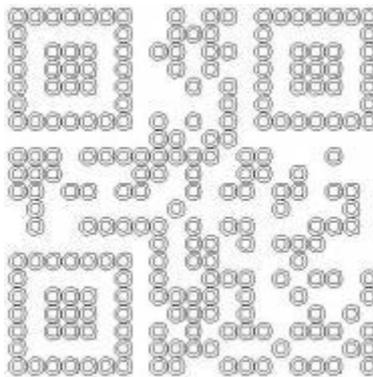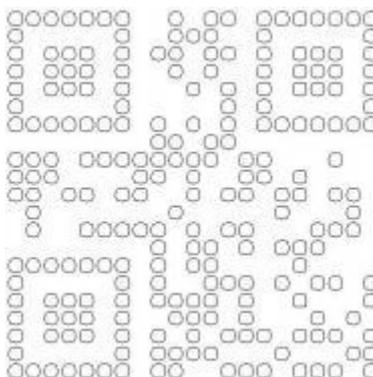

Figure 2- 38

Figure 2- 39

Ordinary fill:

Add a QR code with the content (ABCDEFG1234567980) in the fill

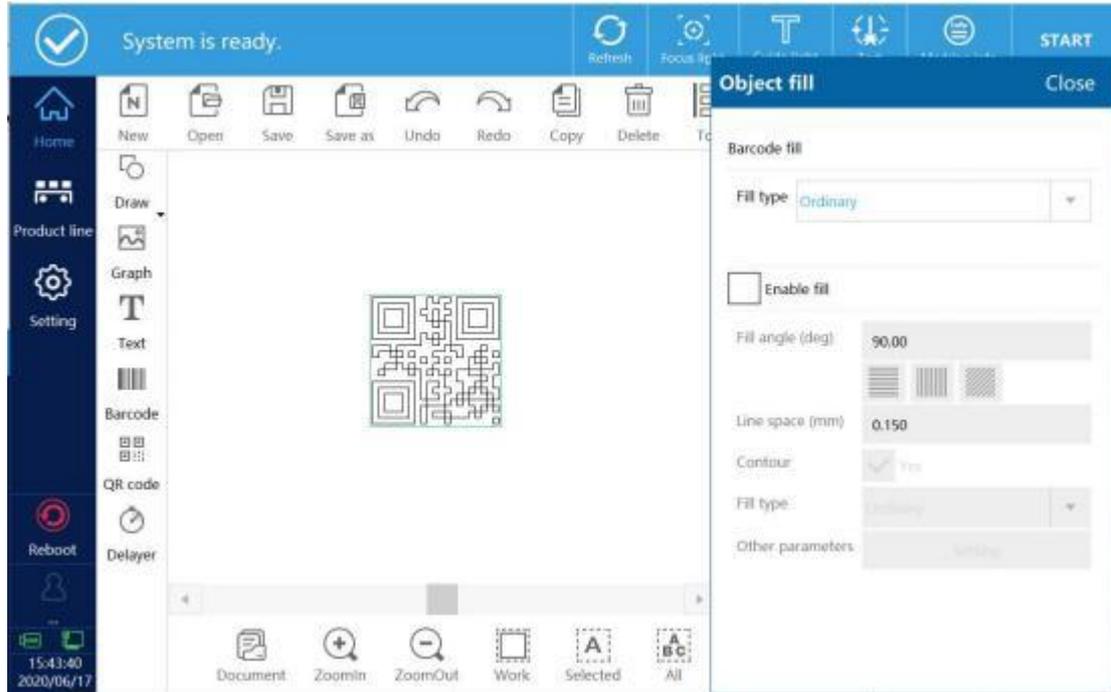type Select normal fill, as shown in Figure 2-40

Figure 2- 40

Select Enable filling, as shown in Figure 2-41, you can change the

filling angle, line spacing, whether to enable the outer frame, whether to

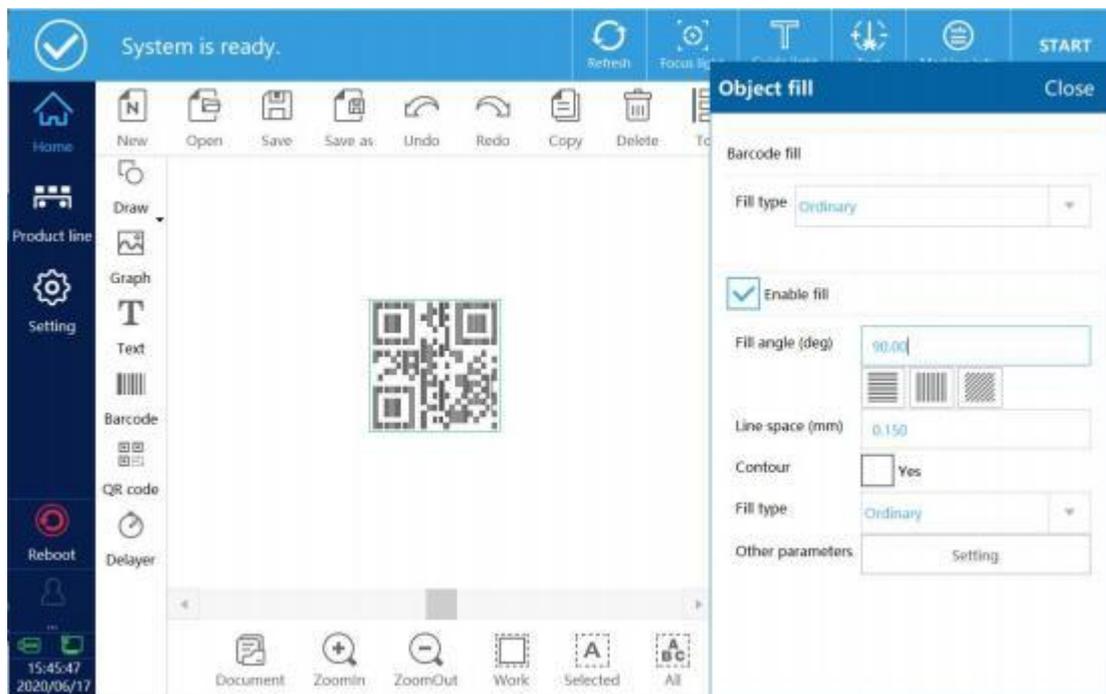optimize the line filling, QR code effect shown in Figure 2-42.
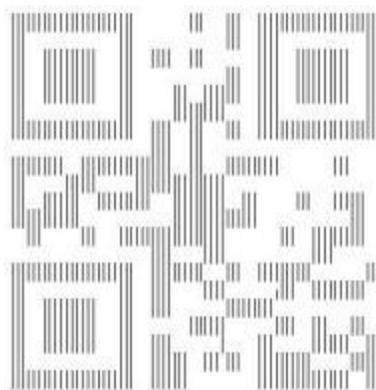
Figure 2- 41

Figure 2- 42

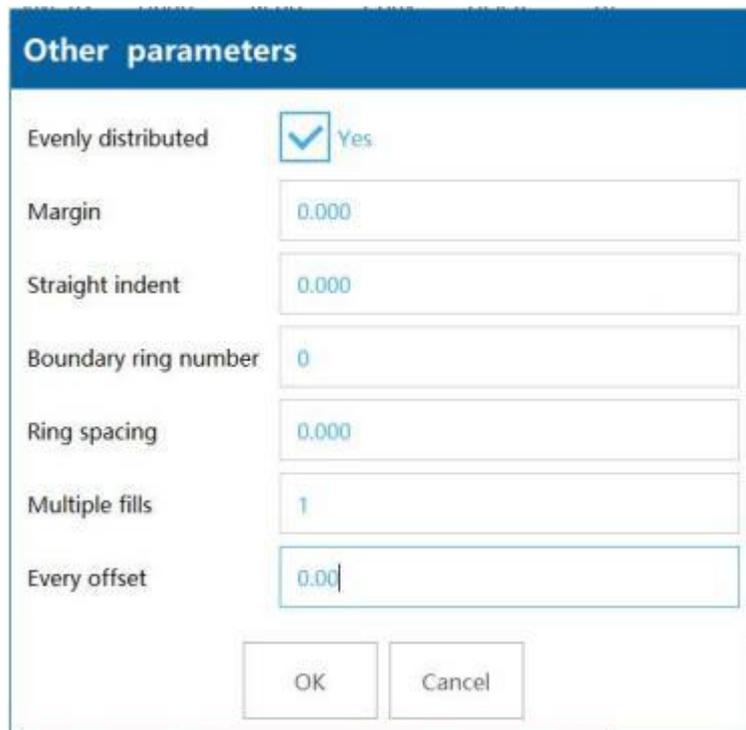**Fill other parameters:**As shown in Figure 2-43

Figure 2- 43

Margin: Distance between filled line and enabled frame.

Straight indent: Distance between straight line and enabled frame.

Boundary ring number: Number of borders

Ring spacing: Distance between frame and frame

Multiple fills: Filling times

Every offset: The previous and next offset angle

1.3.7. Add delayer

Click the homepage delay button to pop up the editing interface, which can modify the time of the delay. This function is only effective for the static function, and the delay must be added before the marking object, and the position of the delay can be adjusted in the object list , As shown in Figure 2-44.
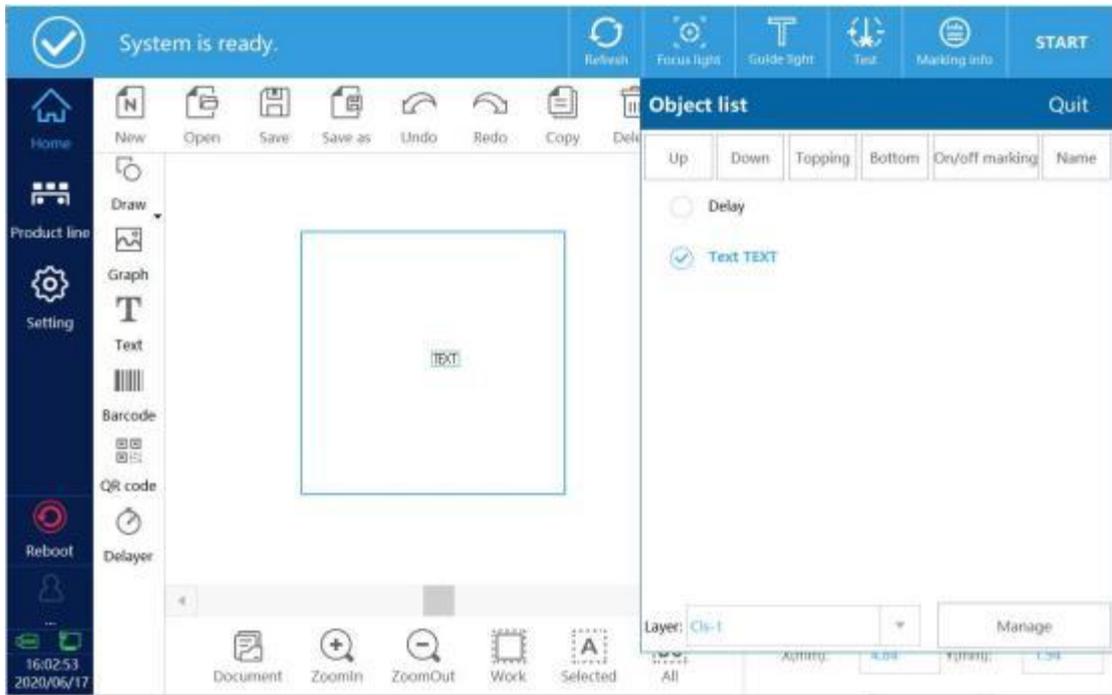
图 2- 44

1.3.8. New

Click the New button, it will pop up whether to save the last edited data. If you want to save, click OK, then the name of the new data file will pop up, enter the name to save the file (for example: 123), as shown in Figure 2-45.
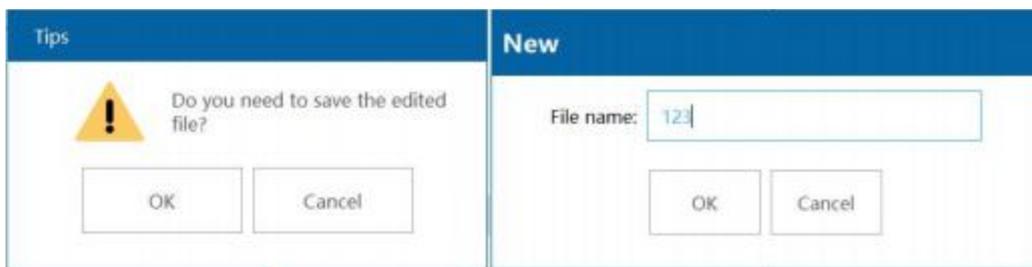

