ZapdosX
Portable H a n d h e l d
Laser Marking Machine

User Manual

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1.Overview

1.1. Introduction of the software

the version is still under revision and improvement, please use it as a temporary use version ,the software has the following main functions:

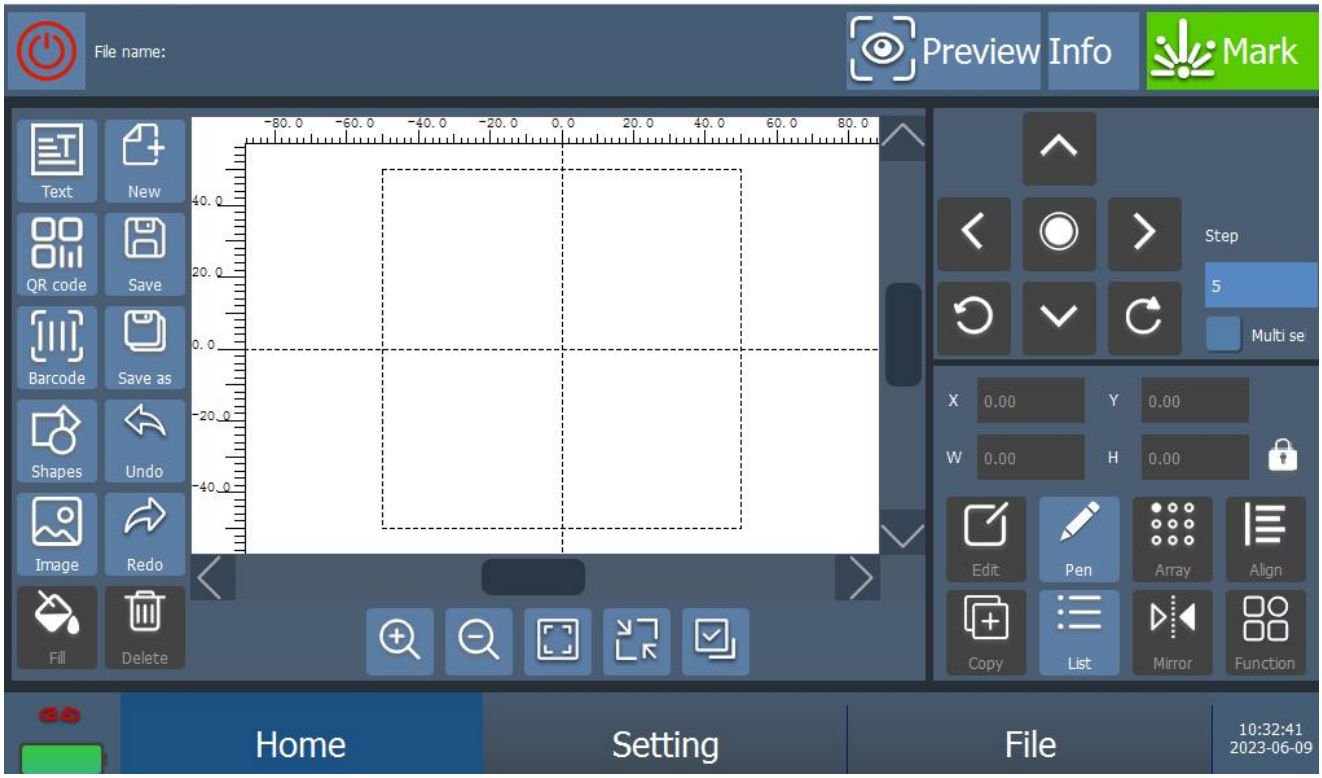
- The software supports user authentication to prevent illegal operations.
- Free design of the graphic pattern to be processed.
- Support all fiber lasers, CO2 and end-pump lasers on the market. Parameters such as adjusting current, adjusting pulse frequency and adjusting duty cycle can be set by the software according to the different types of lasers.
- Support individual red light marking indication.
- The software provides usage authority control, which can prevent the parameters from being modified arbitrarily.
- Support filling operation: provide straight line, ring, bow and other filling methods, can be filled at any angle, adjustable margin, border, spacing, etc.
- Provide variable text function: fixed text, serial number, date, time, network communication, serial communication, etc.
- Support 16 layers of processing parameters: the parameters of each layer can be customized arbitrarily to easily realize multi-parameter marking.
- Provide text input function, support single line, double line, dot matrix and TTF fonts, and support setting different fonts for Chinese and English respectively.
- Support marking dynamic files, when text and pictures are processed, the file name is fixed, but the file content will change during processing.
- Provide powerful editing functions: array, mirror, copy, align, cancel/restore, etc.
- Provide simulation function: you can preview the marking track of graphics before marking operation.
- Support secondary development: provide secondary development SDK library to support users' custom development to extend the functions of existing marking system and meet customers' needs for special applications.

1.2. Description of the manual

- If there is any discrepancy between the actual operation mode and function setting caused by software upgrade and the manual, the software shall prevail.
- Other product and company names mentioned herein may be trademarks of their respective owners.

1.3. Software installation instructions

- The software is green software, unzip it and run it.
- The driver for the board needs to be installed.

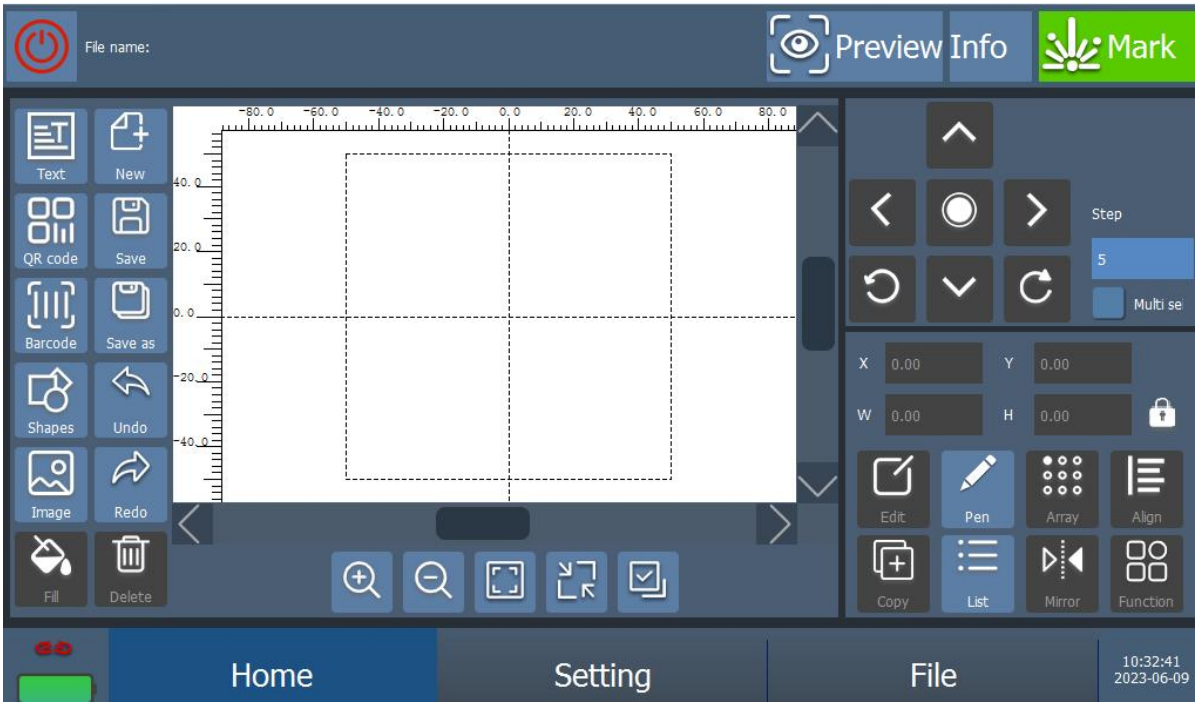


2.Quick Start

Here we will take an example of how to generate a fixed text template file with the content of the production date, lot number.

2.1 Login

After opening the software first check if the connection icon in the bottom left corner is green, if it is red please check the board connection first.

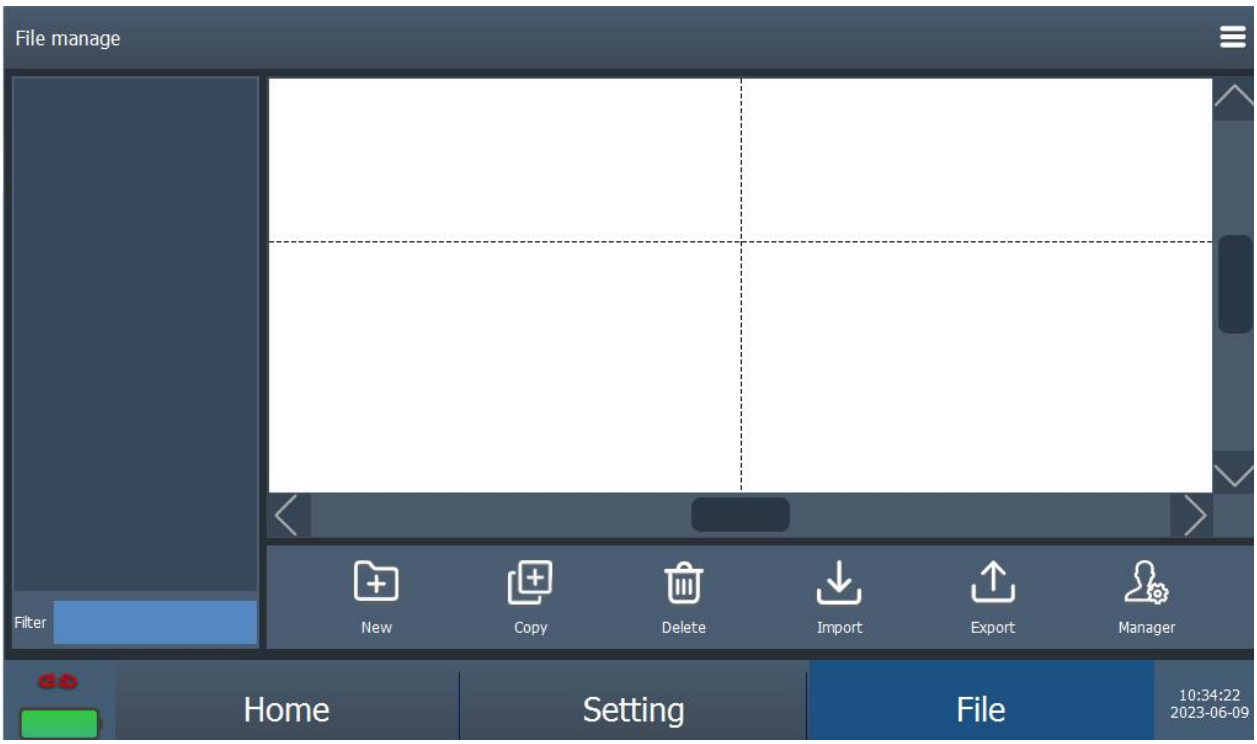


2.2 Create a new document

Then click to switch to the "File" interface and create a new file. (Once the template file is created, it will be automatically saved in the template file once you switch to the "File" interface.)

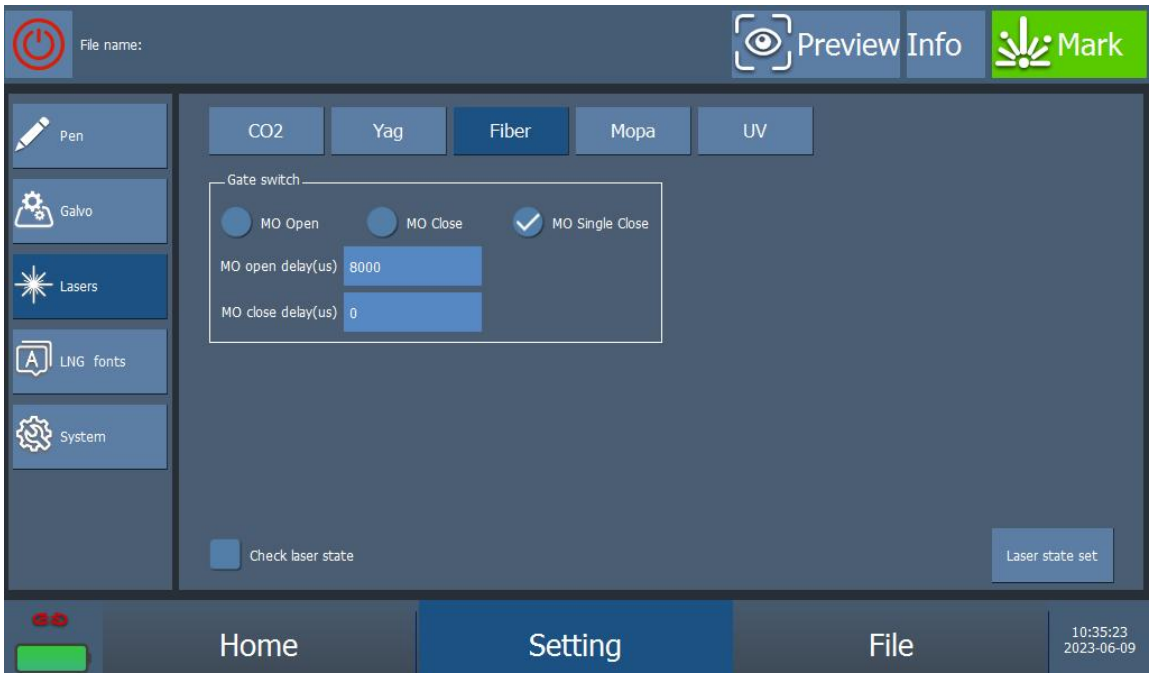
2.3 Set parameters

Switch to the parameters, set the laser parameters, area parameters, pen parameters and marking parameters respectively.



2.3.1 Set the laser parameters

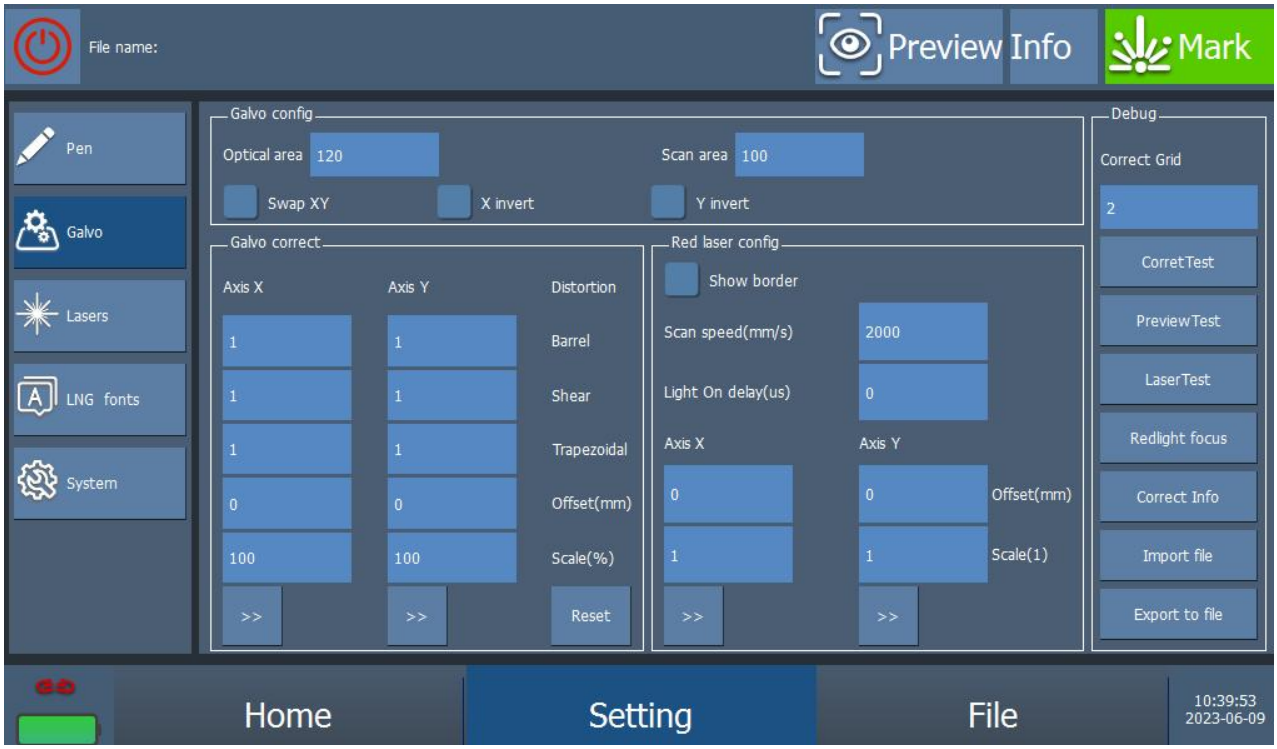
Here the fiber laser as an example, select the fiber, and then use the laser test to detect whether the laser is normal light. Leakage treatment, if the laser does not have the phenomenon of light leakage does not need to be checked.



2.3.2 Set the area parameters

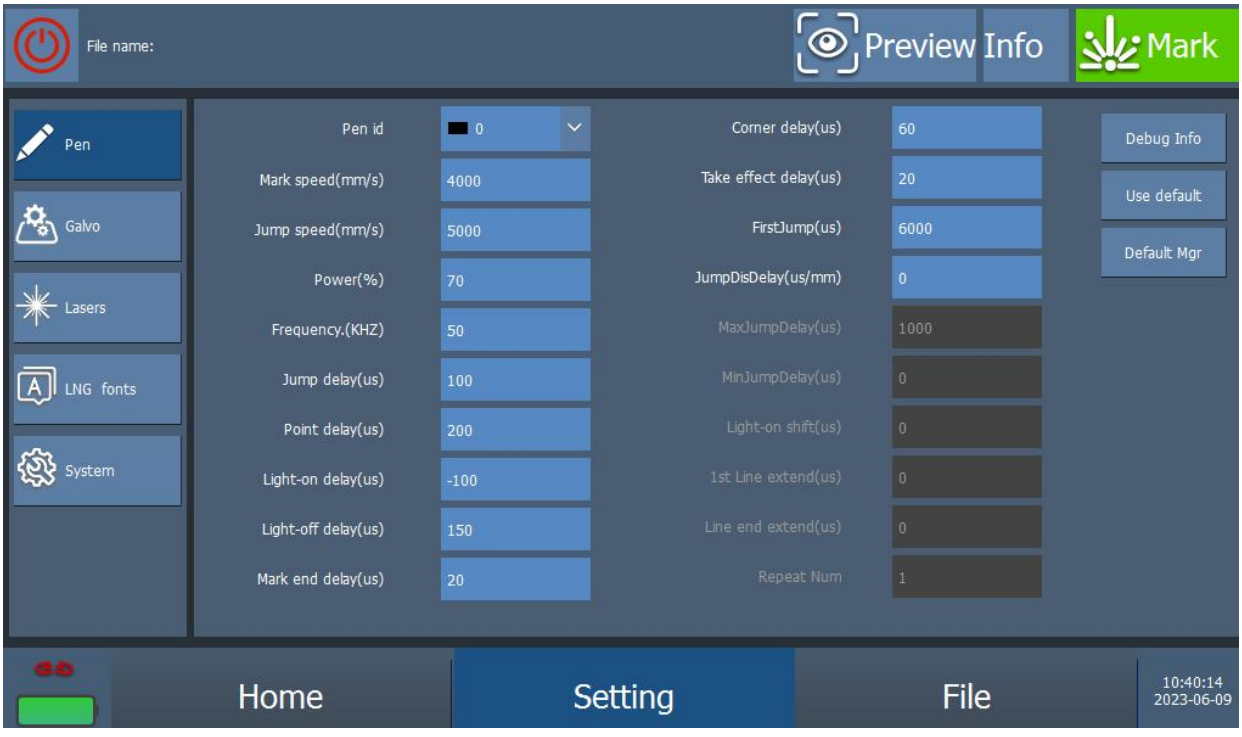
Set the width and working area according to the actual situation of the field mirror (working area should be smaller than the width); adjust XY exchange, X reverse and Y reverse according to

the actual marking effect; adjust the parameters of vibration mirror correction according to the marking effect of calibration test; adjust the parameters of red light correction according to the effect of red light test.



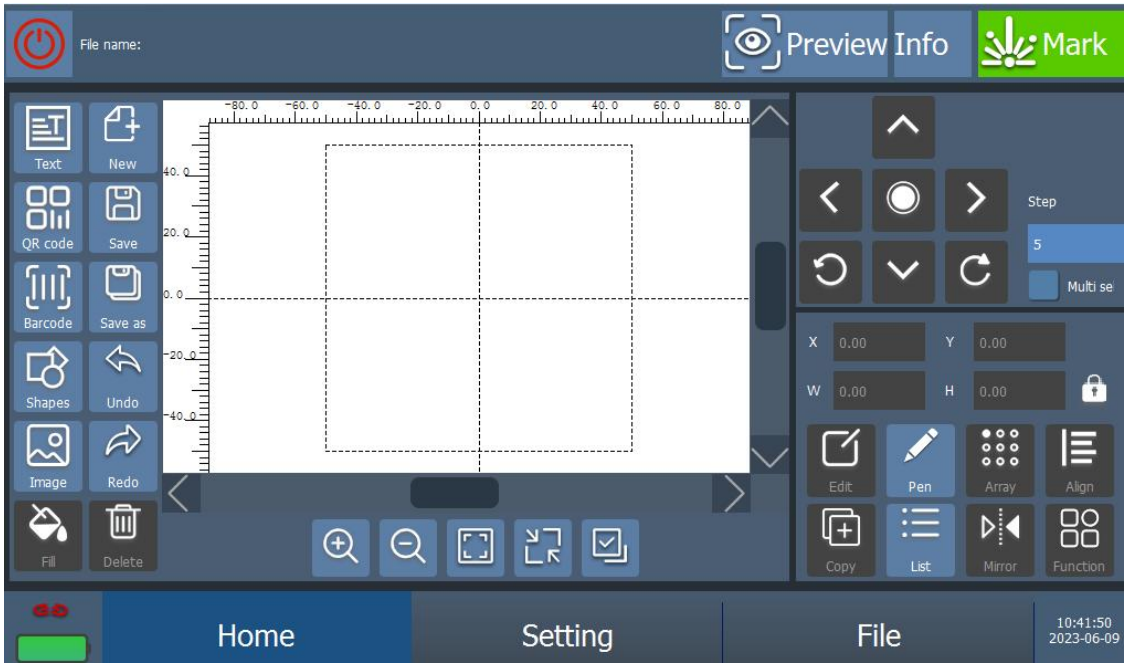
2.3.3 Set coding parameters

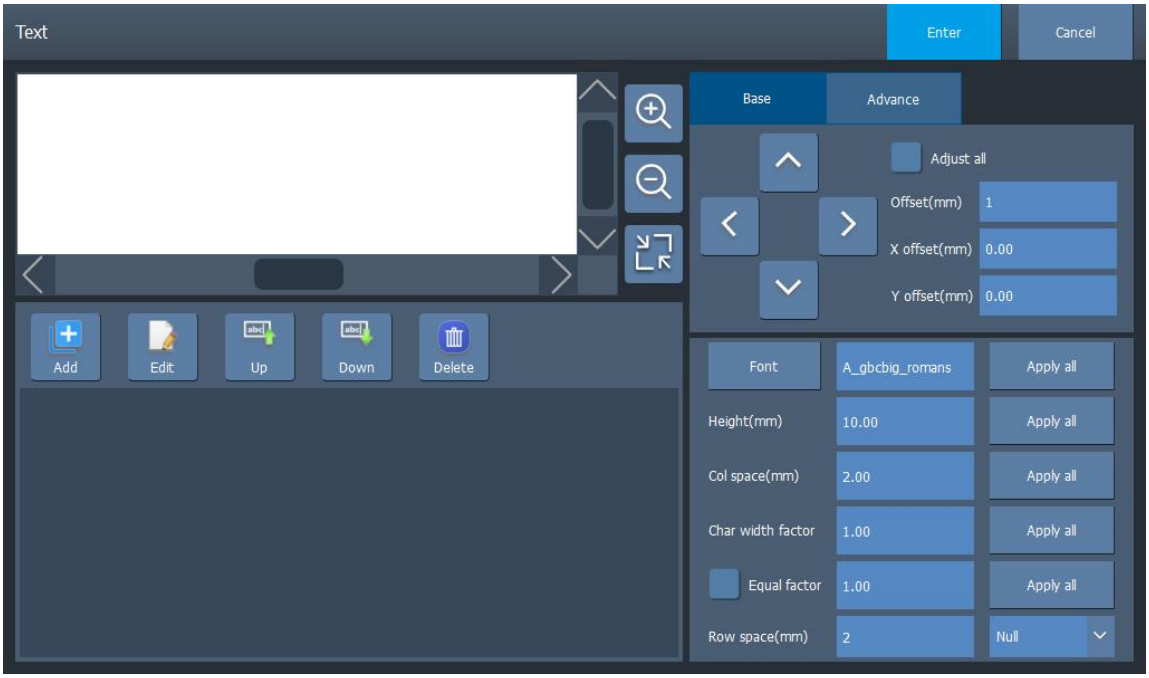
Adjust the coding parameters according to the marking content.

