User Manual@V1.0

Wuhan Xiantong Technology Co., LTD

Version Record

version number	revise content	date changed
V1.0	user's manual	2023-7-26

Catalogue

1. Introduction

1.1 Technical parameters

Display mode	A 7-inch capacitive touch screen
Operating system	The Embedded Linux operating system
Language	Chinese, English, Persian, Spanish, Korean, Vietnamese and other customized according to the needs
Power supply mode	AC110V-220V/60Hz
Power	240W
Watt	20W
Laser life	100,000 working hours
Laser wave length	1064±3nm
Laser pulse width	80-110ns
Laser frequency	27-62kHz
Cooling method	Built-in air cooling
Preview instructions	Red light
Focal distance indication	Double red light focus
Print range	100mm*100mm
Print content	Text, numbers, symbols, pictures, QR code, bar code, date, serial number
Suitable for material	Stainless steel, carbon steel, alumina, aluminum alloy, aluminum, copper, iron, gold and silver carbide carbide and other metal materials, hard plastics
Machine weight	9Kg
Working temperature	+10～+40℃
Environment temperature	-10～60℃
Environment humidity	10%～95%

1.2 Safety information

The machine shall not be used for nonspecified purposes or materials and must be operated, maintained and repaired by personnel familiar with the machine and related fields. Laser beams are dangerous, including its reflectivity, electrical conductivity, the possibility of producing harmful or combustible smoke, etc. No liability for any damage or damage caused by any improper use of the machine. The operator must use the machine in accordance with its specified use, other instructions in the manual, and all applicable local and national laws and regulations. In the process of use, we need to

pay attention to the operation steps and precautions, use the correct operation method and maintenance, you can obtain the ideal printing effect, and improve the work efficiency.

1.2.1 Material safety description

This machine can be used safely with the following materials: aluminum, brass, gold, silver, steel and stone, including granite, marble, titanium, tungsten, hard plastic, etc.

This machine cannot use the following materials or any of the materials including:

(1) Artificial leather containing hexavalent chromium (Cr), containing toxic fumes.

(2) , Contains toxic fumes.

(3) Beryllium oxide, containing toxic fumes.

(4) Bromine, containing toxic fumes.

(5) Chlorines, including polyvinyl alcohol butyraldehyde (PVB) and polyvinyl chloride (PVC, Vinyl, Cintra, etc.), contain toxic fumes.

(6) Fluorine, including polytetrafluoroethylene (Teflon, PTFE, etc.), contains toxic fumes.

(7) Iodine, containing toxic fumes.

(8) Flamflammable items such as paper and cardboard.

(9) Phenolic resins, including various forms of epoxy resin, contain toxic fumes.

(10) Wood, including medium density fiberboard, plywood, plywood, balsa, birch, cherry, oak, poplar and other flammable objects.

1.2.2 Laser safety instructions

This machine uses an invisible level 4 laser, which is the strongest and most dangerous laser available for public use. If accidentally used, serious property damage and personal injury may result, including but not limited to the following:

(1) Lasers can easily burn nearby combustible materials, and do not leave potential combustible, flammable, explosive, or corrosive materials nearby that may be exposed to direct or reflected laser beams.

(2) Some materials may produce radiation or harmful gases during processing, and direct exposure to

the laser can cause physical injuries, including severe burns and irreparable eye damage.

(3) Ensure that the area is free of air pollutants that can pose serious risks of reflection, combustion, etc.

(4) Use this machine only as described in the material safety section of this manual. Relevant printing settings and engraving processes must be appropriately adjusted specifically for specific materials.

1.2.3 Safety use instructions for the machine

(1) Before starting the machine, please check whether the lens protection cover is covered on the lens. If it must be removed to avoid the laser burning the protection cover, it will seriously damage the laser and the lens! When taking off and covering the protective cover, avoid touching the mirror. If there is grease or debris on the focus lens, the lens should remove the lens and scrub with a cotton swab or non-woven cloth with more than 99.5% pure alcohol, otherwise it will affect the marking effect to be marked.

(2) The machine and other related equipment must be grounded safely, before startup operation. The working voltage of the machine is AC100-240V, 50 HZ, total power <240W. When the grid voltage is unstable or unmatched, startup is strictly prohibited.

(3) It is strictly prohibited to have anything unrelated to the machine and with full reflection or diffuse reflection, so as to prevent laser reflection on the human body or flammable items. In an emergency, immediately press the emergency stop switch and cut off the main power supply.

(4) The environment of the machine should be dry, no pollution, no vibration, no strong electricity, no

strong magnetic and other interference and influence.

(5) The machine shall be far away from the electrical equipment sensitive to electromagnetic interference and may produce electromagnetic interference to it.

(6) The laser is an air-cooled laser, the temperature in the working environment (room temperature) is 10-40 degrees Celsius, and the working environment humidity is 10-95%.

(7) Do not bend optical fiber (optical fiber is glass fiber). If necessary, ensure that the minimum circle diameter is greater than 20 cm.

(8) Operators should wear protective goggles and protective gloves, and no part of the body should touch the marking area.

2.Hardware introduction

2.1 Main structure

Figure 2.1 Physical picture of the laser machine

Main:

① Laser print head —— High-speed lens scanning head focuses the laser beam to a fine point and guides it to the appropriate position of the target material for printing during marking.

② The host —— includes power, fiber laser, motherboard, display and various connections.

③ The laser cable —— includes optical fiber and control cables, which transmit the laser and control signals from the host to the laser print head.

④ Lift bracket —— supports a laser print head for rapid height adjustment.

2.2 Input

Figure 2.2 Schematic diagram of the interface

① Power input and switch —— support wide voltage input AC100-240V / 50Hz.

② Data interface —— connect to the PC or external serial port data.

③ The USB interface —— used for software upgrading and the printing of external pictures and data.

④ External trigger interface —— can be used for external photoelectric and foot switch.

2.3 Laser machine control parts

Figure 2.3 Control button

① Focus switch: Press this switch if the two red light do not coincide on the printed object, turning the lifting bracket handle to make the two overlap is the best printing focal length (the red light focal length has been adjusted at the factory).

② Emergency stop button: When laser printing emergency, press the button to stop printing.

③ Trigger button: When the laser machine software is in the "preview" or "print" state, press the trigger button to start printing immediately.

④ Master screen: All software use for the laser machine is operated on the master screen (see Chapter 3 for details).

2.4 Handheld laser marking mode

Figure 2.4 Hand-held laser marking mode

3.Software

3.1 Main interface

The main interface of the machine is shown in Figure 3.1.1 below.

