



# **CYCJET CO2 Fly Laser Printing Machine**

## **Manual**

(V1.6.16)

**SHANGHAI YUCHANG INDUSTRIAL CO., LTD**

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# **Part I**

## **User's Guide for the Machinery**

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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**

## **Notices**

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## **I. 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: 5-40°C; Relative Humidity: 30 ~ 80% (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

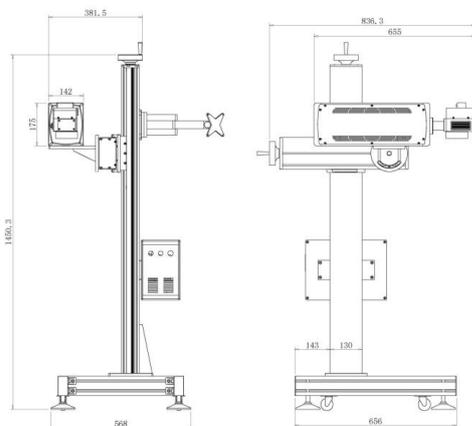
**d. If the carving lines are out-off-straight, please check:**

If the marking head loosening

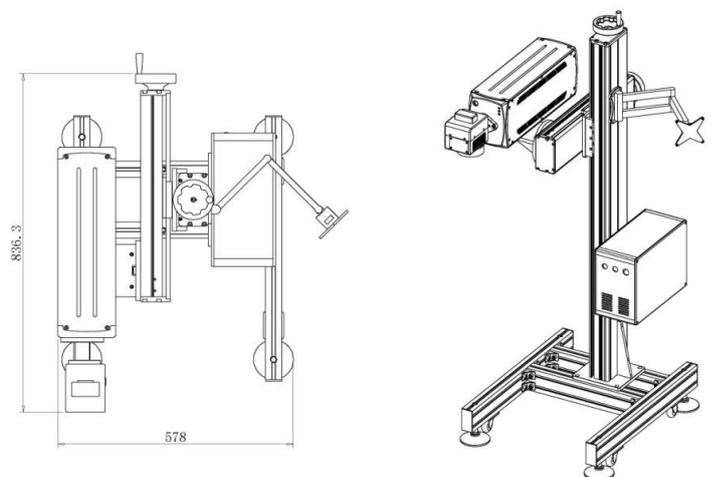
If the machine doesn't connect the earth wire

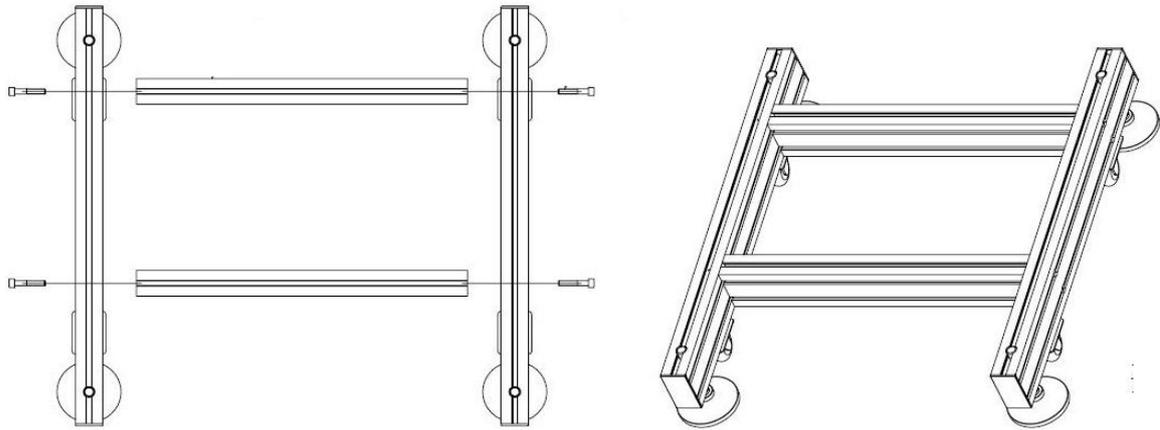
If there is any external electromagnetic interference

**Pic2. Internal installation**



**Pic3. External installation**





**Pic4. Base Installation**

1.Laser Device. 2.Laser Power Station 3. Air Fans. 4. Galvanometer Power Station. 5. Mother Board. 6.Color Touch Screen

## **II. Safety Instruction:**



The CYCJET Laser Model CL Series is a Class IV laser product.

This laser emits about 20/30 Watts of invisible laser radiation in the optical band near 1064 um.

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.

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## 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.



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 CYCJET 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 product emits light at or around 1060 um wavelength at total power of light

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radiated out of the optical output up to nearly 20 W. 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.

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# **Part II**

## **User's Guide for Control System**

# 1.Painting interface



## 1.1 File operation

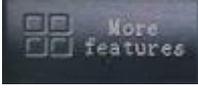


	save		Save as
	open		create a new file
	Into hibernation, then click the screen to wake up. (Note: it is not off state)		Undo

	reduction		Laser control card related parameter setting.
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## 1.2 Zoom bar



	Zoom in the contents of the view area		Reduce the size of the view area
	Revert to the view's original area		Enter the system settings interface
	Start red light, preview the graphics.		

## 1.3 Toolbar

### Make tools



	Click the text to select text, time, date, serial number and other new.		PLT vector file import
	Barcode generation tools		Edit barcode attributes
	Text content editing		delete
	Edit page object list		Coding delete, copy, copy files by clicking on the management.

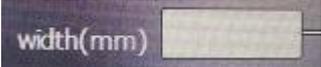
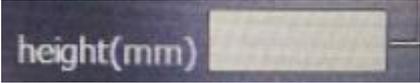
### Operating tools



	rotate to the left		rotate to the left
	Move up		Move Downward
	move to the left		move to the right
	mobile		Select graphics, click copy, then click on the blank space, copy the same graphics.
	Multiple choice graphics		Select all graphics
	Fill the graphic settings		

## Scale bar



	Height adjustment
	Width adjustment
	Character radian adjustment
	Lock solution or open, corresponding to the same regulation xy, and were adjusted.
	Adjust the accuracy of the operation