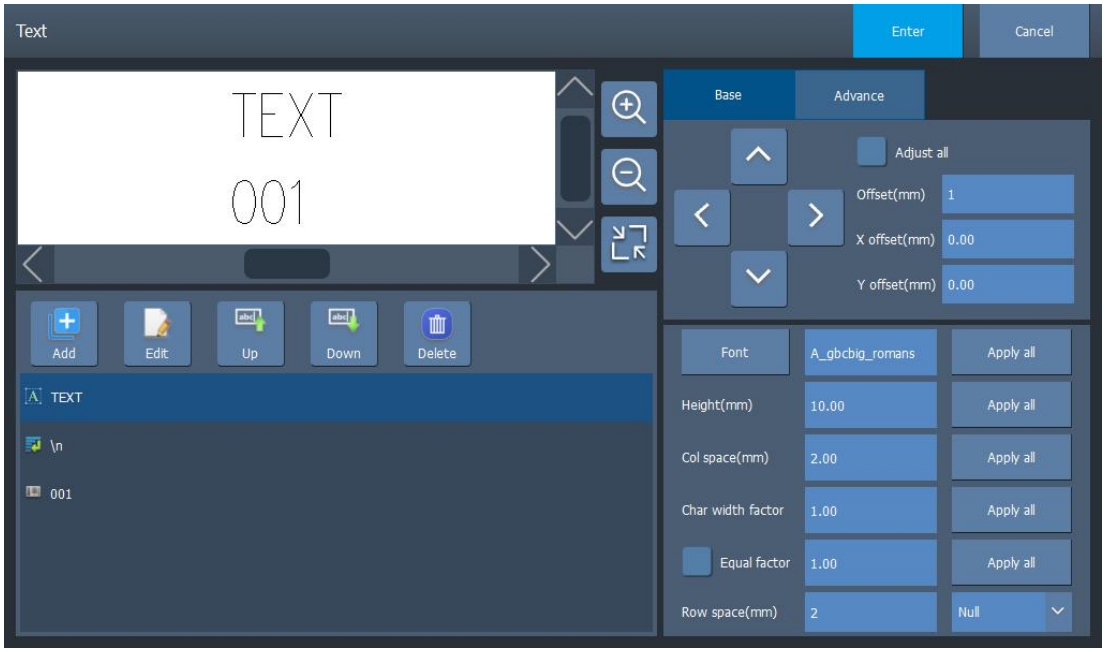


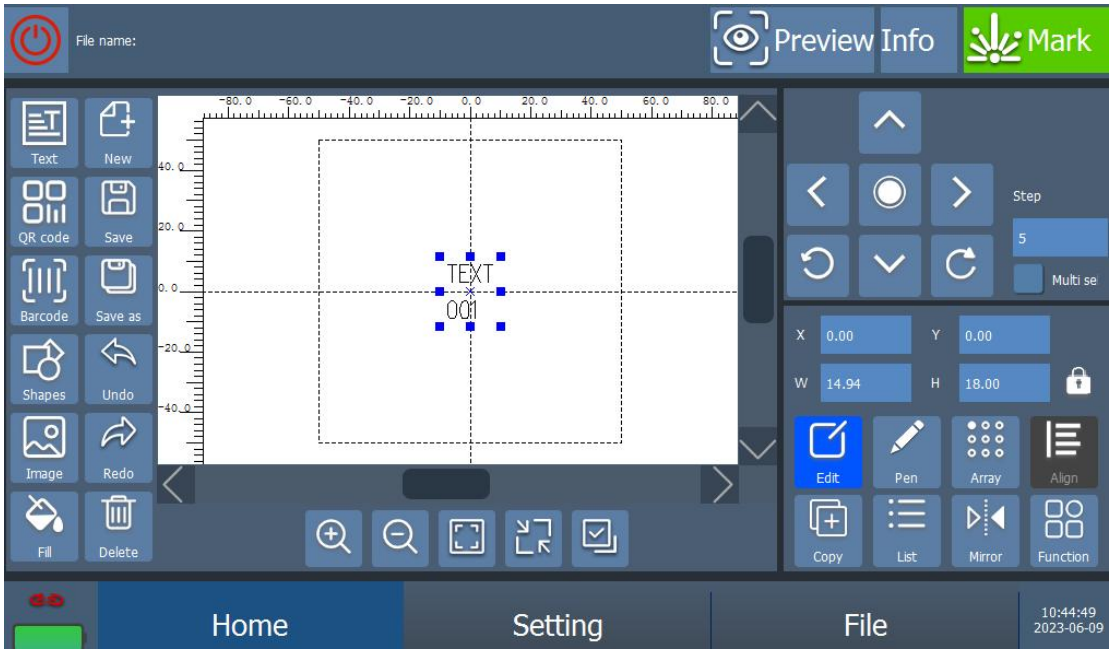
2.4 Edit content

Switch to the editing interface to draw fixed text (note that if the code is to be sprayed on dark material, you need to check the inverse in the fixed text property). When the 2D code is drawn, switch to the template menu to save the current content once.






Text
Enter
Cancel
TEXT
001
Base
Advance
Adjust all
Offset(mm)
1
X offset(mm)
0.00
Y offset(mm)
0.00
Add
Edit
Up
Down
Delete
TEXT
\n
001
Font
A_gbcbig_romans
Apply all
Height(mm)
10.00
Apply all
Col space(mm)
2.00
Apply all
Char width factor
1.00
Apply all
Equal factor
1.00
Apply all
Row space(mm)
2
Null


File name:
Preview
Info
Mark
Text
New
QR code
Save
Barcode
Save as
Shapes
Undo
Image
Redo
Fill
Delete
TEXT
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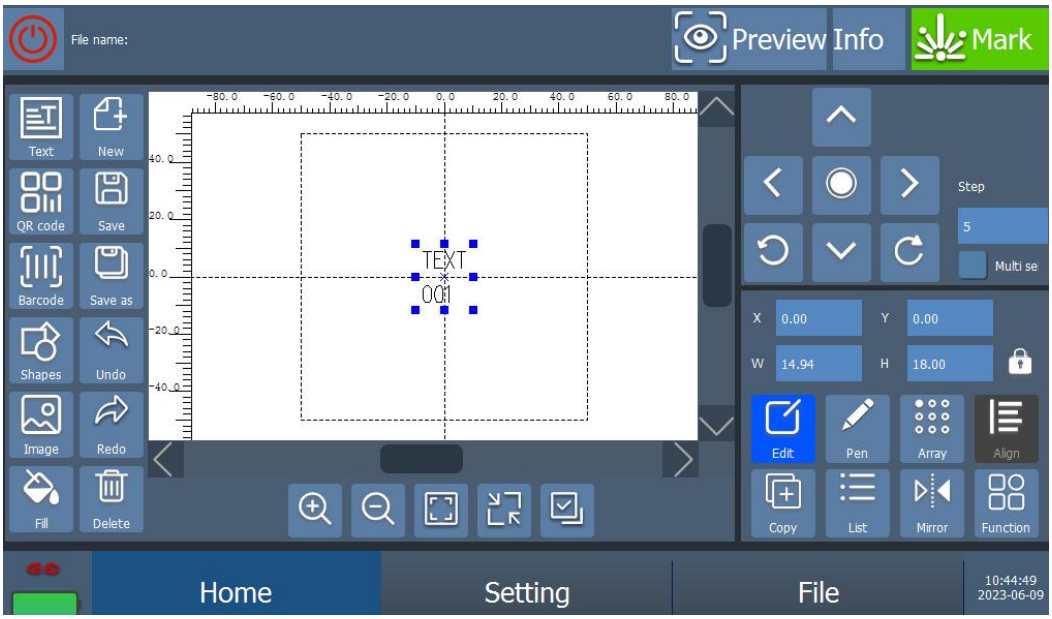
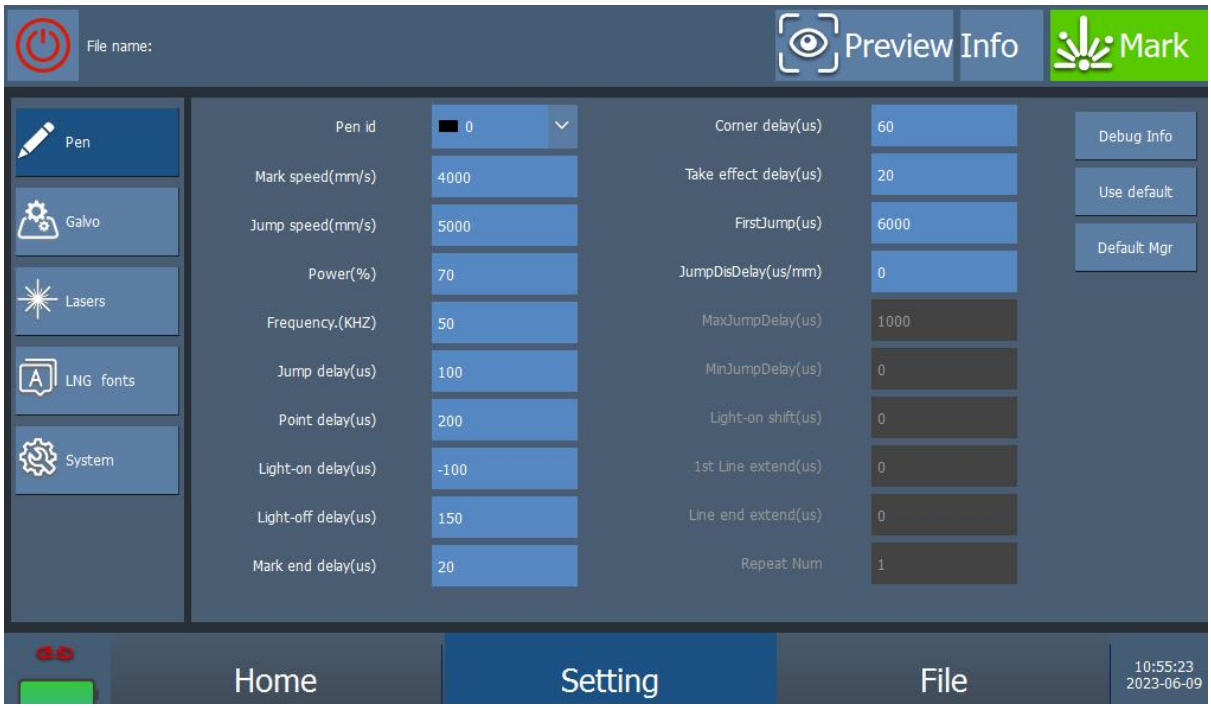
14.94
H
18.00
Edit
Pen
Array
Align
Copy
List
Mirror
Function
Home
Setting
File
10:44:49
2023-06-09

2.5 Marking verification

Click on the marking, enter the marking state, marking after observing the effect.



2.6 Spray code parameters

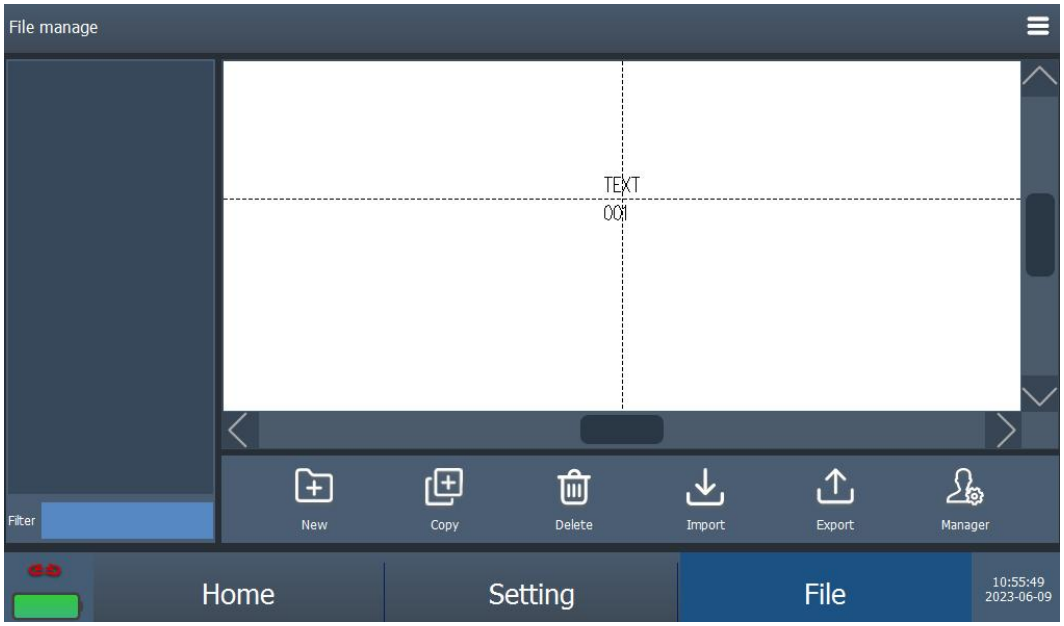


So the parameters are adjusted, you can normal flight marking and then switch to the "File" interface to save. Each time you open the software, just load the "file" template to start working!

3.Software Description

3.1. File Management

File Management is a functional group for managing user's template files, including six sub-functions: New, Copy, Delete, Import, Export and Manage. (The operation of files in the software is for the files in the users folder, and does not affect the files in other folders)



■ New: Create a new blank template file, if there is no template file, click Save directly in the editing interface, it has the same effect.

■ Copy: Copy the currently selected template file.

■ Delete: Delete the currently selected template file.

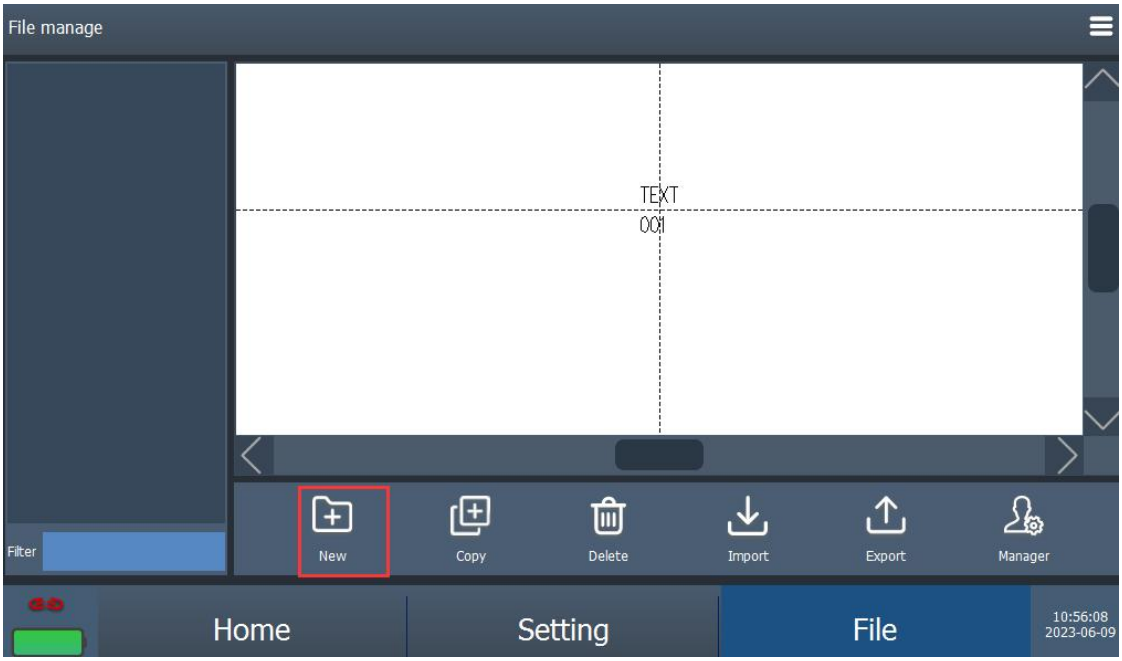
■ Import: Import a template file from the specified location.

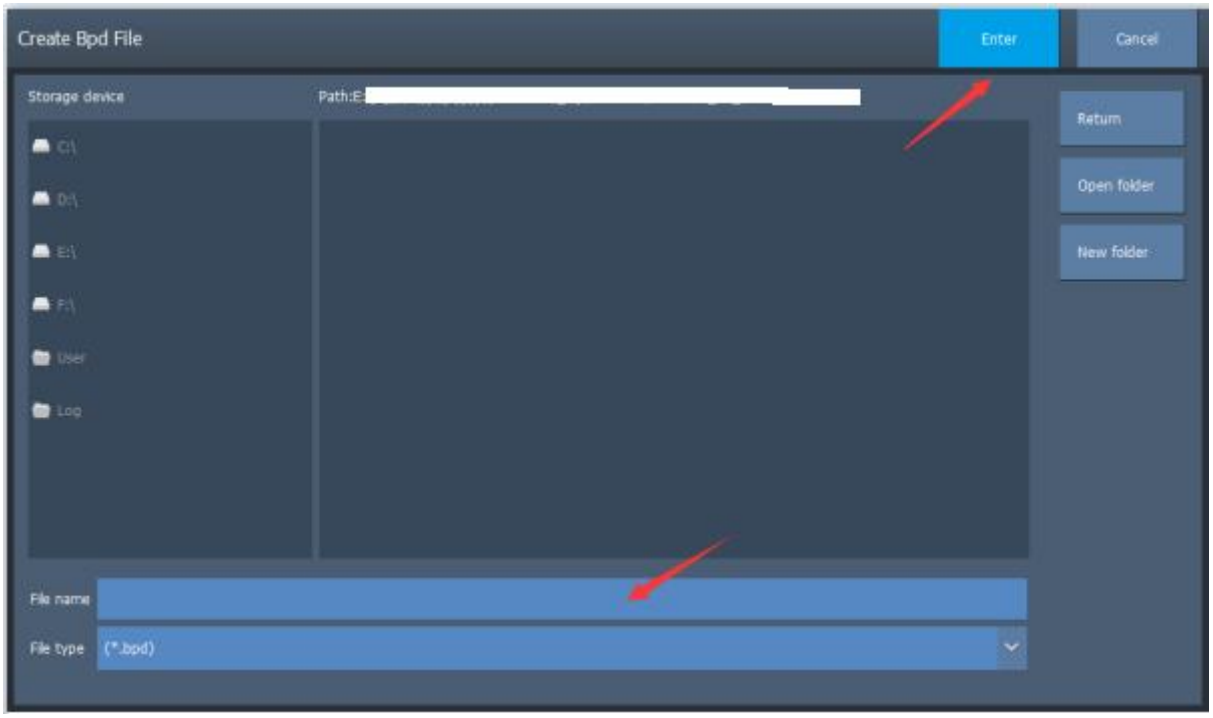
■ Export: Export the currently selected template file to a specified location.

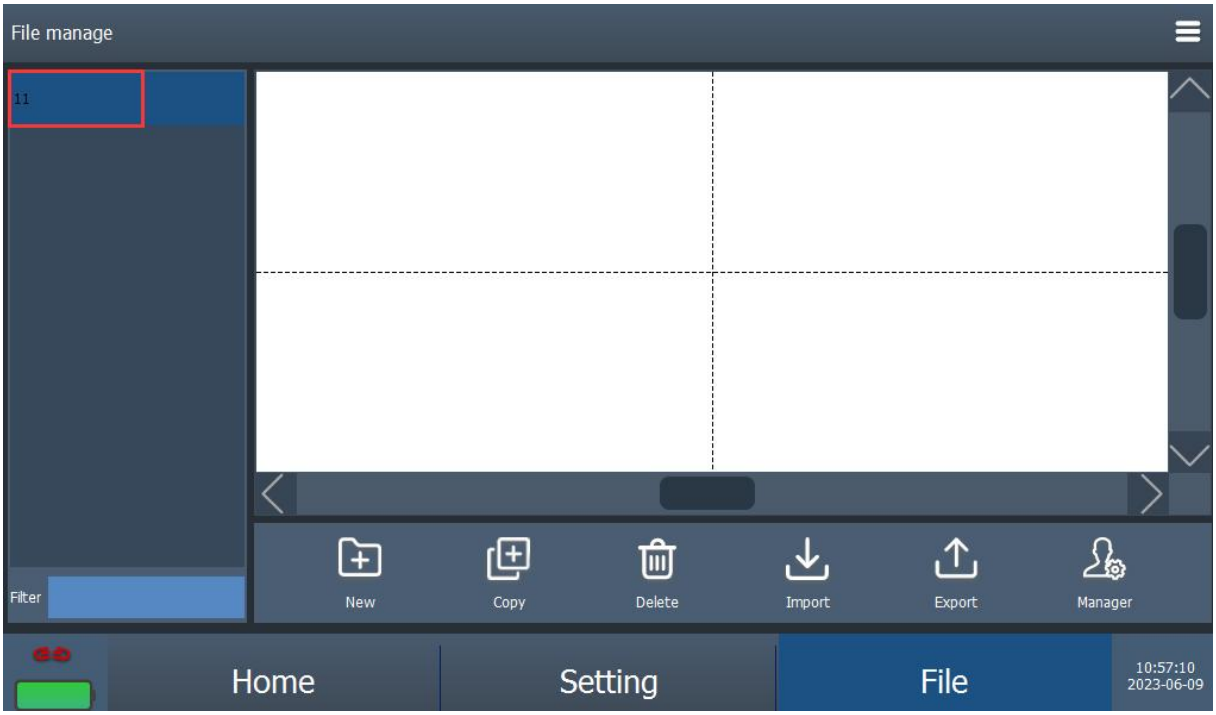
■ Manage: It is the file manager, which can add, delete and change all files.

3.1.1. Function Description

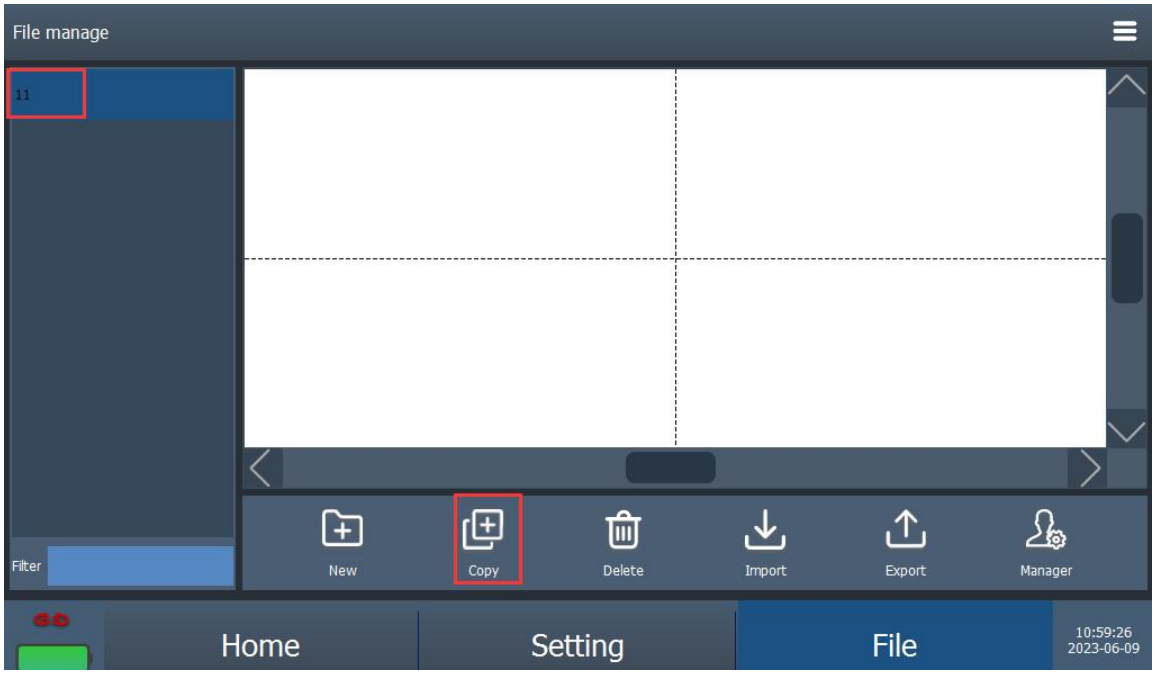
3.1.1.1. New

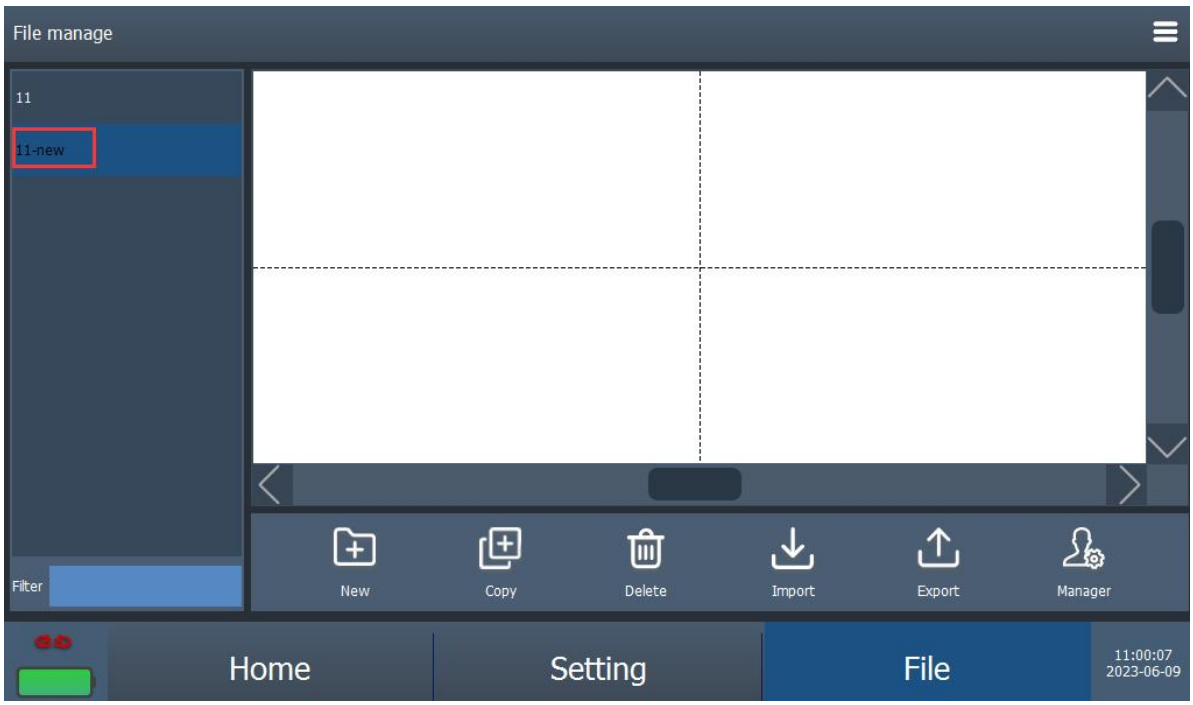




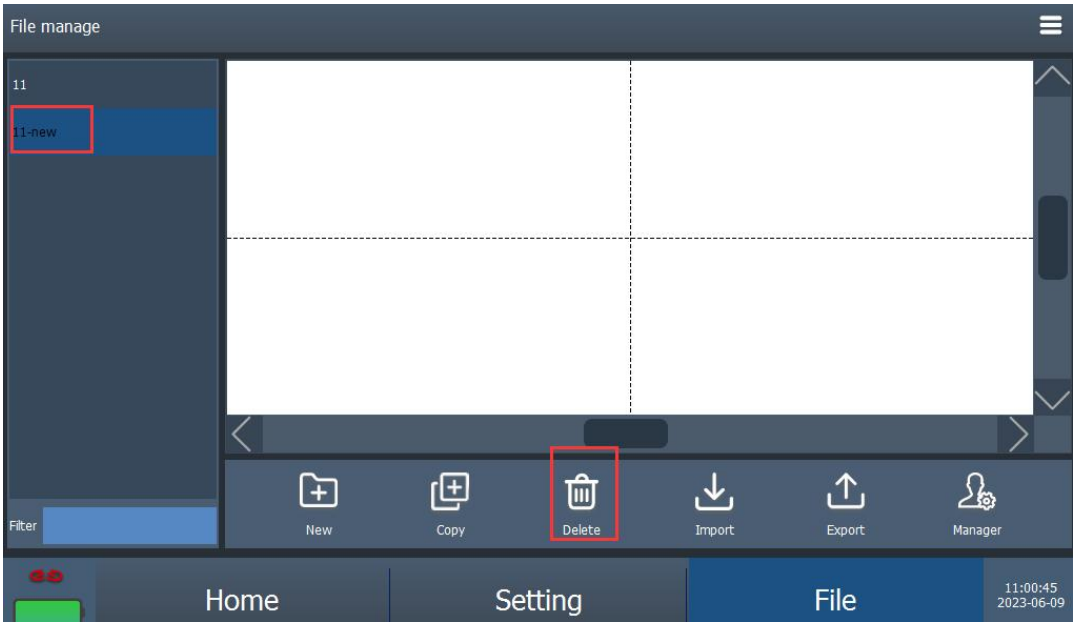

File manage
11
Filter
New
Copy
Delete
Import
Export
Manager
Home
Setting
File
10:57:10
2023-06-09