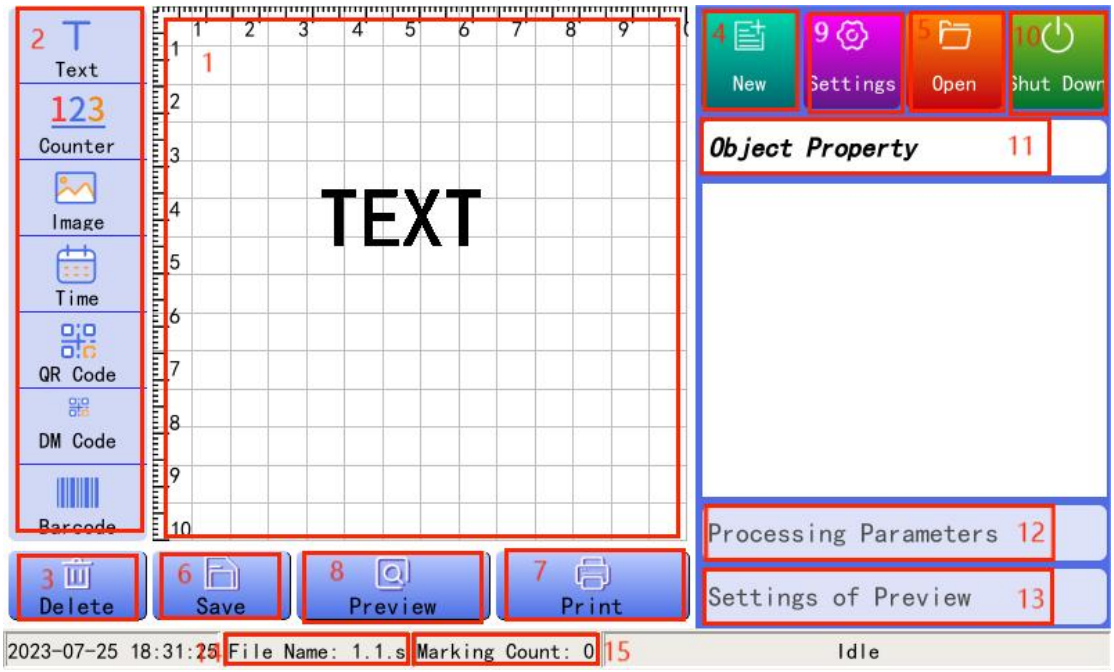

Figure 3.1.1 Main interface

1 —— Information preview area: In this area, you can see the information content that is ready to print, and drag the area left and right to view the information content outside the display area.

2 —— Print content option: Click this button will add the print content and display to the information preview area.

3 —— Delete button: Click the button to delete the selection information after selecting the information in the information preview area.

4 —— New File: Click this button, the software will close the file you are currently editing and establish a new file. If the file you are currently editing is not saved, the software prompts you to save the file.

5 —— Open the file: Click this button to select the printed file saved in the machine.

6 —— Save file: Save saves the drawing drawing with the current file name and Save As to save the currently drawn drawing to a different file name. Both implement the function of saving files.

7 —— Print button: Print information preview area currently drawing graphics.

8 —— Print preview: Clicking this button displays the outline or range of the information to be printed.

9 —— System Settings: Click this button, you will enter the system Settings interface, in which you can perform the system language, system time, font management, version management, log management.

10 —— Shutdown button: When you need to turn off the machine, please click the button first. After the screen is off, press the power button on the left side of the host to shut down.

11 —— Object Properties: This area displays the relevant properties of the required editing information.

12 —— Processing parameters: Laser intensity, speed, pen change delay, marking accuracy and fidelity can be set and viewed in this area. See 3.5 Printing parameter setting for details.

13 —— Preview Settings: This area can set the form of print preview and X offset, Y offset.

14 —— File Name: The area displays the currently loaded file name.

15 —— marking count: display the total marking times of the machine;

3.2 Edit

This chapter describes the basic operational information of the job editor, including the following topics:

How to create a new printed file

How to edit the print information

How to delete / copy the file

3.2.1 How to create a new file

After clicking from the main interface, the software will close the file you are currently editing and establish a new file. As shown in Figure 3.2.1.1.

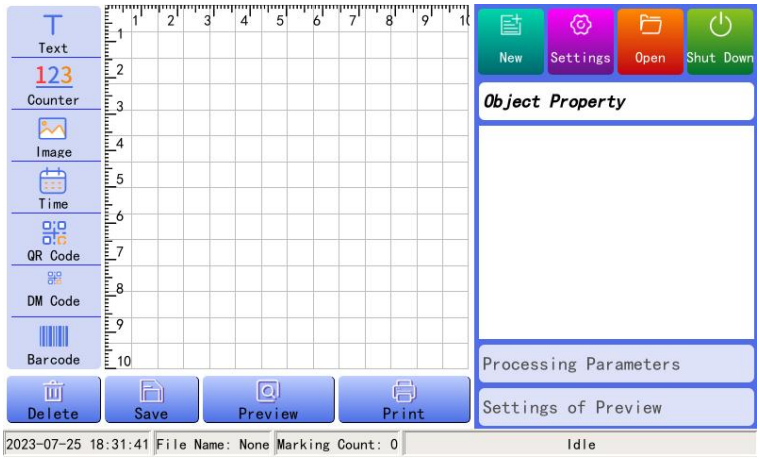

Figure 3.2.1.1 File editing interface

In the edit file interface, you can edit the print information. The content of the printed information can include "Text", "serial number", "Time", "Picture", "QR code", "DM code", "bar code".

3.2.2 Text Editing

① If you want to print Chinese characters (CN), English (EN), numbers, symbols and other contents, please click the "Text" button in the "Information button area", and a default text entry will appear in the "Information editing area". As shown in Figure 3.2.2.1.

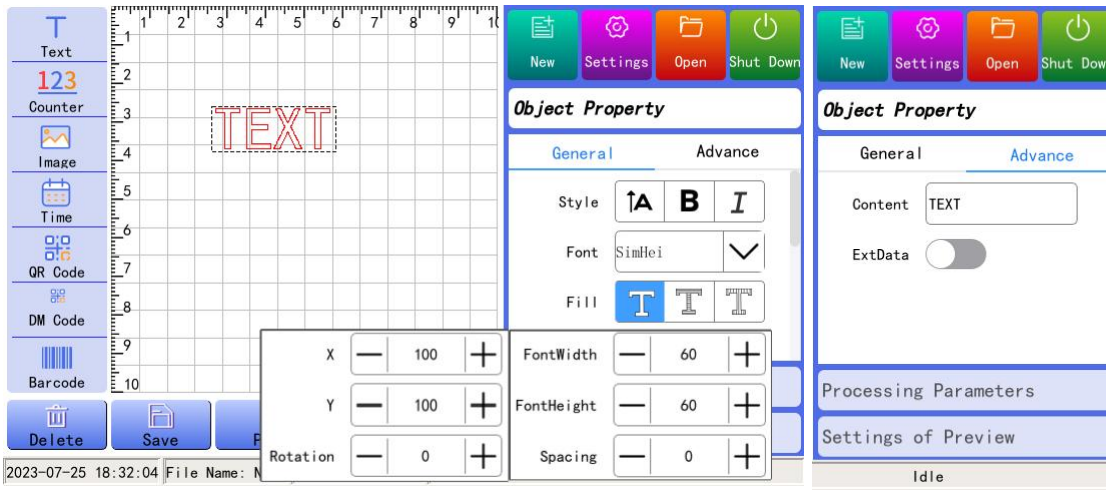

Figure 3.2.2.1 Text editing

② Select this entry and click the Content edit box of Object Properties to enter the required information. In the Object Property Area, adjust the location, font, word height, word width, size, interval, angle, external attributes (see 3.2.9 for details) attributes.