Figure 2- 45

1.3.9. Open

Click the Open button to open the file saved in the system internal

file or USB. If the internal file 123 is selected, click OK, as shown in Figure 2-46.
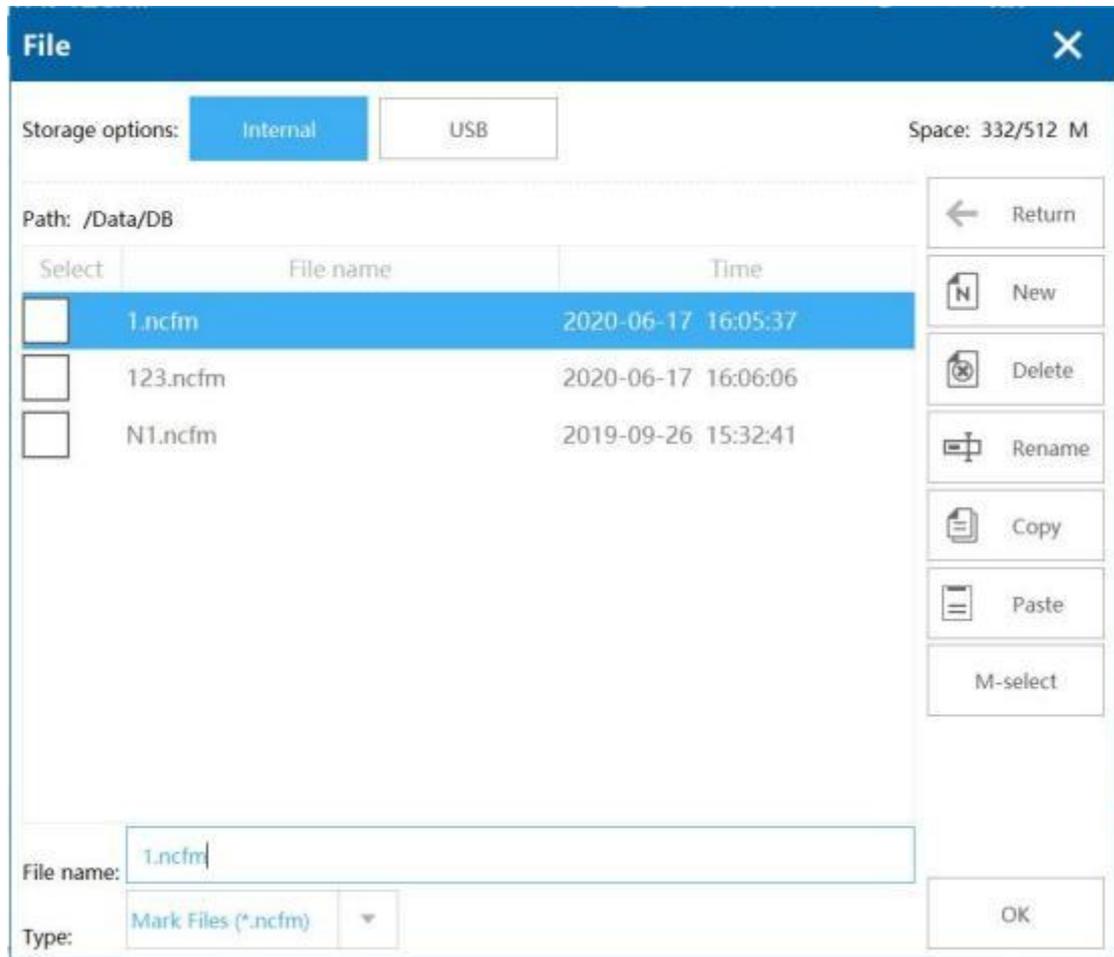

Figure 2- 46

Return: Return to the previous directory

New: Create a new file

Delete: Delete Files

Rename: Rename file

Copy: Copy files (you can copy the files in the USB to the system or copy the internal files to the USB)

Paste: Paste the copied file

1.3.10. Save

Save files

1.3.11. Save as

Save file

1.3.12. Undo

Cancel last operation

1.3.13. Redo

Perform the last undo action

1.3.14. Copy

Copy the selected data, and then click the blank area to automatically

paste

1.3.15. Delete

Delete data

1.3.16. Tool

The tool functions include: alignment, distribution, group,combination

and conversion to curves and other functions

When there are multiple data, you can align the data up, down, left,

right or center.

When there are more than three data, the horizontal and vertical

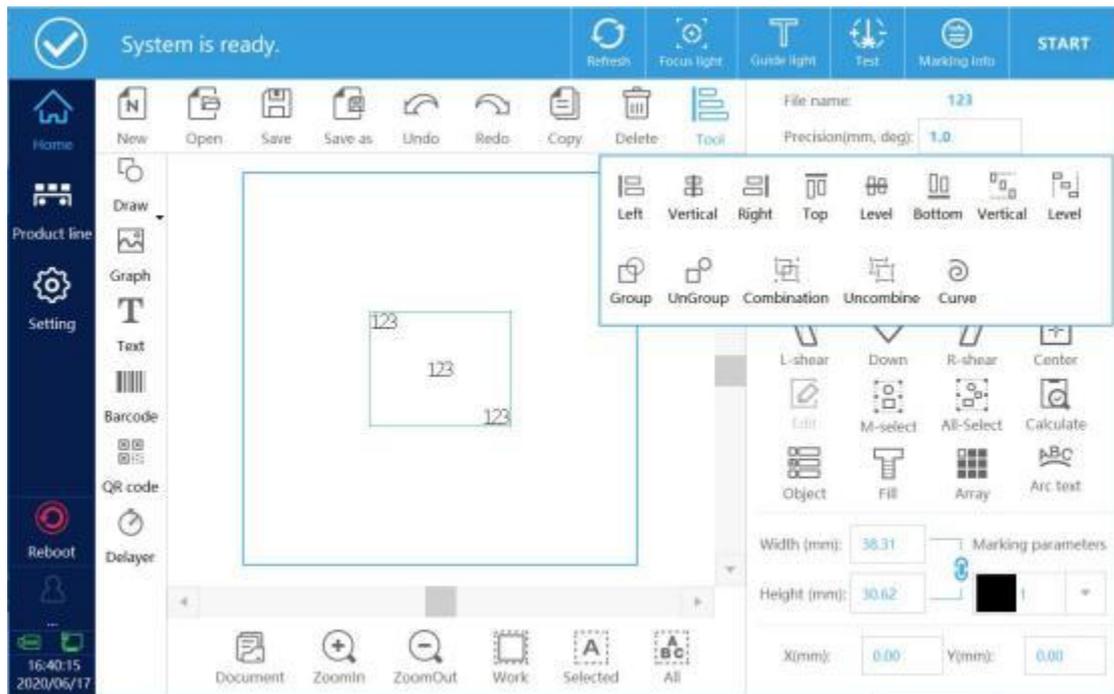alignment of the data can be achieved, as shown in Figure 2-47.

Figure 2- 47

Group: Two or more objects can be combined into one object

Ungroup: Re-separate the assembled objects

Combination: Combine multiple vectors

Uncombine: Separate vector or text content into a single vector

Curve: Convert text to vector

1.3.17.　Object

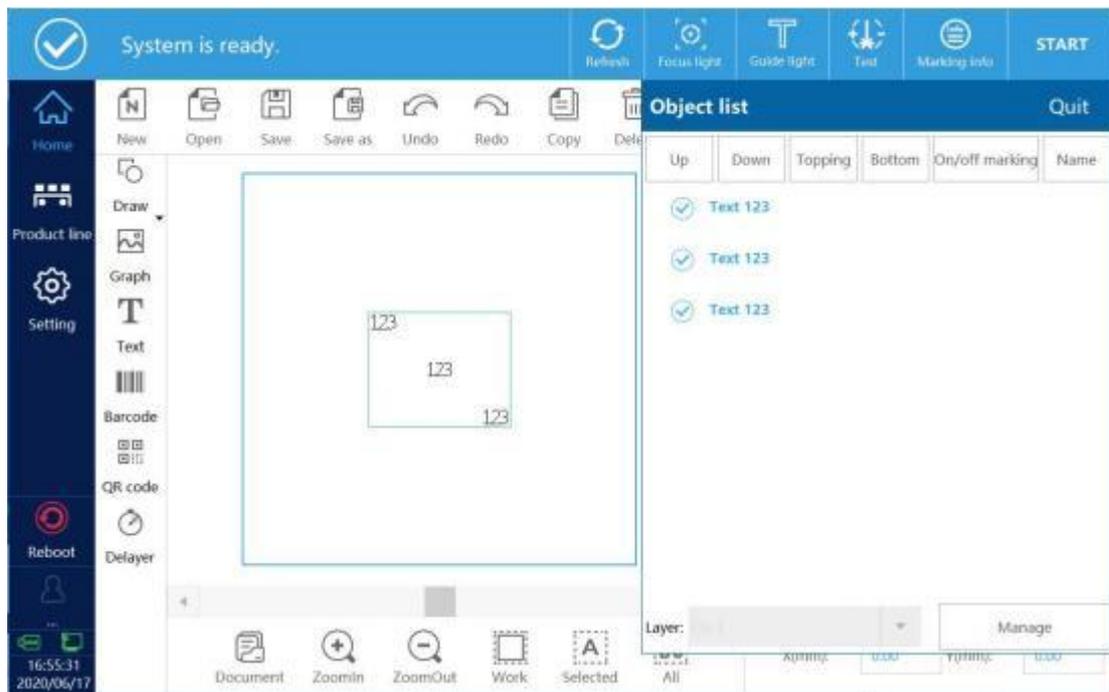The files existing in the current edit box are shown in Figure 2-48.

Figure 2- 48

Up: Move the selected object upwards, adjust the marking order of the objects, and the marking order is from top to bottom

Down: Move the selected object down, adjust the marking order of the objects, marking order from top to bottom

Topping: Move the selected object to the top

Bottom: Move the selected object to the bottom

On/off marking: The selected object can be turned on or off coding

Layer: If there are three pieces of data at the same time, the next piece of data can be marked after the previous one is marked, you need to add a layer, set each piece of text as a single marking layer, change the marking order, and click Manage, as shown in Figure 2-49 As shown. Example: There are three pieces of data in the current edit box, you need to mark the previous one and then mark the next one. At this time, you

need to add three layers, each layer has a serial number, and the start delay of each layer must be set to a value , Can be set to 1. Click OK to return to the home page, as shown in Figure 2-50, each data needs to select a different layer number at the layer.
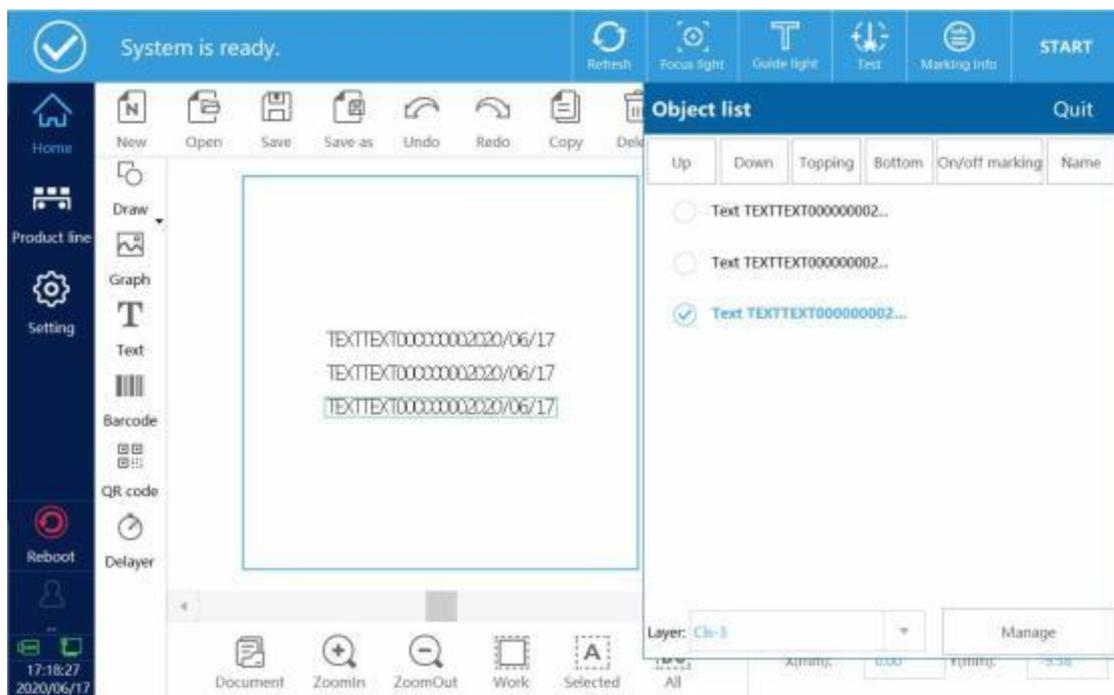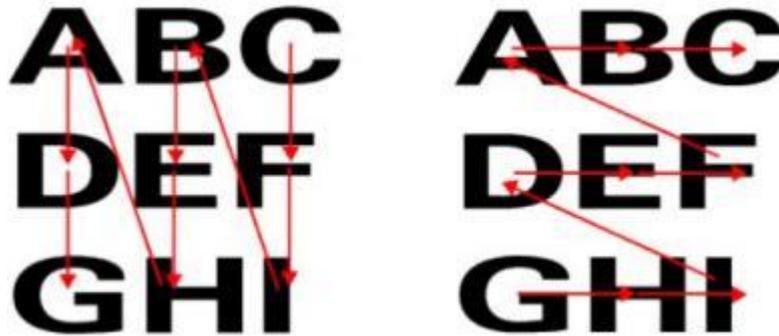

Figure 2- 49

Figure 2- 50

Marking order of the same layer on the left, marking order of different layers on the right