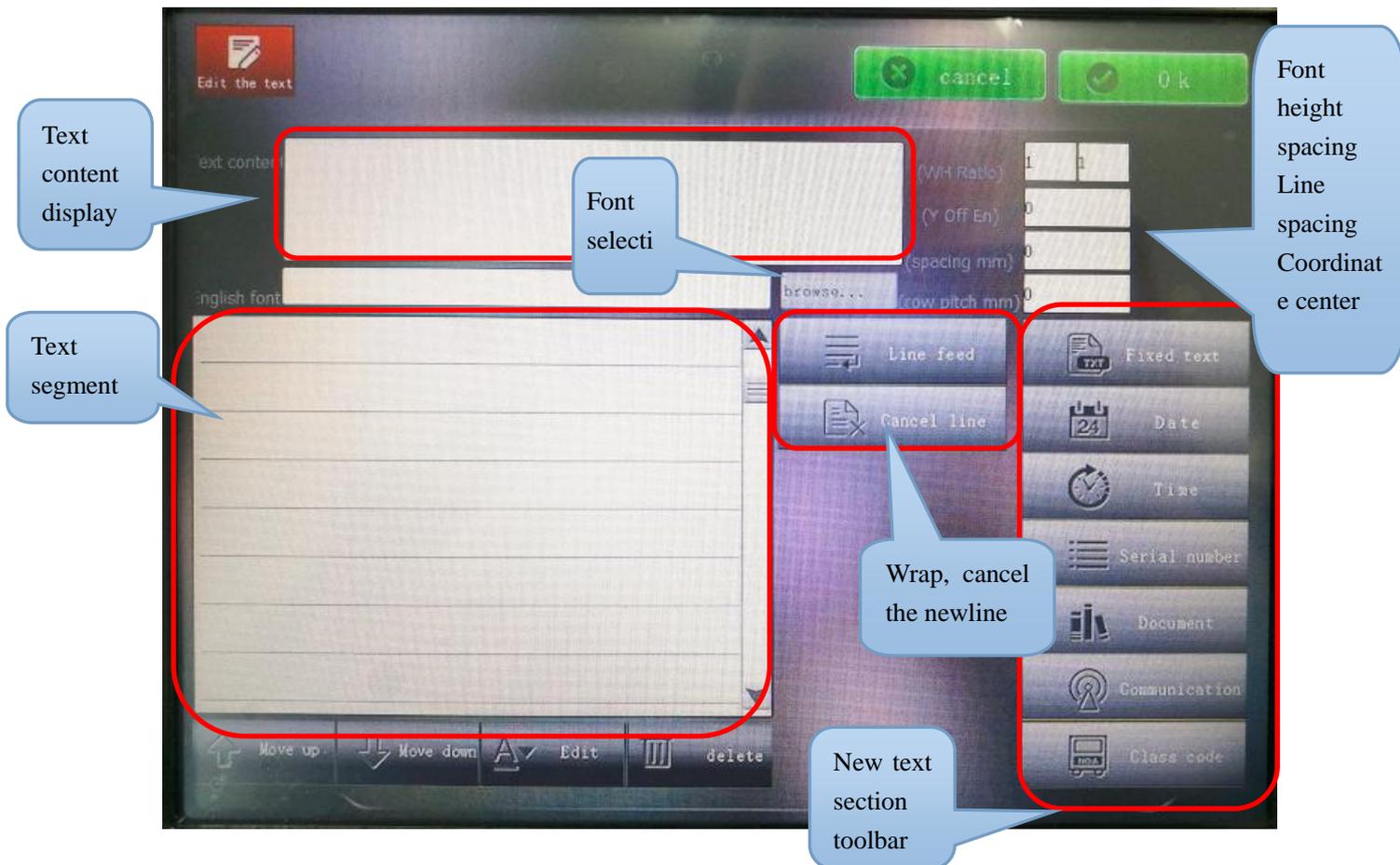
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## 1.4 Object list



Conversion function: When some texts overlap or a text is not in the view area, click conversion button into the area where the text is in and select the text.

## 1.5 Text editing sub interface



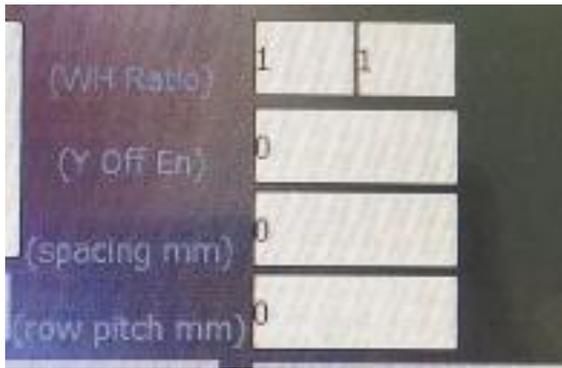
**Text editing interface: Text content display, text segment list, function keys.**

**Text content display bar: Displays the list of input texts.**

**Font**

**selection:** 

**Font height, spacing, line spacing, coordinate center information editing:**



### Function keys:



: Insert fixed text.



: Insert the date text.



: Insert time text.



: Insert the serial number text.



: Insert txt file.



: Edit serial communication files.



: Edit shift information file.



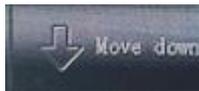
:Use the line feed button to edit multi-segment text, use the text to select a line feed, and click the linefeed button.



:Cancel the newline.



:The selected text segment moves up.



:The selected text segment moves down.



:Modify the currently edited text segment



:Delete the currently edited text segment.



:Save the current edited text, and exit the current interface



: Cancel the current edit text, exit the current interface.

### Keyboard input method:





: Enable English capital input.



:Enable English input.



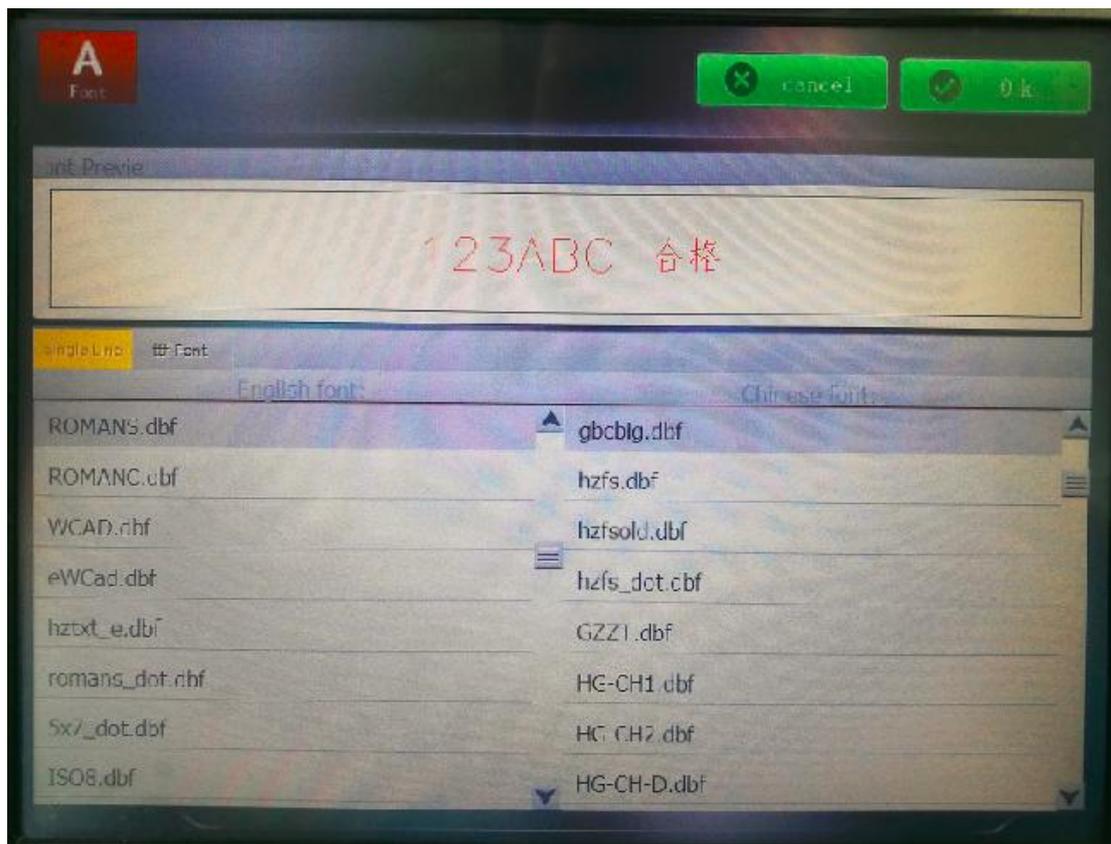
: Enable pinyin input.



: Enable figures, punctuation input.