③ 

Click the Style Bar button to style the text (vertical, bold, italic). As shown in Figure Figure 3.2.2.2.

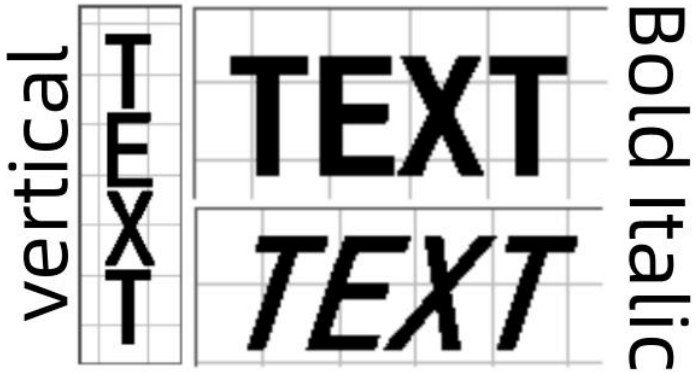

Figure 3.2.2.2 Style Setting

④ Click the fill bar button to set the filling mode and printing mode of physical printing (no filling, horizontal filling, and vertical filling successively). At the same time, the print filling interval can be set, as shown in Figure 3.2.2.3.

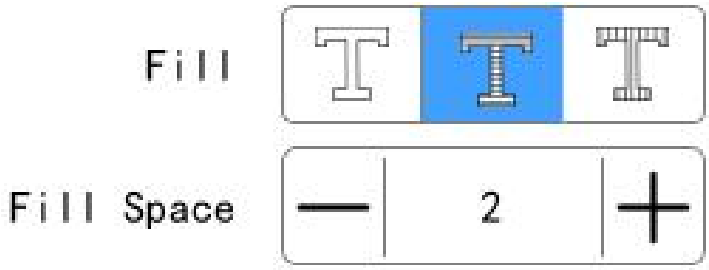

Figure 3.2.2.3 Fill Settings

Line fill: Do not fill the font.

Horizontal line fill: Fill lines are always filled from the transverse direction.

Vertical fill: Fill lines always fill from vertical.

Solid fill: Solid fill when the fill interval is 1.

Fill interval: refers to the distance between the adjacent lines of the filling line. the larger the value, the wider the spacing between the adjacent filling lines.

Supplementary Note: The filling effect will also affect the printing method (lateral filling, vertical printing)

The filling effect is shown in Figure 3.2.2.4.

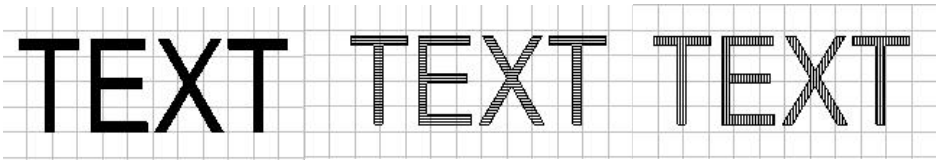

Figure 3.2.2.4 Fill effect

(The left figure is solid filling, the middle figure is horizontal line filling, and the right figure is vertical line filling)

3.2.3 Serial number editing

If you need to print a variable serial number, that is, the count content in the printed information is automatically updated without human intervention, please click the "Serial Number" button, and a default serial number entry will appear in the "Information Editing Area". Select the serial number item, and adjust the position, font, and font size of the serial number item in the "Object Property Area". As shown in Figure 3.2.3.1.

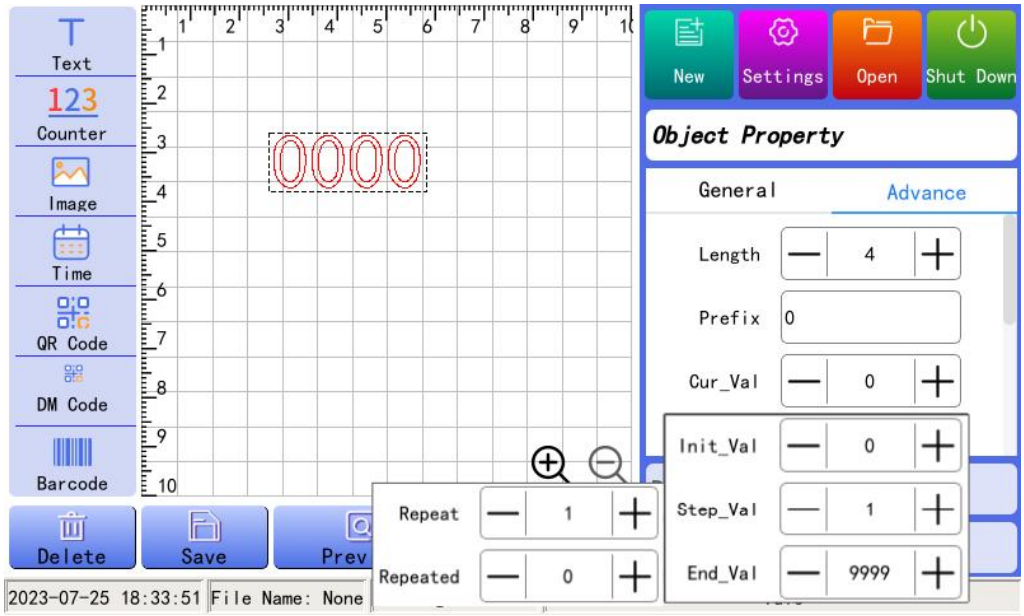

Figure 3.2.3.1 Serial number editing

Serial number can choose different fixed digits (high complement with 0), can also choose the natural number. You can set the initial, step, current, and end values for the counter in Object Properties.

3.2.4 Time editing

The time format text is suitable for printing labels such as generation date and valid date, and can also customize the time format and set the effective date (the final printing time is the current date + valid date), as shown in Figure 3.2.4.1.

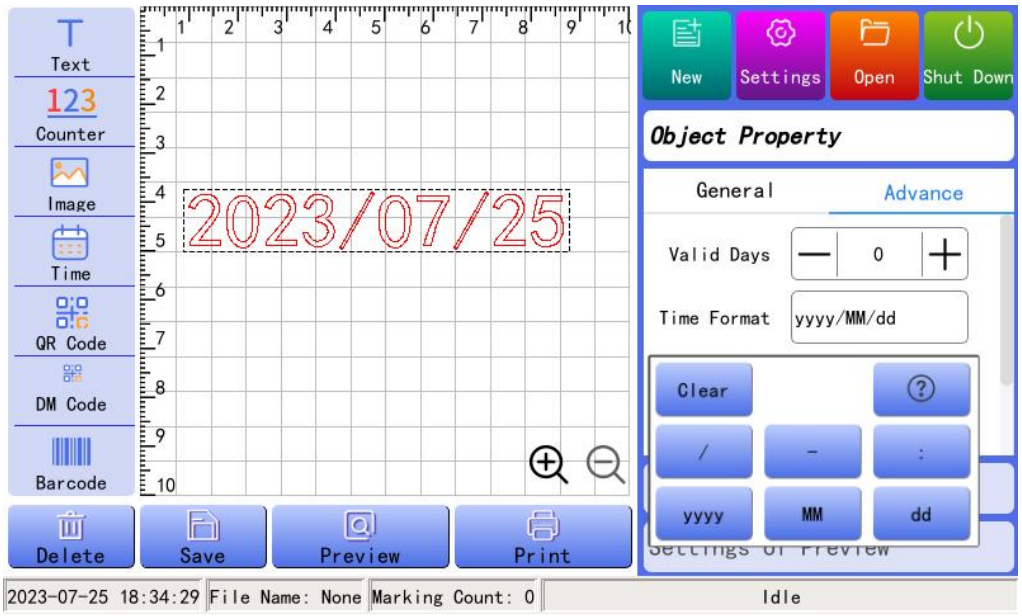

Figure 3.2.4.1 Time Edit

3.2.5 Picture Editing

① To print a picture, click the Information BuArea Image button, and a default IMAGE image entry appears in the Information Edit Area. You can click the "Object Properties" button to select the image file to print, and adjust the height and width.