1.3.18. Arc text

Click the arc text button to modify the current data into arc text, as shown in Figure 2-51. Click Yes, the data will become arc text.
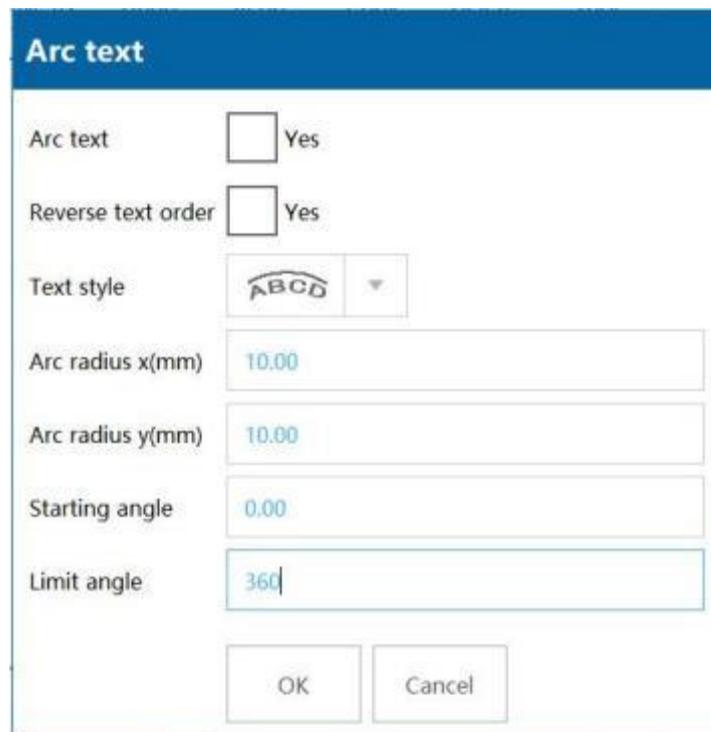

Figure 2- 51

Reverse text order: Text sorting direction

Text style: Choose according to picture

Radius X: Radius of arc text on X axis

Radius Y: Radius of arc text on Y axis

Starting angle: The starting angle of the first character

Limit angle: The angle range of the arc circle (for example, 360-degree arc-shaped text is arc-shaped text, 180-degree arc-shaped text is semi-circular arc-shaped text, as shown in Figure 2-52)
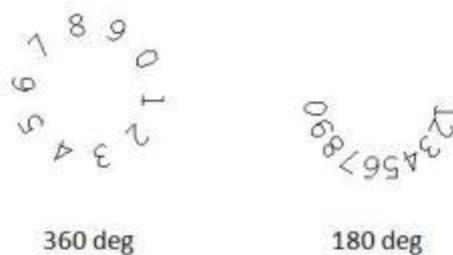

360 deg   180 deg

Figure 2- 52

1.3.19.   Fill

When the font is double-lined, or when the picture is a vector diagram end to end, you can fill it, as shown in Figure 2-53.
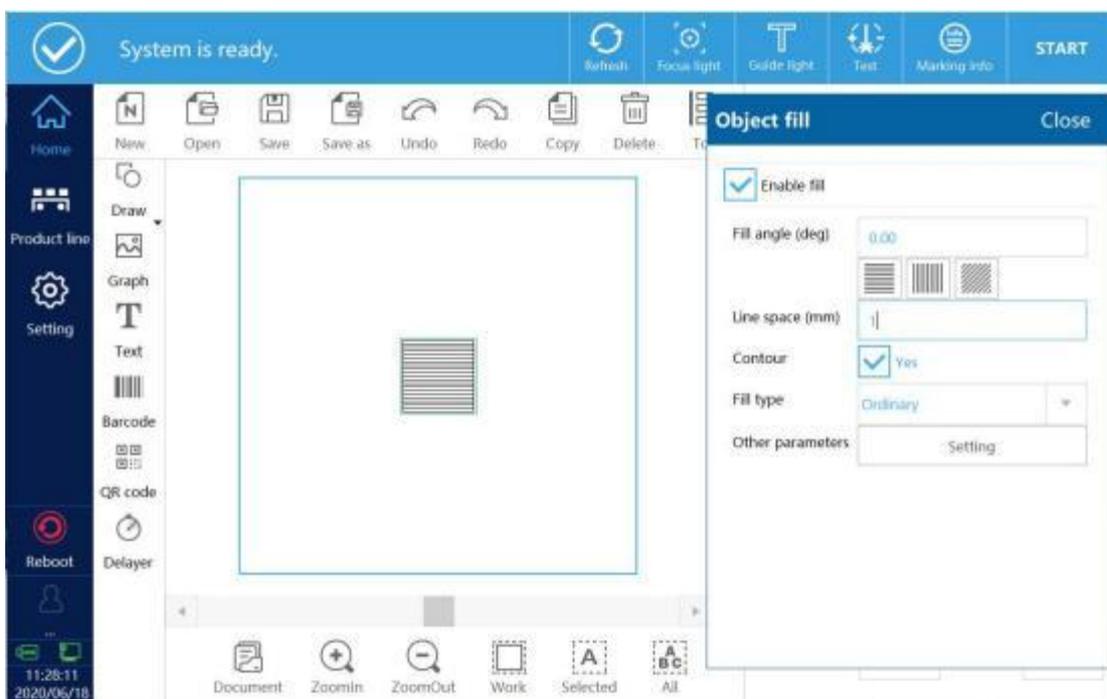
Figure 2- 53

Enable fill: After selected, it can realize graphics or font filling

Fill angle: The angle between the line filling and the X axis, you can choose the graphics to quickly fill

Line space: Distance between filled lines

Contour: Whether to enable the frame

Fill type: Optimize line filling (to reduce the marking time), normal line filling static marking according to the direction of the arrow to mark, as shown in Figure 2-54
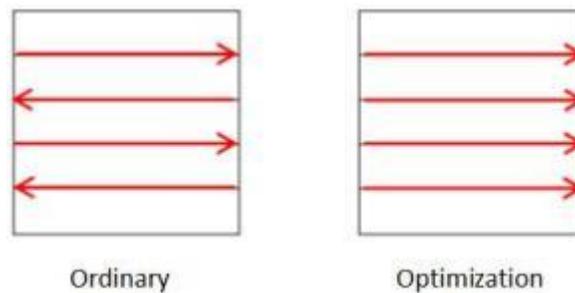

Figure 2- 54

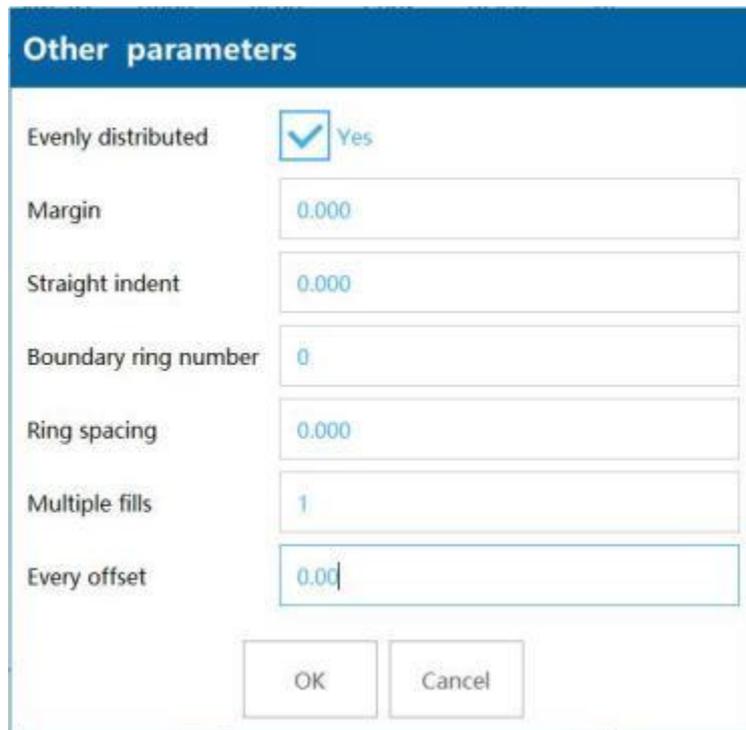**Other parameters:**As shown in Figure 2-55

Figure 2- 55

Margin: Distance between filled line and enabled frame.

Straight indent: Distance between straight line and enabled frame.

Boundary ring number: Number of borders

Ring spacing: Distance between frame and frame

Multiple fills: Filling times

Every offset: The previous and next offset angle

1.3.20. Array

Arrange the objects in an array, as shown in Figure 2-56, you can set the number of X/Y directions and the distance between them. After setting, click OK to confirm as shown in Figure 2-57
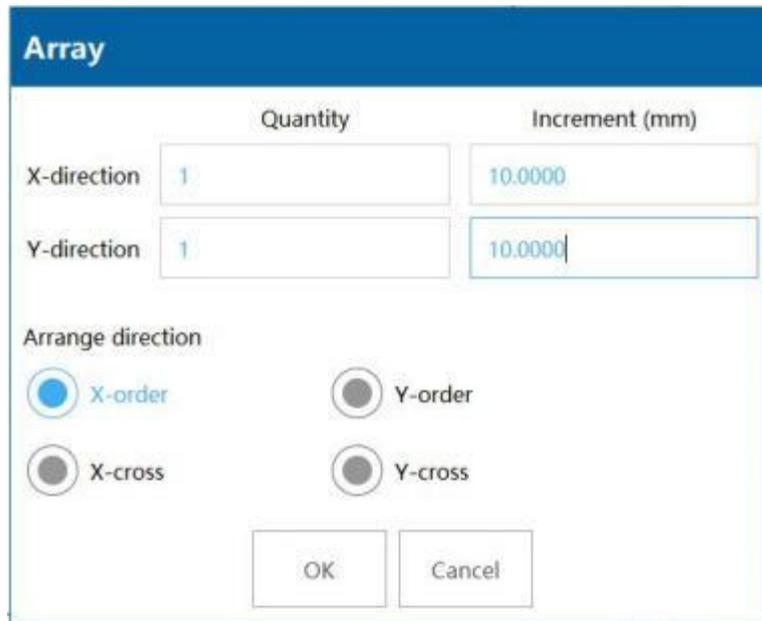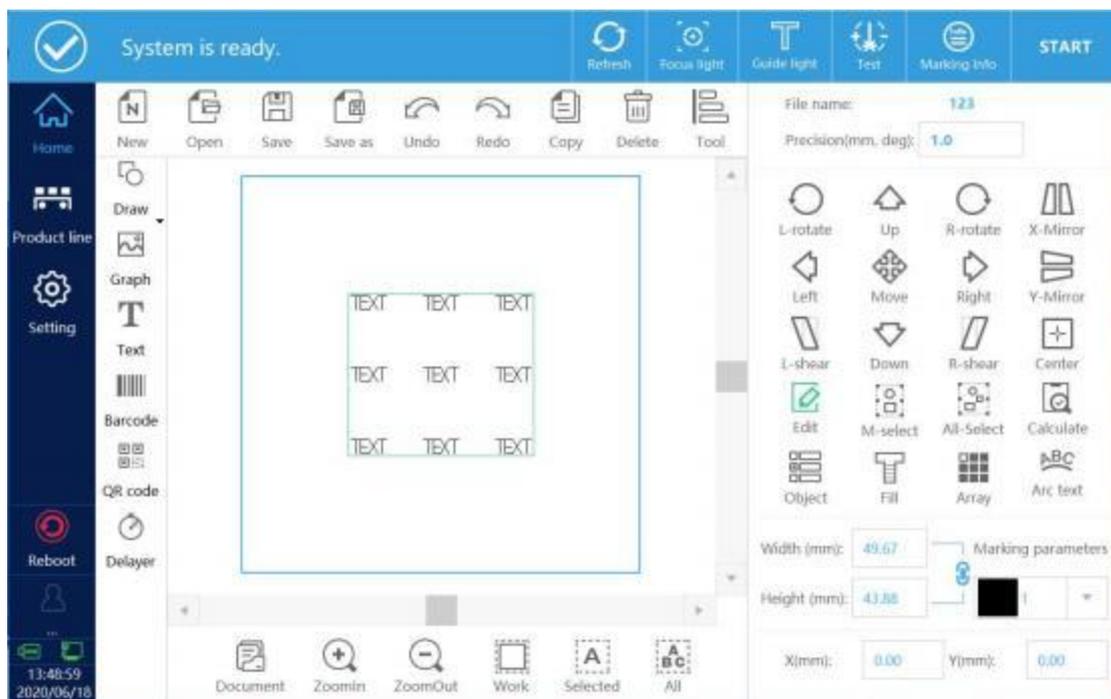
图 2- 56