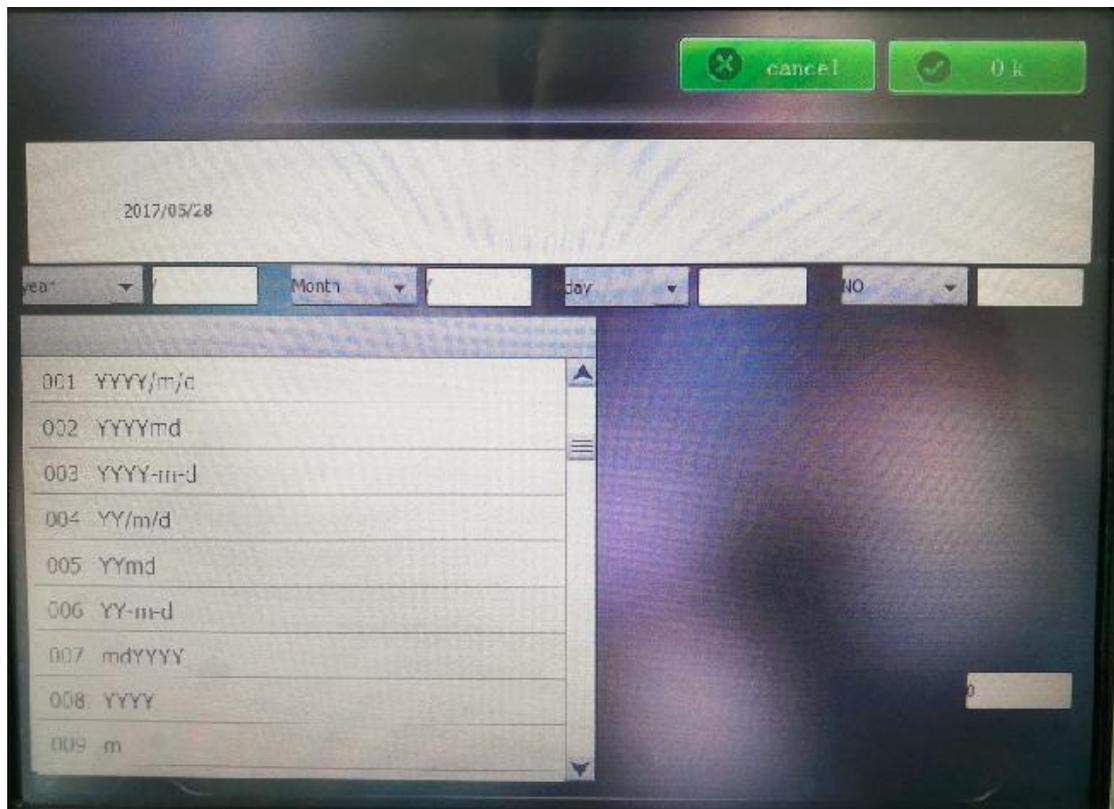
### 1.3 Font preview selection interface

Font preview selection interface, you can preview the font selection font is as follows:



Select the file in the drawing interface, click the Font icon, enter the font library.

## 1.6 date editor sub-interface



The system supports multiple formats of date and time, the list box lists the date of various formats to choose from, if the user needs to set their own format, first select a column, and then click edit to modify their format.

Date Offset: How many days to offset from the current time. If the current time is 2014/7/28, enter 2

Time content will become 2014/7/30.

## 1.7 serial number editing sub interface

multiple	<input type="text" value="3"/>	Fill	<input type="text" value="0"/>
Initial value	<input type="text" value="0"/>	Stop value	<input type="text" value="999"/>
step	<input type="text" value="1"/>	Repeat	<input type="text" value="0"/>
Current value	<input type="text" value="0"/>	Repeat value	<input type="text" value="0"/>

Cycle  Cancel the prefix

Digit: digit of serial number. For input 3, then the content of serial number is XXX.

The system default is 3 digits. Original value: original value of serial number.

Step size direction: used in setting counting sequences. for example 1 represents the increment of 1, -1 represents the decrement of 1.

Current value: The value of the current to paint.

Fill: input number fill character. The default value is zero fill characters. for example, the fill is 0, current value is 1, then the painting result is 001.

Stop value: The final painting number.

Repeat: The number of repeat numbers, The default value is 0, which represents the number of painting is 1. The value is 1, which represents the number of painting is 2.

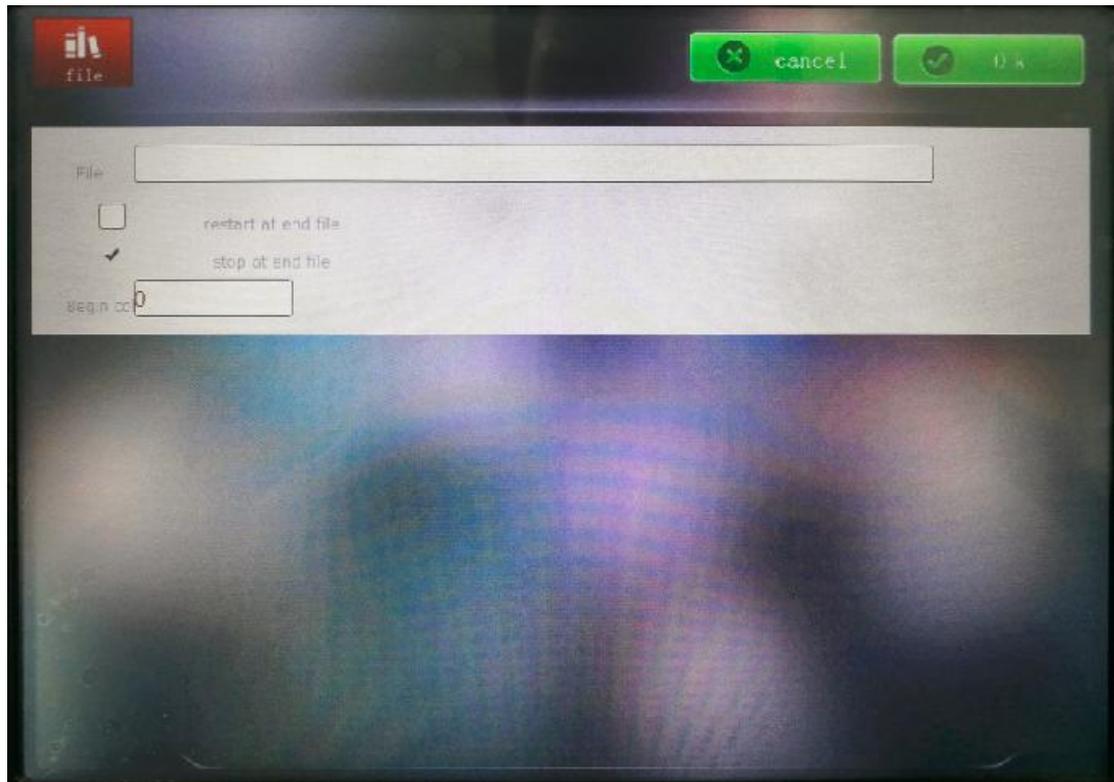
duplicate value: Representing how many times the number painting. User can set the value and restart.

Cycle: checked represent the painting is over and restart painting.

Cancel the prefix: Banning the use of filling symbols. for example, edit a three digit number 000, after checking cancel the prefix, the value of painting become 0.

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## 1.8 Save file interface



When creating the document text, you need to tick the text box.

Click the Browse button to select the desired txt file. Currently only supports \* .txt format text file.

The end of the file to start again: Coding code to the end of the file, will read the beginning of the file coding.

End of the file to stop marking: Coding to the last line of the file will not start over.

Start line: start from the current line Coding, Coding can also be used before the query for progress.

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## 1.9 Save file interface



By selecting the top button, user can save file in the internal storage, SD card, USB storage.

