



DBK5FD01

Software Manual

V 1.0

ChangSha BSL Info. Tech. Co.,Ltd



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Release Notes

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1 OVERVIEW

- This software is used for Relief laser control system.
- The relief software can run on the Windows operating system platform and supports Windows 7, Windows 10, and Windows 11 versions.
- In order to run the relief software smoothly, it is recommended to use a computer hardware environment of i5 (10th generation or above) + 16G memory.

2 SOFTWARE INTRODUCTION

2.1 Software function

- Support 3D model relief processing.
- Support fiber, MOPA, CO2 and UV lasers on the market. The output analog voltage, pulse frequency, duty cycle, etc. can be set through software according to different types of lasers.
- Support independent red light marking indication.
- Freely design the graphics and patterns to be processed.
- The software provides usage rights control to prevent parameters from being modified at will.
- Provide powerful IO control function: through port control, your machine can easily achieve automated control.
- Provide manual correction, equal proportion correction, and fitting correction methods to obtain extremely accurate marking effects.
- Support filling operations: Provides linear and circular filling, can be filled at any angle, cross-filling, margins, borders, spacing, etc. are adjustable. Supports up to three layers of filling combinations, and parameters can be set independently for each layer.
- Provide variable text functions: fixed text, serial number, date, time, network communication, serial communication, SQL database, etc.
- Support image marking.
- Support 16 layers of processing parameters: The parameters of each layer can be customized arbitrarily to easily achieve multi-parameter marking.
- Support PLT, DXF, BMP, JPG, JPEG and other image files.
- Support commonly used one-dimensional barcodes and two-dimensional barcodes, such as Code39, EAN, PDF417, DM, etc.
- Provides text input function, supports TTF fonts, single-line fonts, barcode fonts, and self-added (bitmap fonts, etc.) fonts.

- 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: supports arranging text according to arcs, drawing/editing arbitrary graphics, breaking up/combining, grouping/dismissing, canceling/restoring, shaping, etc.
- Provides simulation function: you can preview the marking trajectory of the graphics before the marking operation.
- Support secondary development: Provide secondary development SDK library to support users in customized development, expand the functions of existing marking systems, and meet customers' special application needs.

2.2 Other statement

- Due to the actual operation methods, function settings, etc. caused by software upgrades, the content of this manual may not be updated in time. If there is any inconsistency with this manual, the software shall prevail.
- Other product and company names mentioned herein may be the trademarks of their respective owners.

2.3 Interface description

- Start the initialization interface

When you start running the program, the startup interface (Figure 2-1) is displayed, and the program performs initialization operations in the background.