Figure 2- 57

1.3.21. Marking parameters

Select the color block corresponding to the marking parameters. The marking parameters can be modified in the setting function-----spraying parameters. Different text can choose different color blocks, and the

same color block can also be selected.
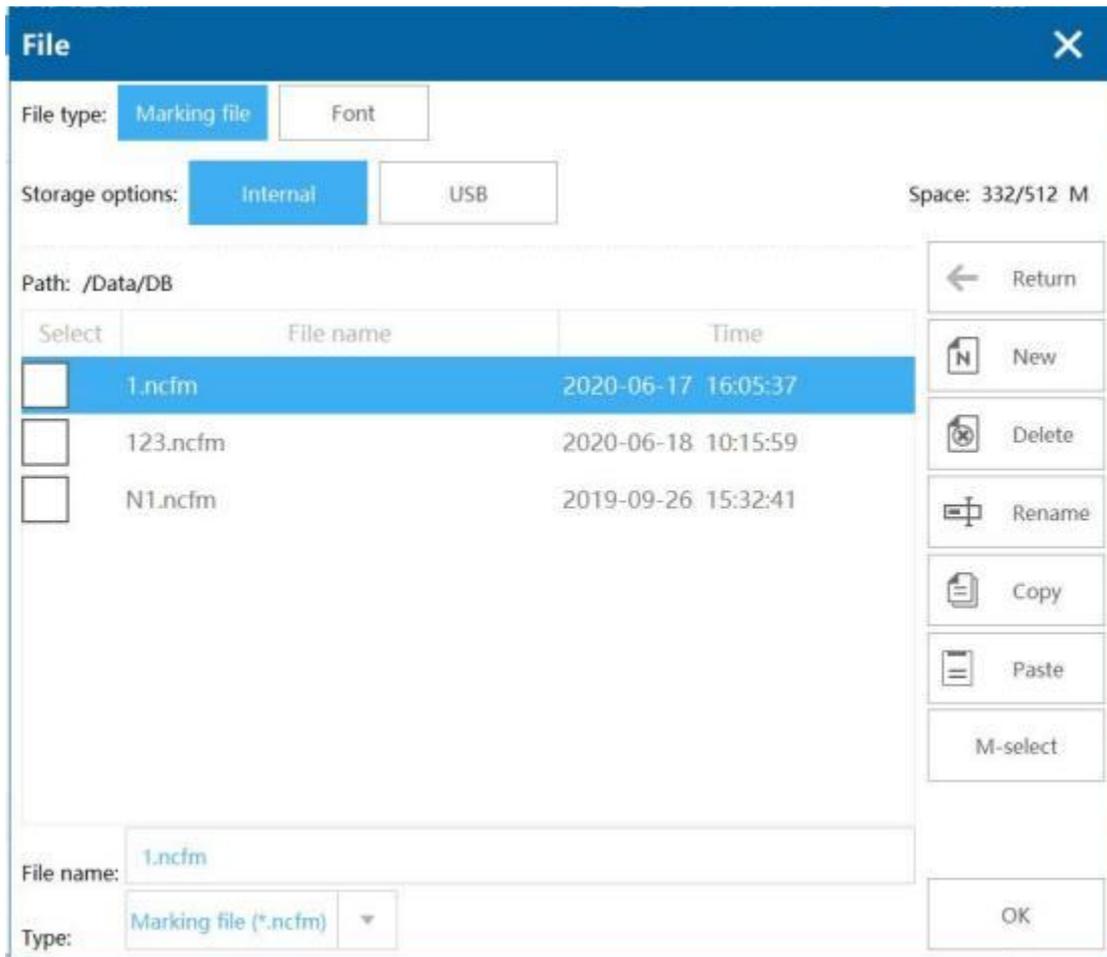
1.3.22. Dimensions and coordinates

Modify the text size and text coordinate position, as shown in Figure 2-58, click the associated button to modify the width or height individually g

宽度(mm): 49.67   喷码参数
高度(mm): 43.88   ▮   1   ▼
X(mm): 0.00   Y(mm): 0.00

Figure 2- 58

1.3.23. Document management

Document management: Manage spray files and fonts, as shown below

Marking file management

You can copy the files saved in the system to the U disk, and you can also copy the files in the U disk to the system.

How to use: 1. Click inside, select the file, and click Copy

2、Click USB, click Paste, the system internal files are successfully copied to the U disk

Font management

Users can upload fonts to the inside of the system, support upload format: ttffont format,

How to use: 1. Insert the U disk with TTF font format into the USB

socket

2、Click the font, then USB, click the font on the upper right, Select the double-line font, click USB again, then select the TTF font and click the import button

3、After the system prompts that the font is successful, restart the system

1.4. System toolbar

Document: Manage spray files and fonts

ZoomIn: Zoom tool

ZoomOut: Zoom out tool

Work: Show the entire marking area

Selected: Maximize display of selected objects

ALL: Maximize all objects

2. Keyboard introduction

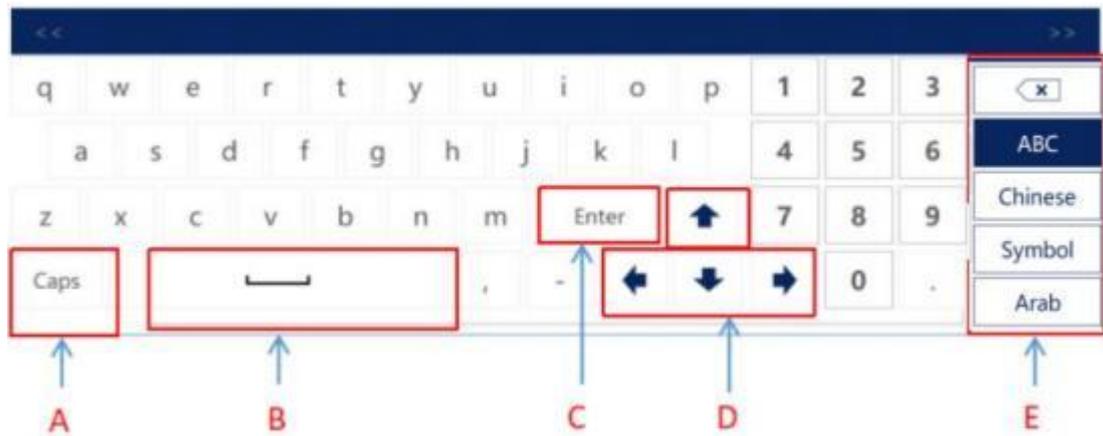The keyboard interface is shown in Figure 2-59

图 2- 59

A： Capitalization switch

B： Space bar

C： Newline key

D： Cursor up, down, left and right

E： Delete, input method switch, close (Note: Chinese is Pinyin input)

3. Production line settings

3.1.1. Static coding settings

1、Pipeline settings

    The direction of the pipeline is selected to be stationary, as shown in Figure 3-1
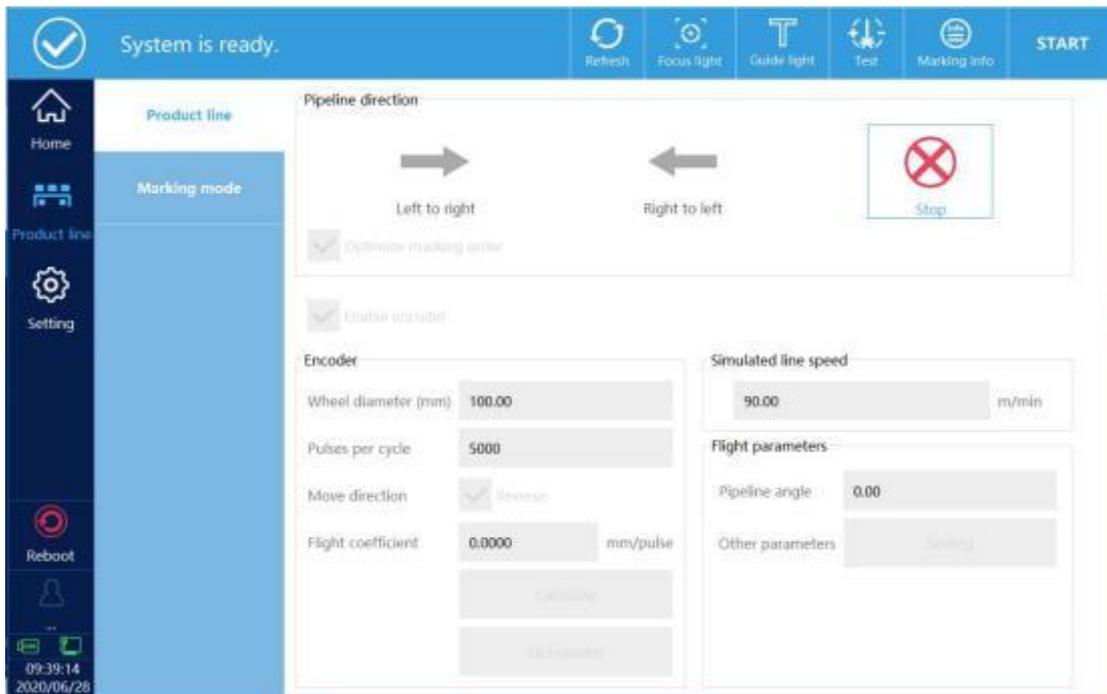
Figure 3- 1

2、Marking mode settings

Marking mode can choose jog mode or signal trigger mode.

3.1.1.1. Jog mode

Marking mode is changed to jog mode, as shown in Figure 3-2.

Pedal Mode: When the mode is jog mode, the pedal mode can be selected as the trigger signal, and the foot filter can be set. After clicking to start marking, wait for the foot signal before marking.

Cont. Mode: When checked, click once to start marking and continuous marking according to the time interval. When not checked, click once to start marking once.

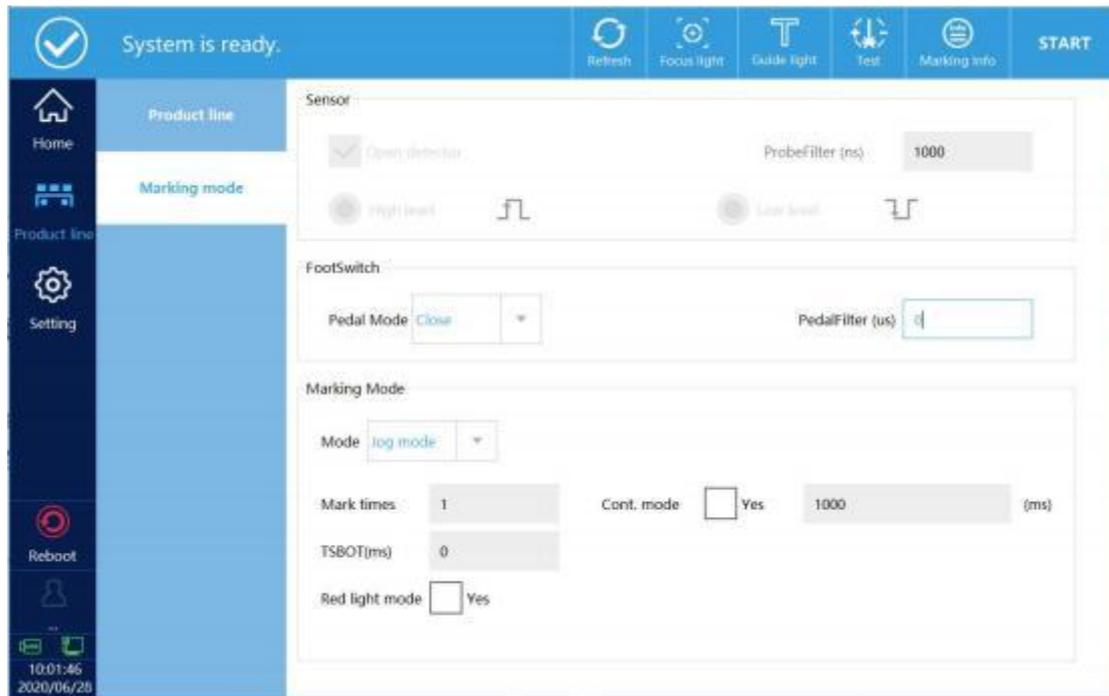**Red light mode:**After marking, the red light guide runs automatically.

Figure 3- 2

3.1.1.2. Trigger marking mode

Marking mode selects the sensor mode, as shown in Figure 3-3. In this mode, the sensor must be turned on, otherwise no trigger signal will be received. In this mode, the foot switch will not take effect.

Open detector: Must be checked, otherwise the trigger signal cannot be received without marking, and the sensor filter can be set.

Level setting: Select the level trigger polarity (high level or low level trigger)

Mark times: After clicking to start marking, the sensor triggers a signal and the system performs several markings.

TSBOT: Within the set time, the system will automatically shield the trigger signal received by the sensor.
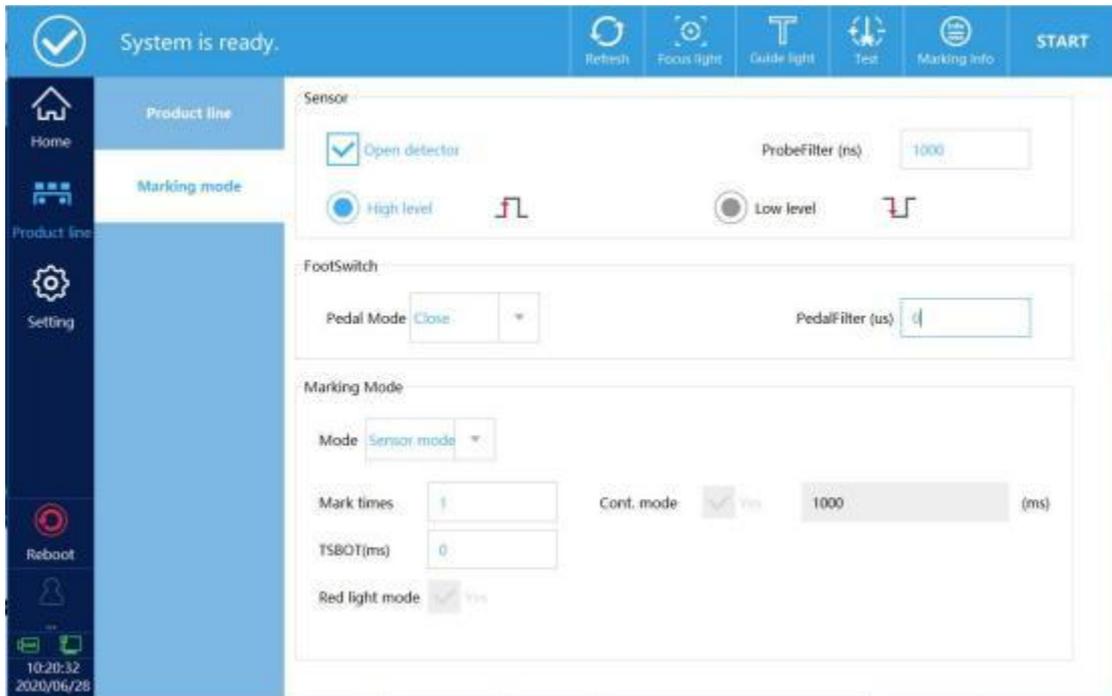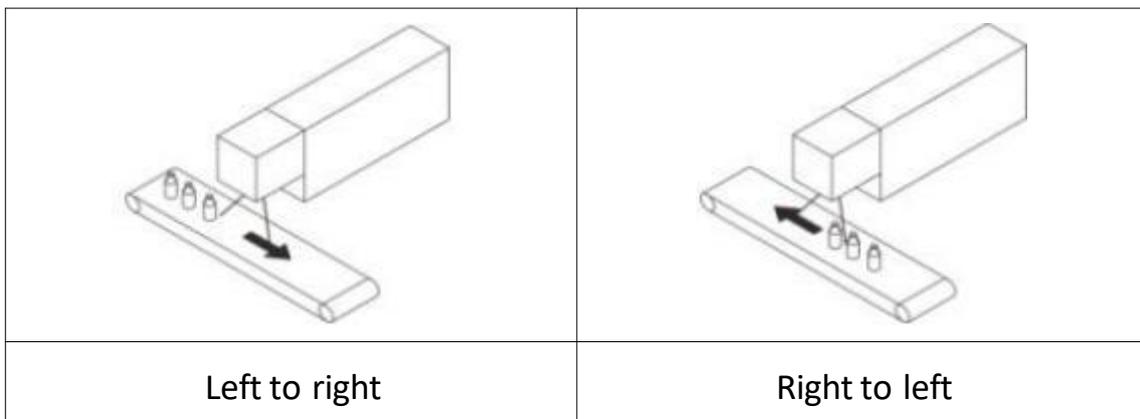
Figure 3-3