## 1.91 Code39 editing sub interface

**Code39:**

**Text content:**

Edit

Barcode height(mm):	<input type="text" value="8"/>	Character Height (mm):	<input type="text" value="3"/>
Narrow strip width (mm):	<input type="text" value="0.2"/>	Character width(mm):	<input type="text" value="3"/>
Extent Ratio:	<input type="text" value="2.5"/>	Character pitch(mm):	<input type="text" value="0"/>
Top margin(mm):	<input type="text" value="2"/>	x offset(mm):	<input type="text" value="0"/>
Bottom margin(mm):	<input type="text" value="2"/>	y offset(mm):	<input type="text" value="0"/>
Left margin(mm):	<input type="text" value="2"/>	<input type="checkbox"/> Type	Layer: <input type="text" value="0"/>
Right margin(mm):	<input type="text" value="2"/>	<input type="checkbox"/> Reverse	<input type="button" value="✓"/> <input type="button" value="✗"/>

Code39 is consist of Arabic numerals. Interface is mainly aimed at the width of the barcode height and margin Settings. The margin in the case of reverse is effective. In order to bring out, some color material need to select reverse painting.

## 1.92 Code128 setting sub interface

**Code128:**

**Text content:**

Edit

Barcode height(mm):	<input type="text" value="8"/>	Character Height (mm):	<input type="text" value="3"/>
Narrow strip width (mm):	<input type="text" value="0.2"/>	Character width(mm):	<input type="text" value="3"/>
Blank Ratio:	<input type="text" value="1"/>	Character pitch(mm):	<input type="text" value="0"/>
Top margin(mm):	<input type="text" value="2"/>	x offset(mm):	<input type="text" value="0"/>
Bottom margin(mm):	<input type="text" value="2"/>	y offset(mm):	<input type="text" value="0"/>
Left margin(mm):	<input type="text" value="2"/>	<input type="checkbox"/> Type	Layer: <input type="text" value="0"/>
Right margin(mm):	<input type="text" value="2"/>	<input type="checkbox"/> Reverse	<input type="button" value="✓"/> <input type="button" value="✗"/>
character set:	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> Auto		

Code128 possess character set, A,B,C. A character set is for Numbers, uppercase letters, and some special characters. B character set include digital, lowercase letters, and some special characters. C only include digital character set, but compress coding width. It is recommended to use the Auto, which is optimal compression bar code.

### 1.93 QR setting sub interface

**DataMatrix:**

**Text content:**

Cell Width(mm)  size

Proportional circle (%)

Outer ring number

Count

Reverse  dot Matrix  Matrix

Layer:

QR code consists of mask, model, error correction. Bitmap print QR code currently supported.

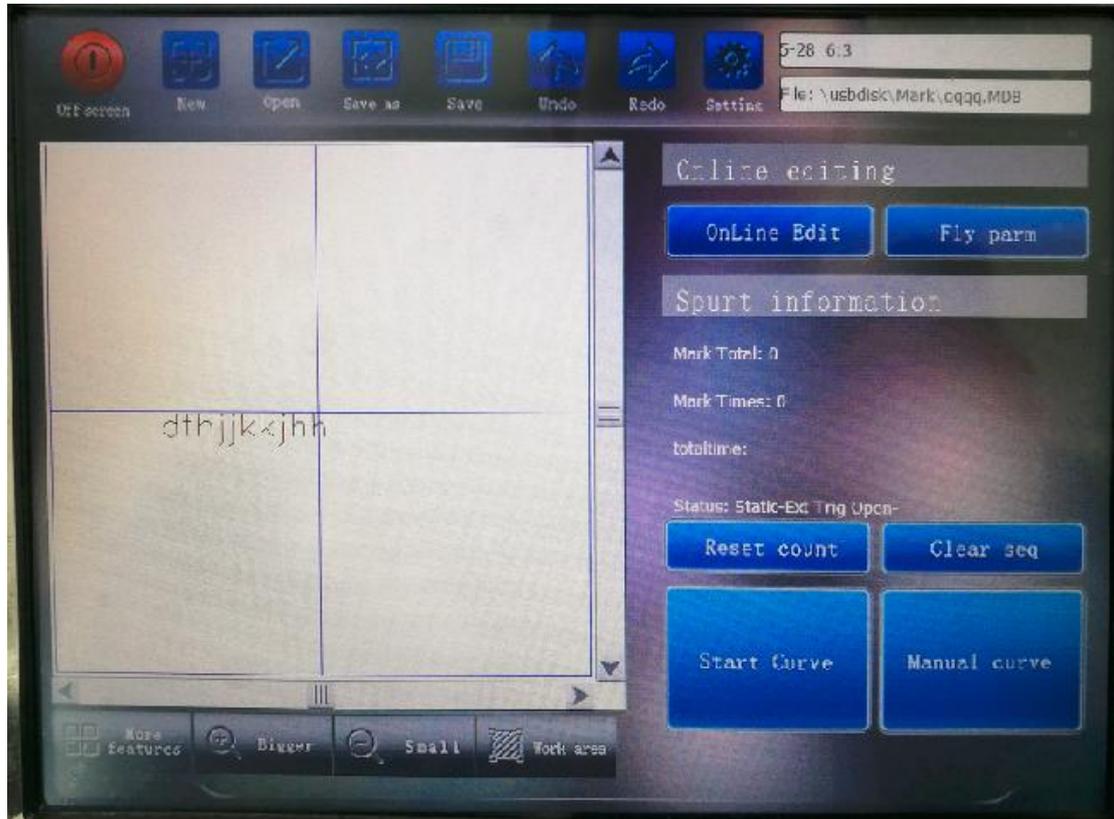
Cell Width: A unit takes up a square side length.

Proportional Circle: In the area of occupied by printing.

Outer Ring Number: In reverse, the outer ring takes up the number of turns.

Count: The number of painting small round.

## 2 Printing interface

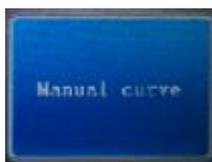


Button Description:

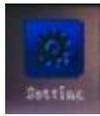
Start button, there must be a text segment, click on the effective



Printing , otherwisse button action is prohibited.



:Manual printing button. In the code running state, click the code button. click once at a time.



: Control card related parameters Settings.



: get rid of the serial number count.



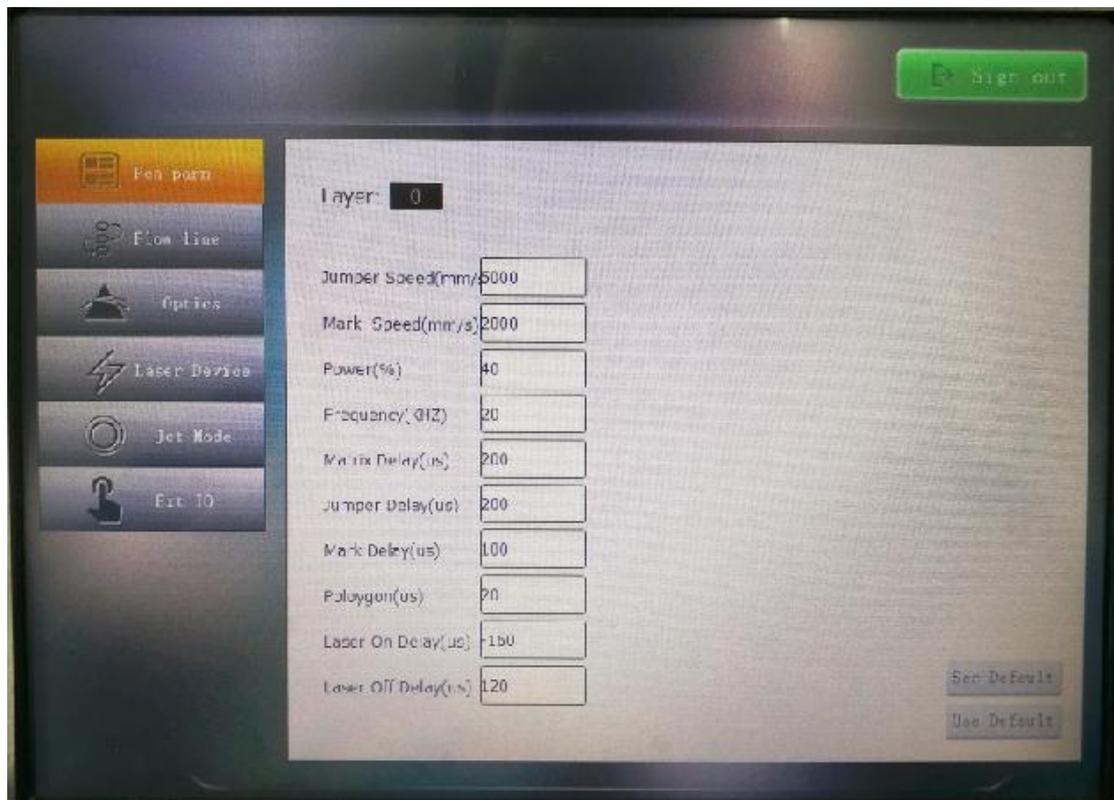
: Adjust the content of working conditions