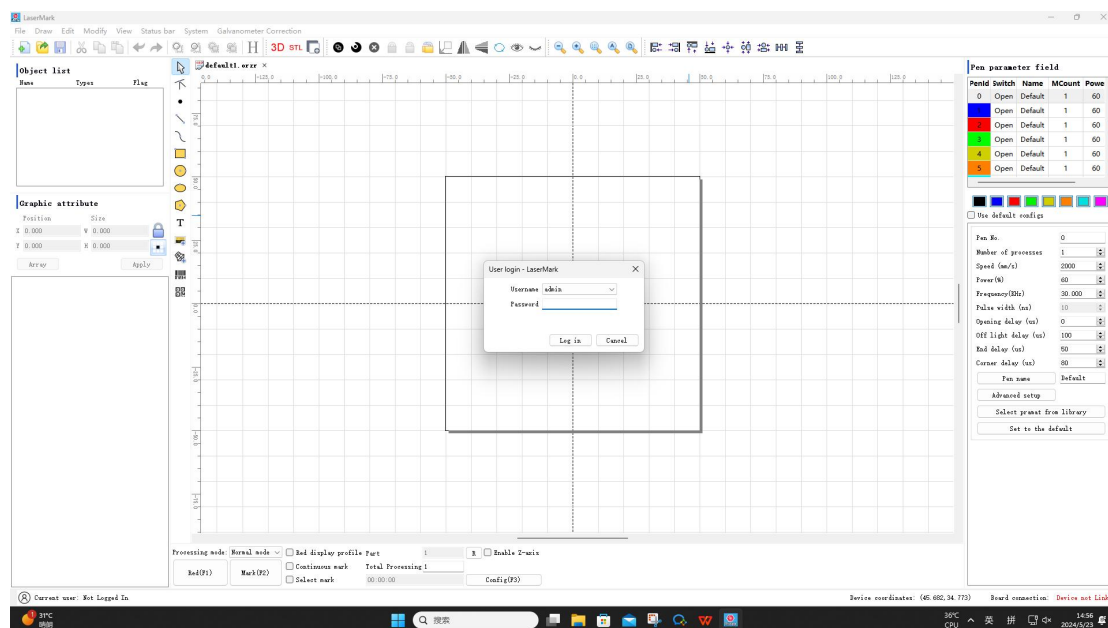


Figure 2-1 Initial interface after program startup

● Main interface

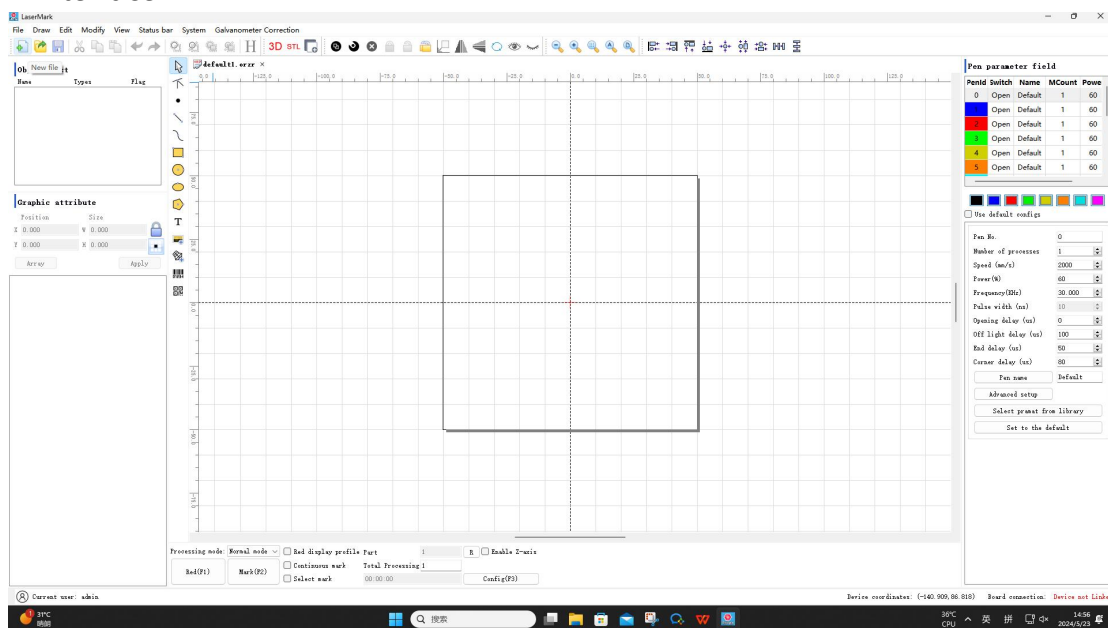


Figure 2-2 Main interface of the program after selecting New

2.4 Content introduction

This manual will introduce how to use the software in the order of the menu bar in the main interface. It includes nine main menus including "File", "Draw", "Edit", "Modify", "View", "Status Bar", "System", "Galometer Correction" and "Log", as well as the object bar, pen Number management column and marking control column.

2.5 Software installation instruction

Relief software adopts a green installation method, just unzip the installation package to the directory specified by the customer on the hard disk.

2.6 Software upgrade instruction

Relief software adopts a green installation method, just unzip the new version installation package to the original version package in the directory.

3 FILE MENU

The "File" menu implements general file operations, such as creating, opening, and saving files. See Figure 3-1.



Figure 3-1 "File" menu

3.1 New

The "New" submenu is used to create a new blank workspace for drawing, and its shortcut key is Ctrl+N.

The toolbar icon corresponding to the "New" submenu is . Click the icon to do the same.

When you move the mouse pointer to the new icon in the toolbar and pause for a moment, the system will display a prompt message briefly explaining the function of the icon. At the same time, a slightly detailed explanation of the function will be displayed on the status bar at the bottom of the main interface window. If you move the mouse pointer to the "New" submenu in the menu bar, only a detailed explanation will appear in the status bar, and the prompt message will not appear.

【 Tip: All toolbar icons in the relief software have the function of prompt information and status bar display of detailed information. At the same time, each toolbar icon corresponds to a certain menu item, and both implement the same function. This manual will not repeat the instructions in subsequent chapters.】

3.2 Open

The "Open" submenu is used to open an .orzr file saved on the hard disk, and its shortcut key is Ctrl+O.