(Insert U disk) Click "Picture", "Select picture", "U disk" to select files "Copy to local", "local file" (select the previous step to copy to local file) The "OK" white window will display the selected image to format according to the requirements. The picture editing interface is shown in Figure 3.2.5.1.

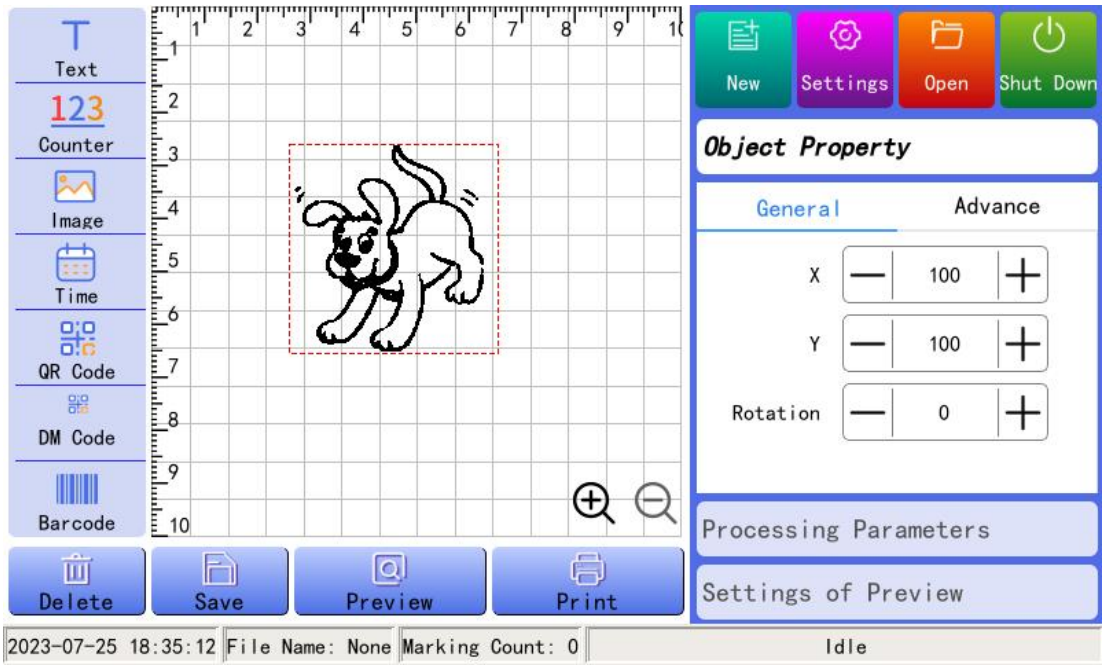

Figure 3.2.5.1 Picture editing

②  Click the style bar button to set the picture style (reverse color, outline, visual gray). The effect of the style setting is shown in Figure 3.2.5.2.

Figure 3.2.5.2 Picture Style

(From left to right, the original image, no style, reverse color, outline, visual grayscale)

3.2.6 QR-code editing

If you need to print a QR code, please click the "QR code" button in the "Information button area", and a default QR code entry will appear in the "Information Editing Area". You can modify the QR code generation rule by adjusting the object properties.

Content: Text data content stored in the QR code.

Zoom: the zoom size of the QR code, the larger the value, the larger the size.

Error correction rate: According to the proportion of error correction rate, the QR code can still be scanned normally after being blocked.

Version: The higher the version, the more content that the QR code can be stored, and the

more dense the dot matrix.

Printing method: can be set laser to print QR code in a vertical or horizontal way.

Back color: reverse the QR code color block and add a black edge, suitable for the black material on the white.

External data: using external text files or serial data, see 3.2.9 for details.

The QR code editing interface is shown in Figure 3.2.6.1

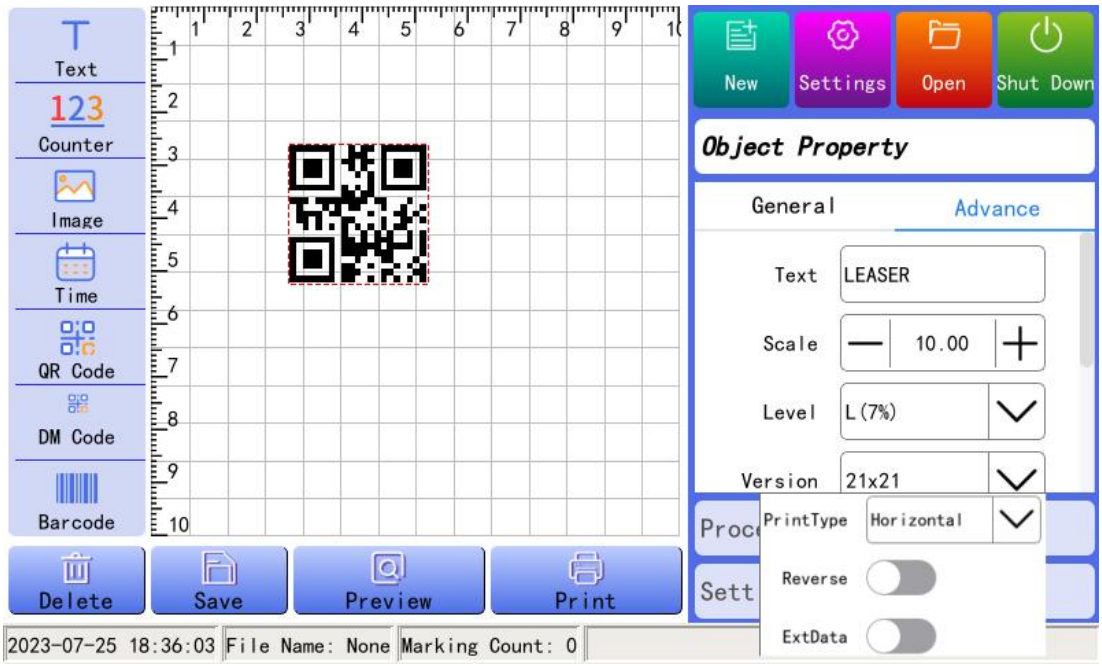

Figure 3.2.6.1 QR code editing

3.2.7 DM code editing

To print the DM code, please click the "DM code" button in the "Information button area", and a default "Information edit area" will appear as a DM code entry. You can modify the DM code generation rule by adjusting the object properties.