3.1.2. Flight marking settings

The direction of the pipeline is selected from left to right or from right to left, according to the situation of on-site coding, as shown in Figure 3-4.
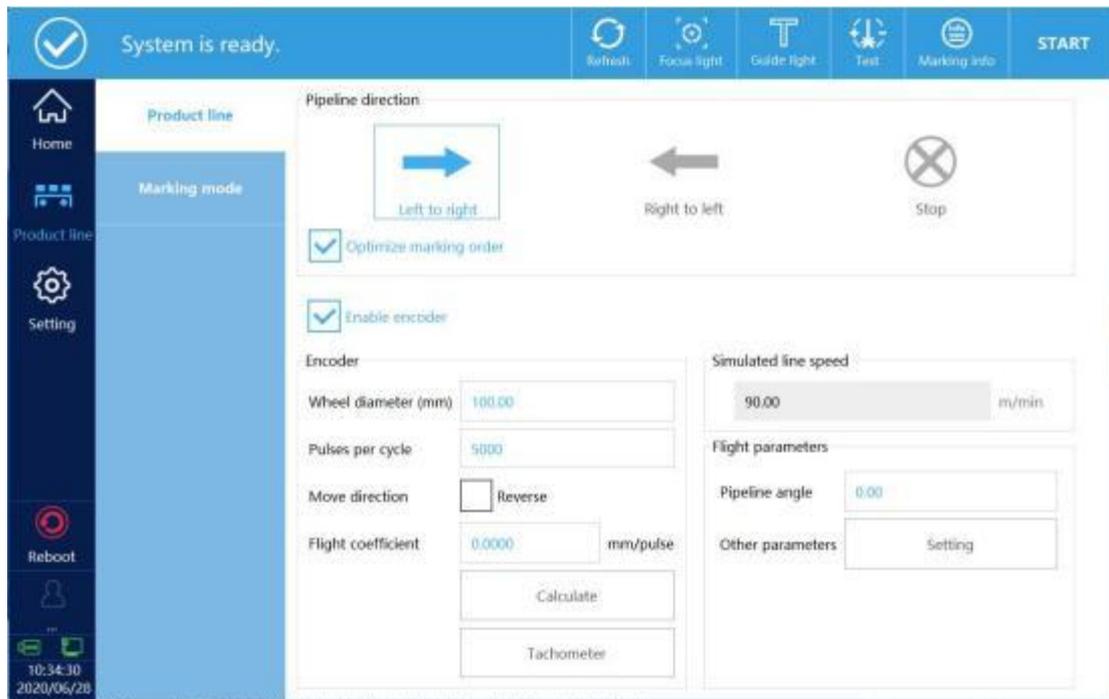
Left to right	Right to left

Figure 3-4

Optimize marking order: The comparison between optimized coding order (left) and non-optimized (right) is as follows.

Enable encoder: When checked, the encoder is used to mark the pipeline speed simultaneously; when unchecked, it is marked with the analog pipeline speed.
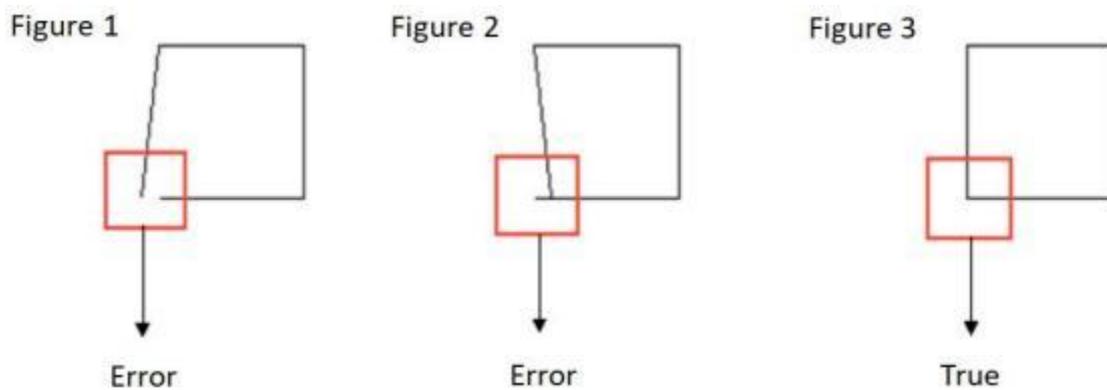
Encoder settings:

Wheel diameter: The diameter of the wheel mounted on the encoder.

Pulses per cycle: The number of encoder pulses can be obtained on

the encoder label.

Move direction: Click to calculate the coefficient and speed to automatically identify whether to run in reverse

Flight coefficient: Click the calculation coefficient to automatically obtain the flight marking coefficient (this value is the calculated value, fine-tuned according to the marking effect on site).

Figure 1   Figure 2   Figure 3

Error   Error   True

When the situation in Figure 1 or Figure 2 occurs, increase or decrease the coefficient according to the on-site laser placement direction and the pipeline direction until the figure marked is shown in Figure 3.

Pipeline angle: The angle between the laser and the pipeline, when the laser machine and the pipeline have a small angle, and the physical adjustment is not accurate enough, the angle can be corrected by software modification. The pipeline angle is shown in Figure 3-5.
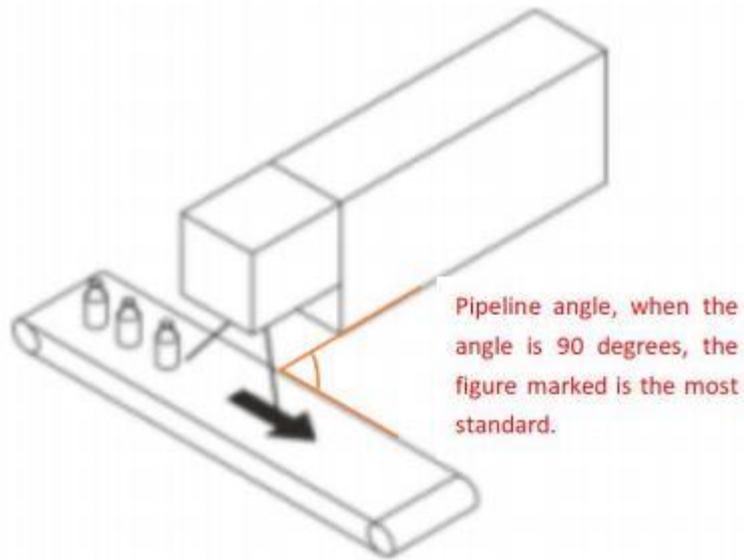
Figure 3- 5

If the angle is incorrect, the following two situations will appear, as shown in Figure 3-6
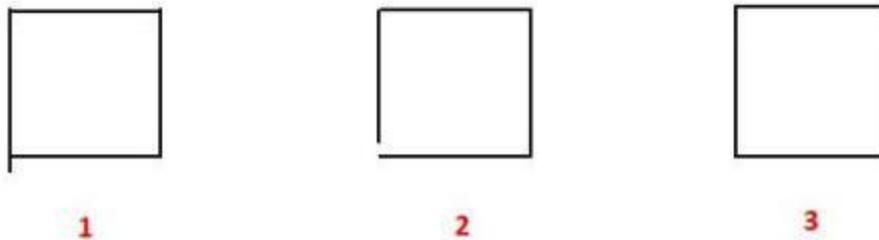

Figure 3-6

When the situation of Figure 1 or Figure 2 occurs, increase or decrease the angle of the pipeline (can be changed to a negative number) according to the direction of the laser placement on the site and the direction of the pipeline, until the marked figure is shown in Figure 3.

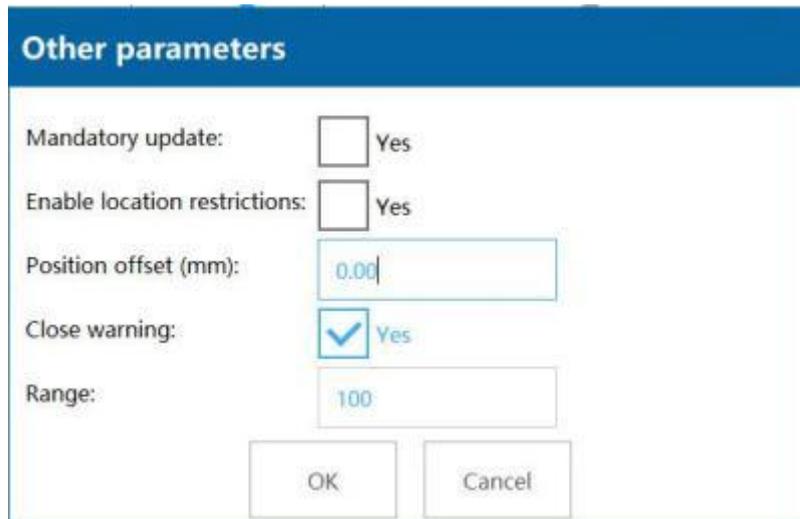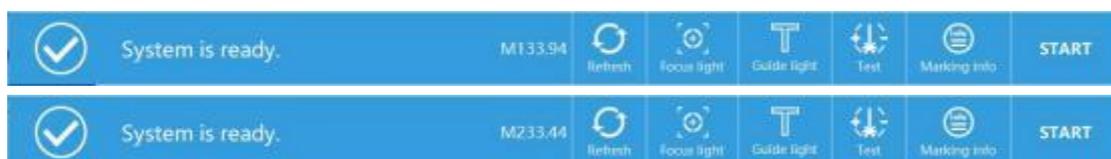**Other parameter:**The interface is shown in Figure 3-7.

Figure 3-7

Mandatory update: If the current information is fixed content (excluding changes), if you want to realize the online update function, you must select "Yes" to force the update.

Enable location restrictions: When unchecked, the laser emits light from the edge of the galvanometer to increase the pipeline speed of the data; when checked, the laser emits light according to the position of the galvanometer where the data is located. For example: add the code content: 2020/06/28, the data is centered by default, click the calculation function, when checked, the current position of the data is allowed. The fastest pipeline speed: 133.94m/min. When not checked, the fastest line speed is obtained: 233.44m/min, as shown in the comparison below.

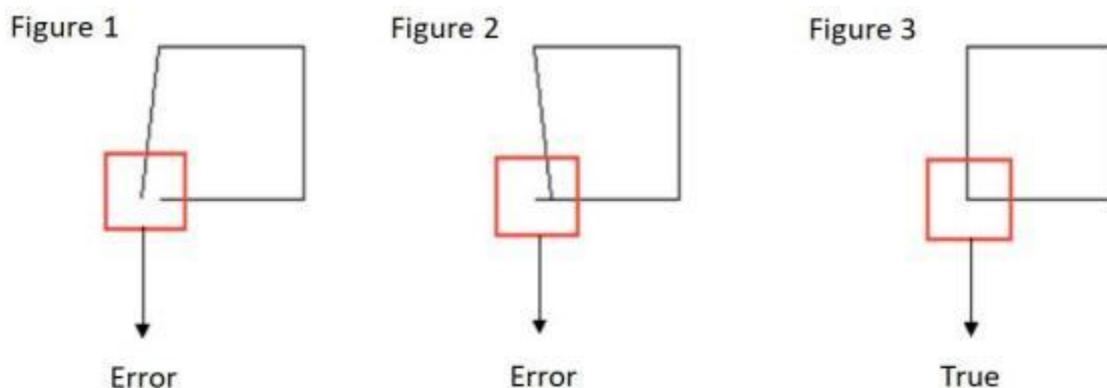**Position offset:**This value will only take effect when Enable Location

Limitation is not checked. Example: The value is 10mm, that is, the laser light exits from the edge 10mm.

Close warning: Close all alarms, that is, no alarm prompt appears at the top of the interface.

Range: This feature is temporarily unavailable.

Simulated line speed setting

Setting method: Use the encoder unchecked, as shown in Figure 3-8. Measure the line speed first, then fill the line speed into the fixed speed. When the following conditions occur during marking, the fixed speed can be modified until normal.