When you select the "Open" submenu, a dialog box for opening a file will appear (Figure 3-2), asking you to select the file you want to open. When you select a valid .orzr file, a preview graphic of the file will be displayed below the dialog box.

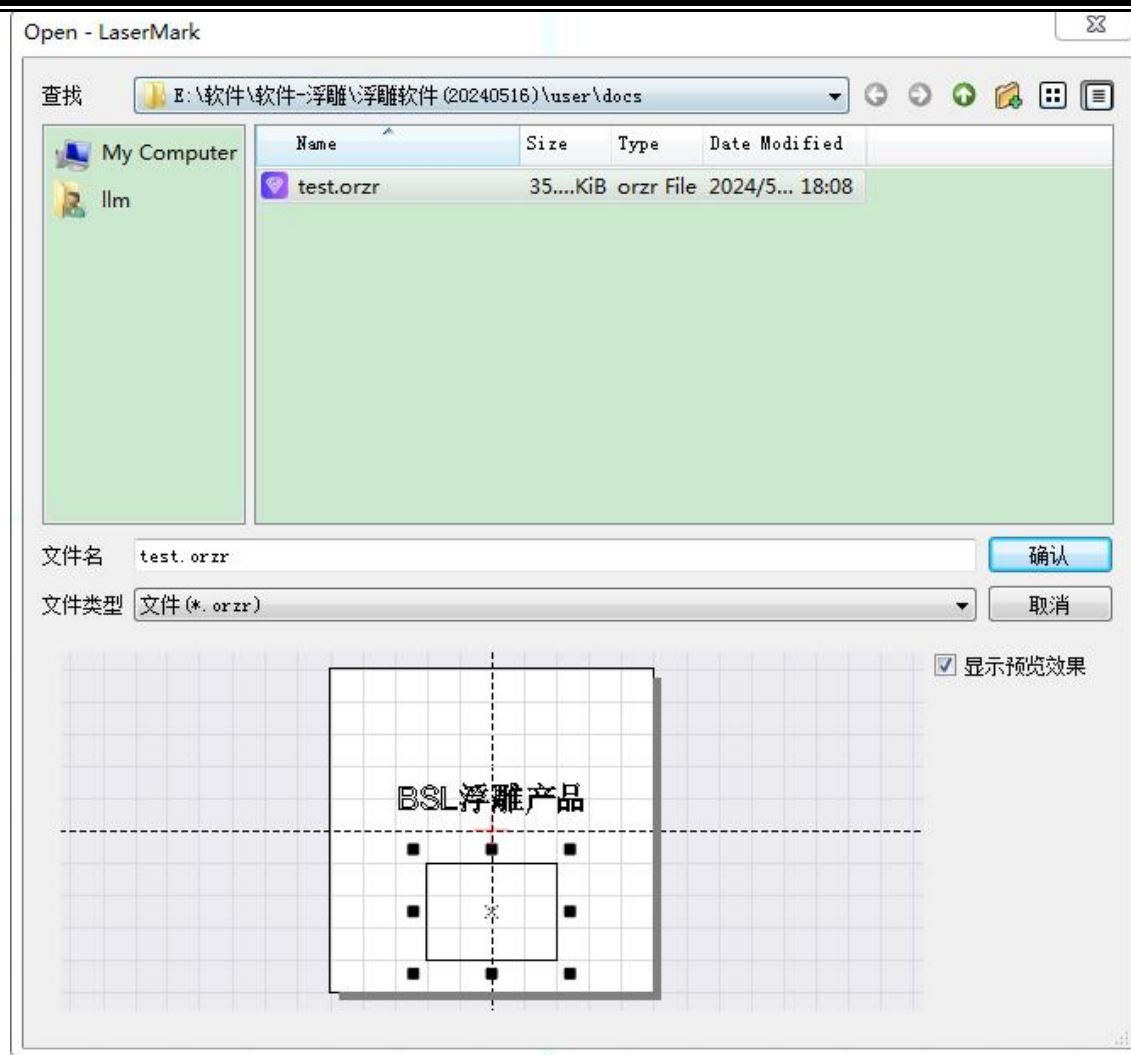


Figure 3-2 "Open" dialog box

The toolbar icon corresponding to the "Open" submenu is .