Content: Text data content stored in the DM code.

Zoom: DM code zoom size, the larger the value, the larger the size.

Type: Data format for to print the DM codes.

Printing mode: you can set the laser to print the DM code in a longitudinal or transverse way.

Display content: Set whether the data text content is displayed below the DM code.

Internal data: A special format of data can be customized in the program, see 3.2.10 for details.

External data: using external text files or serial data, see 3.2.9 for details.

The DM code editing interface is shown in Figure 3.2.7.1.

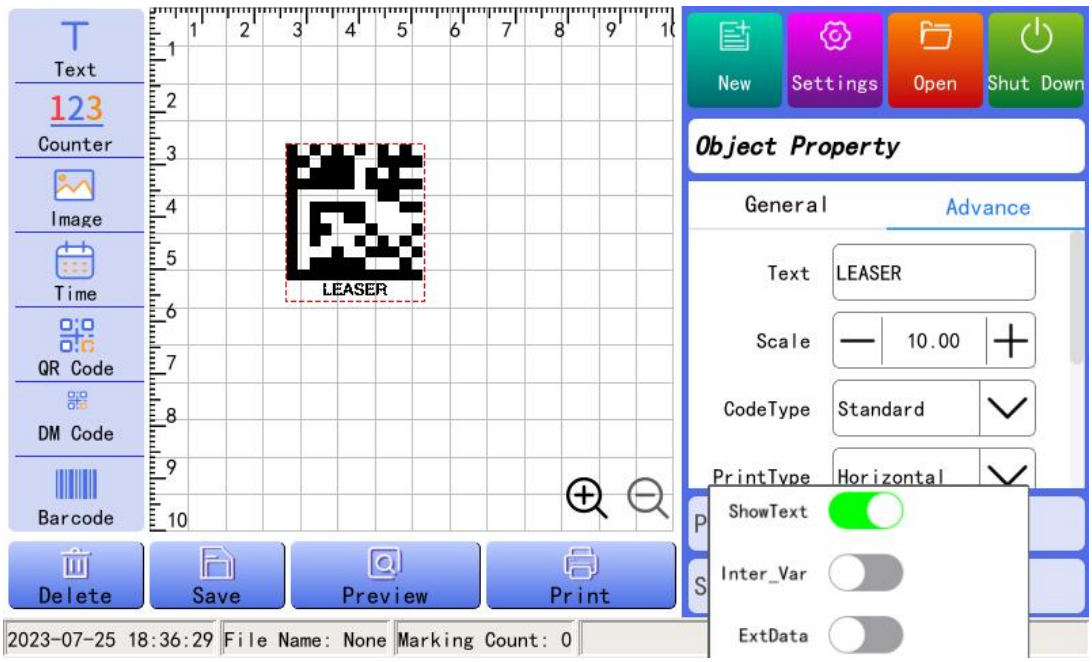

Figure 3.2.7.1 DM code editing

3.2.8 Bar code editing

To print a barcode, click the barcode button and a default barcode entry will appear in the Message edit section. You can select the barcode size through the wide and high options, select different barcode types through the barcode type option, and set whether to display the barcode text content.

It should be noted that different barcodes have their own definition specifications, and if the edited content does not respond to the barcode specification, it may lead to barcode display errors. The barcode editing interface is shown in Figure 3.2.8.1.

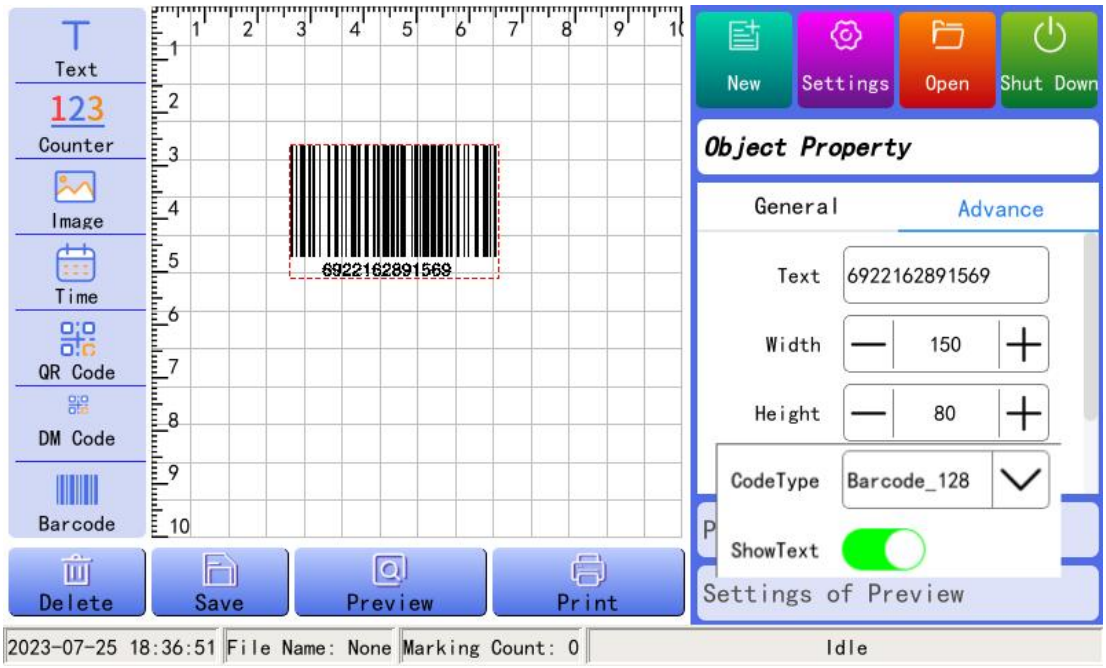

Figure 3.2.8.1 Bar code editing interface

3.2.9 External data

At present, the external data option can be opened in the advanced attributes of "Text", "QR code", "and" DM Code ", which enables users to choose the custom" text file "or" external serial port device " as the variable data source to realize the dynamic change effect within printing.

①  Users can click to select a "text file", and set the start line, end line, current line, whether to repeat to define the variable print content rules. As shown in Figure 3.2.9.1.