: Adjust the parameters under working conditions

## 2.1 control card Settings interface

### 2.2.1 Printing parameters



Jumper Speed: The galvanometer rotational speed when jumping.

Mark Speed: The galvanometer rotational speed when bright dipping

Power: Laser output power when printing. The greater the power, the deeper the dozen.

Frequency: Laser light frequency. The greater the frequency, the better The consistency of line.

Laser On Delay: Adjust system by starting movement until the end of the laser with time lag. Time is too short - line beginning place without marking. Time is too long - line at beginning of marking is too heavy.

Laser Off Delay: Adjust the system at the end of the laser, movement to the end of time. Time is too long - line ends of marking is too heavy. Time is too short - line ends place without marking.

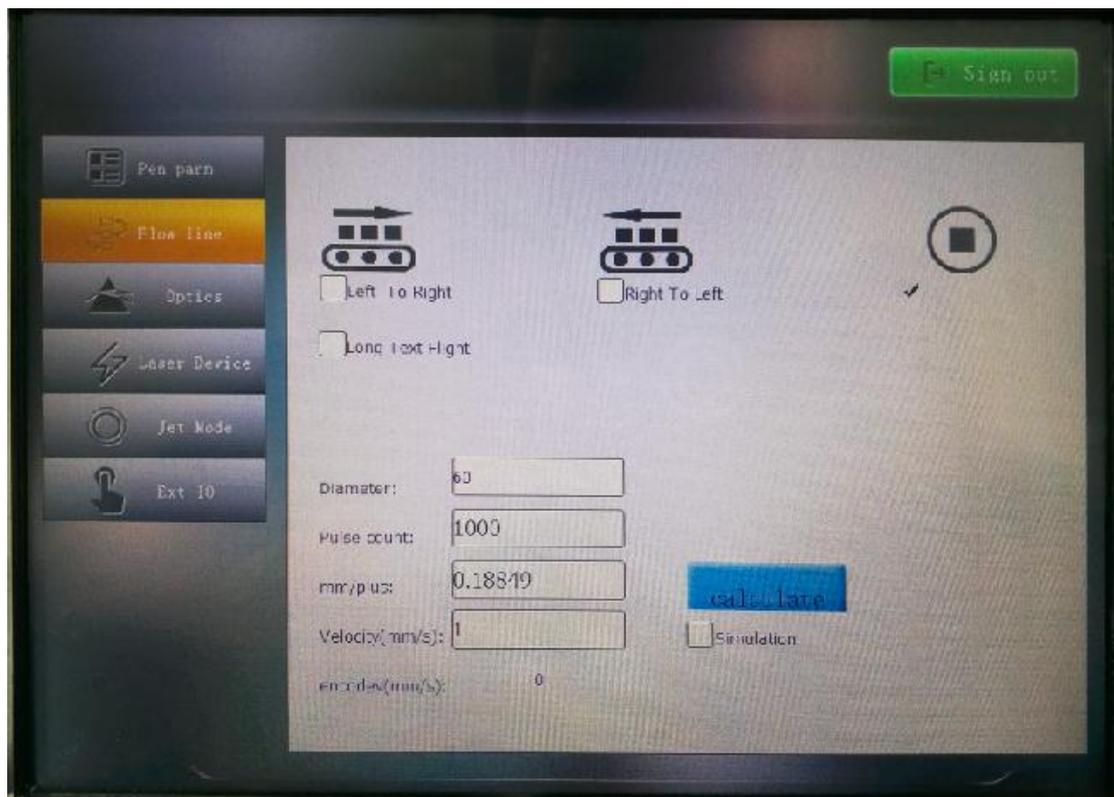
Polygon: Adjusting system When turn the time lag of. Time is too short - Angle becomes arc shape. Time is too long - corner will marking is too heavy.

Matrix Delay: When selecting a bitmap fonts, delay time of each printing point. the longer the time, the more heavy the marking

Set Default: Set the default printing parameters, click save

Use Default: export the default parameters had been set up

## 2.2.2 Assembly line



Assembly line direction: there are two set of assembly line direction At present:from left to right or from right to left. If encounter in the Y direction , it can be solved by axis transformation.

flight parameters with encoder and flight parameters (simulated flight) without encoder.

Simulation: Check represents the flight mode without encoder. Otherwise, represent external

encoders

Velocity(mm/s): Running speed of belt pulley. For example, 1000 represents running speed of 1000mm/s.

For example, the running speed of belt pulley is 20m/min, then converted to 1 s for 667 mm/s.

mm/plus: the length of Each pulse, unit is mm

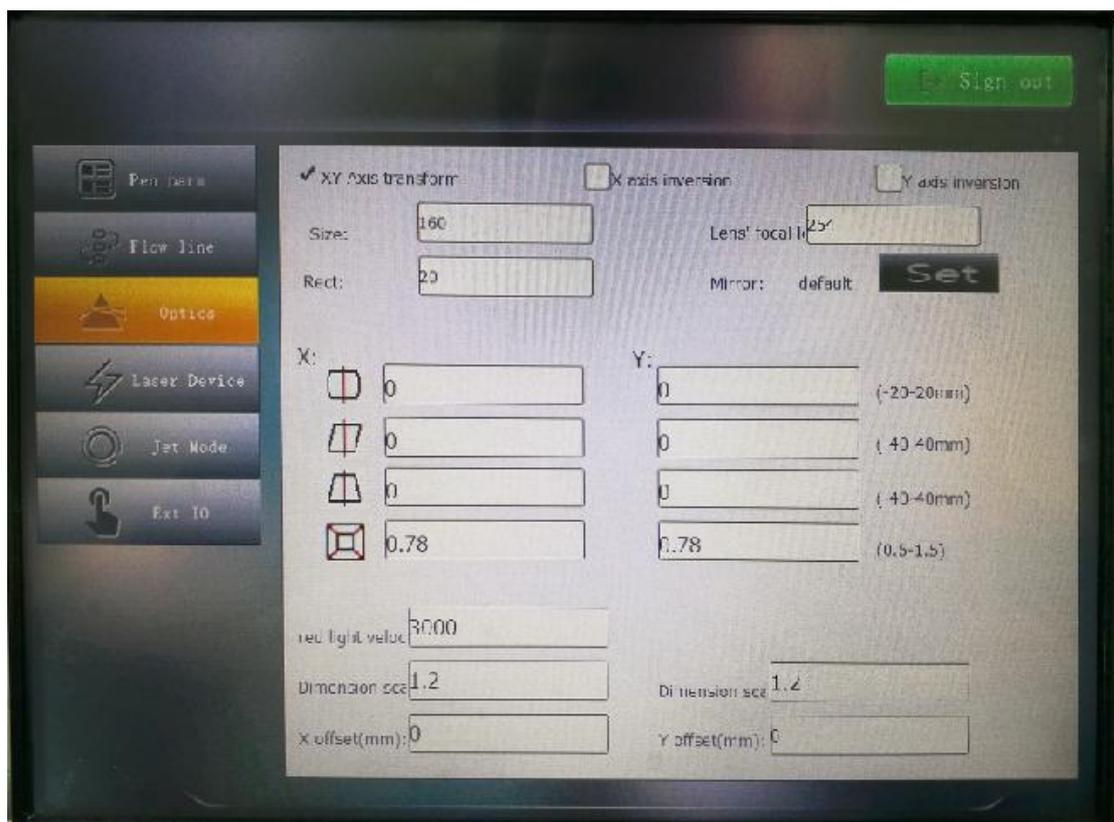
Diameter: diameter of the scroll wheel.mm

Pulse Count: One revolution of the encoder pulse number.