3.3 Save and save as

The "Save" submenu saves the drawing being drawn with the current file name, and its shortcut key is Ctrl+S. The "Save As" submenu is used to save the currently drawn graphics as another file name, and its shortcut key is Ctrl+Shift+S. Both implement the function of saving files.

If the current file already has a file name, the "Save" command saves the currently drawn graphics with the file name, otherwise a save file dialog box will pop up, asking you to select the path to save the file and provide a file name. Regardless of whether the current file has a file name, the "Save As" command will pop up the Save As dialog box (Figure 3-3), asking you to provide a new file name for saving to prevent the old file from being overwritten.

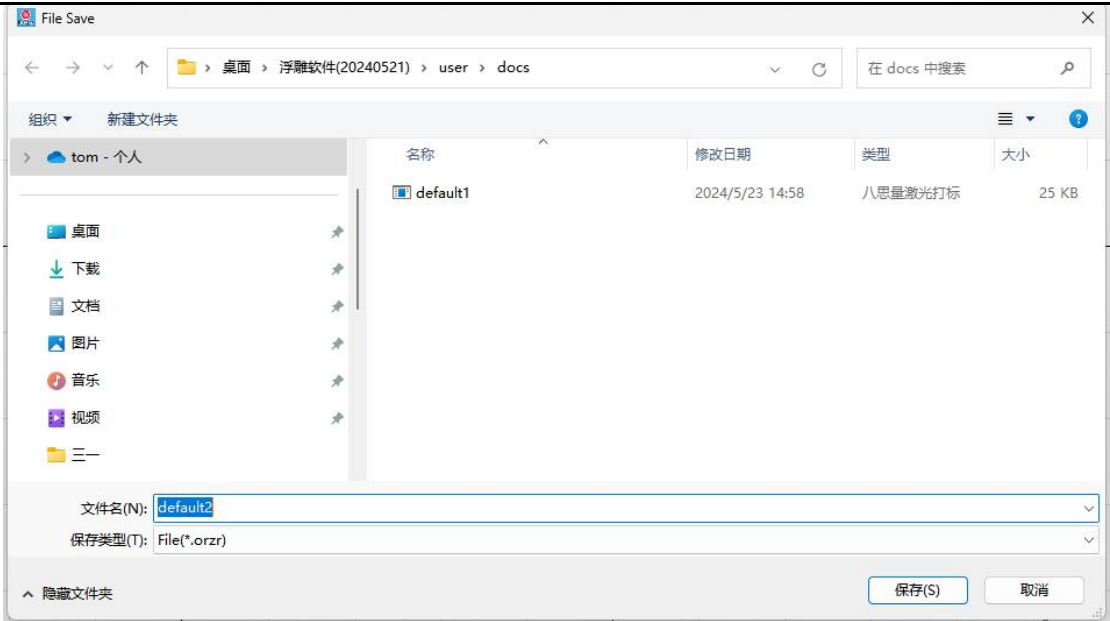


Figure 3-3 "Save as" dialog box

The toolbar icon corresponding to the "Save" menu is .

Note: If you change the path or file name, you need to re-associate it in the device association.

3.4 Close

The "Close" submenu is used to close a currently opened and activated marking file. If no marking file is currently open, no operation will be performed.

3.5 Recently opened files

After the "System Parameters" menu, the files recently opened by the user are listed. If the software has never opened/saved any .orzr files, there will be no files listed.

3.6 Object list

In the main interface of relief, the left side is the object list, as shown in Figure 3-4.

Object list		
Name	Types	Flag
Rectangle1	Rectangle	
Ellispe1	Ellispe	
Polyline1	Polyline	

Figure 3-4 Object list

Note: During processing, the system will process the objects in the list according to the order in which they are arranged (from top to bottom).

Users can select objects in the list and use right-click options to adjust the order of objects, remove objects, and rename objects.

3.7 Object property bar

On the left side of the main interface of the software is the object property bar, as shown in Figure 3-5.

Graphic attribute

Position Size

X 0.000 W 26.252

Y 40.000 H 7.158

Array Apply

Type of font TrueType Font

Font selection Arial

Fill Style Output

Text content

TEXT

☒ Enable Variable Text

Figure 3-5 Object property bar

Position X: Indicates the X coordinate of the currently selected object. Use the coordinate information button to set the base of the selected object's position coordinates.

Position Y: Indicates the Y coordinate of the currently selected object. Use the coordinate information button to set the base of the selected object's position coordinates.