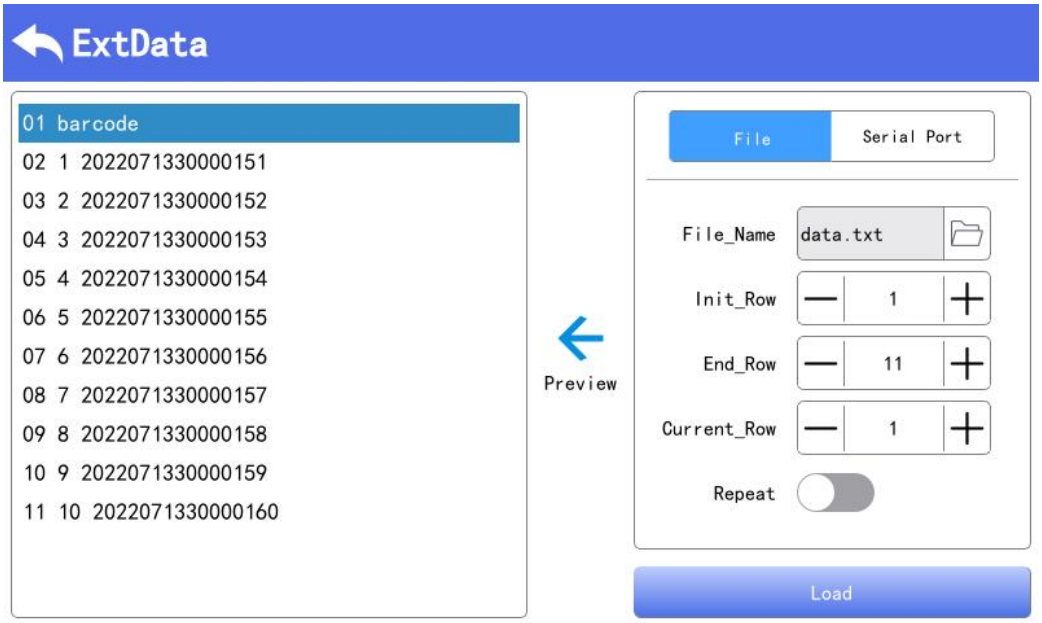

Figure 3.2.9.1 External file data

② Users can select an "external serial port device" as the data transmission source (e. g., electronic scale, computer, code scanning gun, etc.), and the system will receive and update the printed content of the external device data according to the specified communication protocol (see "Serial Port Data Protocol Manual"). You can set the number of cache data or clear the cache in the attribute bar, as shown in Figure 3.2.9.2.

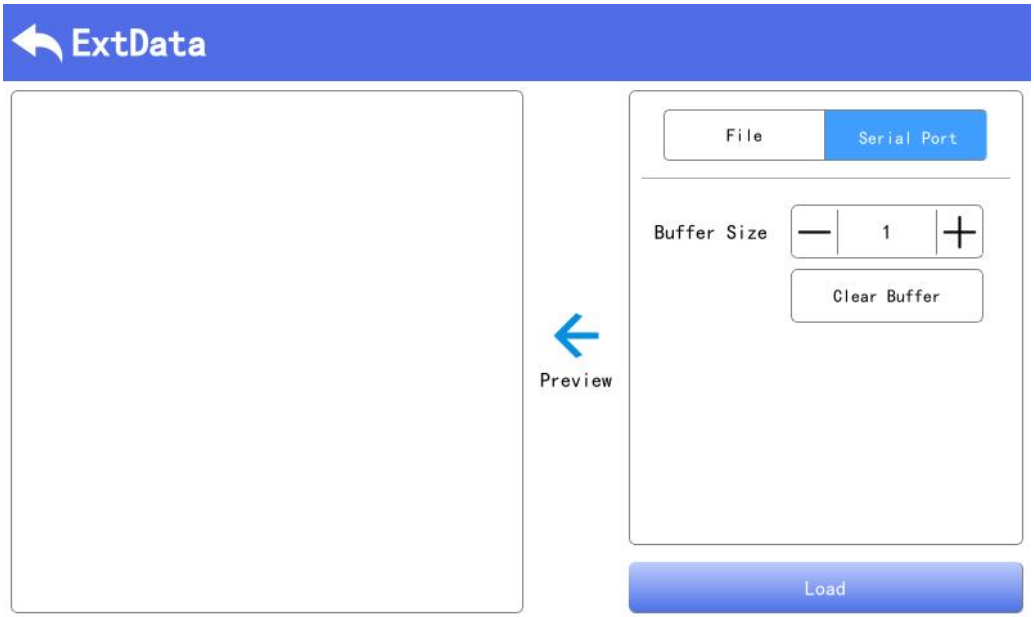

Figure 3.2.9.2 External File data

3.2.10 Internal data

At present, the internal data option can be opened in the advanced attribute of "DM code", which supports users to choose the custom "text", "serial number" and "date" to synthesize a data as a variable data source, so as to realize the dynamic change effect within printing. As shown in Figure 3.2.10.1.

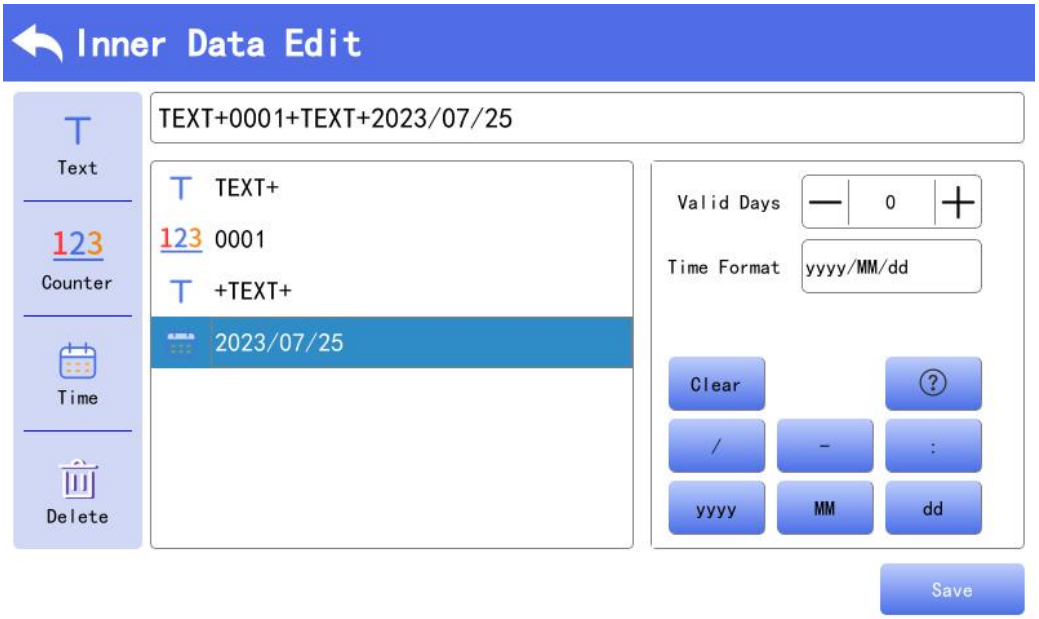

Figure 3.2.9.2 Internal data

3.3 How to edit the print information

① Touch the New button button on the main interface to create a new blank canvas.

② Edit the relevant information that you need to print on the canvas.

③ After editing the information is completed, click the "Save" button, enter the file name, and save the file in the local machine.

④ Click the Save As button to save the changed printed file using the new job name.

3.4 How to delete / copy a file

Delete files: Click the "Open button" in the main interface to enter the selection file interface. As shown in the figure below, select the files to be deleted, and then click the "Delete" button to delete the file.

Copy files: click the "Local" button in the select file interface to display the local related files on the left side, click the files to be copied, and then click the "Copy to U disk" button to copy the local files to the U disk. U disk file copy to the same. The file selection interface is shown in Figure Figure 3.4.