3.1.1.2. Copy

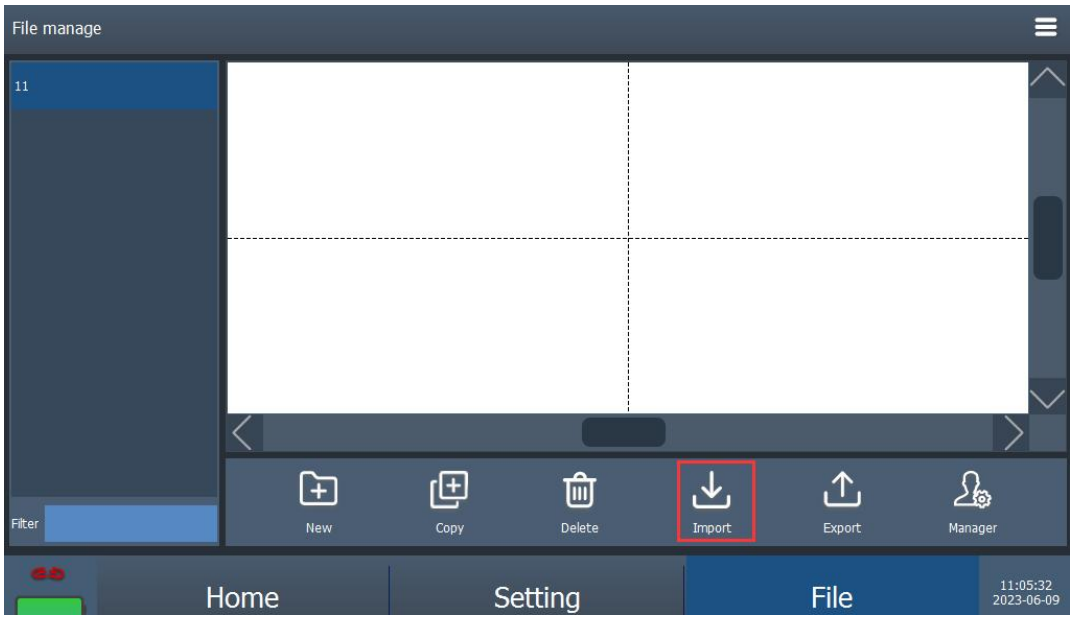

File manage
11
Filter
New
Copy
Delete
Import
Export
Manager
Home
Setting
File
10:59:26
2023-06-09


File manage
11
11-new
Filter
New
Copy
Delete
Import
Export
Manager
Home
Setting
File
11:00:07
2023-06-09

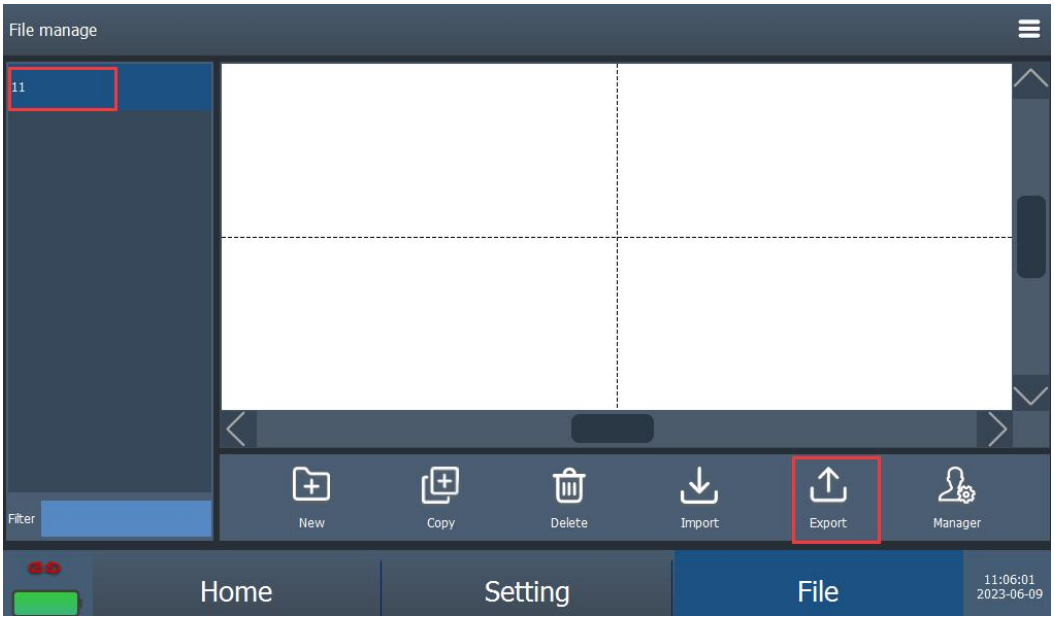
3.1.1.3. Delete


File manage
11
11-new
Filter
New
Copy
Delete
Import
Export
Manager
Home
Setting
File
11:00:45
2023-06-09

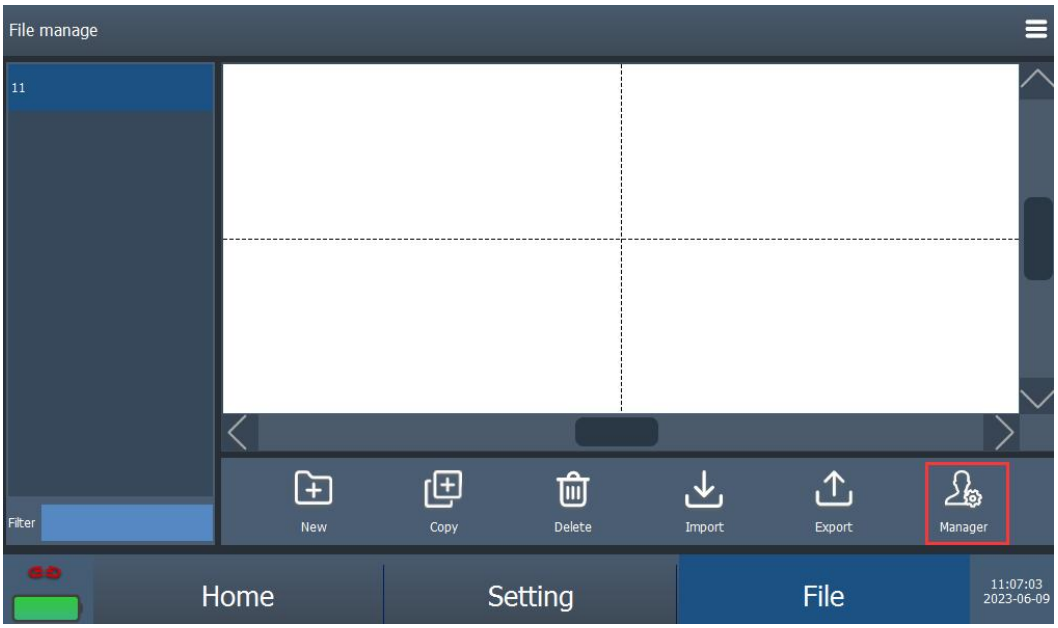
3.1.1.4. Import files

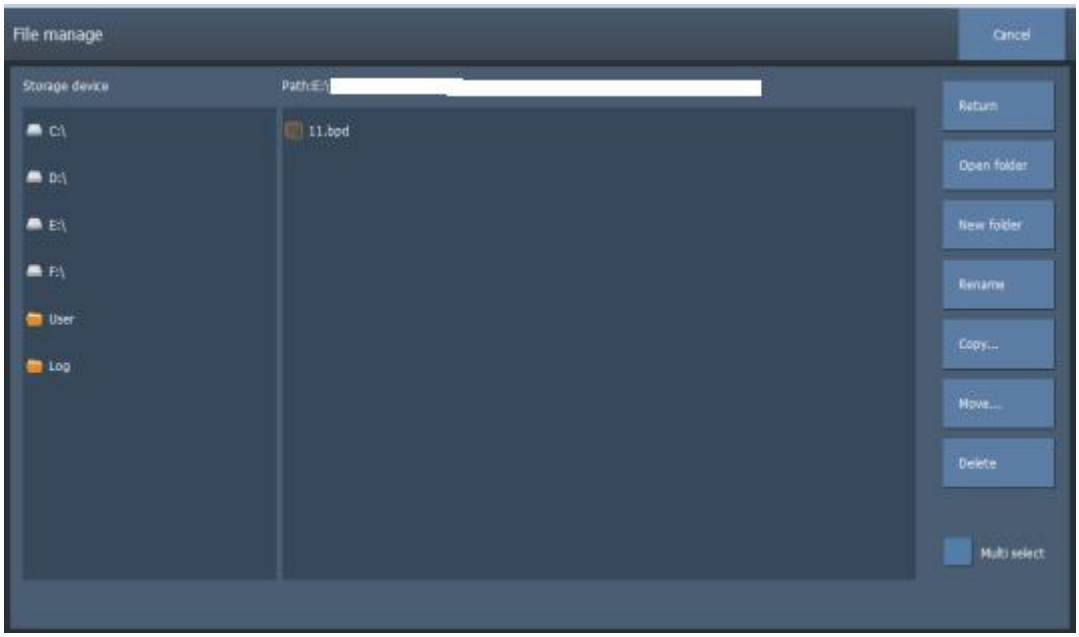


3.1.1.5. Export files



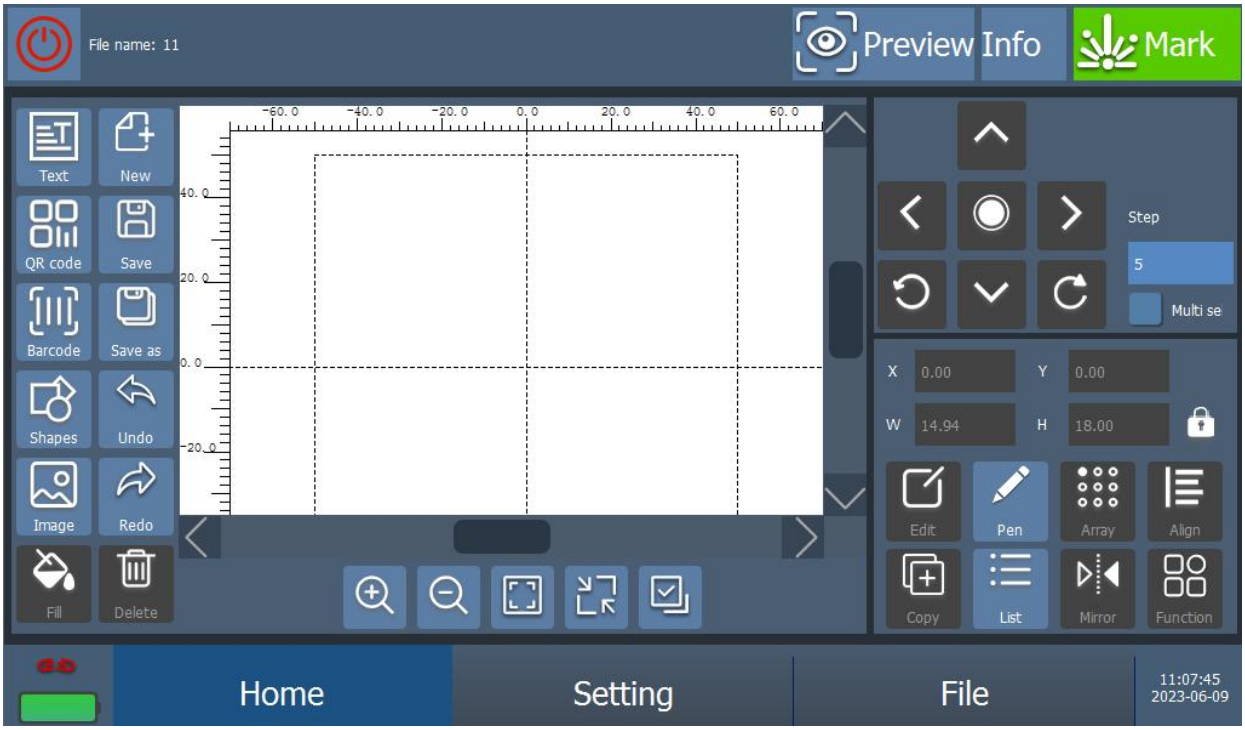
3.1.1.6. Management





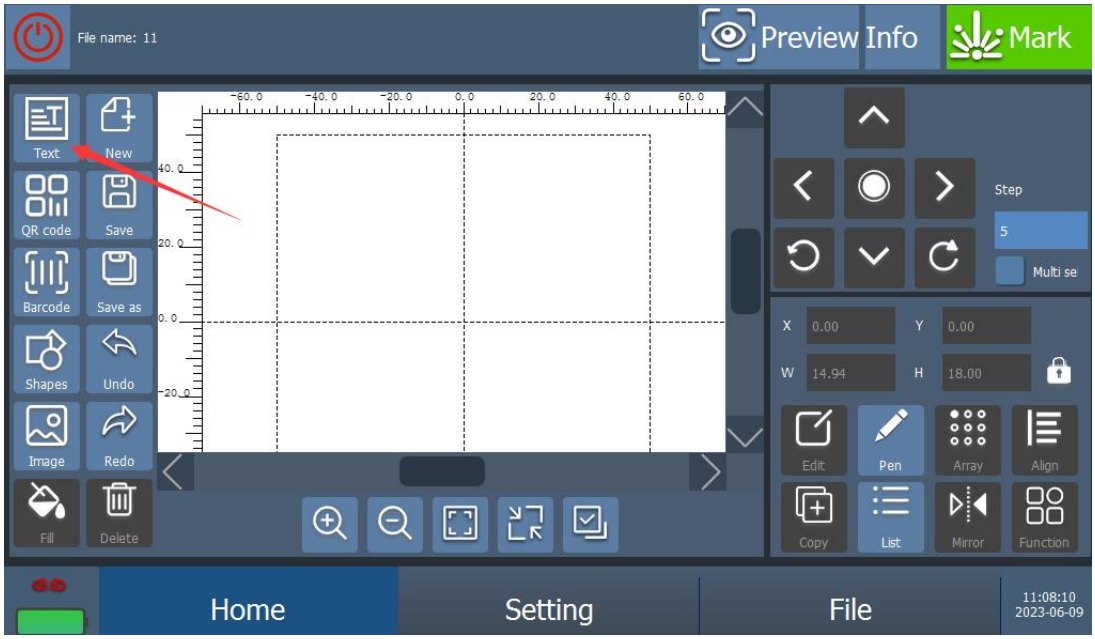
3.2. Editing

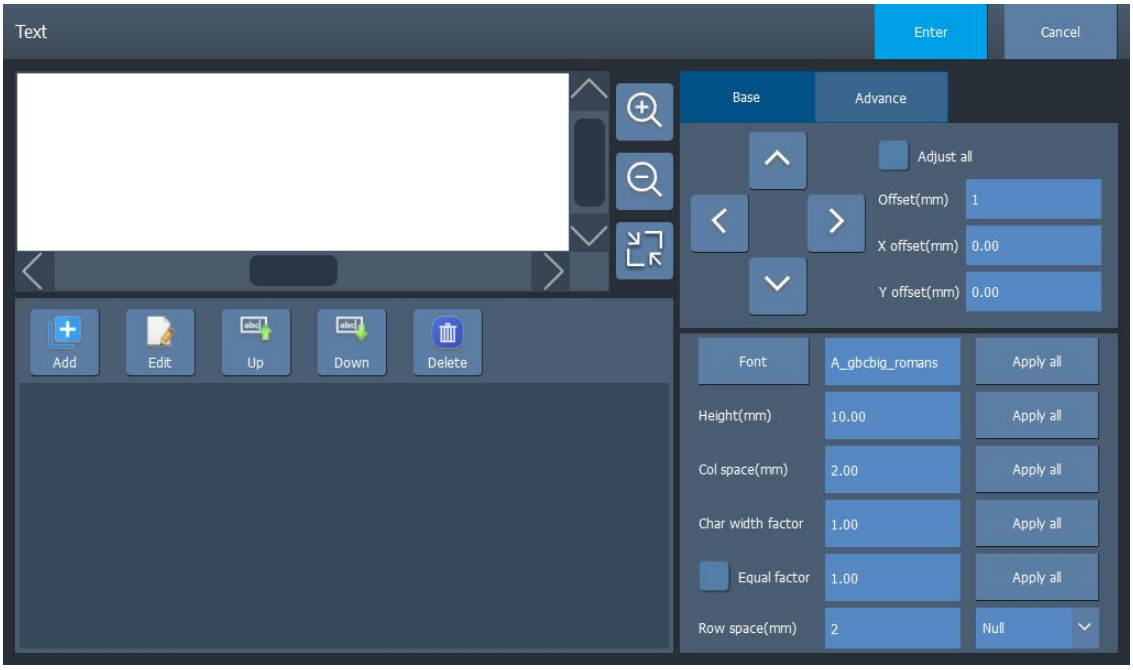
Editing is a group of functions for drawing and editing various drawing elements. It includes sub-functions for drawing (text, 2D codes, barcodes, geometric elements, vectors and pictures), editing, filling, mirroring, arraying, moving, rotating, etc.



3.2.1. Drawing area

3.2.1.1. Text elements





3.2.1.1.1. Element Preview Window

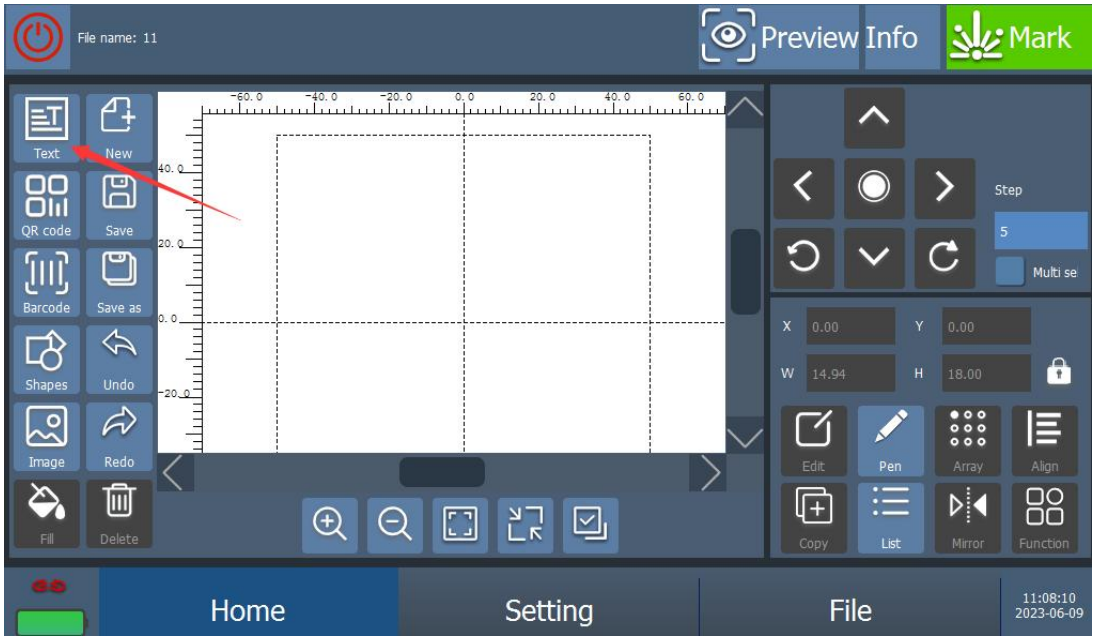
the area displays all the contents of the current text.