Calculate: According to the current pulse number, diameter to calculate the product value when clicked.

Encoder Test: display the number of pulses of encoder .

## 2.2.3optical paramete



XY Axis transform: change the physical output.

X axis inversion: the mirror of X axis .

Y axis inversion: the mirror of Y axis.

size: The size range output of the output field , 70mm represents 70x70.

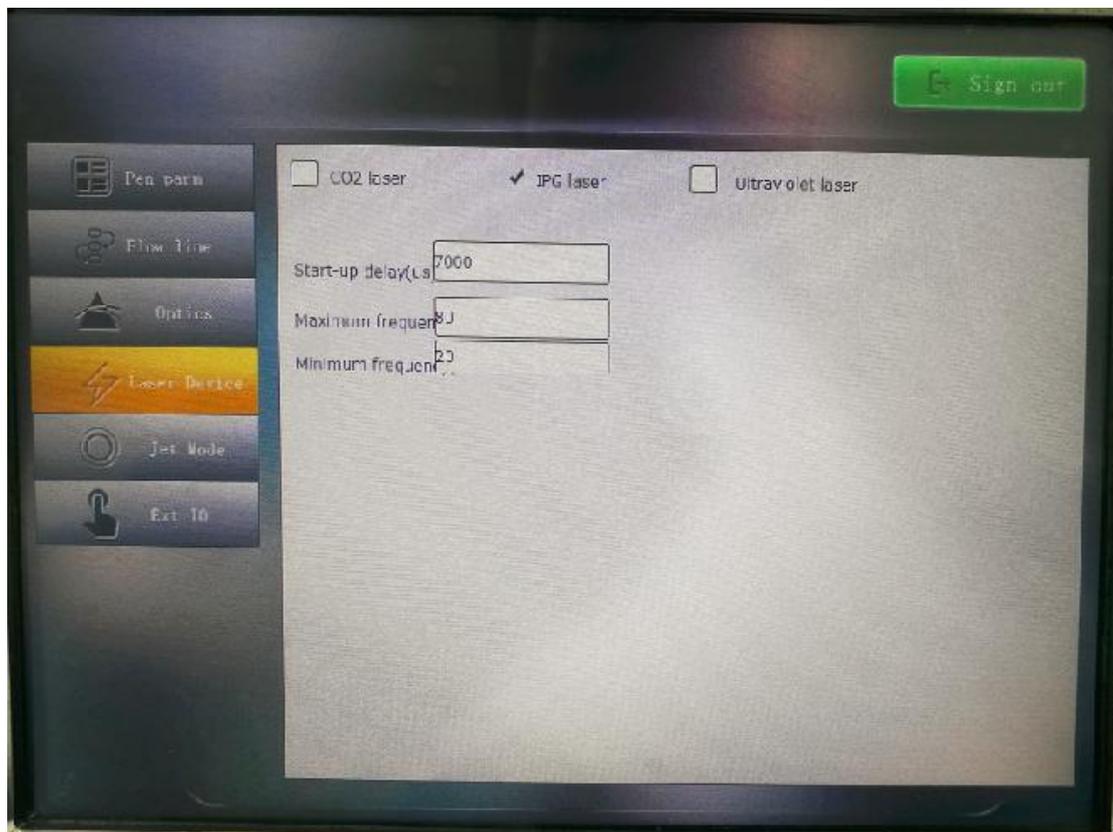
rect: The size of a square output for debugging.

Correction includes bucket, rhombus, trapezoid, and proportion correction.

proportion correction generally is ok in the printing machine. The method of proportion correction as follows :

- 1, Set the size in focal length size interface
  - 2, Set the size of marking the square to 20mm.
  - 3, Enter the code interface, Check the square in advanced options interface.
  - 4, Start printing, print the square.
  - 5, Measuring the square X, Y axis length are 25,25, respectively, then The proportion coefficient of the X axis is 20/25, The proportion coefficient of the Y axis is 20/25
- 1.

## 2.2.4 Laser

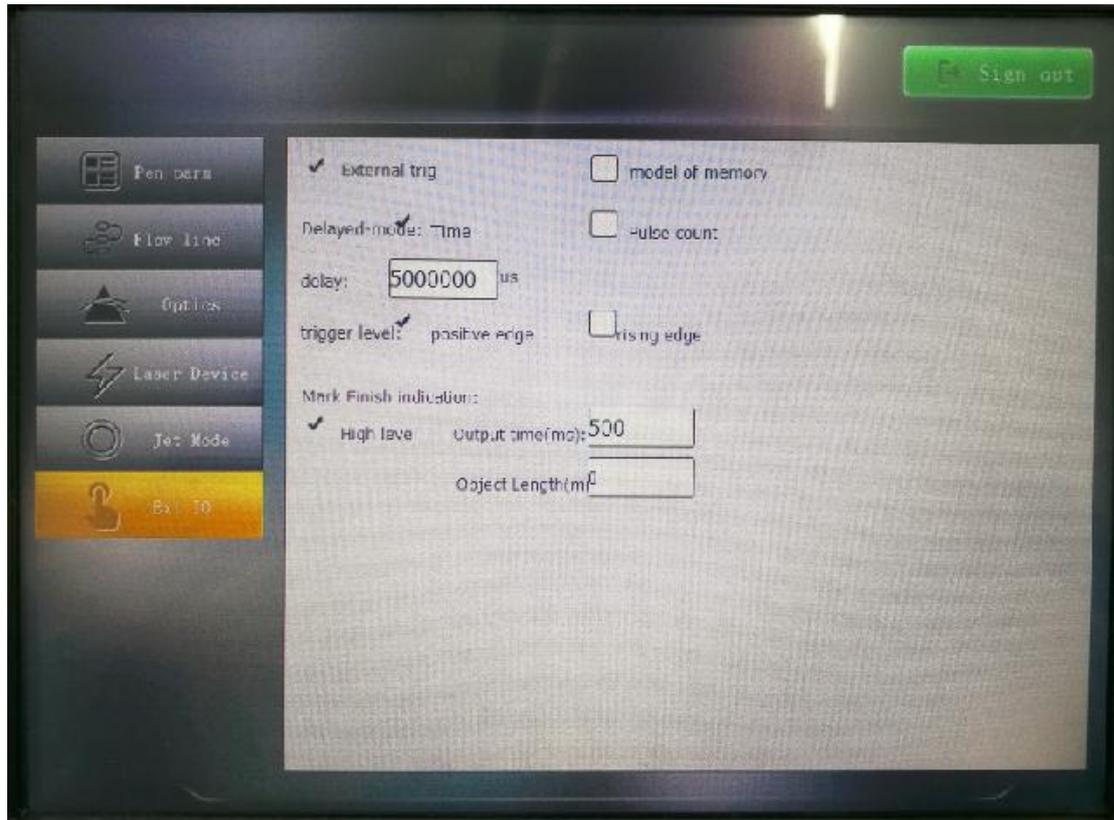


Laser Settings include optical fiber and CO2 laser.