When the situation in Figure 1 or Figure 2 occurs, increase or decrease the simulation speed value according to the on-site laser placement direction and the pipeline direction until the marked figure is shown in Figure 3.
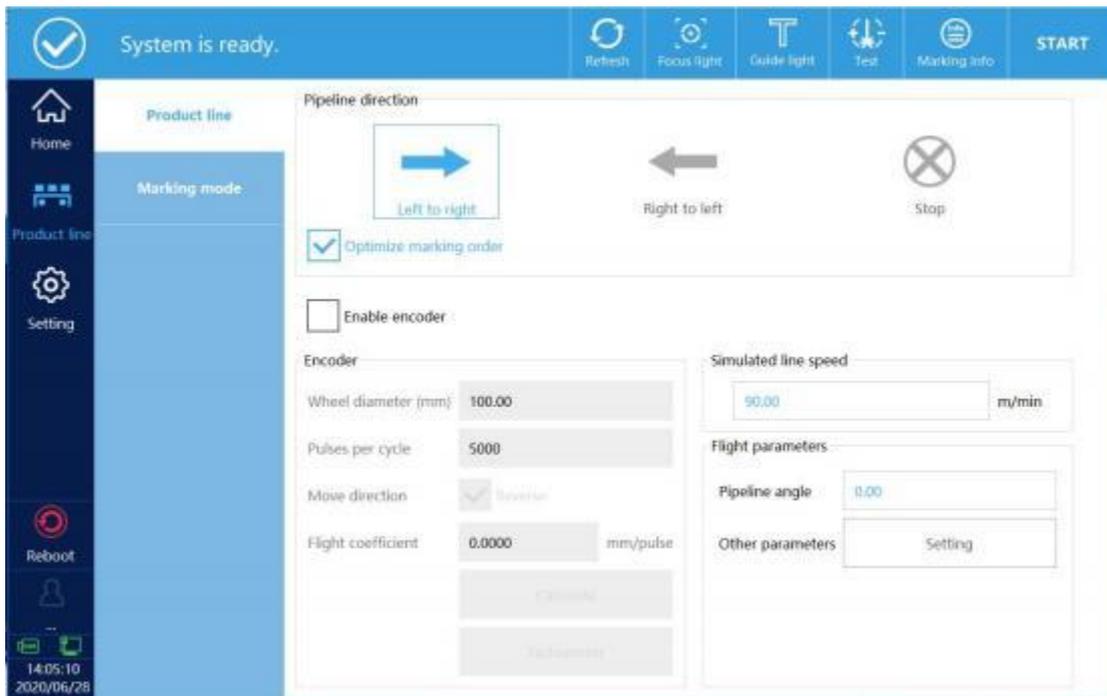
Figure 3-8

Marking mode settings

Three marking modes: normal mode, pipeline mode, continuous marking mode

3.1.2.1. Normal mode

Select normal mode for the coding mode, and the sensor is turned on, as shown in Figure 3-9.

Sensor distance: Probe distance, that is, the distance between the probe installation position and the marking position.

TSBOT: Within the set distance, the system will automatically shield the trigger signal received by the sensor.
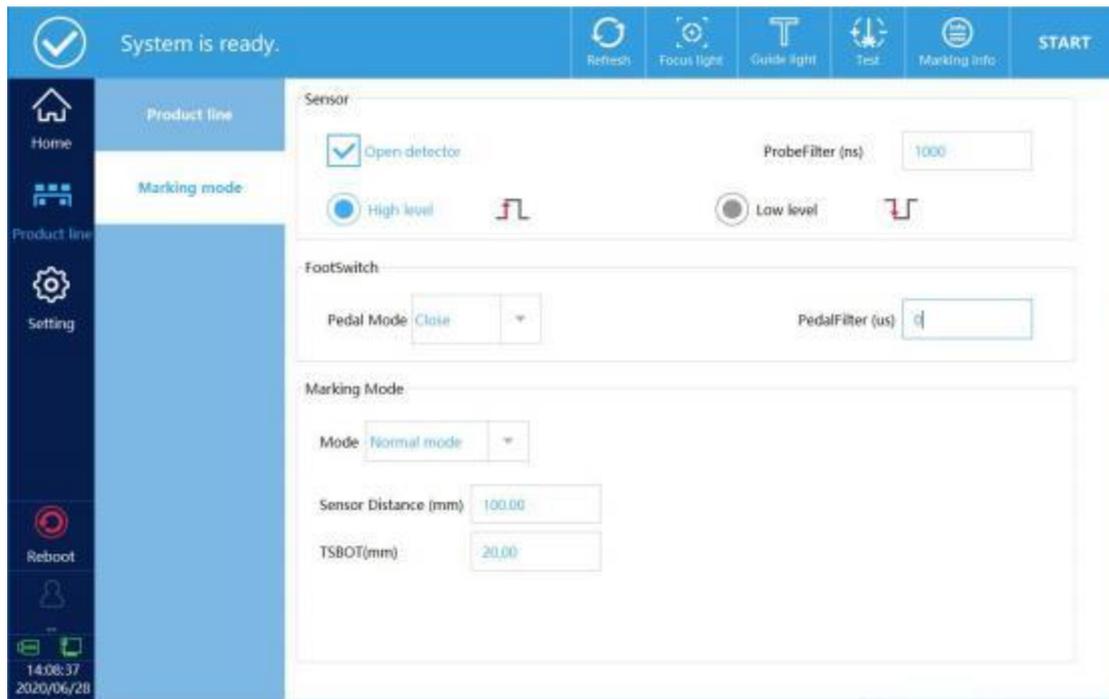
Figure 3-9

3.1.2.2.　Pipeline mode

The marking mode selects the pipeline mode, as shown in Figure 3-10

Starting distance: From the moment you click to start marking, the code starts to be coded after this distance.

Mark distance: The distance between the last marking and the next marking.
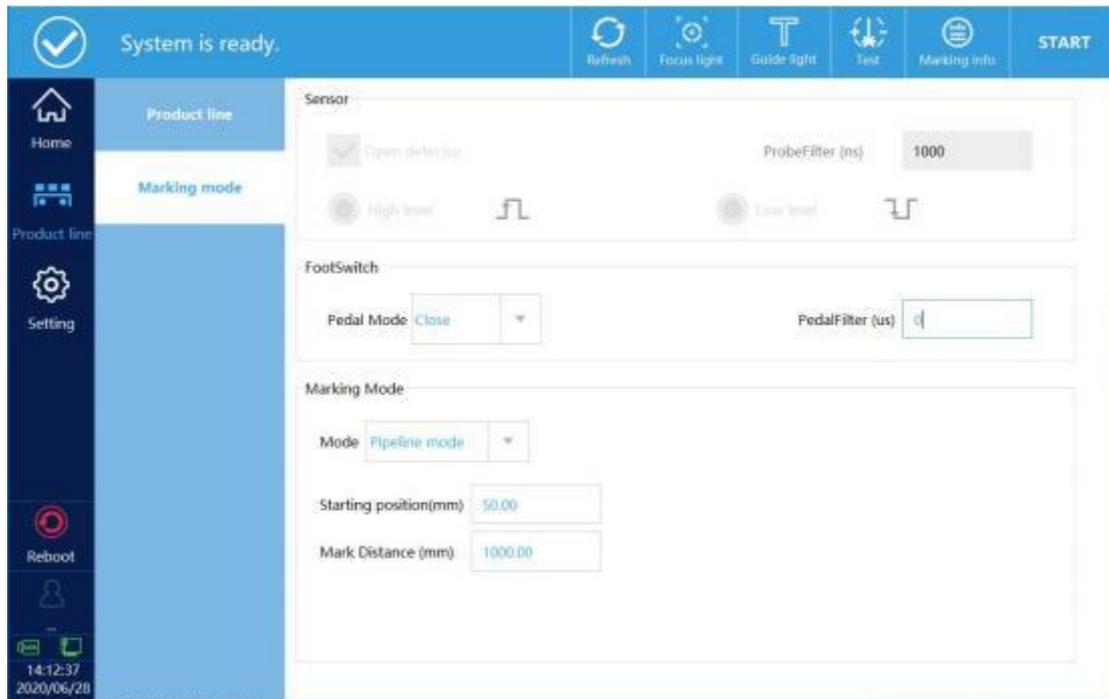
Figure 3-10

3.1.2.3. Continuous mode

Select continuous coding for the coding mode, as shown in Figure 3-11. At this time, the sensor must be turned on and the code will be printed only when the sensor is always at a high level.

Sensor distance: Probe distance, that is, the distance between the probe installation position and the marking position.

Mark times: Set the number of continuous coding, when there is no limit, when the sensor is at high level, the system will always code according to the set distance.

TSBOT: Within the set distance, the system will automatically shield the trigger signal received by the sensor.

Mark space: The distance between the last marking and the next
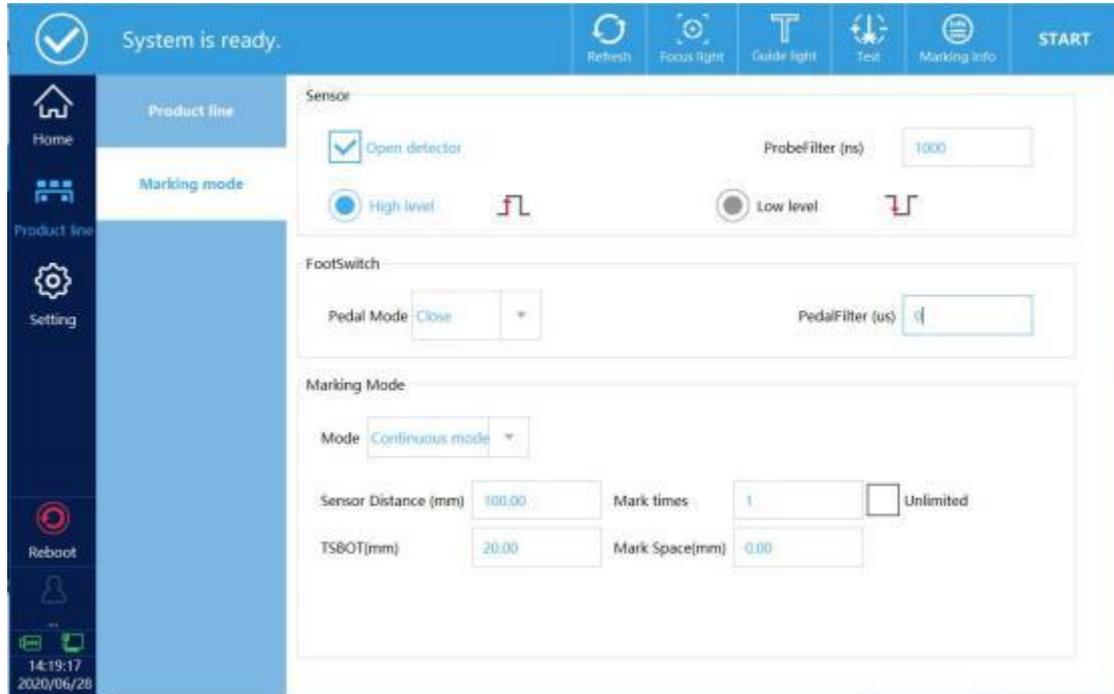
marking.

Figure 3-11

4. Setting

4.1. Marking parameters

Select the marking file on the homepage, click Settings-spraying parameters to change the parameters of the marking data, you can modify the default value.
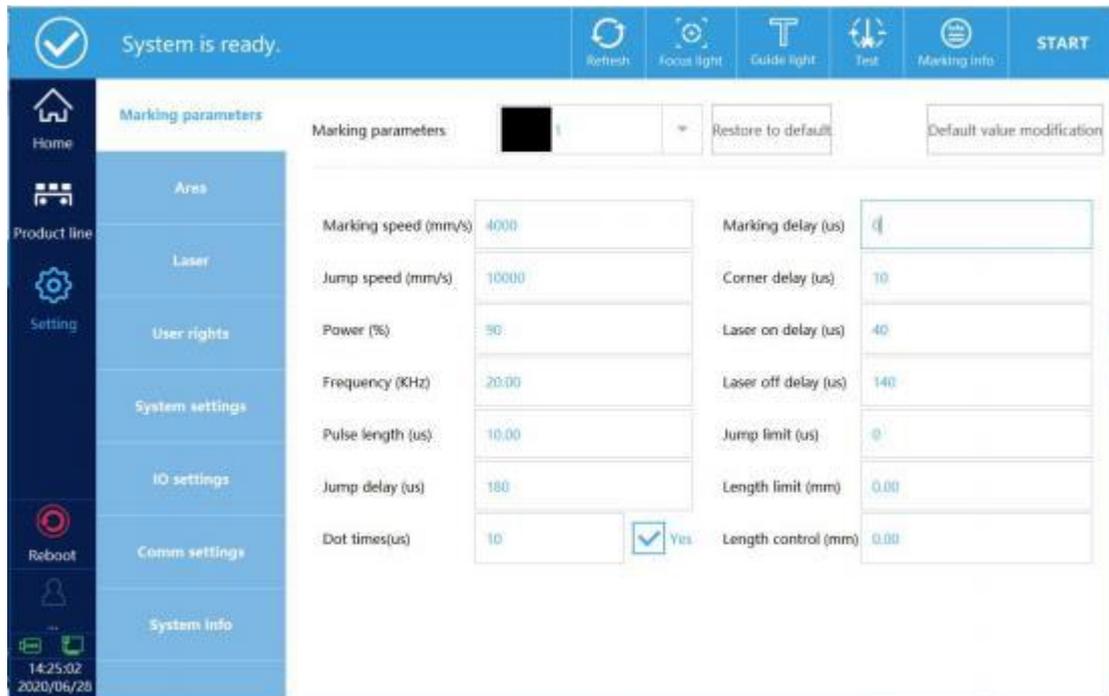
Figure 4- 1

Marking speed（mm/s）

Marking speed describes the "writing" speed of the focus of the laser beam on the surface of the marking object

Jump speed(mm/s)

Jump speed describes the speed at which a vector graphic is drawn after jumping to the next vector graphic. The typical value is twice the marking speed.