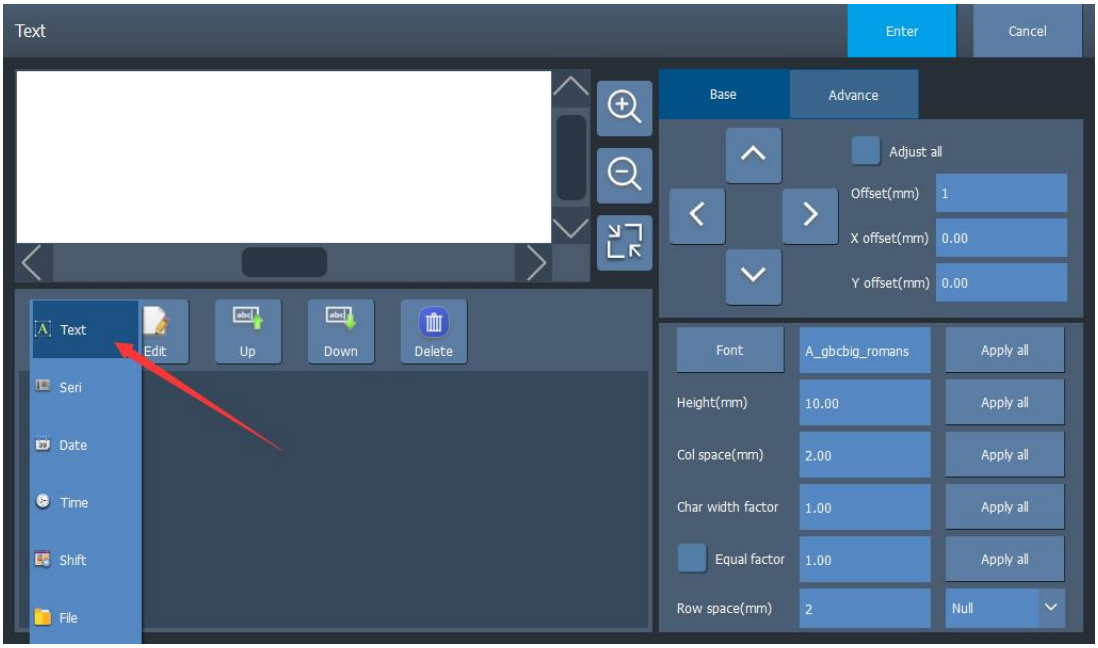
3.2.1.1.2. Element list area

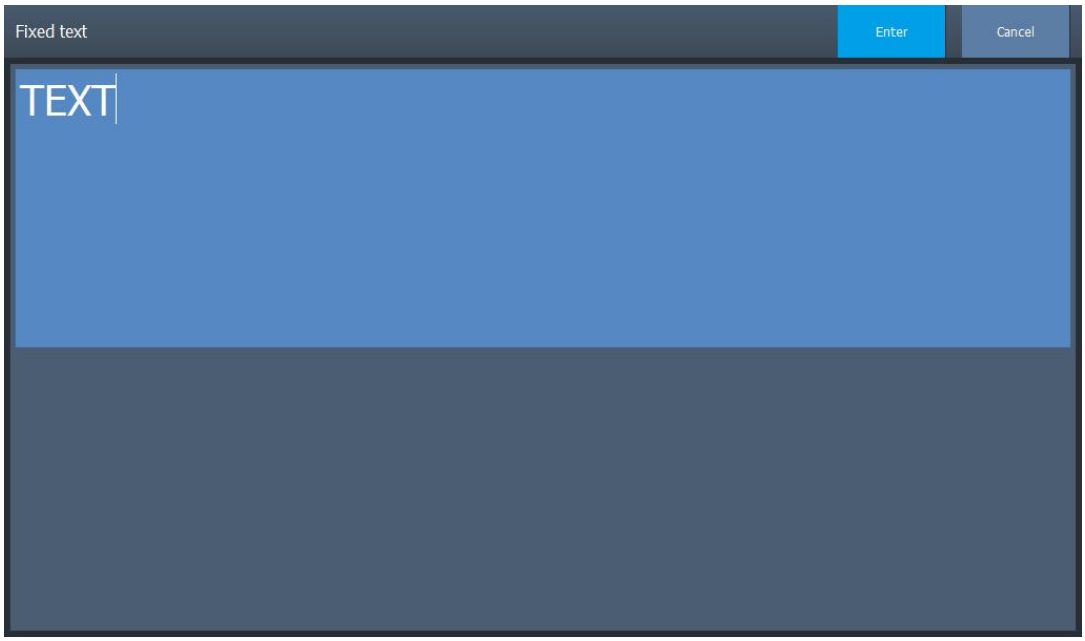
Here each element of the text content is displayed. Once selected, you can use the edit button below to perform the corresponding action.

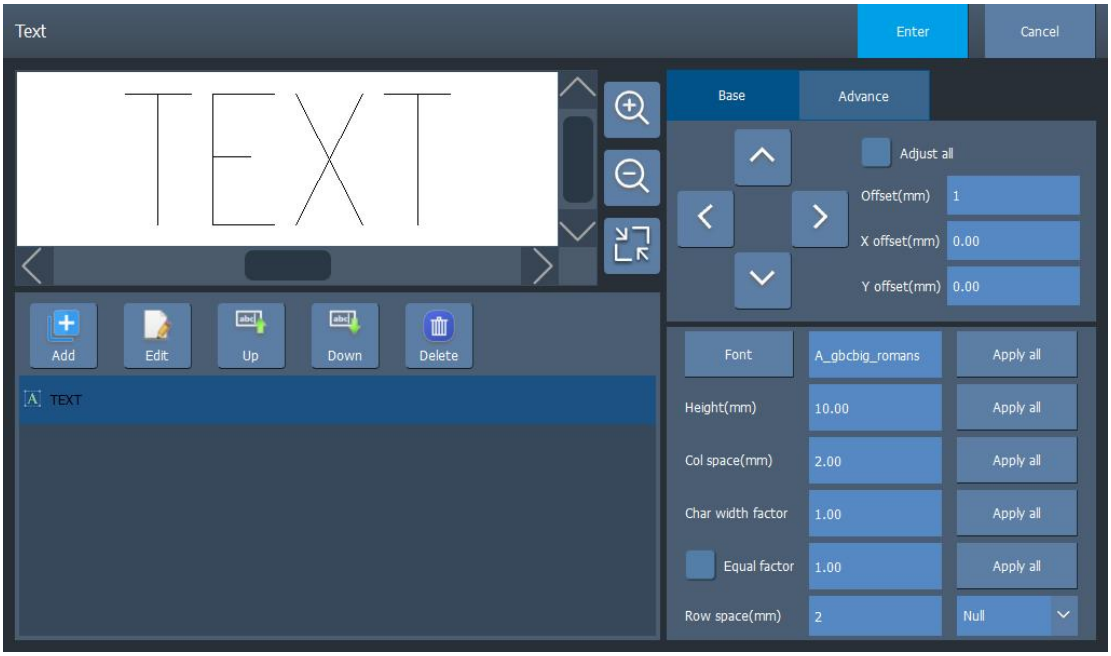
- **Add:**Add a new element, press the button to edit it.
- **Edit:**Select an existing element and press the button to edit or modify its properties.
- **Move up/down:**Modify the position of the selected element.
- **Delete:**Deletes the currently selected element.

3.2.1.1.3. Fixed text



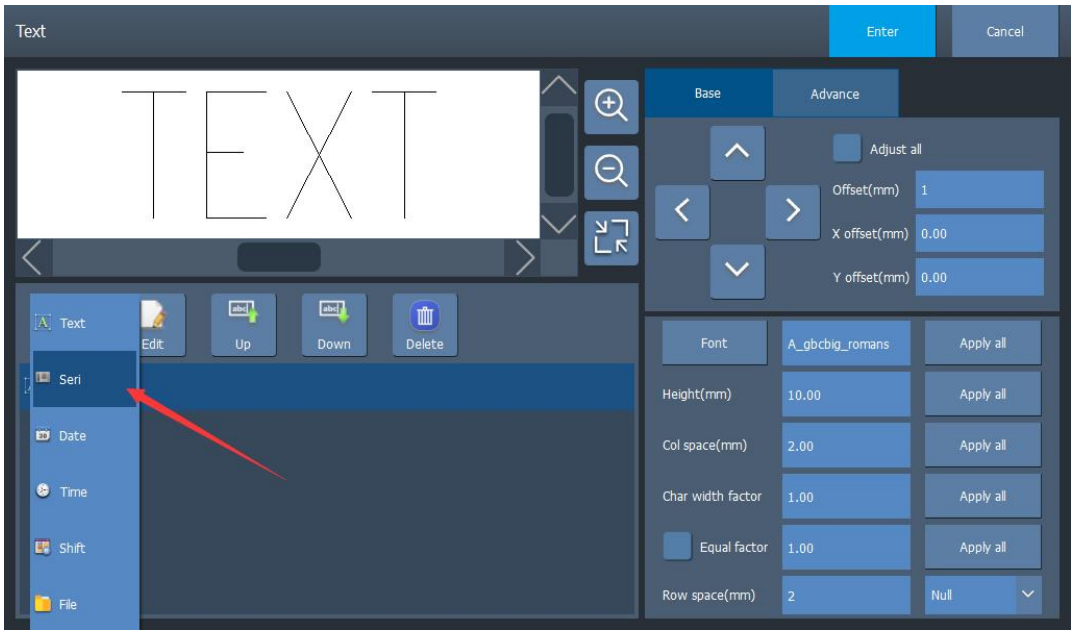

Text
Enter
Cancel
Base
Advance
Adjust all
Offset(mm)
1
X offset(mm)
0.00
Y offset(mm)
0.00
Text
Edit
Up
Down
Delete
Seri
Date
Time
Shift
File
Font
A_gbcbig_romans
Apply all
Height(mm)
10.00
Apply all
Col space(mm)
2.00
Apply all
Char width factor
1.00
Apply all
Equal factor
1.00
Apply all
Row space(mm)
2
Null

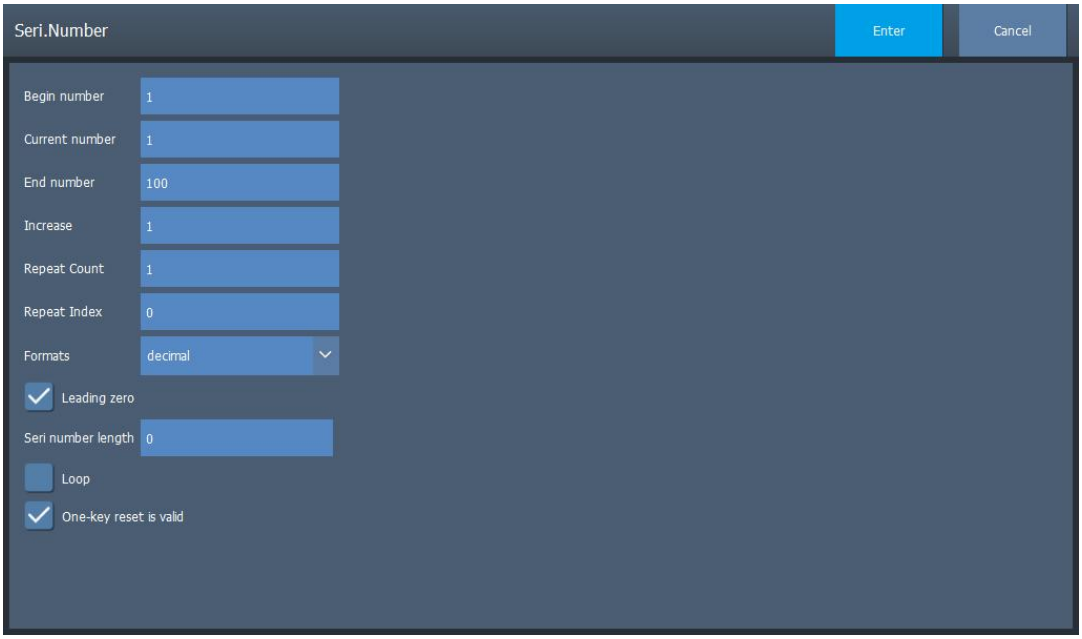

Fixed text
Enter
Cancel
TEXT



3.2.1.1.4. Sequence number

The text element (sequence number) that changes in fixed increments during processing. As shown in the figure (Previous steps can be found in the fixed text addition step):





◆ **Start number:**Number at the beginning of the sequence number.

◆ **Current serial number:**The number of the current serial number.

◆ **End sequence number:**The number of digits of the group of sequence numbers and the group of sequence numbers that are finished processing when the processed sequence number equals the value of the sequence number.

◆ **Increment:**The increment of the sequence number of the group.

◆ **Repeat Count:**Refers to the number of times each value of the group of sequence numbers is processed to the specified number before it becomes the next sequence number.

◆ **Interval:**The binary mode of the sequence number. The default choices are decimal, hexadecimal uppercase, and hexadecimal lowercase.

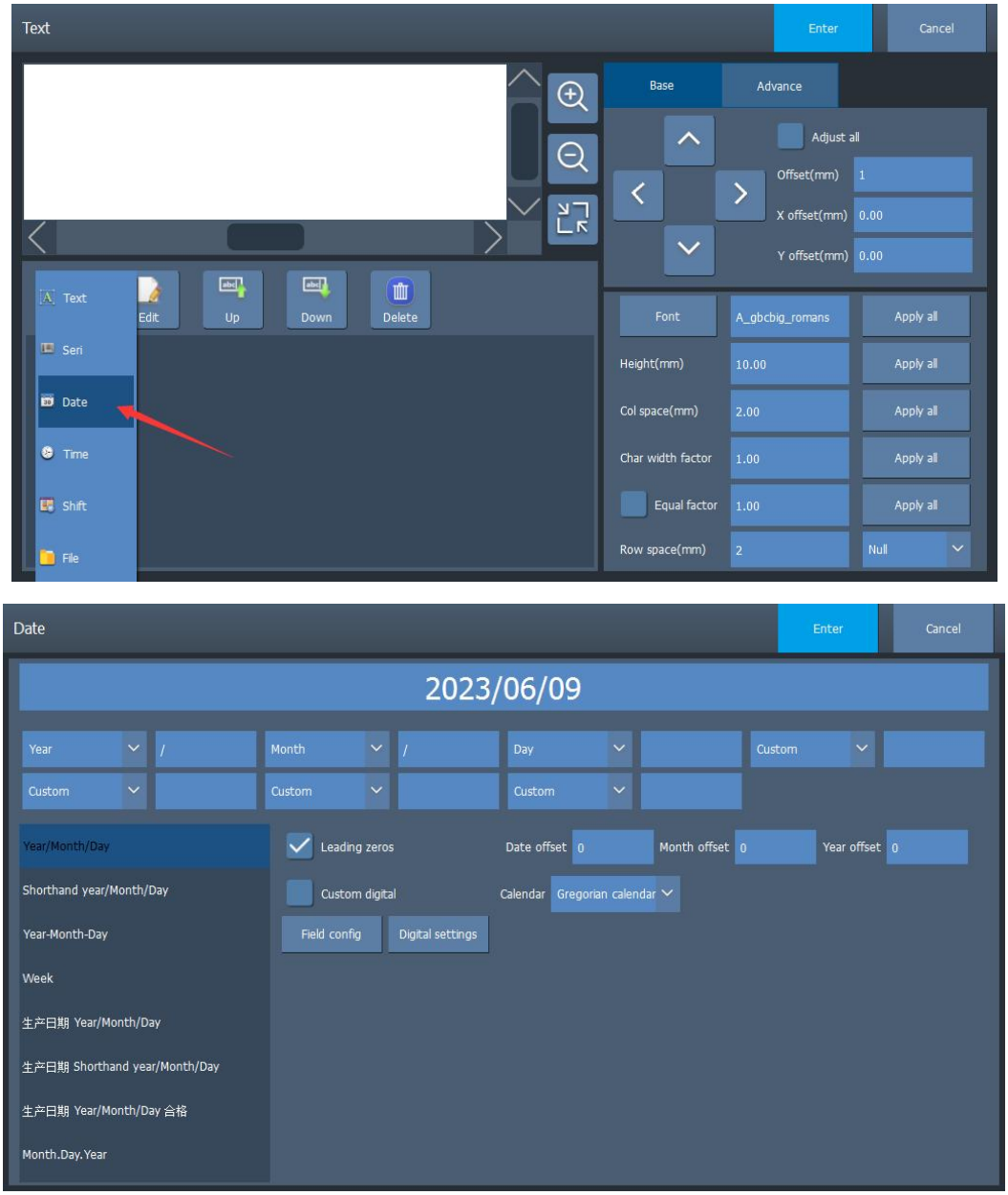
◆ **Leading Zero:**Whether to display the complementary zeros in front of the sequence number.

◆ **Data loop:**Whether to automatically start typing from the start sequence number when the end sequence number is finished.

3.2.1.1.5. Date

The text element that the system automatically takes the date information from the computer during processing. A variety of date formats are provided by default to choose from, and the default format can also be modified. As shown in the figure (Previous steps can be found in the

fixed text addition step):



Content preview window: Preview the current date effect.

Default format selection:A variety of date formats are built in, so you can make personalized changes in the custom format window after selecting.

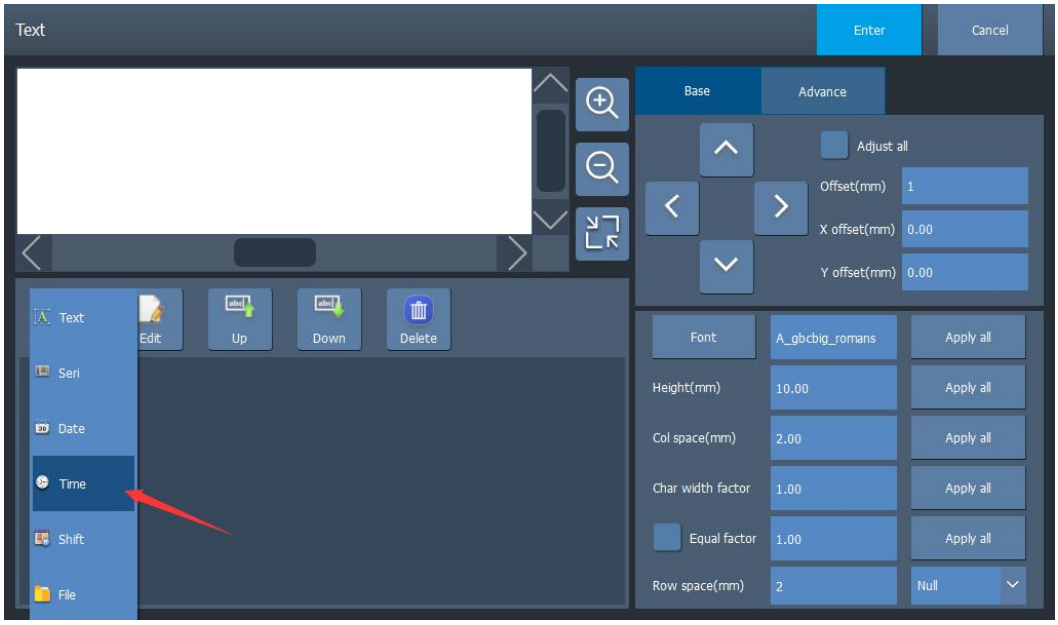
Field customization: Drop-down box to select the element to be defined, input box to enter the content of the element.

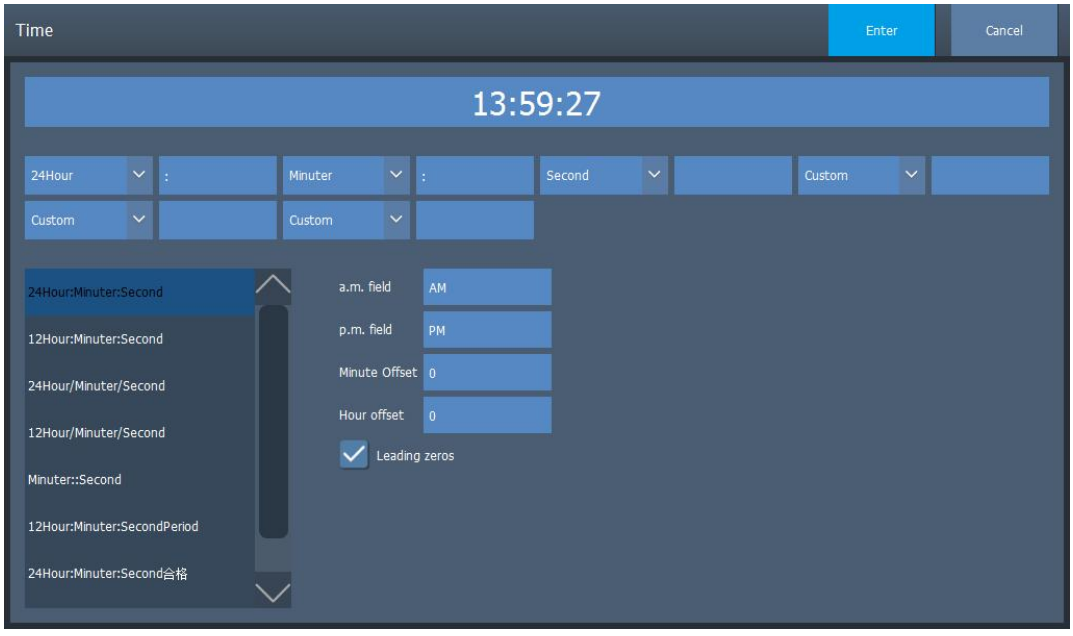
Field settings: You can customize the display of the week and the English month. For example, English week, English abbreviated month, etc.

Date Offset: Display the date plus or minus the value and spray the 0 code out.

3.2.1.1.6. Time

The text element that the system automatically takes the time information from the computer during processing. A variety of time formats are provided by default to choose from, and the default format can also be modified. As shown in the figure (preceding steps can be found in the fixed text addition step):

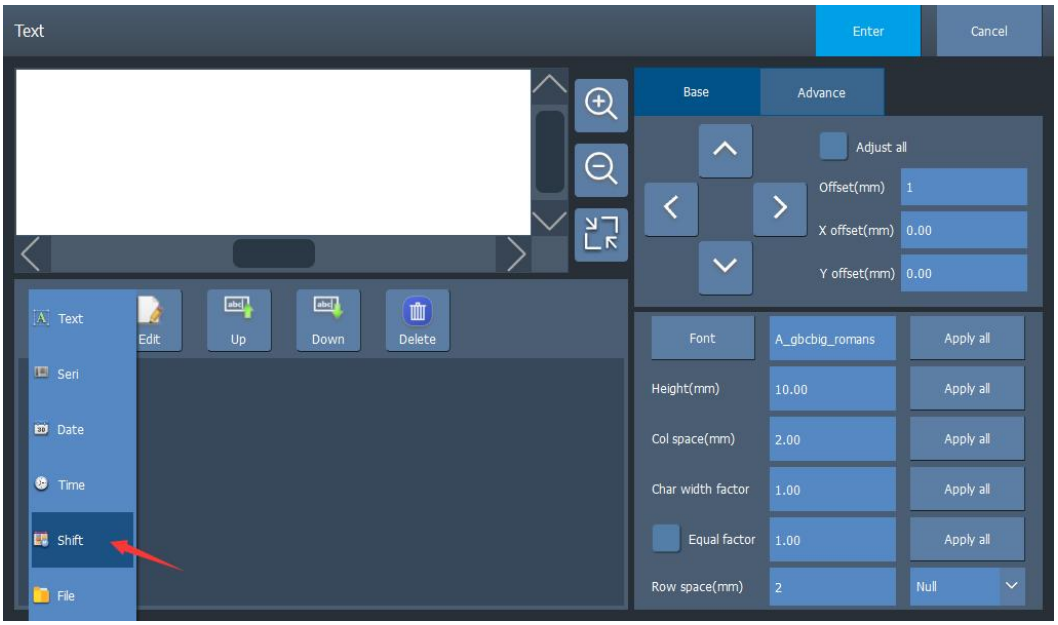


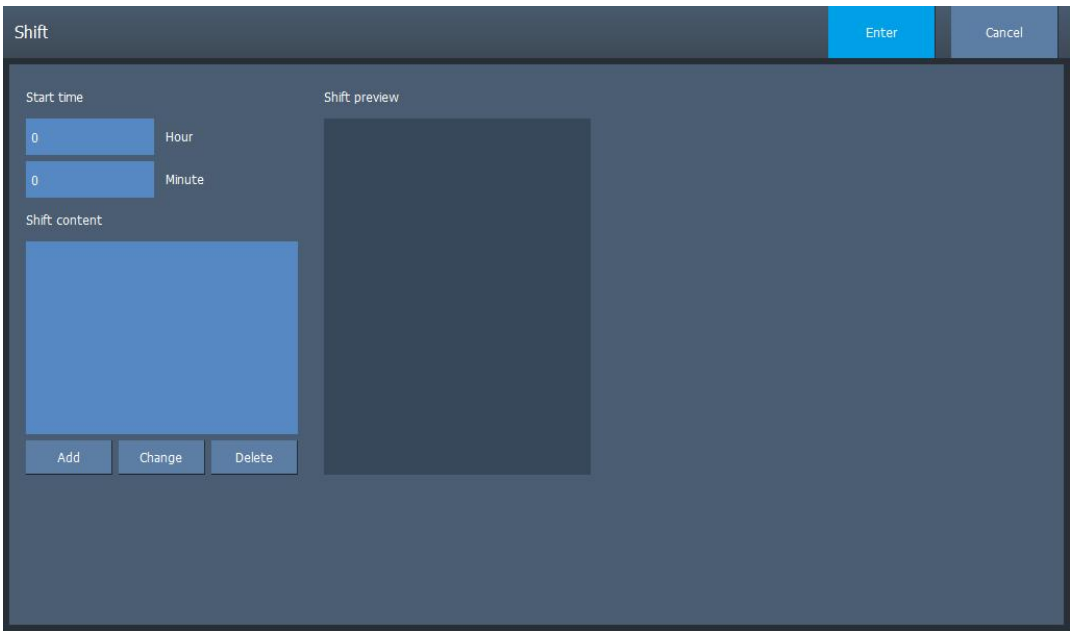


- **Leading zeros:**Whether to display the complementary zeros of the time
- **Default format selection:**A variety of time formats are built in, you can customize them in the custom format window after selection
- **Field customization:**Dropdown box to select the element to be defined, input box to enter the content of the element
- **Morning field / afternoon field:**Customize the content of the characters displayed in time slots

3.2.1.1.7. Shift

Used to set the work shift (equivalent to the function of a timed jump code). As shown in the figure (previous steps can be found in the fixed text addition step)