CO2 laser settings include first pulse preionization and inhibition. The first pulse suppression is in the presence of focused

IPG laser settings include startup latency and frequency limits.

## 2.2.5 external triggering

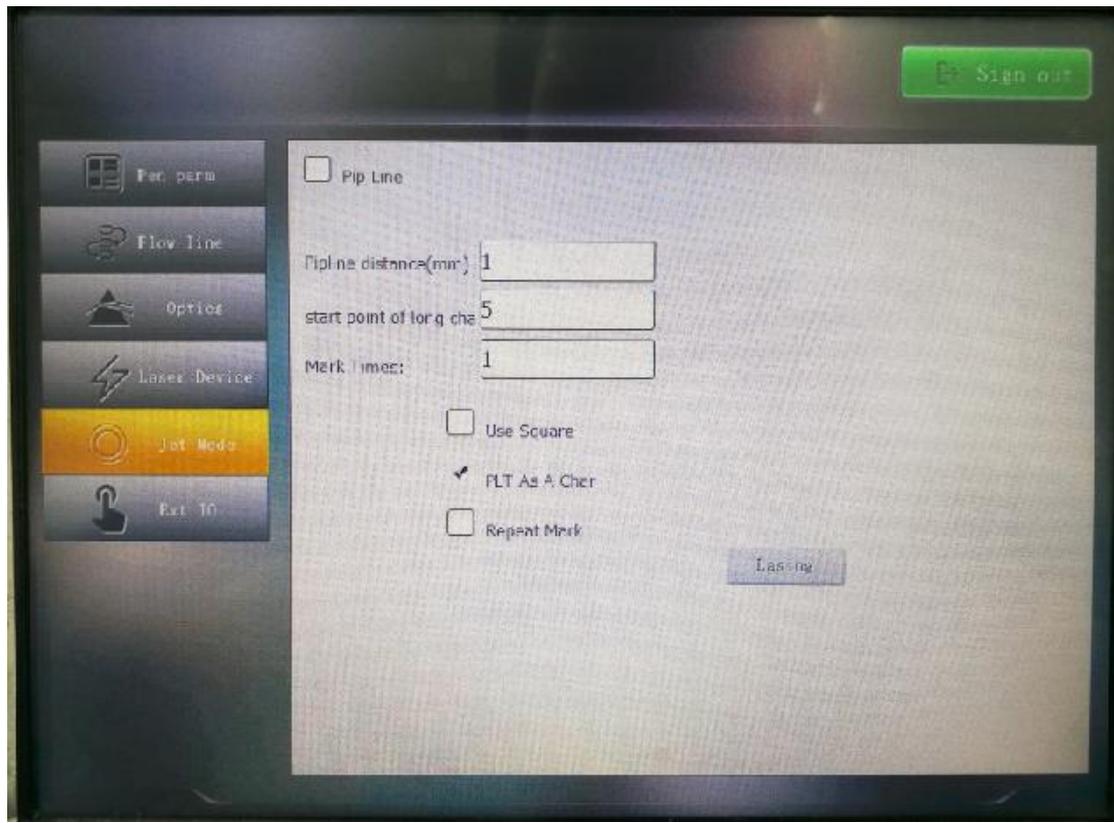


External trigger must be checked on the software to take effect.

There are two kinds of external trigger delay model: Time delay and pulse delay. Can not choose the pulse mod without encoder

notice: 1000000us is equal to 1second.

## 2.2.6 Printing mode



Pipeline: In the mode of production or cable, the pipeline mode need to be checked.

Pipeline distance: How many mm every printing again.

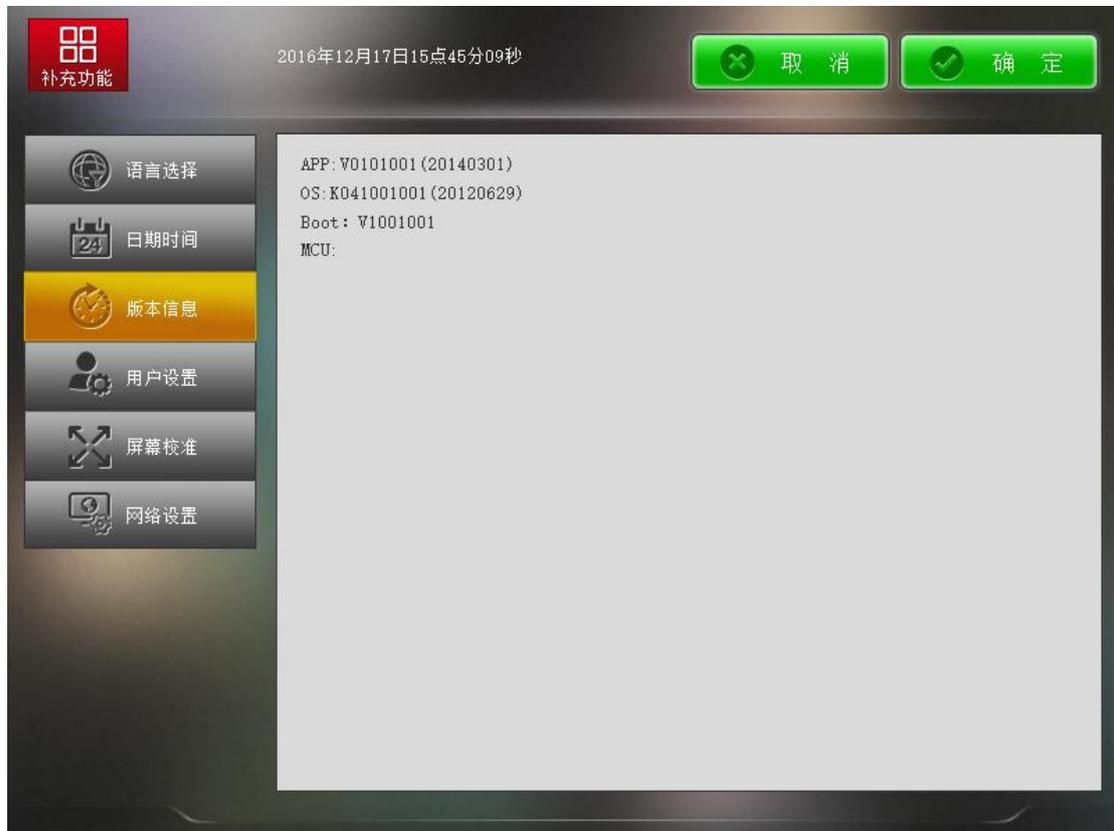
start point of long character : In the case of characters long flight, the starting point of the galvanometer is in middle position coordinates. The deviation can be modified by setting the starting position.

Use Square: Only for the printing square and other text are ignored when selected. mainly used for size and the number of product testing.

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## 3. setting interface

### 3.1 system setting interface



Date/time: Adjust the system time .

correction of touching screen: Correction of touch screen function. If the touch screen is not accurate, enter the calibration interface to recalibrate.

file management: The code file to delete, copy, copy by clicking on the file management to enter.

version: Check the system software version, convenient maintenance

update: Update Software.

Startup Picture: user can update their boot LOG.