Power（%）

The relative power of the laser (unit: %). The larger the value, the higher the power. It is recommended not to exceed 90% during use.

Frequency（KHz）

The laser frequency describes the number of pulses per unit time, that is, the number of points per second (unit: KHz)

Pulse width (us)

Laser pulse width

Delay parameter

The delay parameters mainly include jump delay, light-on delay, laser-off delay, marking delay and corner delay.The delay must be adapted to the defined jump speed and marking speed. If the delay is not optimized, the quality of the marking result will decrease and the marking time will be extended.

In general, the length of the open laser delay and the off laser delay have no effect on the total scan time. The on-laser delay and off-laser delay should be optimized first, followed by the delay of the mark control, ie the jump delay, the end-of-mark delay and the turning point delay. It is very useful to set the jump delay and the end of the marking delay to a large value during the optimized laser delay.

Below we will illustrate the effect of various marking delays on marking quality by way of example:

Jump delay is too short

If the jump delay is too short, after the jump, the scan head is not positioned yet.The first marking vector has started and will show an in-motion oscillation effect, as shown in Figure 4-2.

Figure 4- 2

Jump delay is too long

If the hop delay is too long, there is no significant impact. However, the marking time will be extended.

Laser-on delay is too short

If the Laser-on delay is too short, the laser is turned on at the beginning of the marking vector. Even if the galvanometer has not reached the required angular velocity, the starting point of each vector has a coking phenomenon, as shown in Figure 4-3.
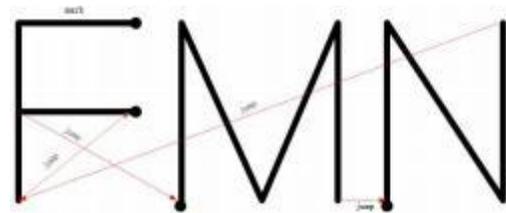

Figure 4- 3

Laser-on delay is too long

If the laser-on delay is too long, the laser turns on too late at the beginning of the marking vector. The starting point of the vector is not marked, as shown in Figure 4-4.
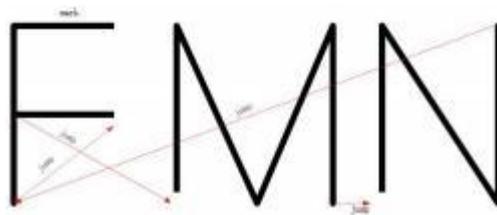
Figure 4- 4

Laser-off delay is too short

If the laser-off delay is too short, although the galvanometer has not yet reached the final position of the vector, the laser is turned off after the last marking command of a straight line or polyline, resulting in the respective vectors not being fully marked.As shown in Figure 4-5.

Figure 4- 5

Laser-ff delay is too long

If the laser-off delay is too long, the laser is turned off too late after the last marking command of the line or polyline, the laser is still on, even if the galvanometer has stopped or moved very slowly, the result is that the end of each vector is coking phenomenon,As shown in Figure 4-6.

Marking delay

No significant change, but the larger the value, the longer the marking time.

Corner delay is too short

If the corner delay is too short, the marking command on the subsequent polyline is already being executed, but the galvanometer has not reached the end point of the previous marking vector, which will cause the corner to appear arc-shaped.As shown in Figure 4-7.
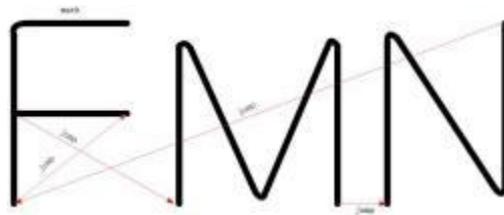

Figure 4-7

Corner delay is too long

If the corner delay is too long, the galvanometer moves too slowly at this time or even stops when the subsequent marking command is executed. Since the laser is not turned off between these vectors, coking will occur, as shown in Figure 4-8.

Figure 4-8

Dot times(us)

Single-point energy, this function is effective when the font is dot matrix font or dot and dot matrix QR code is added, when √, it is dot time output, when it is not √, it is dot pulse output.

Jump limit, length limit, length control: Being not

4.2. Area

The area includes galvanometer calibration and red light guidance calibration, as shown in Figure 4-9.
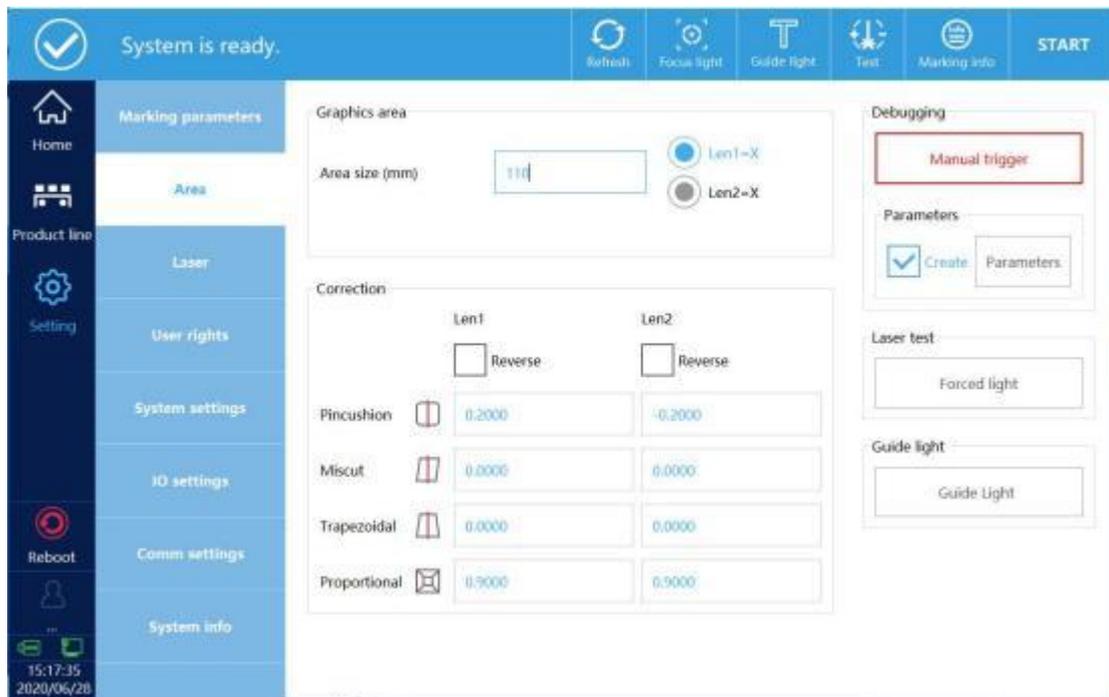

Figure 4-9
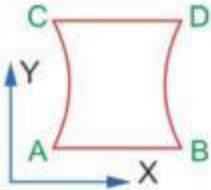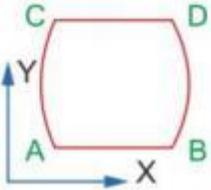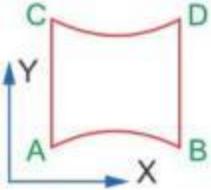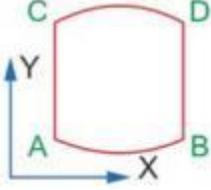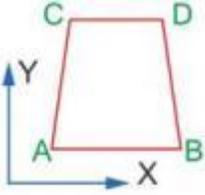
4.2.1. Galvanometer calibration

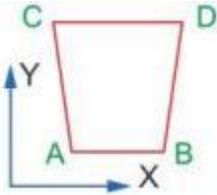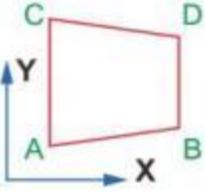**Area size:**Marking range of current field lens.

Len 1=X, Len 2=X: Select Len 1=X and click manual trigger. When the marked ABC is horizontal, it is correct. When the marked ABC is vertical, it means that the selection is wrong, then choose Len 2=X.

Correction: Observe whether the marked ABC is reversed according to the on-site situation, rotate it, and select the corresponding galvanometer to reverse until the marked content is what you need.

The coefficient correction method is shown in the following table

First, select the automatic creation of debugging parameters, and then click the test parameters to set the size of the rectangle. Example: If the area size is 110, the rectangle size is set to 109, and then click to trigger manually.

Pincushion	
Reduce X or Y axis corresponding galvanometer coefficient	Increase the X or Y axis corresponding to the galvanometer coefficient
Reduce X or Y axis corresponding galvanometer coefficient	Increase the X or Y axis corresponding to the galvanometer coefficient

Trapezoidal	
Reduce X or Y axis corresponding galvanometer coefficient	Increase the X or Y axis corresponding to the galvanometer coefficient
Reduce X or Y axis corresponding galvanometer coefficient	Increase the X or Y axis corresponding to the galvanometer coefficient

Miscut	
Reduce X or Y axis corresponding	Increase the X or Y axis

galvanometer coefficient	corresponding to the galvanometer coefficient
Reduce X or Y axis corresponding galvanometer coefficient	Increase the X or Y axis corresponding to the galvanometer coefficient
Proportional	
Measure the length of the frame that is actually marked, and then fill in the coefficient obtained by dividing the set length by the length of the actual mark (Note: the coefficient cannot be greater than 1, such as setting the range of 109, the mark is only 100, indicating that the maximum area range can only be marked with 100, and then the area range can be changed to 100)	

4.2.2. Red light guide calibration

Click the red light guide setting to enter the red light guide calibration interface, as shown in Figure 4-10.

Figure 4- 10

Frame: When "Yes" is selected, it is guided by a rectangle; when it is not selected, it is guided by the full path of the glyph.

Guide speed: Guide red light line drawing speed.

The red light guide calibration method is as follows:

1、 Add a rectangular marking.

2、 Click the red light guide, adjust the offset, zoom, etc. so that the red light guide light completely coincides with the marked figure.

The red light focusing method is as follows:

1、 Red light focusing must have two red lights, one for fixed red light and one for adjustable red light.

2、 Check the red light focus adjustment, adjust the four buttons up,

down, left and right to make the two red lights completely coincide.

4.3. Laser

Select the laser type and modify the laser parameters, the interface is shown in Figure 4-11.

Figure 4- 11

Laser type: Select the type of laser, if the laser is CO2, it should be correspondingly selected as CO2, restart the system.

Parameter range: Modify the range of laser power and frequency.

Fiber laser properties: The interface is shown in Figure 4-12

MO signal: Can choose normally open or not normally open, usually MO needs to be opened.

MOPA ： If the laser is a MOPA structure laser, MOPA needs to be turned on.

Figure 4- 12

CO2 laser properties: The interface is shown in Figure 4-13

    Pre-ionization: Generally do not need to be modified, if the laser is found to have weak light leakage, reduce the pulse frequency.

    First pulse suppression: If the starting point is too deep, you need to turn on the first pulse suppression and set the starting power.

Figure 4- 13

UV laser properties

The minimum and maximum frequency of PWM can be set. For some brands of UV lasers, when the light output reverses, that is, 1% power output power is maximum and 100% output power is minimum. In this case, select "Yes" for the PWM signal reverse, such as light output If the phenomenon is normal, you do not need to choose, as shown in Figure 4-14.

Figure 4- 14

Inno/lightwave laser properties: The interface is shown in Figure 4-15.

All configurations on this page can be selected by default, because the UV laser needs to be preheated. After a few minutes after booting, the laser will automatically start.

Figure 4- 15

4.4. User rights

Set user permissions and passwords hierarchically, as shown in Figure 4-16. Log in to the administrator user (password: 123), and set the permissions and password for each user. Example: Change the password of Level1 user to 888, as shown in tu, set the user's use rights, and cancel the three functions of adding objects, editing objects, and file operations using Figure 4-17, as shown in Figure 4-18. Log out of the administrator user and log in to the Level1 user. The user's shielding function has become gray and cannot be used, as shown in Figure 4-19.

Figure 4- 16

Figure 4- 17

Figure 4- 18

Figure 4- 19

4.5. System settings

As shown in Figure 4-20.

Figure 4- 20

System settings:

Date: Set system date.

Time: Set system time.

Internet Information: Set the DHCP information of the motherboard, click Settings, and the interface pops up, as shown in Figure 4-21. Click Enable to set the network information, and then click Save.

Figure 4- 21

Host name: Set the motherboard name.

IP address: Set the motherboard IP address.

No need to set subnet code, gateway, DNS

Language: Set the system language type, support Chinese and English, you need to restart the system after switching languages.

BC settings: Developer options.

Screensaver settings

Enable the screen saver function, you can set the screen saver time, screen saver content, backlight, etc., as shown in Figure 4-22.

Figure 4- 22

Other settings

Automatically load files: Automatically load files opened before shutdown after booting.

The menu displays: Whether the check function is displayed in the status bar, for example: red light focus is not checked, as shown in Figure 4-23.

Figure 4- 23

Keyboard characters: To add symbols that are not in the existing keyboard, click Settings to enter the keyboard character management interface, as shown in Figure 4-24, click Add Character, Jinfu Unicode encoding interface, each character has its specific Unicode encoding, available online Find or find in Word. Example: Add the symbol ®, the corresponding Unicode code is 00AE, click 00AE on the interface, as shown in Figure 4-25, click Add, the symbol will be added to the keyboard character management interface, as shown in Figure 4-26, After the addition is complete, you can see the changed characters on the keyboard of the edited content, click the More button on the keyboard, as shown in Figure 4-27.