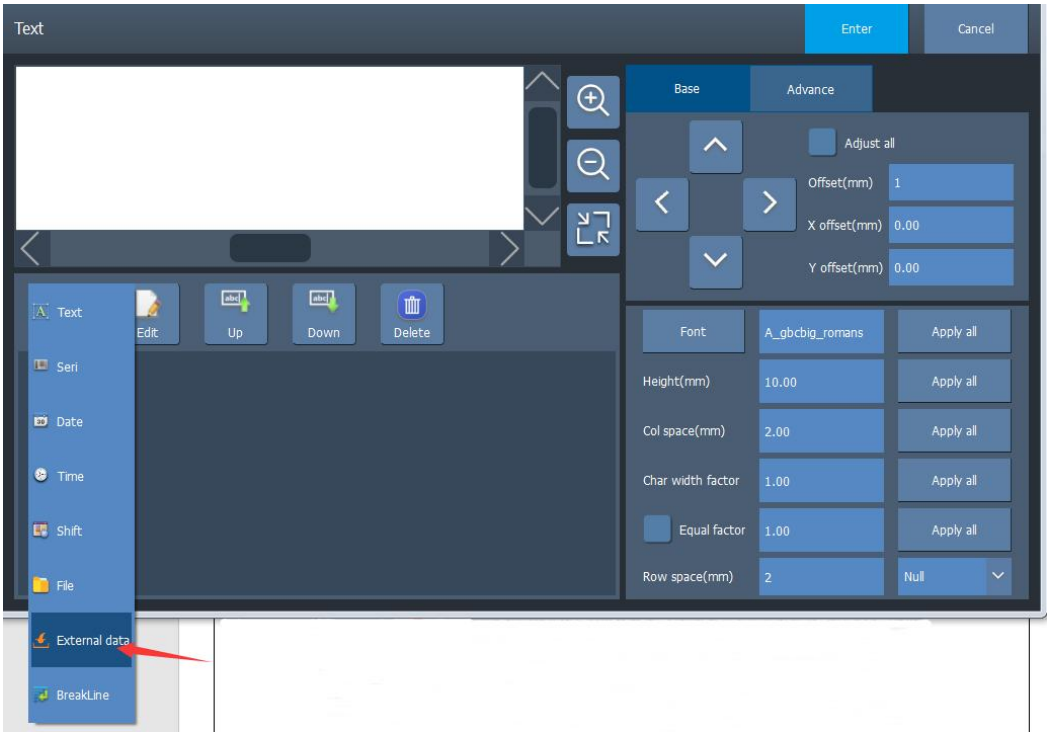


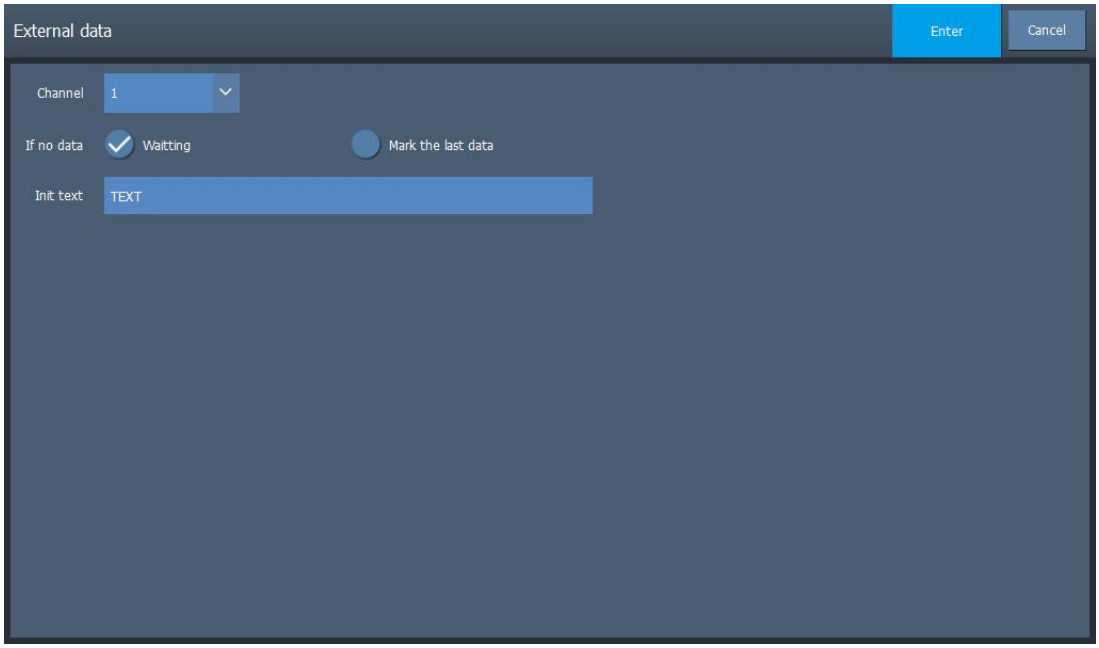


- **Start time:**Start time of each shift, which can be set to minutes. When the set time is reached, it will become the shift corresponding to the time.
- **Shift content:**The name and code of each shift.

3.2.1.1.8. External data

The external communication element is the element that the system automatically gets the text from outside through the net/serial port during processing. As shown in the figure (previous steps can be referred to the fixed text addition step).



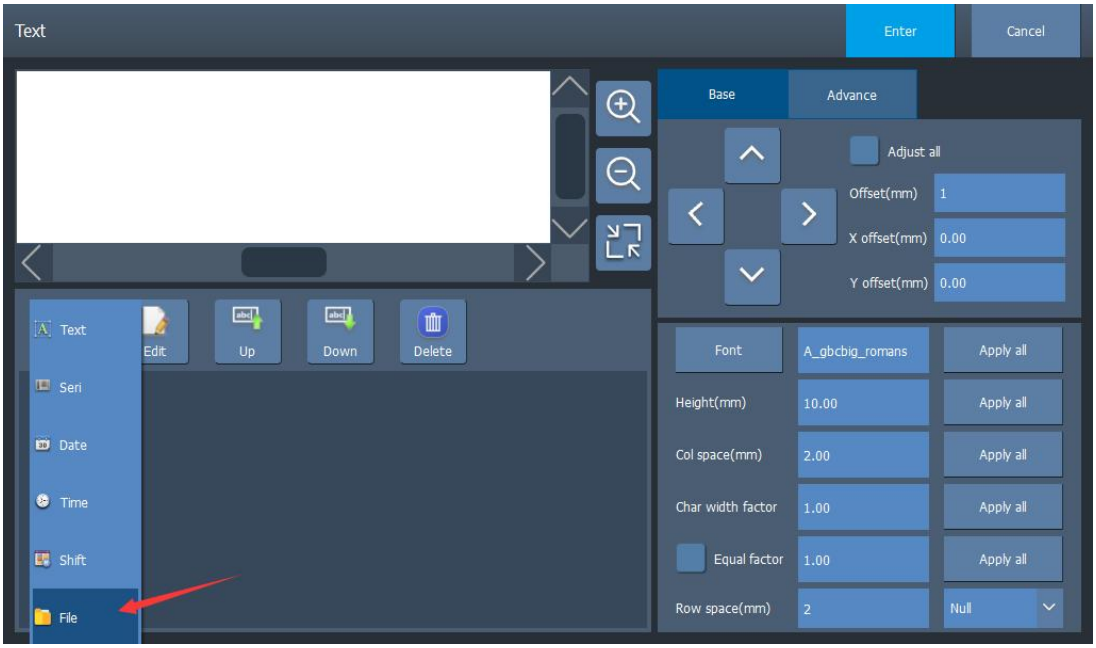


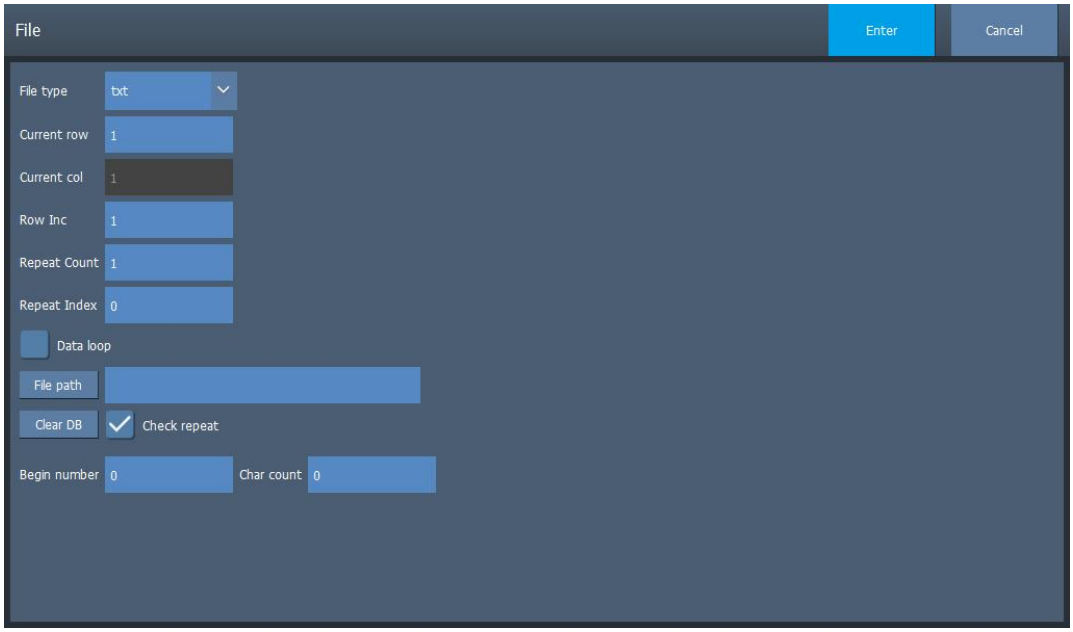
- **Channel:**Selects the channel for data transfer.
- **Without data:**Selects the action of the laser when no data is transmitted.
- **Initial content:**Sets the most initial content.

3.2.1.1.9. File

The file element is the text element to be processed that is read line by line from a txt or Excel file during processing. As shown in the figure:

Note:file content, must have the same number of characters per line, and no empty lines.





File type: Select the type of associated file, support TXT and CS

Current line number: The line from which to start reading the processing data.

Current column number: Which column to read processing data from.

Row increment: How many rows to read at a time for coding

Data loop: Whether to loop through the file content when it is read to the last line.

whether to mark the current line:whether the content of the current line number is sprayed, if not, the spraying starts from the next line of the current line number.

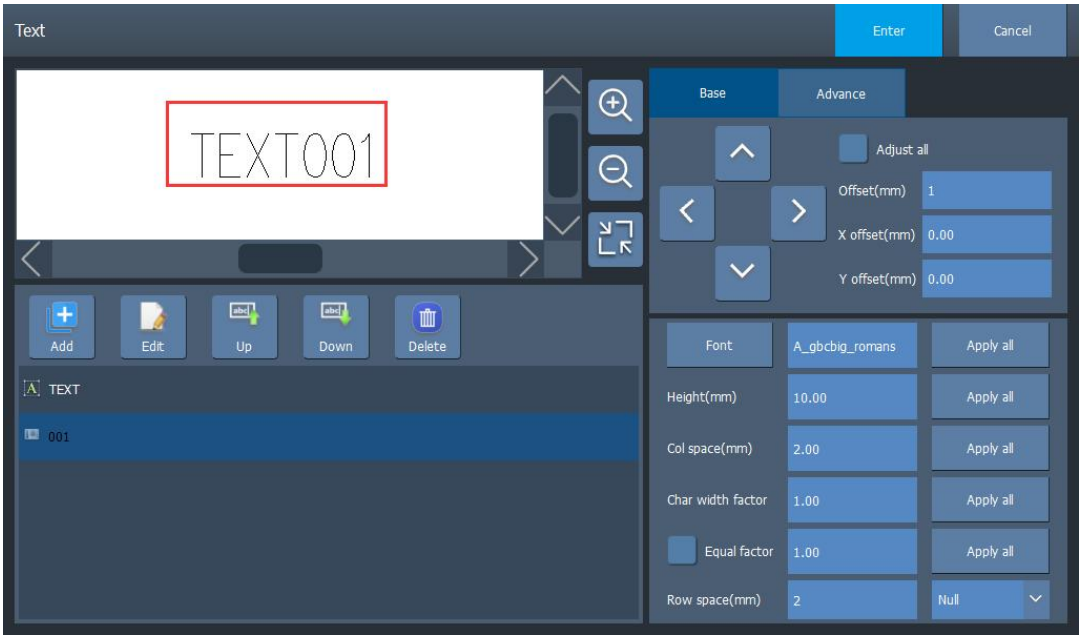
File path: Specify the path of the associated file.

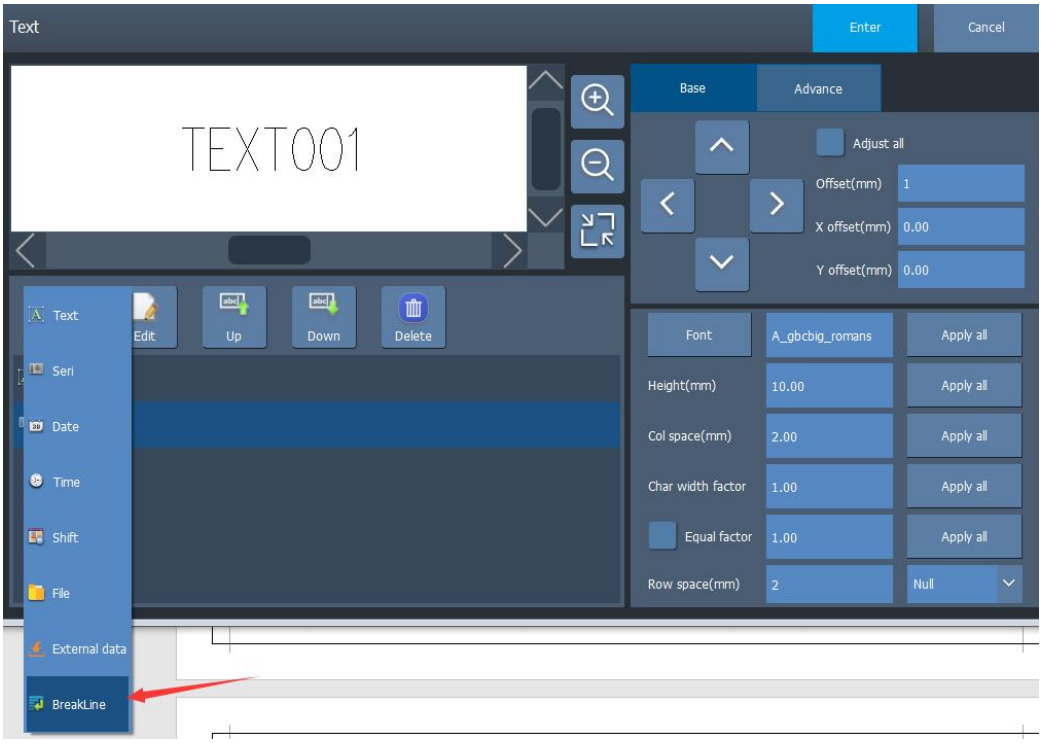
Clear cache: Clears the files saved to prevent re-coding.

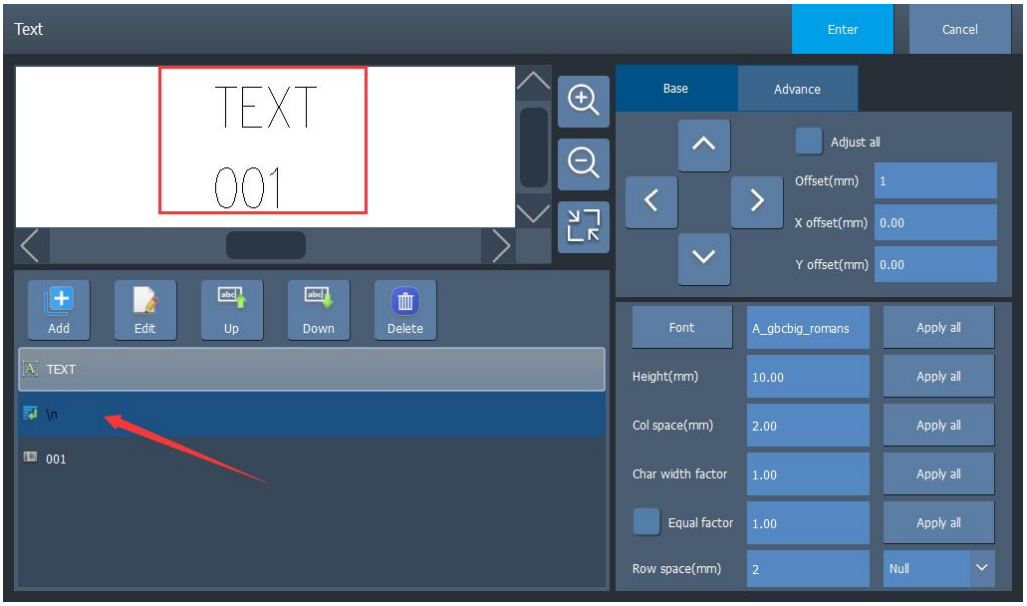
Check for re-coding: Check the box to stop coding if the content is found to be coded.

3.2.1.1.10. Line break

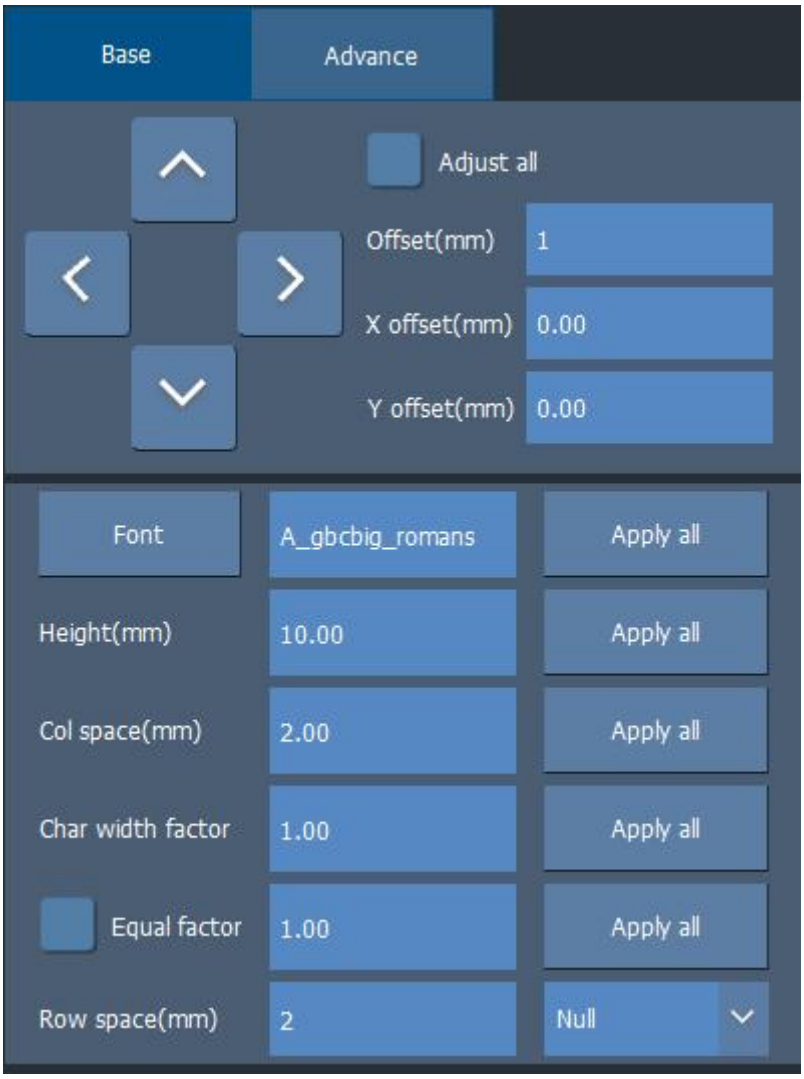
Insert a line break between two text elements in the text list to make the two text elements display in separate lines. In the absence of a line break, the text elements of the default text list are all on one line.


Text
Enter
Cancel
TEXT001
Base
Advance
Adjust all
Offset(mm)
1
X offset(mm)
0.00
Y offset(mm)
0.00
Add
Edit
Up
Down
Delete
TEXT
001
Font
A_gbcbig_romans
Apply all
Height(mm)
10.00
Apply all
Col space(mm)
2.00
Apply all
Char width factor
1.00
Apply all
Equal factor
1.00
Apply all
Row space(mm)
2
Null


Text
Enter
Cancel
TEXT001
Base
Advance
Adjust all
Offset(mm)
1
X offset(mm)
0.00
Y offset(mm)
0.00
Text
Edit
Up
Down
Delete
Seri
Date
Time
Shift
File
External data
BreakLine
Font
A_gbcbig_romans
Apply all
Height(mm)
10.00
Apply all
Col space(mm)
2.00
Apply all
Char width factor
1.00
Apply all
Equal factor
1.00
Apply all
Row space(mm)
2
Null


Text
Enter
Cancel
TEXT
001
Base
Advance
Adjust all
Offset(mm)
1
X offset(mm)
0.00
Y offset(mm)
0.00
Add
Edit
Up
Down
Delete
TEXT
\n
001
Font
A_gbcbig_romans
Apply all
Height(mm)
10.00
Apply all
Col space(mm)
2.00
Apply all
Char width factor
1.00
Apply all
Equal factor
1.00
Apply all
Row space(mm)
2
Null

3.2.1.1.11. Basic parameters



Font: Choose the font of the text. Supports single-line, double-line, dot matrix and TTF fonts.

Height (mm): The height of the font.

Spacing (mm): The distance between characters.

Character width factor: Arrange the characters according to the set character width.

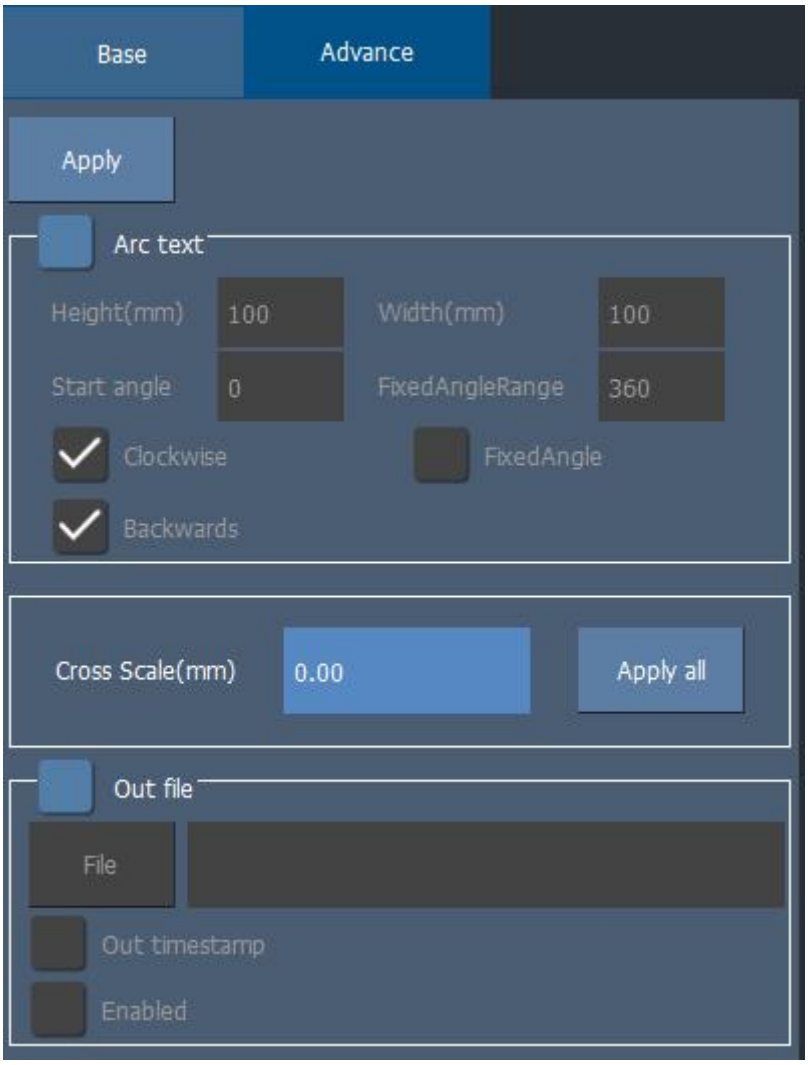
Equal width factor: Aligns the characters according to the set placeholder width.

Line spacing (mm): The distance between each line of characters.

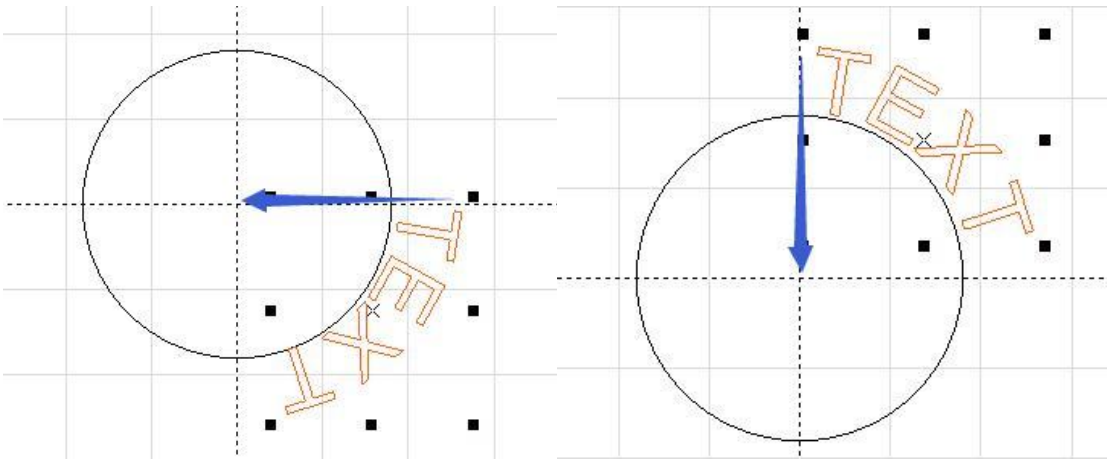
Align: Modifies the alignment of text elements

Apply All: When clicking Apply All, the parameter will take effect on the text of all elements in the element.