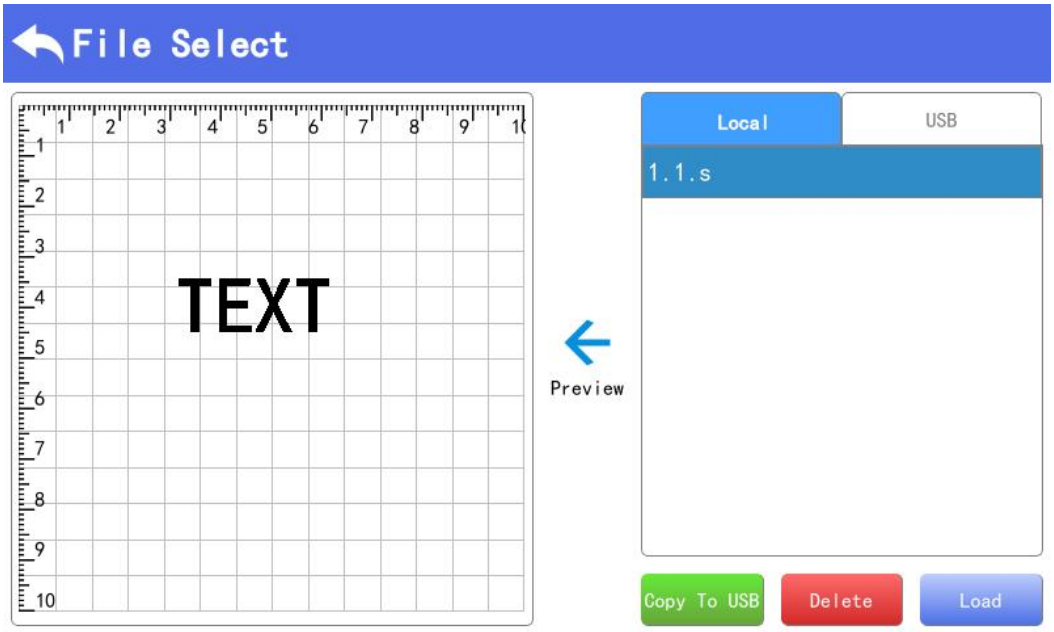

Figure 3.4 File selection interface

3.5 Print parameter settings

Click "Processing Parameters" on the main surface to open the processing parameter interface, as shown in Figure 3.5.

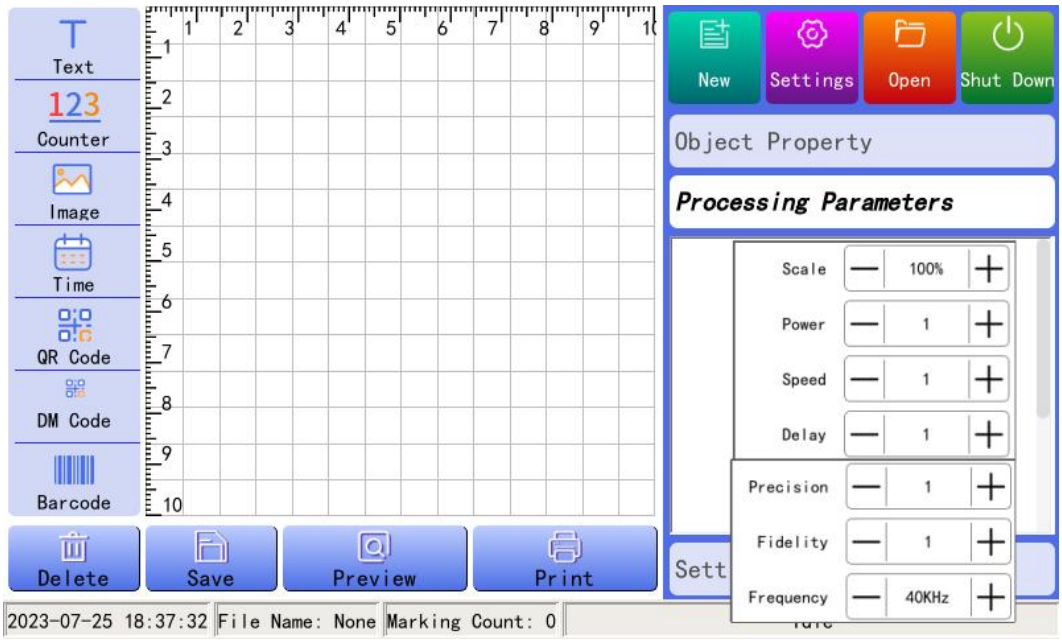

Figure 3.5 Setting of machining parameters

Scale —— print content overall scale to scale, can be matched with the printing content size setting to reach millimeter level adjustment.

Intensity —— When the laser opens the laser intensity, the greater the value, the stronger the laser intensity.

Speed —— refers to the speed of laser printing, the larger the value, the faster the printing speed.

The pen change delay —— The actual printing content will be divided by the machine into multiple strokes respectively. There will be a switch light interval between the stroke and the stroke, and the pen change delay will be used to adjust the length of the stroke interval. It is mainly used to solve the problems affecting the printing quality caused by trailing and trimming due to the short changing interval (switch photoswitch is too fast).

Mapping accuracy —— is the resolution of printing; the higher the printing accuracy, the higher the laser engraving stroke density, is usually used to improve the printing quality, but accordingly will increase the data processing capacity and affect the program processing efficiency (slow processing speed), but also cause a stronger degree of laser impact on the punctuation (greater damage degree, deeper color); in unnecessary cases, usually the default marking accuracy is 2 (the lowest value);

Fidelity —— lower fidelity, the program will ignore more edge pixels, otherwise will retain more edge pixels; suitable for picture situations, in unnecessary circumstances, usually the default fidelity is 5;

Frequency —— According to different printing materials to choose different laser frequencies can achieve better printing effect, the specific parameters need to be confirmed according to the actual material, usually the default frequency is 40 KHz;

3.6 Preview settings

Click "Preview Settings" on the main surface to open the preview Settings interface, as shown in Figure