Figure 4- 24

Figure 4- 25

图 4- 26

Figure 4- 27

Input method settings: Set the input method in the keyboard. The keyboard supports up to 4 input methods at the same time, as shown in Figure 4-28.

Figure 4- 28

4.6. IO settings

Detection settings:(For developers)

IO output settings: As shown in Figure 4-29, there are three IO signal outputs. Can be set: marking ready output, marking output, fault output, meter output, serial number end output.

Example: When the marking is required to end the output, the setting method is as follows:

1、OUT-1 is set to mark the end of output.

2、(Note: IO output is low level), if the wiring object is a solid state relay, the positive pole of the relay is connected to the 5V (PL19) output port of the interface board, and the negative pole is connected to the O_1 port.

3、Set the output signal width at the end of marking.

4、Click Save and restart the system.

(Specific wiring and use method: please contact after-sales staff)

Figure 4- 29

Example: When the meter output is required, the operation steps are as follows:

1、OUT-1 is set to meter output.

2、(Note: IO output is low level), if the wiring object is a solid state relay, the positive pole of the relay is connected to the 5V (PL19) output port of the interface board, and the negative pole is connected to the O_1 port.

3、Marking mode is set to flying marking, trigger setting select pipeline mode.

4、Click the coding information button at the top right of the screen, as shown in the meter counting information in Figure 4-30, enter the meter

counting function setting interface, as shown in Figure 4-31.

5、Set metering parameters:

Length: Set the metering length. The metering starts when the pipeline is turned on, and a signal is output every time this value is reached (high level or low level, settable)

Output: Set the output signal to high or low.

Signal time: Set signal output time, unit ms.

Output delay: Set whether to delay the signal output, unit mm.

Cumulative length: The meter starts counting when the pipeline is turned on, and outputs a signal (high level or low level) whenever the accumulated length reaches the set length value.

Signal status: Current signal status

6、Restart the system.

Figure 4- 30

Figure 4- 31

4.7. Communication settings

If you need to use this function, please contact our staff.

4.8. System info

Display system related information and software update and registration, as shown in Figure 4-32.

Figure 4- 32

4.8.1. System update

System updates include software upgrades and changes to the boot interface.

The software upgrade steps are as follows:

1、Save the update file to the USB flash drive and insert the USB flash drive.

2、Click Software Update, the pop-up interface is shown in Figure 4-33.

Figure 4- 33

3、Click to select, the pop-up interface as shown in Figure 4-34.

File ✕

| Storage options: | Internal | USB | | Space: 332/512 M |

Path: /Data/Uploadfile

Select	File name	Time

← Return

[N] New

[⊗] Delete

⊏╪ Rename

[📄] Copy

[=] Paste

M-select

File name: |

Type: Img (* .img) ▼   OK

Figure 4- 34

4、Click USB, select the update file, click OK, click start update.

The steps to change the boot interface are as follows:

1、Boot picture production (format: bmp, resolution: 1280*800, bit depth: 32,)

2、Name the created picture as a logo, then save the picture and update tool (please ask the staff for the update tool) to the U disk, and then insert it into the USB at the bottom of the screen.

3、Click System Update, the interface pops up, as shown in Figure 4-35.

Figure 4- 35

4、Click to select, click USB, select the update tool, click OK, click to start the update.

4.8.2. Registered

Limit software usage time or days.

Proceed as follows:

Step 1: Export the machine code to the U disk, the operation steps are as follows:

1、Turn on the machine and log in to the system (password: 123)

2、Click Settings --- System Information --- Export Machine Code (According to the system prompt to complete the operation)

Step 2: Open the registered software register.exe, as shown in Figure 4-36 (the registered software is sent to the laser manufacturer separately)

Figure 4- 36

Step 3: Import the machine code (Note: The machine code can be directly exported from the operation screen to the U disk, and the specific operation is completed according to the prompts on the screen)

Step 4: Set the secret key (the secret key is the secret key of the machine, you must keep in mind that the next time the machine is registered, you must use the secret key to register)

Step 5: Set the time limit or days of use, and also lift the limit

Step 6: Production registration code, save to U disk, as shown in Figure 4-37

Figure 4- 37

Step 7: Register on the machine

1、 Login user, password 123 (administrator)

2、 Click Settings ---- System Information, import the registration code (TXT file saved in the U disk before)

3、 Click to register

5. Alarm information

System error: Click to open the settings --- detection settings --- enable detection (this function is used by developers, no need to tick during normal use).

Data initialization failed: When the data marking time is very long, click the test code and then click to start the code, there will be data initialization failure. (Re-switch the marking mode to remove the fault).

System warning 3000: The system failed to communicate with the lightwave laser.

System warning 3001: Warming up.

GRENTSUN
LC Terminal Block
Interface
Description

content

1. Description of wiring board

The wiring board contains 4 major interfaces, namely the controller

interface, the galvanometer interface, the fiber laser control interface and the terminal interface. The controller interface is connected to the main controller through a standard 37-core cable, and the other three interfaces are described in detail below.

Wiring board

37-pin controller

2. Galvo Interface

The galvanometer interface is a DB15 hole type interface.

Galvo Interface Pin Definition

Foot	Function	Describe
1	CLK-	Clock signal negative (for connecting digital galvanometer)
2	SYNC-	Negative sync signal (for connecting digital galvanometer)
3	X CHANNEL-	X channel digital signal negative (for connecting digital galvanometer)
4	Y CHANNEL-	Y channel digital signal negative (for connecting digital galvanometer)
5	LASER PWM	TTL square wave signal with adjustable frequency and pulse width. When CO2 laser is selected, adjusting the laser power can change the pulse width of the signal. When selecting IPG laser, the frequency is uninterrupted.
6	LASER ON	High level when the laser is out, low level when the laser is out
7	SCAN READY	Galvo ready signal
8	GND	Power 0V
9	CLK+	Clock signal is positive (for connecting digital galvanometer)
10	SYNC+	Sync signal is positive (for connecting digital galvanometer)
11	X CHANNEL+	X channel digital signal positive (for connecting digital galvanometer)
12	Y CHANNEL+	Y channel digital signal positive (for connecting digital galvanometer)
13	DS PWM	TTL square wave signal with adjustable frequency and pulse width. When CO2 laser is selected, adjusting the laser power can change the pulse width of the signal. When selecting IPG laser, the frequency is uninterrupted.
14	LASER ON	High level when the laser is out, low level when the laser is out
15	GND	Power 0V

3. Fiber Laser Control Interface

The DB25 needle is the fiber laser control interface, which can be directly connected to the IPG laser using the DB25 cable.

Laser Interface Pin Definition

Foot	Function	Describe
1~8	D0-D7	Power setpoint output
9	Power latch	Power latch signal output
10−15, 24	Public place	public place
16，21	Laser Status	Laser Status Input
17	NC	NC
18	MO	MO signal output
19	Laser on/off	When light is emitted, this pin outputs H level
20	PWM	Pulse repetition frequency output
22	Red light	Red light control output
23	Enable	This pin outputs H level by default. If the software enables the laser enable control, this pin will output the H level only by operating the laser enable through the software.
25		This pin has been connected to a 200 ohm resistor to the common ground

4. Terminal block

Interface Description

As shown in the figure below, the terminal interface is divided into two rows, A and B. The outer side is row A, and the inner side is row B. There are function descriptions of all pins on the back of the terminal board for reference.

Terminal block interface

Terminal pin definition

A----interface definition table

Seat	Foot	Function	Describe
PL18	PWM	PWM+	TTL square wave signal with adjustable frequency and pulse width. When CO2 laser is selected, adjusting the laser power can change the pulse width of the signal. When selecting IPG laser, the frequency is uninterrupted.
	GATE	GATE	Laser switch signal
	PPK	PPK	first pulse suppression
	5V	5V	5V voltage output, the total output current should not exceed 500mA
	GND	Machine GND	Machine GND
	RL1	Red light guide	Then preview the red positive pole
	GND	GND	Then preview the red negative pole
	RL2	Red light focus	Connect to focus red positive
	GND	Machine GND	Connect to the negative pole of the red light
	LTX	Laser serial transmission	Laser serial transmission

	LRX	Laser serial port receiving	Laser serial port receiving
	GND	GND	Connect to laser serial port GND

B---interface definition table

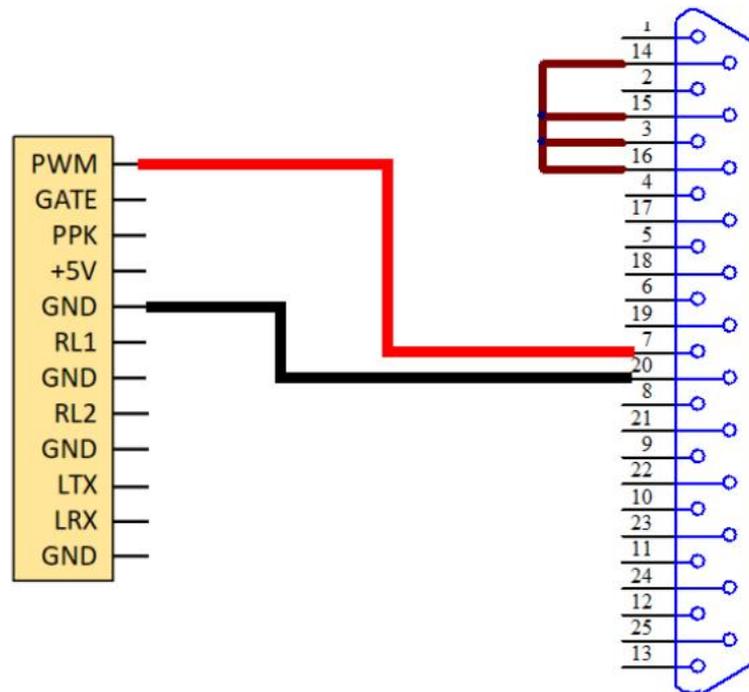| Seat	Foot	Function	Describe
PL14 System power socket	+12~24V	System power supply input	Support 12~24V voltage input
	GND	System power supply GND	System power supply GND
	+15V	Galvo power supply +15V input	Galvo power supply +15V input
	GND	Galvo power supply GND	Machine GND
	−15V	Galvo power supply - 15V input	Galvo power supply - 15V input
PL15 Photoelectric sensor socket (or foot switch)	+15V	+15/24V output	Connect the power cord of the photoelectric sensor
	TRIG	signal input	Connect the photoelectric sensor signal line (or pedal signal line)
	GND	Machine GND	Connect the ground wire of the photoelectric sensor (or the ground wire of the foot pedal)
PL16 normal encoder socket	+15V	+15/24V output	Connect the encoder power cable
	SA	A input	Connect to the input terminal of ordinary encoder A
	SB	B input	Connect to the input terminal of ordinary encoder B
	GND	Machine GND	Connect to ordinary encoder ground wire
PL19 Differential encoder socket	5V	5V output	Connect the differential encoder power cable
	DA−	A-input	Connect to differential encoder A-input
	DA+	A+input	Connect to differential encoder A+ input
	DB−	B-input	Connect to differential encoder B-input
	DB+	B+input	Connect to differential encoder B+ input
	GND	Machine GND	Connect to differential encoder ground wire
	+12~24V		12~24V output, can be used with IO output port, such as when connecting a relay, this port is connected to the positive pole of the

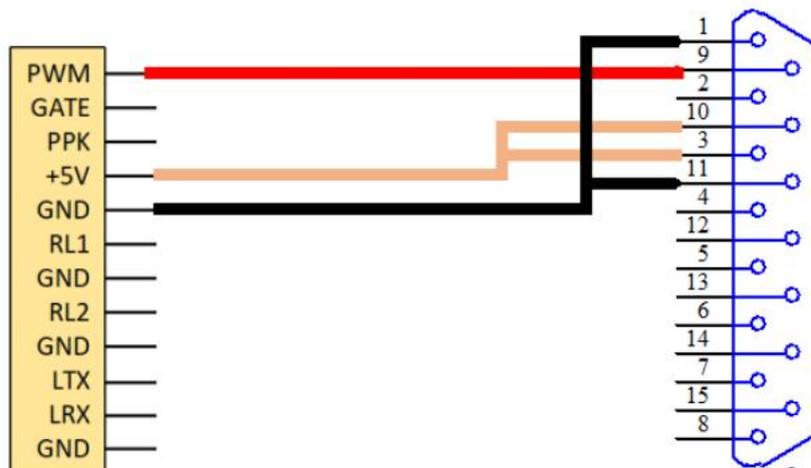|		relay
0_0 0_1 0_2	IO output	IO output port, low level output, if connected to a relay, this port is connected to the negative pole of the relay
0_3 0_4	IO input	IO input port, accept low-level input, short-circuit with GND
LON	light signal	Output low level when light is emitted
GND	Machine GND	Machine GND
5V	5V output port	5V output port, the total current of 5V output port should not exceed 500mA
TX	Communication serial port sending	Communication serial port sending
RX	Communication serial port receiving	Communication serial port receiving
GND	GND	

Laser Wiring Instructions

DAVI, COHERENT-30W, C55, V30

COHERENT-100W

PWM	
GATE	
PPK	
+5V	
GND	
RL1	
GND	
RL2	
GND	
LTX	
LRX	
GND	

1
14
2
15
3
16
4
17
5
18
6
19
7
20
8
21
9
22
10
23
11
24
12
25
13

Synrad-Ti

PWM	
GATE	
PPK	
+5V	
GND	
RL1	
GND	
RL2	
GND	
LTX	
LRX	
GND	

1
9
2
10
3
11
4
12
5
13
6
14
7
15
8

Synrad-Vi30

PWM	1
GATE	6
PPK	2
+5V	7
GND	3
RL1	8
GND	4
RL2	9
GND	5
LTX	
LRX	
GND	