3.2.1.1.12. Advanced parameters



- **Apply:**Makes the advanced parameter take effect immediately.
- **Rounded Font:**Whether to allow the current rounding feature to take effect.
- **Width/Height:**The width and height are equivalent to the diameter of circular arcing if they are the same, and become elliptical arcing if they are not.
- **start angle:**refers to the text alignment angle base, the leftmost side of the text as the starting base of the angle. As shown in the figure below:



The left side is the base angle = 0, the right side is the base angle = 90.

- **Fixed angle range:**If the parameter is selected, the system will shrink the text within the restricted angle no matter how much text is entered**.**

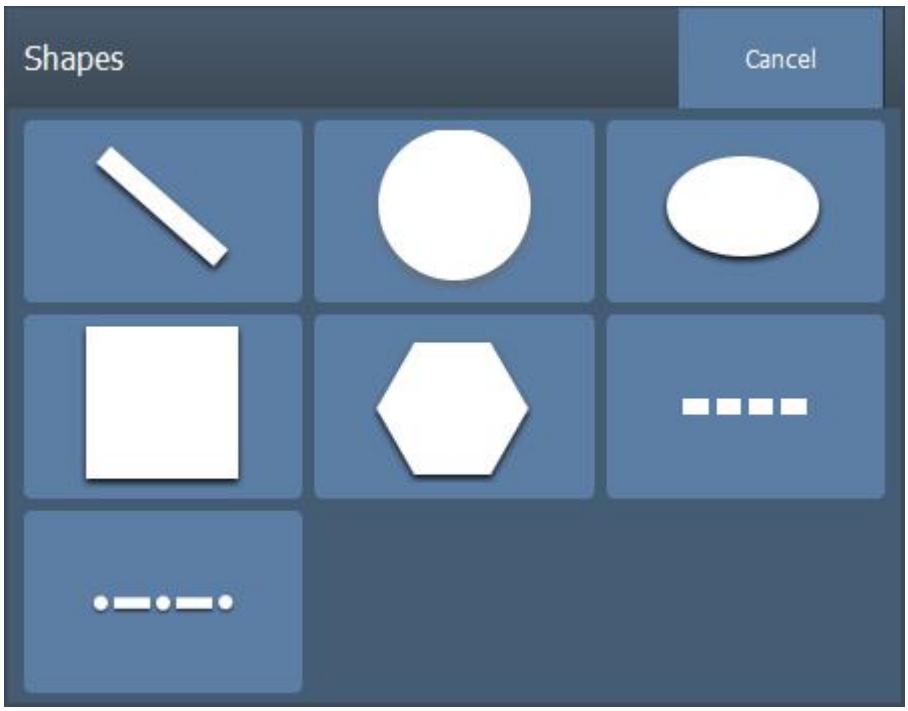
  Clockwise:Round the string and arrange it clockwise.

  Text Outward:Mirror the string in the Y direction of the string.

- **Remove intersections:**Remove intersections between lines
- **Output file:**Output the content of the marker to the specified file after the marker is finished

3.2.1.2. Geometric drawing element

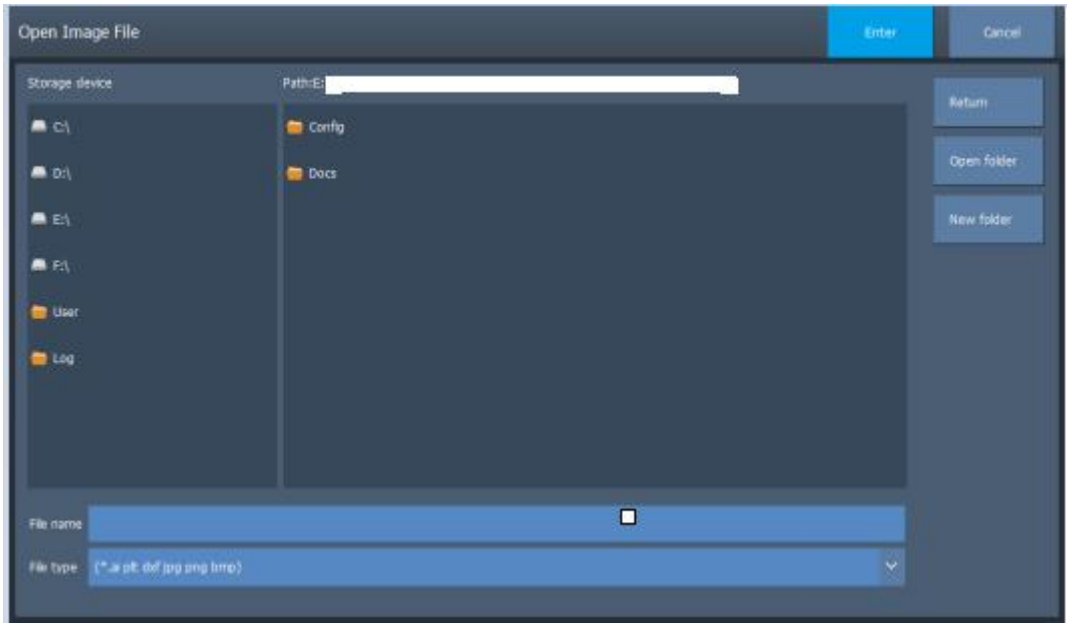
Used to draw lines, circles, ellipses, points, polygons, rectangles, and triangles. As shown in the figure.



- **Polygon:**Draws a polygon with a custom number of sides.

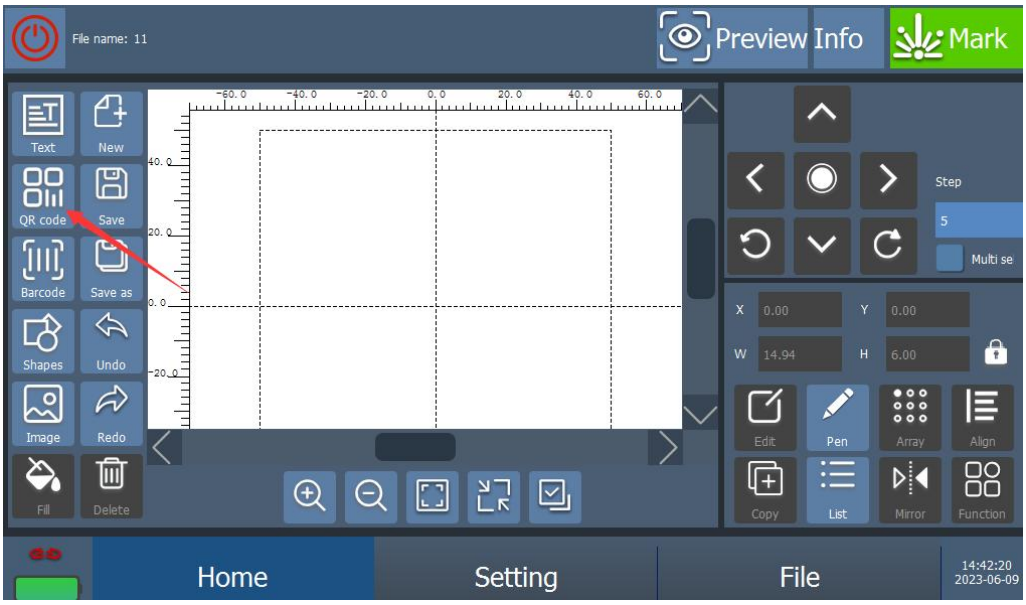
3.2.1.3. Image

The current software supports vector images in DXF, PLT, and AI formats andautomatically modifies the bitmap to a 256-level grayscale bitmap after importing it and gridding it.



3.2.1.4. 2D Code

The steps to add a QR code are similar to those offor adding a text element, please refer to the text element description for details.



Bar Code Properties

Type: Select the type of QR code, currently we provide QR-Code, Data Matrix, Aztec-Code, Han Xin-Code, MicroQR-Code.

Dotcode six types

Mode: Select the way to compose the 2D code pattern, there are eight modes: rectangle mode, dot mode, circle mode, line mode, regular line mode, bow mode, back mode and dashed mode.

Error correction level: Select the error correction level of the QR code

Version: Select the version of the QR code. (Default is Default, the version will be selected automatically according to the amount of QR code content)

Mask: equalize the ratio of black to white blocks on the QR code pattern

Height: set the side length of the QR code, in mm

Proportion: set the percentage of the size of the graphic composed of the QR code

Inner scale: The percentage of individual dots when mode is selected as return

Number of returns: The number of returns for a single point when the mode is selected as a return

Delete middle block: Set the size of the empty center of the QR code

Acceleration distance: Set the parameter appropriately to eliminate uneven dotting at the beginning of marking

Reverse: whether to reverse the processing; some materials are light-colored after laser marking, so the switch must be selected at the time

Module fixed direction: whether to enable the fixed direction when sweeping the QR code

X/Y multiplier:Multiplication of QR code dot matrix

Start number: The start number of the text that appears when the code is scanned

Number of characters: The number of characters that appear from the start number when the code is scanned

Text properties

The text properties of the barcode are the same as those of the QR code, so I will not repeat them in the barcode description

Show text: Whether to display the current QR code content below the QR code

X/Y Offset: Set the position of the text below the QR code

Start number: Select the number of digits to be displayed from the beginning (from 0). If it is 0, display all

Number of characters: Set how many characters to display. If 0, all characters are displayed.

Number of characters in a line: Sets how many characters are in a line

Character width factor: Set the width factor of each character

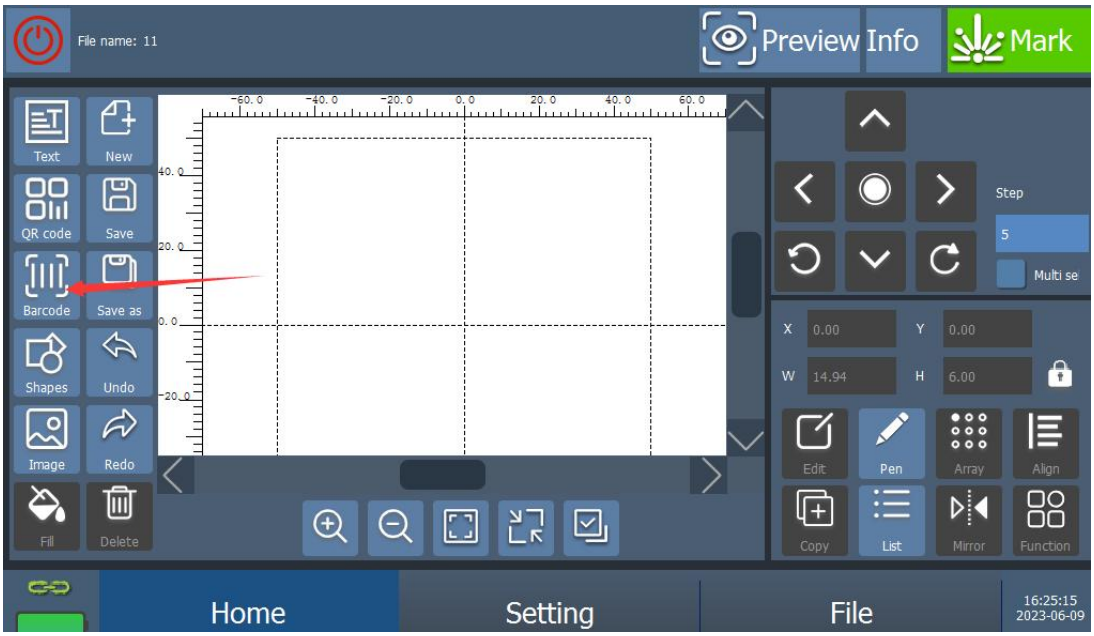
Equal-width text: whether to use the equal-width parameter

Equal width: Set the text width of equal width text

Advanced

3.2.1.5. Bar Code

Adding steps are similar totext element adding steps, please refer to the text element description for details



Bar Code Properties

Barcode Type: Select the type of barcode

Height: Set the height of the barcode

Module Height: Set the standard module width of the barcode

Top/low/left/right spacing:Top/bottom/left/right spacing of barcode when "Invert" is selected

Reverse: means whether to reverse the processing, some materials are light-colored after laser marking, so the switch must be selected to achieve black and white reversal

: When editing graphics, if you are not satisfied with the current operation, you can use "Undo" to cancel the current operation and return to the state of the previous operation; after undoing the current operation, you can use the "Restore " function to restore the canceled operation. the is one of the most common functions for editing work.

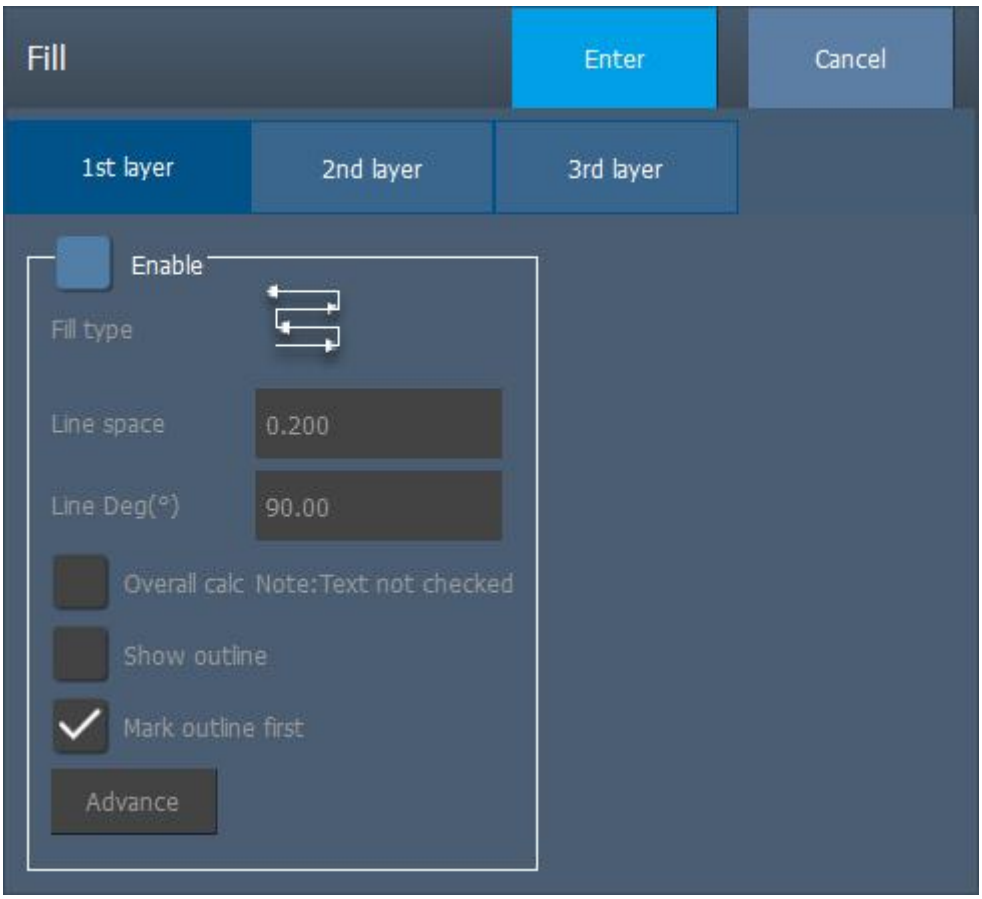
: Deletes unwanted graphics elements.

: Use the function to create a template file and save the current contents when there is no template file created. If you have a template file, use the function to save the current content.

: Save the current file as a file with a different file name, generally used to save backup files.

: Create a new file

: Fill can be used to fill the specified graph, the graph to be filled must be a closed curve, as shown in the figure

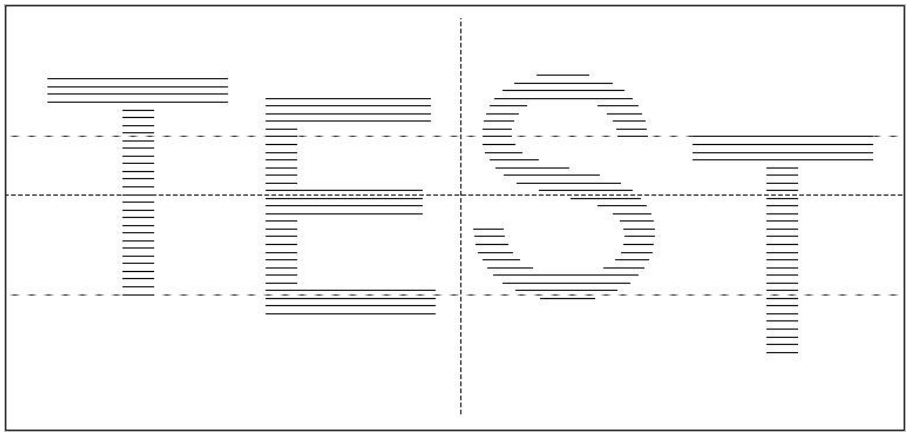


Enable fill:Whether to allow the current fill parameters to be valid

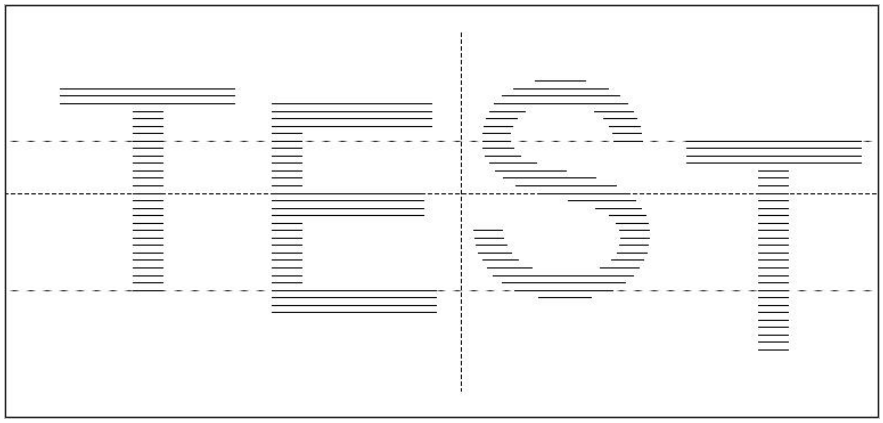
Calculate as a whole: is an optimized option which, if selected, will calculate all elements of the drawing that do not contain each other as a whole when performing the fill calculation, which in some cases will increase the speed of processing. (If the option is selected, it may cause a decrease in computer speed.) Otherwise, each separate area will be calculated separately. For the sake of description, let us now give a special example to illustrate the function

Example: Draw a text element in the workspace, containing four independent fixed text elements "T", "E", "S", "T ", the fill line spacing is 0.3mm, and it is 0 degree fill.

without "Overall calculation" checked:in the processing will be in accordance with the processing order in the list of objects in order to mark their fill lines, that is, first carving the fill map of one object and then carve the next one. As shown in the figure:



check the "Overall calculation": in the processing of all the fill lines are marked at once, that is, several objects in the same line of fill lines are marked together. As shown in the figure:



Enable outline:Indicates whether to show and mark the outline of the original drawing, i.e. whether to keep the original outline of the filled drawing

outline drawn first: indicates that the priority outline line when printing code

indicates: whether to display and mark the original outline: indicates the priority outline line when printing code

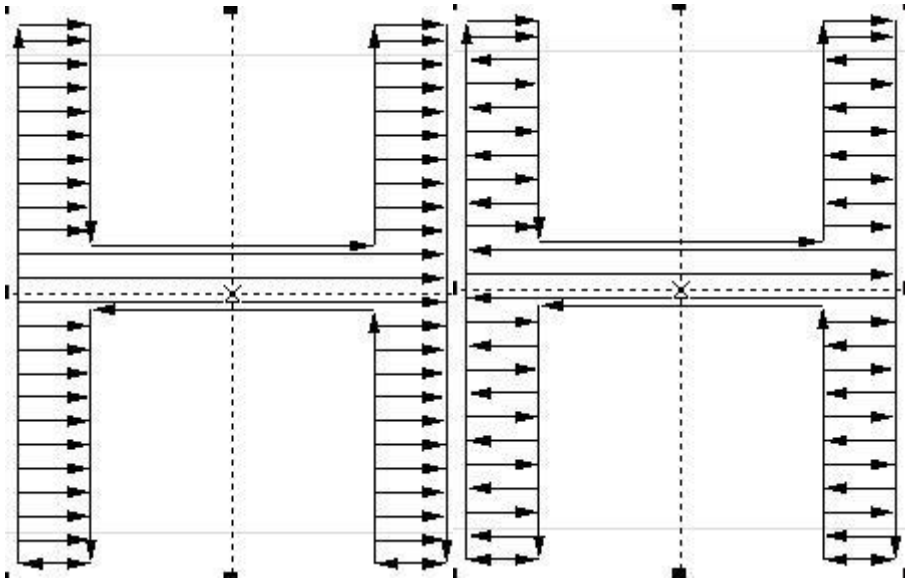
: Bidirectional fill, fill line is filled first from left to right, then from right to left, the rest of the cycle filled

: One-way fill, the fill line always fills from left to right

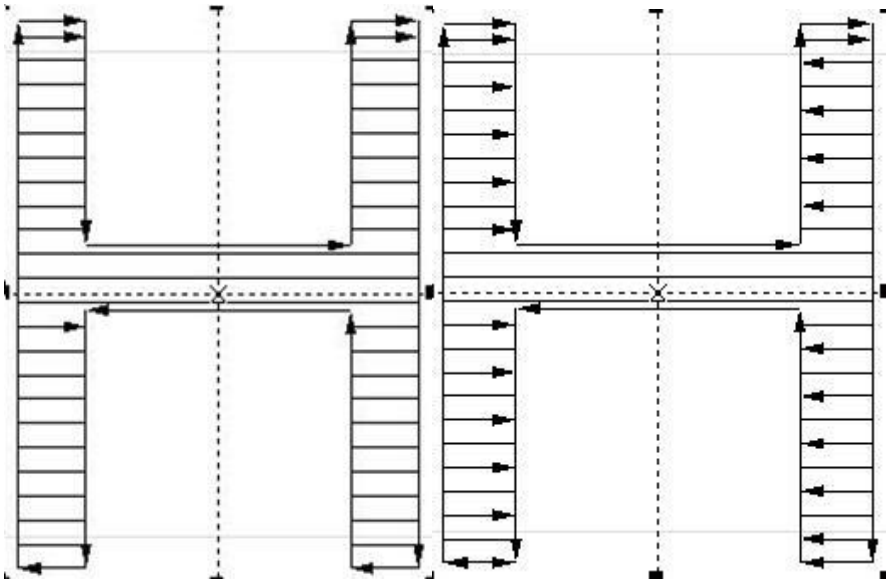
: Optimized bi-directional fill, similar to bi-directional fill, but with connecting lines between the ends of the fill lines

: Optimized bow fill, similar to bow fill, still jumps over to fill where the object is blank

: Back fill, similar to bow fill, still jumps over to fill where the object is blank



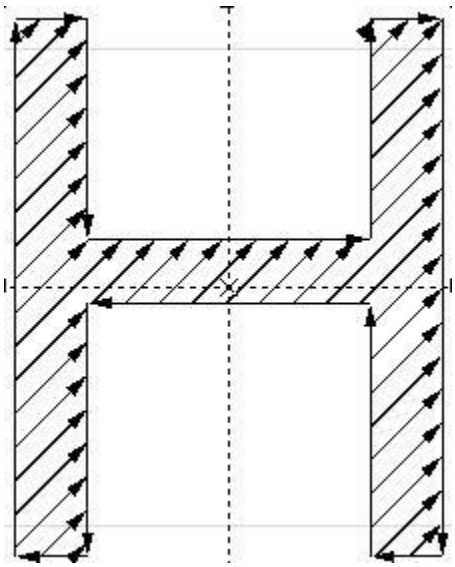
Left is one-way fill, right is two-way fill



The left is optimized bidirectional fill, the right is optimized bow fill

Line spacing: The distance between the lines adjacent to the fill line

Fill angle:is the angle between the fill line and the X-axis. The figure shows the fill pattern when the fill angle is 45 degrees



The fill angle is 45°

3.2.2. Interface function area

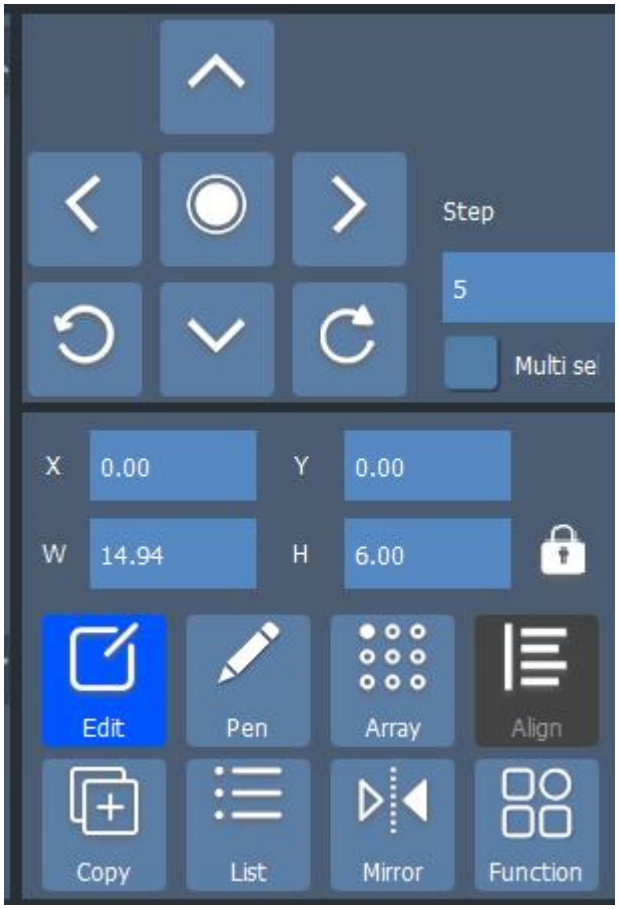
: Zoom in or out the display of the working area.