Dimension X: Indicates the width of the currently selected object.

Dimension Y: Indicates the height of the currently selected object.



indicates locking the current aspect ratio. If the user changes the X or Y dimensions, the software ensures that the aspect ratio of the changed object is the same as before the change.



indicates that the current aspect ratio is not locked. If the user changes the X or Y dimensions, the software stretches the object, changing only the modified dimensions and keeping the other dimensions.

Coordinate information button : Specify position X and position Y corresponding to the coordinates of the lower left corner of the object, or the center position, or other specified positions. After the user clicks this button, a dialog box pops up asking the user to select the corresponding position of the position coordinates. The currently displayed coordinate information specifies position X and position Y, which represent the coordinates of the lower left corner of the object.

Array : copy the current object to the specified location. The operation dialog box is shown in Figure 3-6:

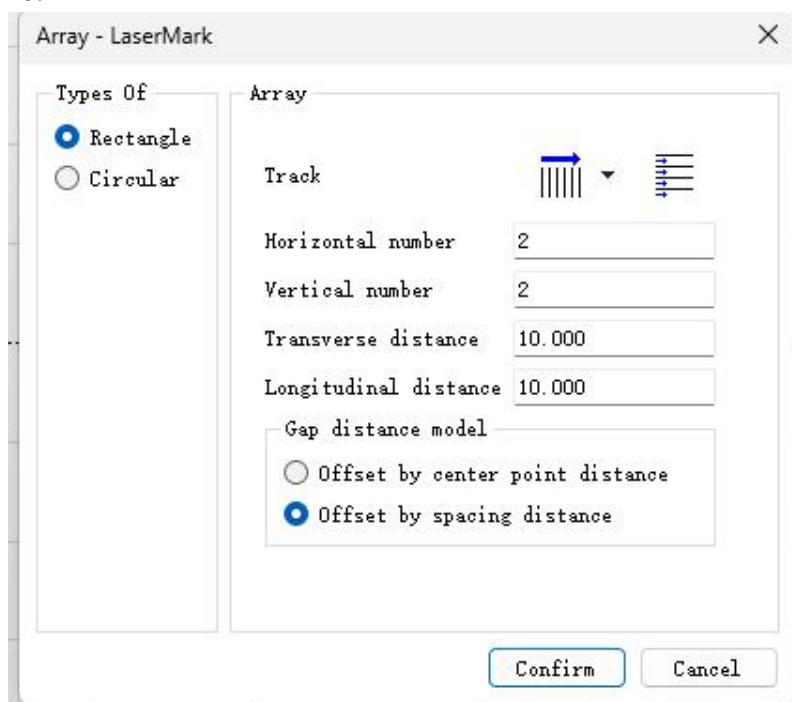


Figure 3-6 Array operation dialog box

Figure 3-7 shows the object situation when the number of arrays is X=3 and Y=2.

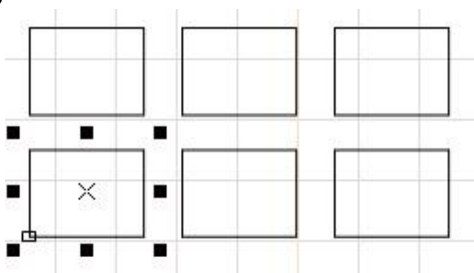


Figure 3-7 Array operation result diagram

4 DRAW MENU

The Draw menu is used to draw commonly used graphics, including points, lines, curves, polygons, etc. This menu corresponds to a shortcut toolbar, and commonly used operations can be performed using the buttons on this toolbar. As shown in a) and b) of Figure 4-1.

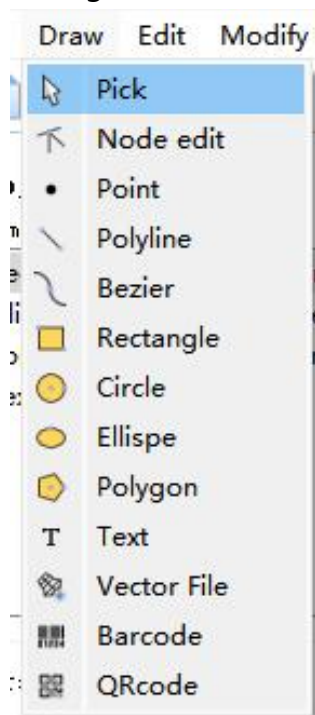


Figure a) "Draw" menu



Figure b) "Draw" shortcut toolbar

Figure 4-1 "Draw" operation

4.1 Points (P)

Drawing a point within the workspace is the simplest drawing operation. Select the "Point" command item in the menu and click the left mouse button at a suitable place in the workspace to draw a point at that position. You can continuously click the left mouse button to draw more points. When the drawing is completed, click the right button of the mouse. At this time, the command to draw points ends, and the last drawn point is displayed as the selected graphic.