## 4system setting.

### 4.1 System initialization.

1. Choose the right type of laser. setting interface-control card-laser.
2. Set the size of the optics. set-optics- Focal length size interface.
3. Detection of X, Y axis is correct or not. Editing a text"ABC", then set correctly in optics-axis

transformation

## 5.2 Normal flight initialization Settings

1. First, check or uncheck simulated flight and uncheck the encoder. setting-control card-marking on the fly
2. Set the size of the marking on the square. set-optics- Focal length size interface.
3. Check the square, In the printing interface of advanced options.
4. Choose the direction of the pulley, From left to right or from right to left. In the printing interface of advanced options.
5. Select normal flight. In the printing interface of advanced options.( If have a photoelectric, select external trigger)
6. printing, According to the square of the closed situation, adjust the product number or simulation speed. set-control- marking on the fly.

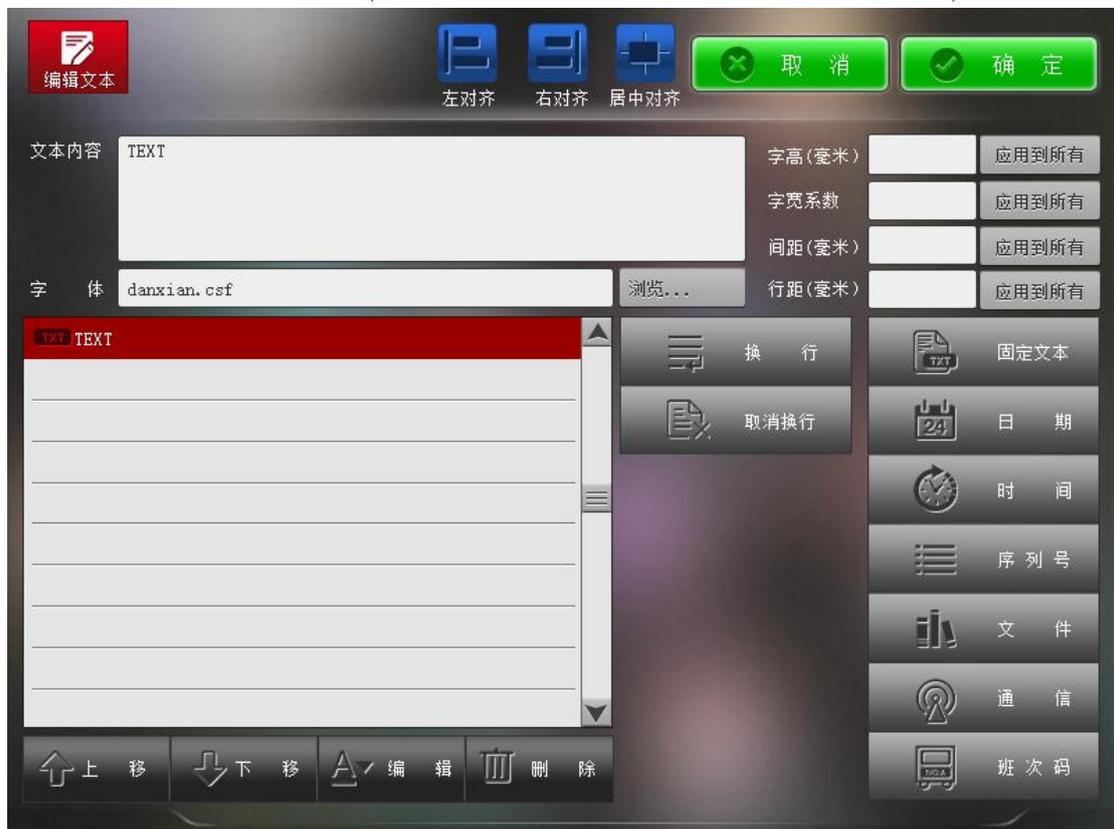
If square overlap is more, the accumulation and simulation speed decrease. If the square is not closed, the accumulation and simulation speed decrease

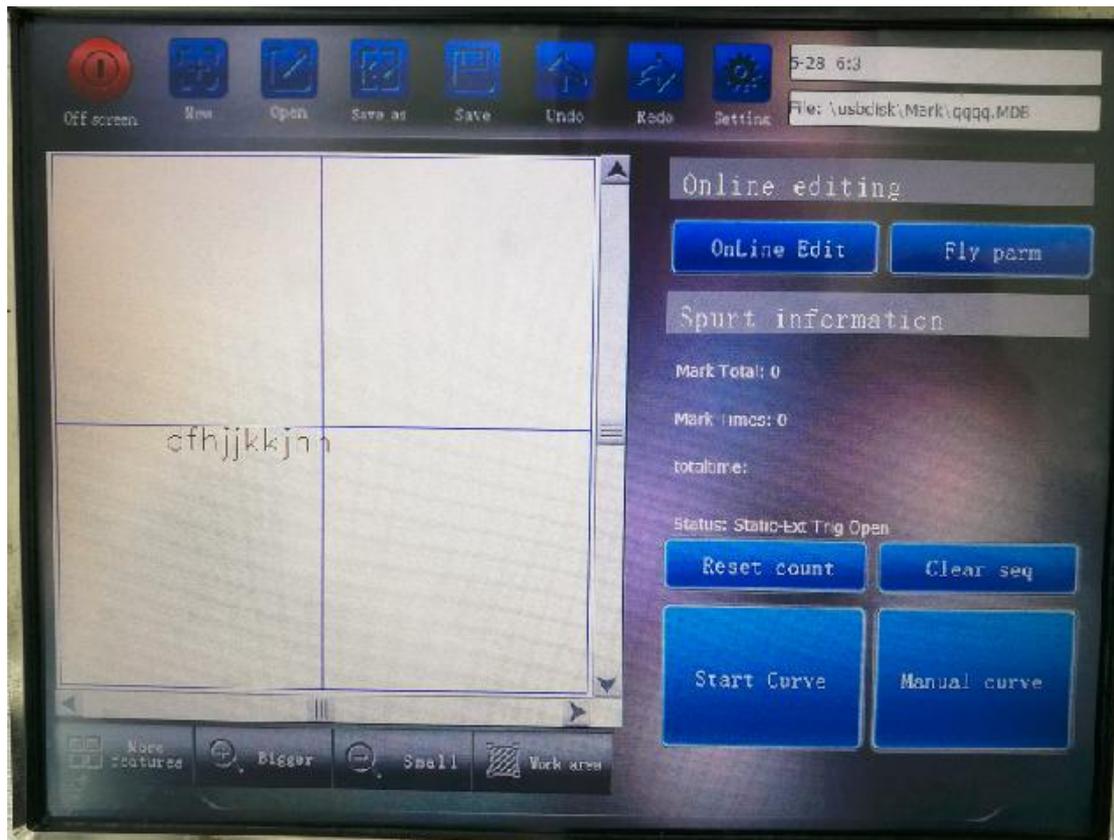
## 5.3 use of the long characters.

1. First, adjust simulation speed and product according to 5.2
2. Editing a text or a few piece of text. Text content can be present within the scope of the mirror, can also be outside the scope.
3. choose long flight characters In the printing in the advanced options. in the process of printing, adjust the starting position of the characters if not gush out. set-control card- Long character starting position. adjust the spacing between characters if speed is too fast.

## 5.4 use of meter mark.

1. First, adjust simulation speed and product according to 5.2
2. Create a text as shown below (Contains the serial number and fixed character "m"):





3. Enter the printing interface, choose long flight characters. Then select the assembly line direction.
4. Enter the set interface, pipeline mode of marking mode in control card setting. Pipeline spacing is 1000mm
5. Enter the printing interface, The status bar displays as follows:

**Status: Long Text-Ext Trig Close-use encoder-Pip Mode-**

**If any further assistance, please feel free to mail to us by [service@cycjet.com](mailto:service@cycjet.com) to get more supporting.**