3.6

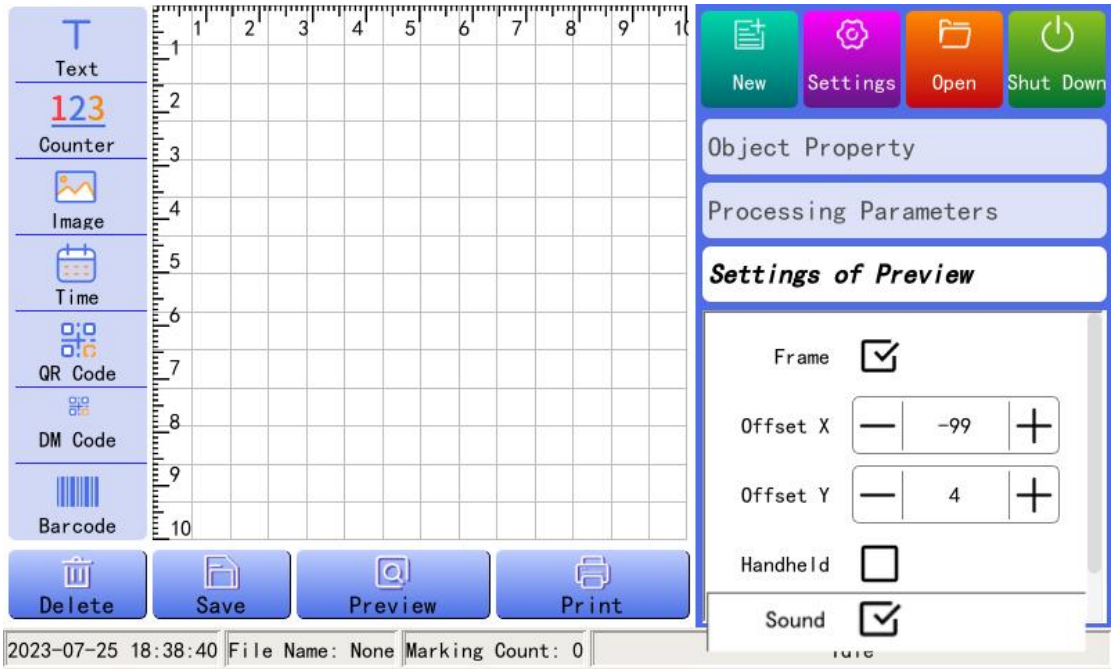

Figure 3.6, preview settings

Outer box preview —— Select the check box to open the outer box preview mode.

X offset, Y offset —— calibration the position of red light preview and laser printing, X offset value is larger, the red frame is moved right; Y offset value is larger, the red frame is moved down, and vice versa.

Handheld —— The current check box is selected when handheld printing is required.

After the sound feedback ——, the buzzer will make a "drop" sound after each printing.

4.System setting

Click the "Settings" button on the main interface to enter the system setting interface, as shown in Figure 4.1 below.

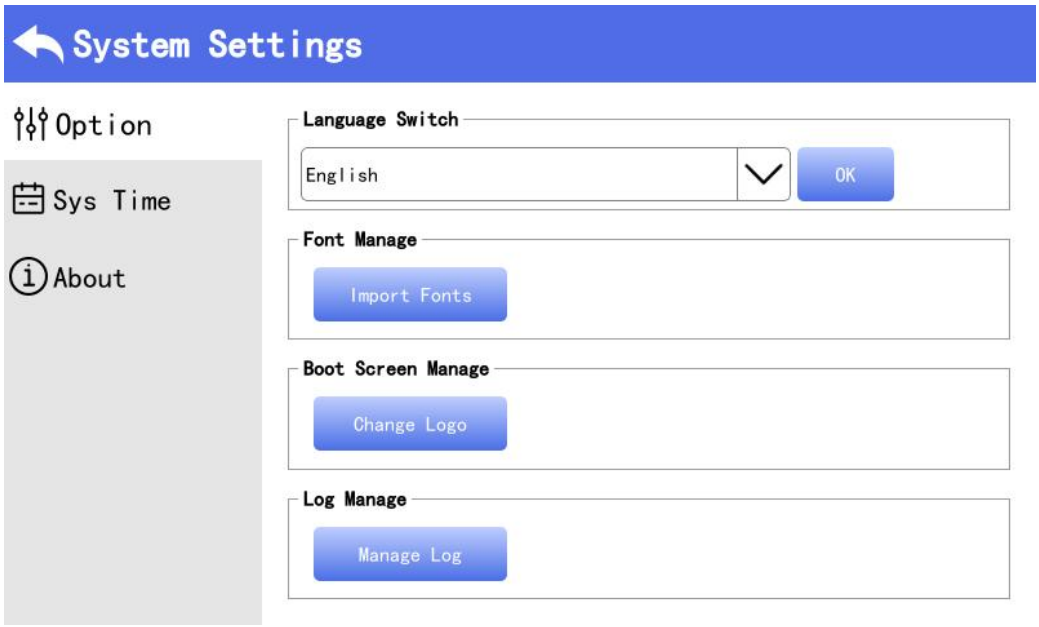

Figure 4.1 System Settings-System Options

System Language —— Select the corresponding system language in the "System Language" drop-down box, and the system will automatically restart after switching. At present, the machine supports simplified Chinese, English, Arabic, Vietnamese, Korean, Persian and so on.

Import the word library —— If there is no font you need in the machine, you can copy the font you need to add to the U disk and insert the U disk into the machine. Click the "Manage Font" button, select "USB" in the pop-up interface, select the font file and click "Copy to local", and the font can be successfully installed.

Replace the boot screen —— Change the system boot screen, and contact the technical personnel for operation.

Management log —— View the system print log for technicians to troubleshoot and maintain the machine.

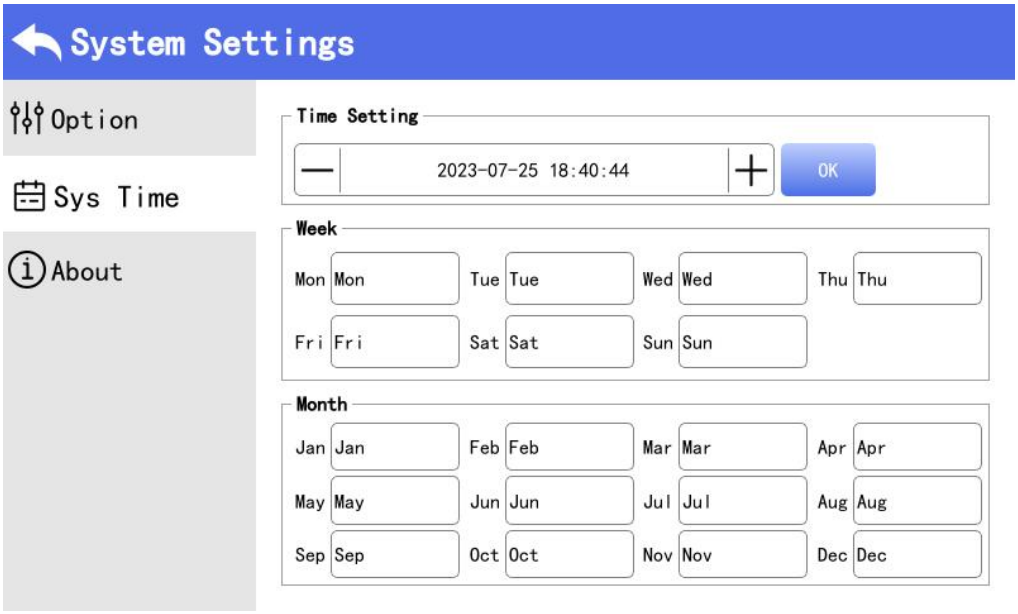

Figure 4.2 System Settings-System Time

System time —— Click the required setting field in the "System Time" setting bar, and adjust the corresponding content through "+" and "-".

Custom date format —— In the "Week", "Month" setting bar can set custom nicknames for weeks and month, and displayed in the "Date" printing properties through "ND", "NR" format, more details in the "Custom Date Description".

Figure 4.3 System Settings- -About the native machine

Local —— version management includes "version upgrade" and "version fallback", firmware version, specific version number of software version, total number of machine marking, zero reset button.