: Restore the default work area display size.

: Maximize the display of the currently selected image element.

: Selects all elements of the work area.

3.2.3. Edit ribbon



- and step: Move the selected element up, down, left, and right, and the distance is the step parameter.
- :centering allows any position of the element to be placed directly in the center of the working area.
- **Angle, left and right rotation:**Clicking on the left or right rotation icon allows you to rotate the element. The rotation angle is the angle parameter.
- **Pen parameters:**Set the pen parameters for the currently selected element.
- **Copy:**Copies the selected element (there will be a icon in the upper left corner of the working area) and pastes it by clicking on any blank space in the working area.
- **Mirror:**Mirror the element horizontally/vertically
- **Array**

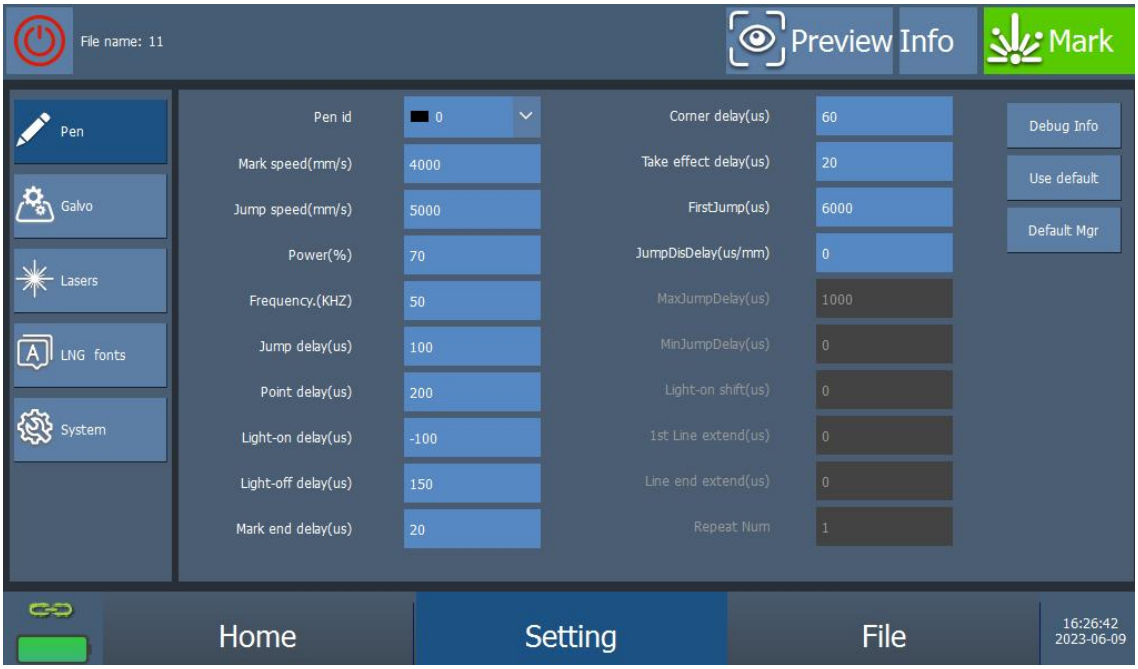
  - **Number of horizontal/vertical arrays:**Number of horizontal or vertical arrays when arraying.

- **Horizontal/vertical increment:**The distance between horizontal or vertical graphs after arraying.
- **Orientation:**Toggles whether the graphic elements of the array are sprayed horizontally or vertically in order.
- **mode:**toggle the array of graphic elements spray code way is unidirectional or back and forth in both directions

- **Align:**Aligns the selected plural elements to the selected alignment.
- **Edit:**Modify the content of the selected elements (text, QR code, barcode)
- **List:**Sort and manage the elements in the list (coding order from top to bottom of the list), or delete them.

3.3. Parameter setting

3.3.1. Coding parameters

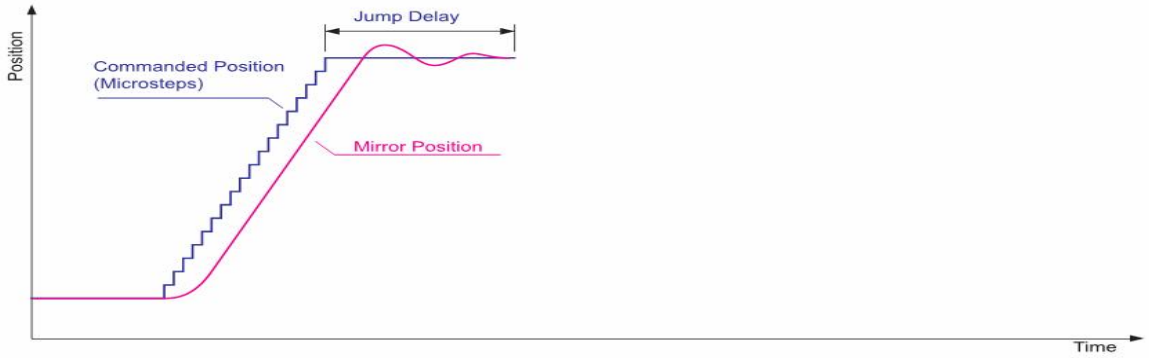


- **Pen number**: Select different pen numbers from 0 to 15 for configuration. Each pen number corresponds to one color.
- **Power (%):**The output power of the laser, the range of values is 0% ~ 100%
- **Frequency (kHz):**The pulse frequency of the laser, with reference to the laser type.
- **Marking speed (mm/s):**The speed at which the oscillator runs during marking.
- **Jump speed (mm/s):**The speed of the oscillator running during the empty jump, the

empty jump speed is generally debugged with the jump delay, the larger the empty jump speed, the larger the jump delay is generally required.

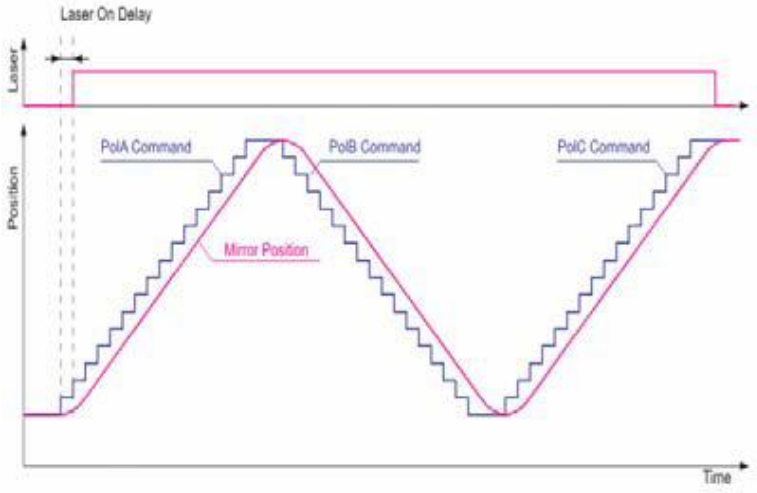
- **jump delay time (us):**jump position delay time value;

  Function: Waiting for the Galvanometer to jump to the target point before continuing with the next vector command;



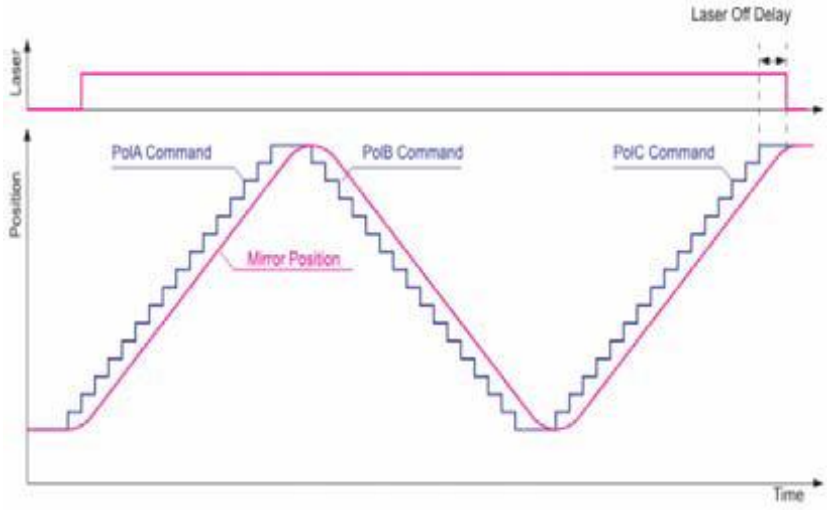
Jump delay diagram

- **Pulse width (us):**Duty cycle of the output signal frequency.
- **MOPA pulse width:**Set the pulse width value of the mopa laser.
- **Punch time (us):**The time used to plot each point.
- **On delay time (us):**The delay time for the laser to turn on when the printing starts. Set the appropriate delay time parameters can be set to remove the "match head" at the beginning of the code, but if the delay time is set too large will lead to the phenomenon of missing strokes at the beginning of the segment. Can be a negative value, a negative value indicates that the laser early light.



Light on delay time diagram

- **Off delay time (us):**Laser off delay time at the end of coding. Setting the appropriate off delay parameter can remove the non-closing phenomenon at the end of the coding, but if the off delay is set too large will result in the end segment "match head". Can not be a negative value.



Off light delay time diagram

- **Effective delay time (us):**Each time the pen number is switched, a period of time is unconditionally executed to ensure that the parameter change takes effect.
- **End-of-Graph delay (us):**Vibrator delay (0, + ∞) after the laser is turned off;

  function: to ensure the accuracy and precision of the galvanometer trajectory at the unspotted position,to a certain extent to reduce the IPG laser trailing phenomenon;
- **Opening lag (us):**There is a time difference between the oscillator and the laser to execute the command, usually the oscillator is slower than the laser by about 100us, so use the parameter to compensate.
- **first jump delay (us):**the first jump when marking, in addition to the original jump delay time to increase a certain delay time.
- **First stroke extension (us):**
- **Line segment extension at both ends (us):**
- **Corner delay (us):**Delay time between each segment when marking.
- **Variable corner angle:**The smaller the enabled corner angle, the smaller the delay time. When the function is on, it can ensure the quality of both right angle and circular

arc printing code.

Save default parameters: Save each parameter under the current general parameters as default parameters.

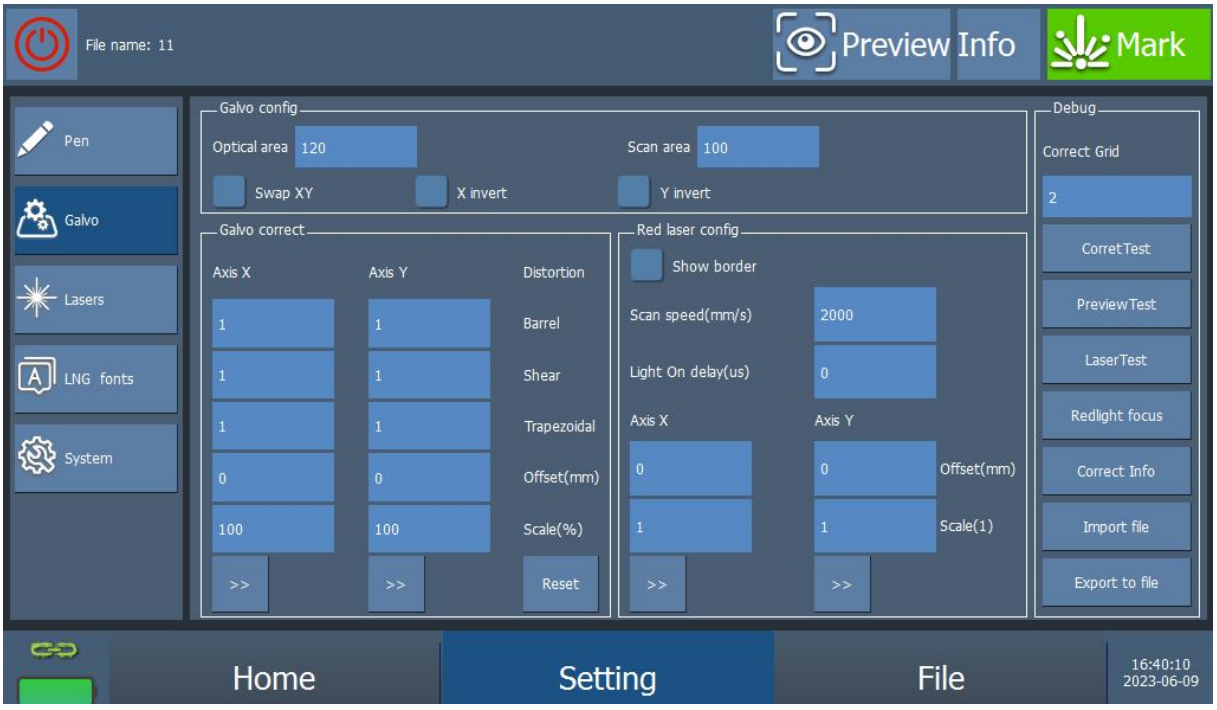
Use default parameters: Replace the current parameter configuration with the configuration of the default parameters.

	too large	**too small**	**Whether can be negative value**
Speed	The marked strokes are not fine enough, sparse, no depth, fast marking speed	Marked strokes are fine, dense, with depth, marking speed is slow	No
Opening delay	Will lead to the phenomenon of missing strokes in the starting section	Match head" focus phenomenon at the beginning of coding	Yes (negative value means that the laser early light)
Off light delay	Will lead to the end of the section of the "match head" focus phenomenon	The phenomenon of non-closing at the end of spraying code	No
Jump speed	Short processing time for empty strokes, reduced total marking time, but the strokes will be connected and the mirror movement will be unstable	Long processing time for empty strokes and increase in total marking time	No
Jump position delay	The oscilloscope has been fully rotated and stays for a while before processing the next stroke, increasing the marking time	The PC starts processing the next stroke before the mirror is fully rotated, scattered dots will appear at the beginning of the stroke and jitter will appear at the start of the stroke	No

Corner delay	Will lead to increased coding time, and the corner will have the focus of the phenomenon	Rounded corners when spray coding right angles	No
Figure element end delay	Corner has focus and increase marking time	At high speed, the end of the effective vector trajectory is incomplete and easily deformed	No

Pen parameter setting size comparison table

3.3.2. Area parameters



Regional parameters

3. 3. 2. 1. **Oscilloscope setting:**is used to set reference of oscilloscope X/Y axis and range.

- **Magnitude (mm):**Set the range of the oscillator.
- **Working area (mm):**Set the size of the working area.
- **XY exchange:**Adjust whether to use the X-axis of the oscillator as the X-direction of

the software coordinate system or the Y-axis of the oscillator as the X-direction of the software coordinate system.

- **X/Y Reverse:**Mirror the image element with X/Y direction as the reference.

3. 3. 2. 2. Galvanometer correction

Correction of the galvanometer, two vertical rows of corrections correspond to galvanometer X and galvanometer Y respectively.

- **Barrel correction:**indicates the barrel or pillow correction factor, the default factor is 1.0 (parameter range 0.5-1.5)**.**
- **Tilt correction:**indicates parallelogram correction factor, default factor is 1.0 (parameter range 0.5-1.5).
- **Trapezoid correction:**indicates the trapezoid correction factor, the default factor is 1.0 (parameter range 0.5-1.5)**.**
- **Offset correction (mm):**Adjusts the deviation between the actual printout and the expected position of the image element.
- **Scale correction (%):**Scaling scale, default value is 100%. the parameter needs to be modified when the actual size of the printout is different from the size shown in the software. When the actual size of the printout is smaller than the design size, increase the value of the parameter; when the actual size of the printout is larger than the design size, reduce the value of the parameter.
- Ratio: When setting the ratio, you can directly press , at the time, the dialog box shown in the figure will pop up, we can input the size set in the software and the actual size of the measured marking, the software will automatically calculate the expansion ratio.

Set the scale

3. 3. 2. 3. Debugging

- **Laser test:**Check whether the laser is producing normal light.
- **Calibration test:**Draw a rectangular box according to the set parameters and test whether the calibration effect meets the requirements.
- **Red light test:**Test whether the red light changes correctly according to the red light parameters.

3. 3. 2. 4. Red Light Correction

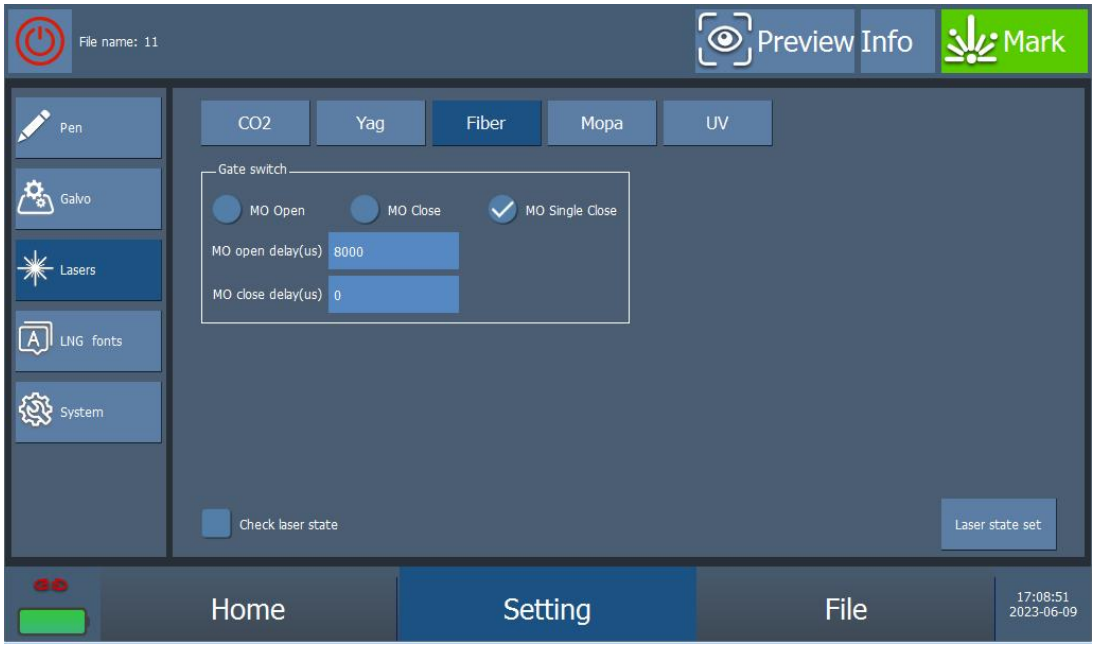
- **Enable show outline:**Check to show the outline of the image element.
- **On delay time (us):**The delay time for the red light to turn on.
- **red light speed (mm / s):**the speed of the red light; the slower the speed, the more obvious the red light path; the faster the speed, the clearer the outline of the red light.
- **Offset position X (mm):**Make the outer frame or outline of the red light to X direction offset set distance.
- **Offset position Y (mm):**The set distance to offset the frame or outline of the red light to the Y direction.
- **Size ratio X/Y:**The size deviation of the red light from the laser. Adjust the parameter to make the laser and the red light coincide exactly.

3. 3. 2. 5. Export file/Import file

Saves the current calibration value as a file/is reads the saved calibration file.

3.3.3. Laser parameters

Used to set the type of laser currently in use and to make the relevant basic parameter settings. As shown in the figure.



Laser parameters

CO_2

Enables pre-ionization: Enables the pre-ionization signal. Some manufacturers of CO2 lasers require the signal for proper operation, such as SYNRAD lasers in the USA.

- **Pulse width:**Pulse width of the pre-ionization signal.
- **Pulse frequency:**Pulse frequency of the pre-ionization signal.

◆ **First pulse suppression:**the function is to solve the marking on the CO_2 machine, the laser power is too strong or long interval, the laser energy accumulation more, in the beginning of the coding caused by the phenomenon of "first point heavy".

- **Starting power:**The starting power level of the first pulse.
- **Power increment:**The power increment value of each pulse up to the set power value.

CO2/YAG/UV

Light Leakage Handling: Handling of the gate signal delay time. When the laser is unstable, check the light leakage processing, each time the laser is turned on/off during the marking process, the corresponding gate signal on/off delay time will be executed first. If the light leakage processing is not checked, only one door signal on/off delay time will be executed at the starting position during the marking process.

- **Door signal on time (us)**: Door signal on delay time before the laser turns on the light.
- **Door signal off time (us):**: Door signal off delay time before laser light off.

YAG

- **Enable PWM signal:**Generates a modulating signal at a certain frequency at the PWM pin.

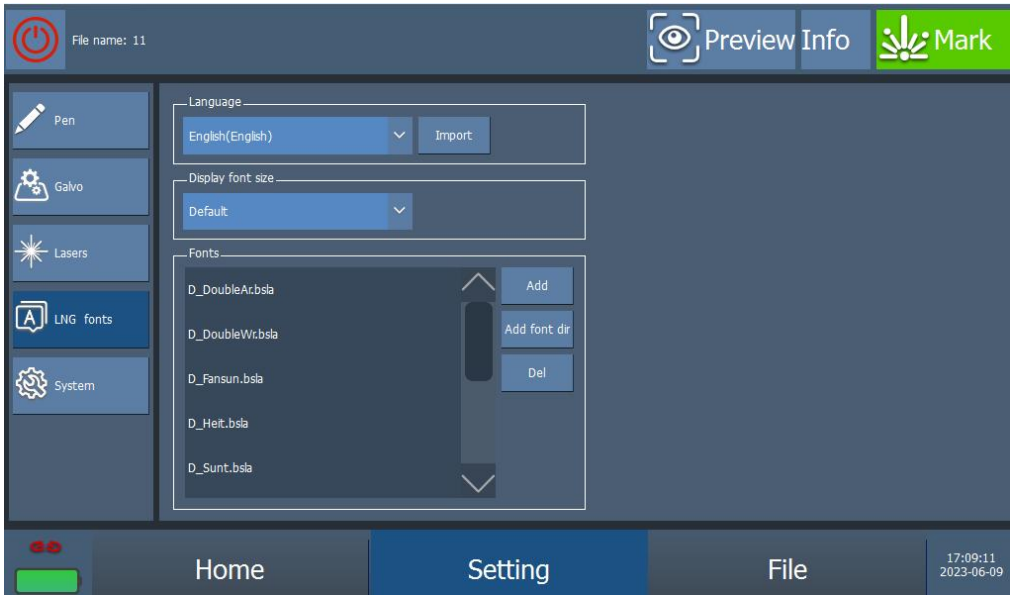
YAG/UV

- **Pulse Width Inversion:**Changes the PWM pulse high to low, and the corresponding low to high and shifts it by the corresponding phase angle to meet the PWM low active Q driver requirement.

Fiber/MOPA

- **MO on/off time (ms):**MO needs to be turned on early before the laser transmitter pin is turned on; set the MO on/off start time.

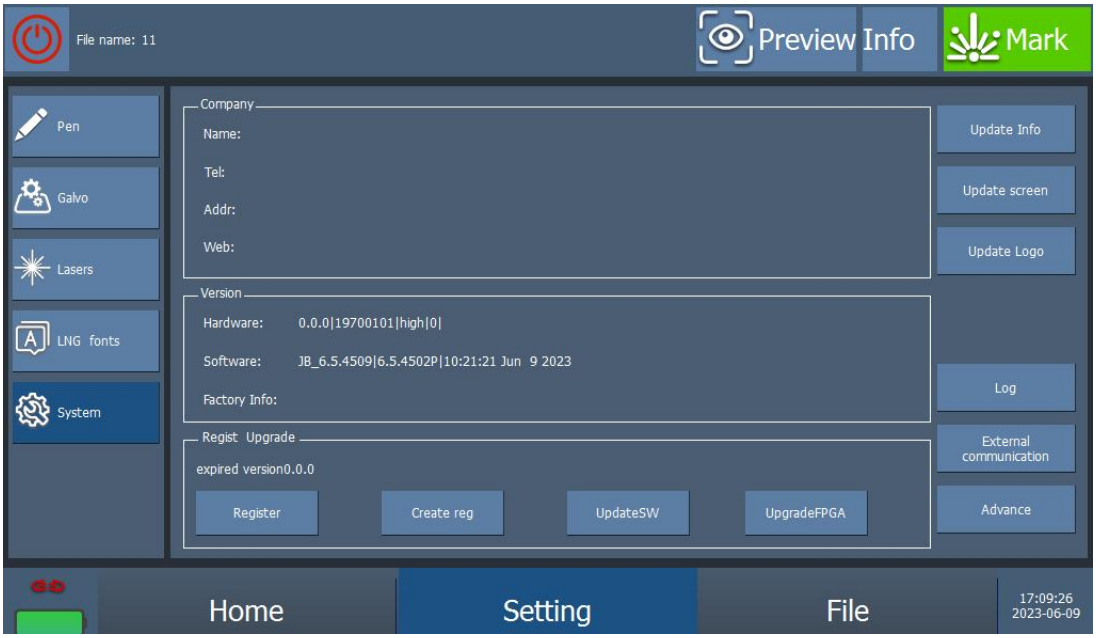
3.3.4. Language font



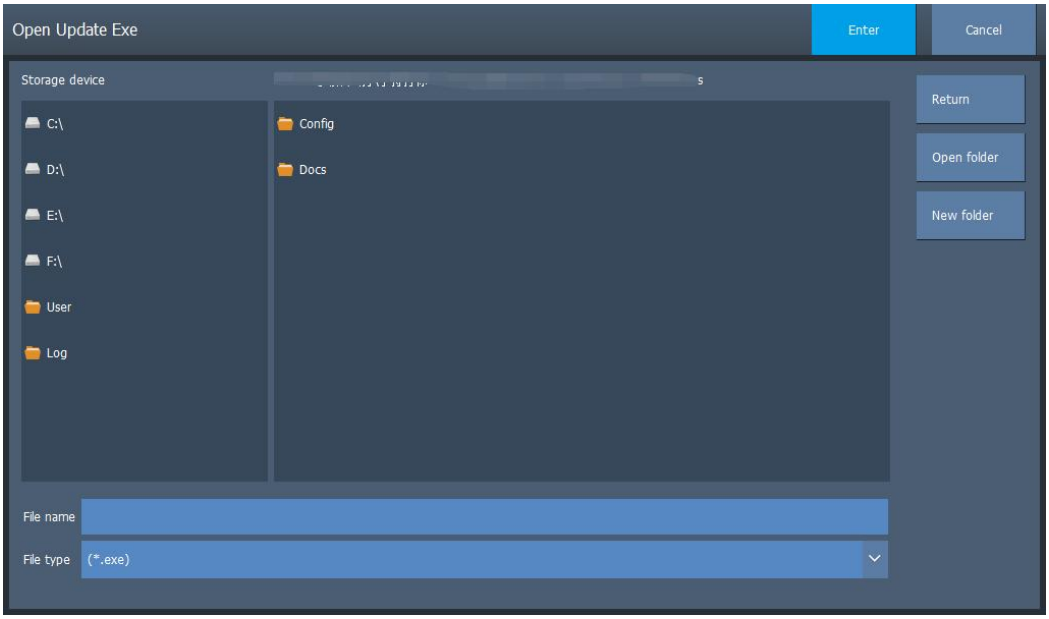
Language: Select the language of the software, currently available in Simplified Chinese and English.

Fonts: Manage the existing fonts in the software. You can import fonts from specified location or delete existing fonts.Currently, only .bsla format fonts are supported, you need to use font conversion tool to convert them.

3.3.5. System



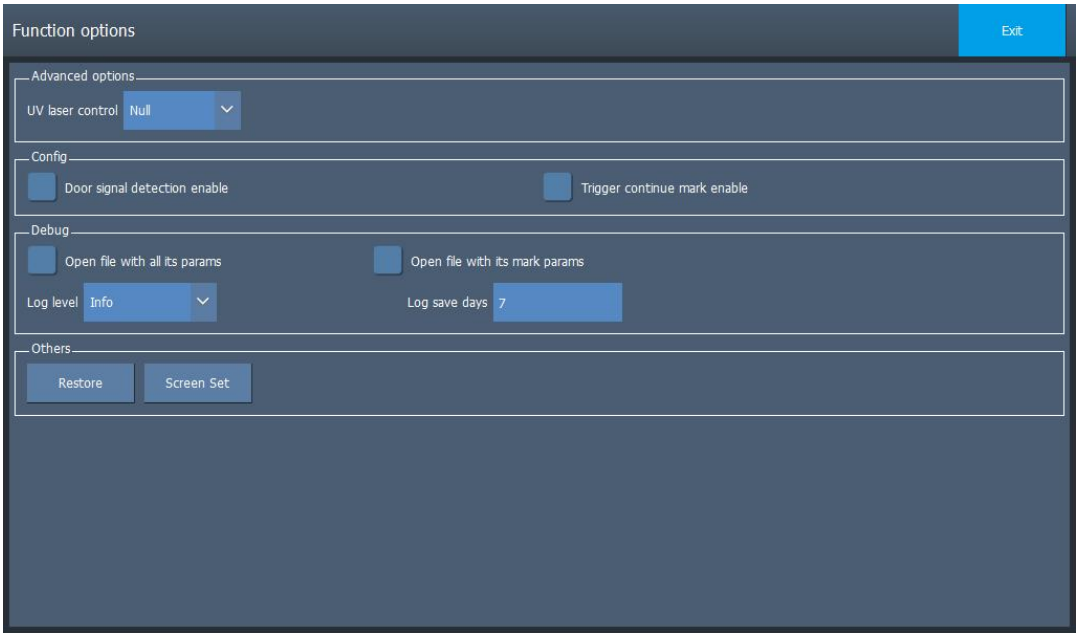
- **Company Information**: Display company related information.
  - **Update:**You can change the company information by importing the specified XML file.
  - **Update boot screen:**Specify the required bitmap file to change the boot screen.
- **Version information:**Display software and hardware version numbers
- **Registration and Upgrade:**Displays the current software activation status and provides registration and upgrade functions.
  - **Registration information:**Specify the registration file generated by the manufacturer to complete the registration.
  - **Generate file:**Generate a file containing local information to provide registration to the manufacturer.
  - **Upgrade FPGA:**Upgrade the version of the hardware.
  - **Upgrade software:**Upgrade the current software version.



Click on the "Upgrade Software" button and select the provided upgrade tool.

Enter the upgrade program, the red box is to select the new installation package to be upgraded, the green box is to specify the files or folders that are not allowed to be modified under the original program (the is generally not necessary to deal with), click start installation, and wait for the installation to finish.

- **Advanced Features**



1. Advanced features

- **UV laser control:**Select the type of UV laser to use
- **Gate signal detection:**Whether to enable gate signal

2. Debugging:

a) **Logging level:** Selects the level of logging.

b) **Template marking parameters on:** When checked, the marking parameters will be saved in the template.

c) **Template Full Properties On:** After checking, all the parameters will be saved in the template.

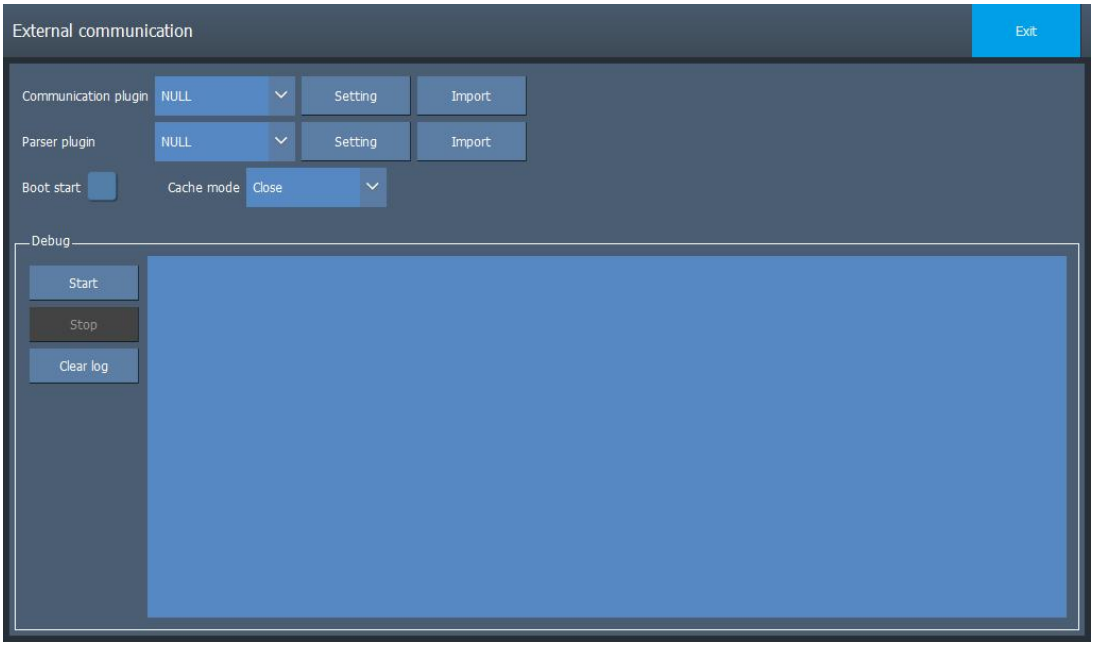
3. Others

Restore factory: All settings can be restored to factory state.

Screen settings: Setting the screen saver

◆ **External communication**

Implement external control board



Power on start: Whether to enable start external communication function

Cache mode: Whether to enable cache mode

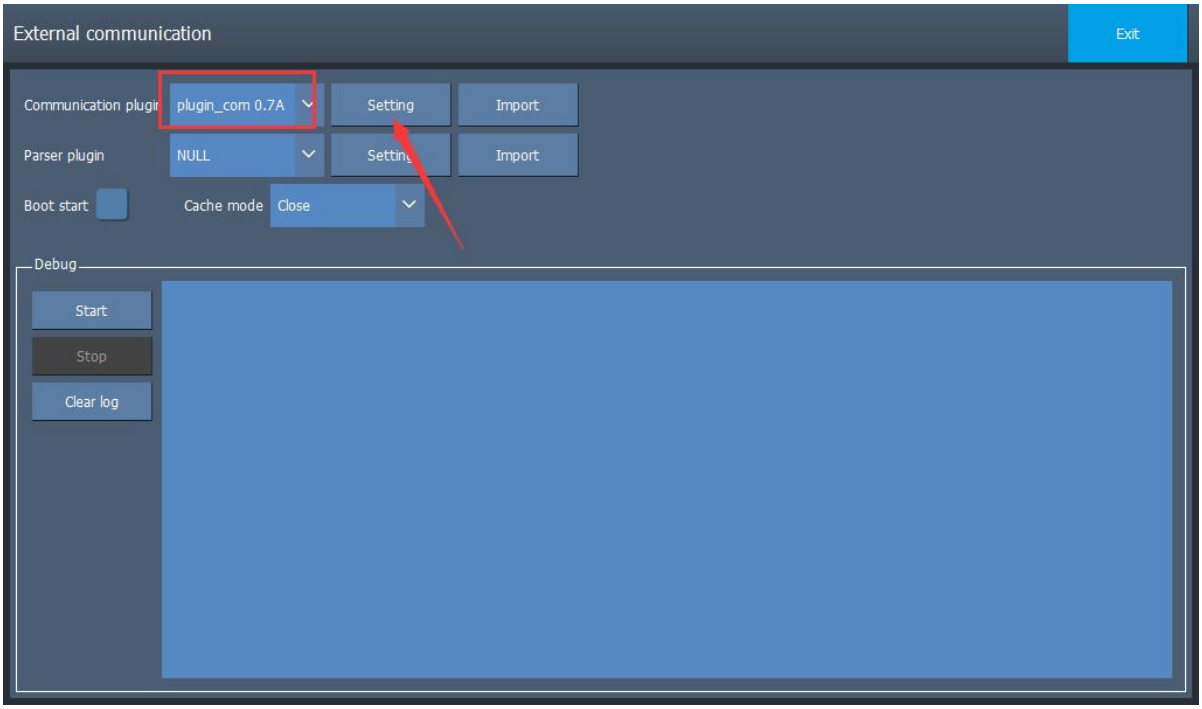
Start: Start external communication

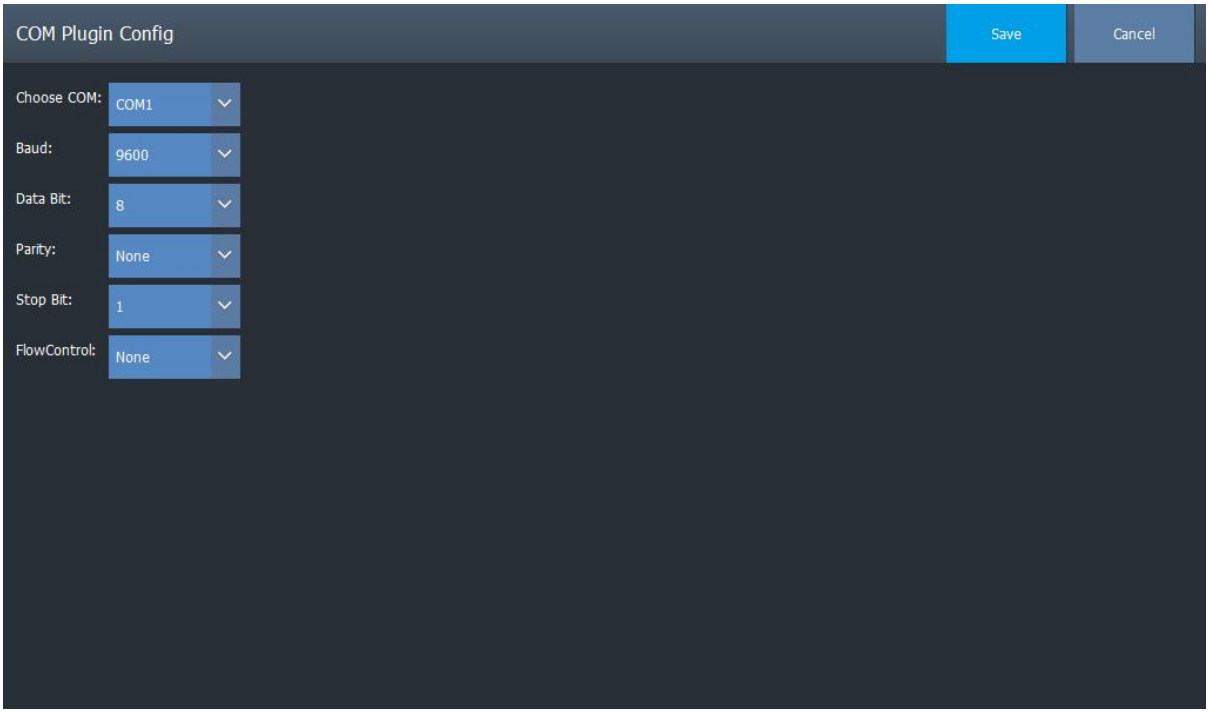
Stop: Stop external communication

Clear: Clear the message window

Serial communication

Using serial communication, communication plug-ins need to select the serial plug-in, as shown in the figure, click Configure, enter the serial configuration interface





Note: Serial communication rate is low, it is recommended to transmit short strings using the method.

Select serial port: use which serial port on the device will select the corresponding serial port number

Baud rate:Selects the baud rate used for serial communication

Data bits:Selects the number of bits of data to be used for serial communication

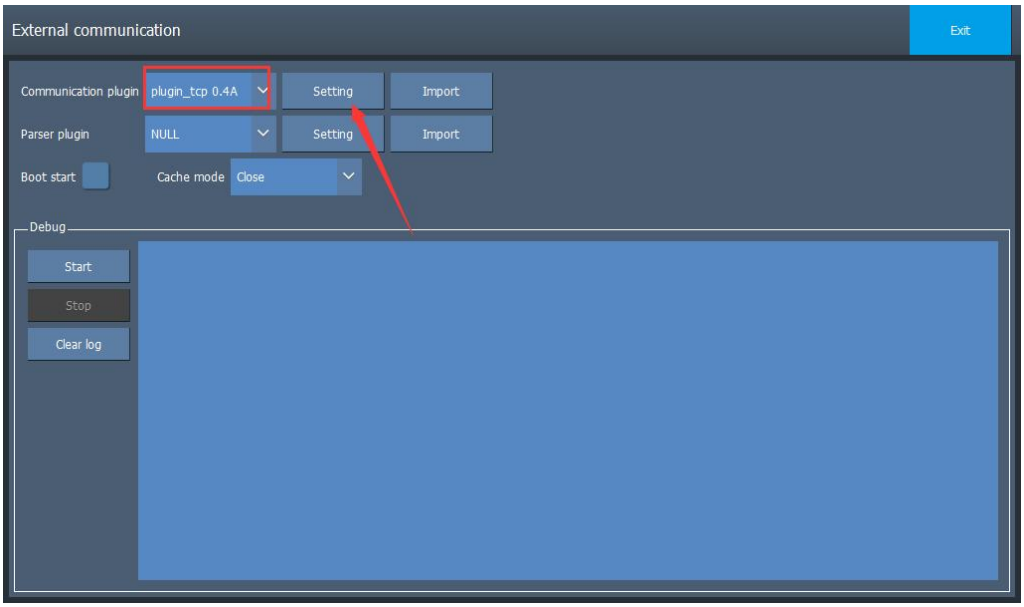
Parity:Selects the bits of parity used for serial communication

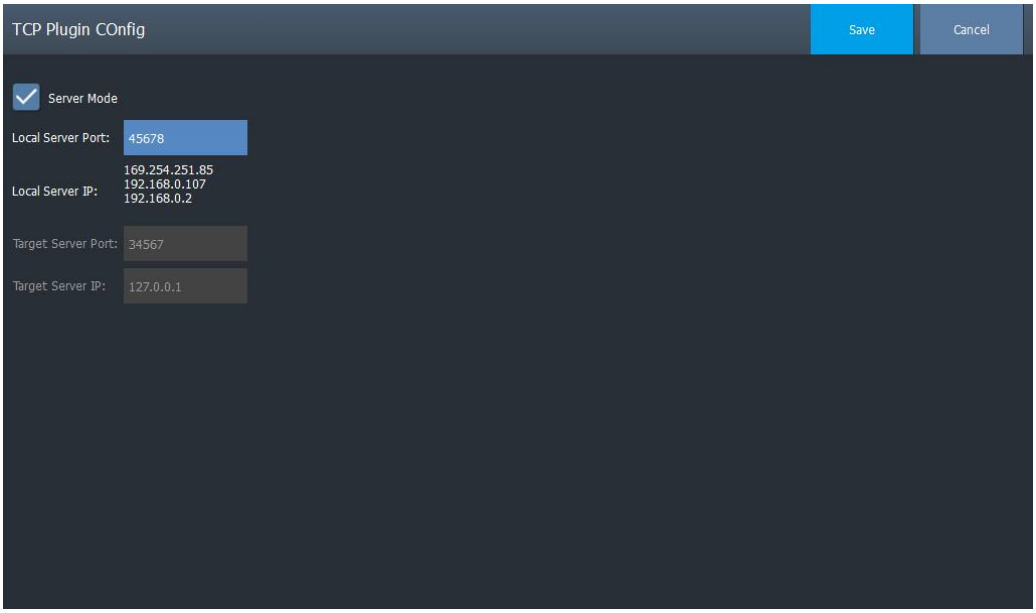
Stop bit:Selects the number of bits of the stop bit used for serial communication

Flow control: Selects the data flow control method

Network port communication

To use the network port communication, the communication plug-in needs to select the network port plug-in, as shown in the figure, click Configure to enter the network port configuration interface





check the local machine to do the server: the device to do the server side

Local server port: set a port number to use for network communication

Local server IP address: display the IP number of the current device

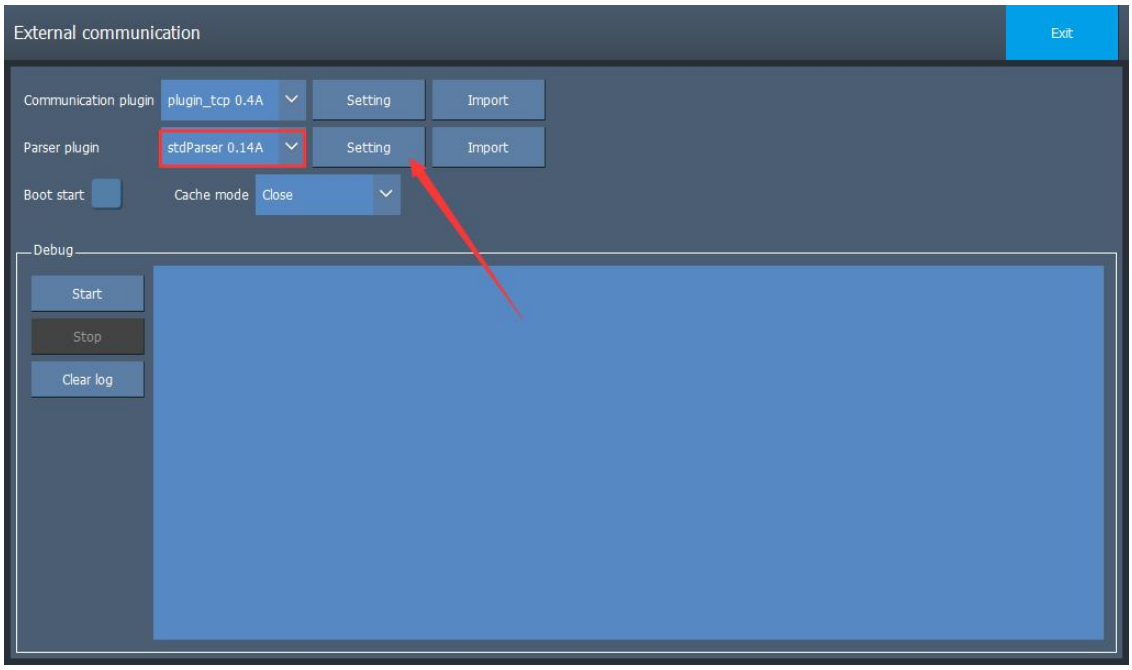
Uncheck Local server: the device is the client

Target server port: fill in the port number of the target server

Target server IP address: the IP address of the server

Parsing plug-in

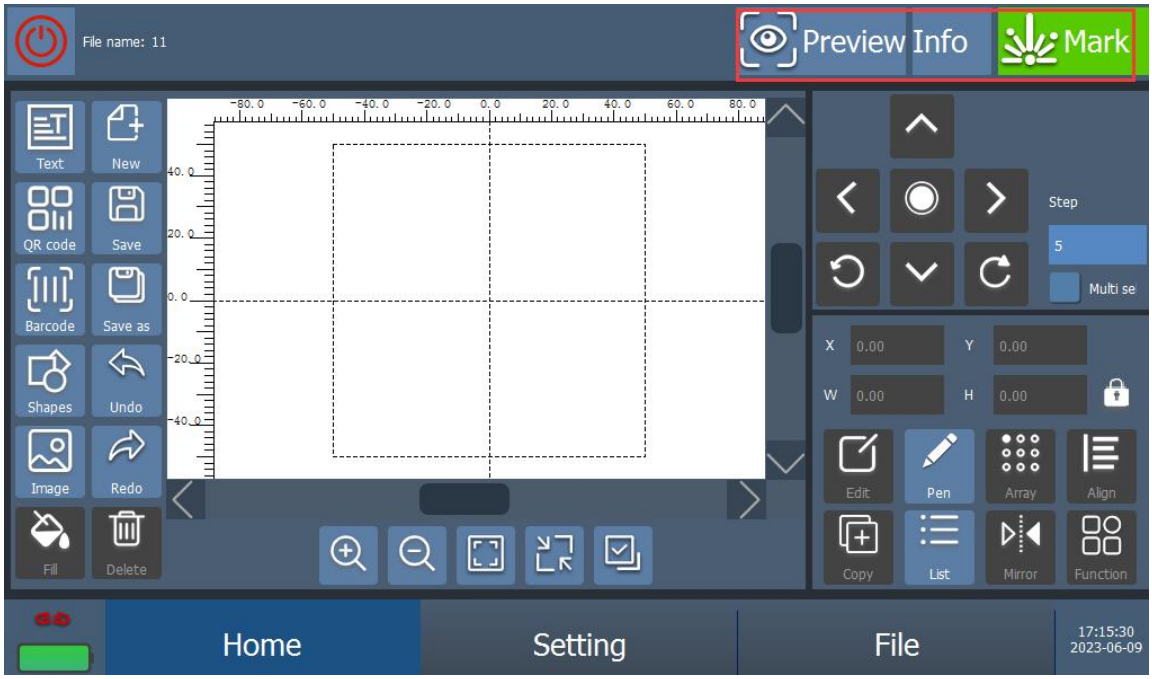
The same resolution plug-in is used for the network port and serial port, as shown below



3.4. Marking

The "Marking" window is the interface to perform laser operation on the completed design file. Before the formal marking, please repeatedly debug the marking parameters and carefully check the design file to avoid unnecessary losses!

Note:Since the laser can cause irreversible damage to your body, you should be cautious when operating and keep the non-related personnel away from the operation area.



- **Number of false triggers:**If the trigger is triggered again during the coding process, then the trigger is counted as a false trigger.
- **Serial Number Reset:**Select a serial number to use the function to reset the serial number to the desired number. Without any graphic element selected, it will reset all serial numbers to the starting serial number.
- **Count Clear:**The Count Clear function can be used during the coding process to clear the value of the number of times the code has been printed, etc.
- **Manual trigger:**After setting the non-internal trigger method, you can use the function directly to print codes.