4.2 Straight line (L)

To draw a straight line, select the "Line" command in the Draw menu or click the icon . Under the draw straight line command, press the right button of the mouse to directly input the absolute coordinate value of the target point, as shown in Figure 4-2 below:

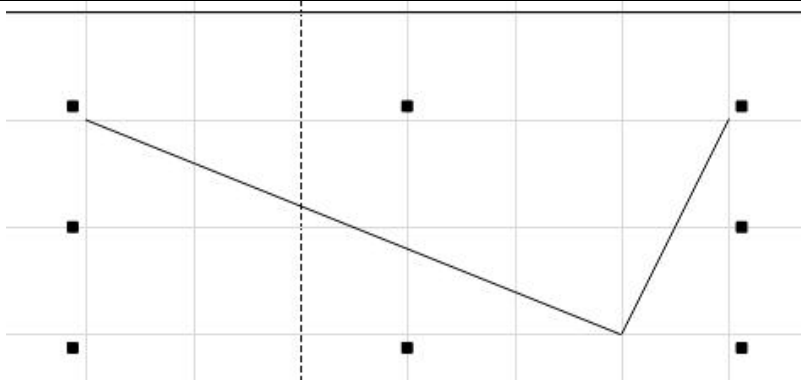


Figure 4-2 Drawing polyline

4.3 Curve (S)

To draw a curve, select the "Curve" command in the draw menu or click the icon , as shown in Figure 4-3.

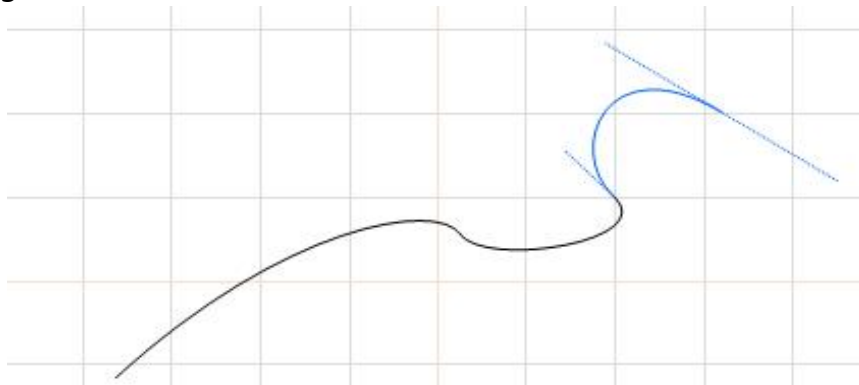


Figure 4-3 Drawing a curve

Under the Draw Curve command, hold down the left mouse button and drag to draw a free curve.

Under the draw curve command, at any time, press the right mouse button to select the automatic closing function to close the current curve.

4.4 Rectangle (L)

To draw a rectangle, select the "Rectangle" command in the Draw menu or click the icon , as shown in Figure 4-4.

Under Draw Rectangle, hold down the left mouse button and drag to draw a rectangle.

After selecting the rectangle, the rectangle properties as shown in Figure 4-4 will be displayed in the property toolbar.

Graphic attribute

Position Size

X 0.000 W 40.000

Y -5.000 H 30.000

Array Apply

Radius of rounded corners

☒ Consistency

0.0 0.0

0.0 0.0

☒ Clockwise

Figure 4-4 Rectangular property bar

Corner radius: refers to the arc radius of each corner of the rectangle.

Consistency: When this function is enabled, when the user changes the roundness of the upper left corner, the remaining three corners will increase the corresponding roundness.

Clockwise: refers to the direction of the primitive path

Note: Each time you modify the parameters in the properties, you must click the "Apply" button to make the modified parameters take effect. The following are the same and will not be repeated.

4.5 Circle (C)

To draw a circle, select the Circle command in the Draw menu or click the icon .

Under the Draw Circle command, press the left mouse button and drag to draw a circle.

After selecting the circle, the circle attributes shown in Figure 4-5 will be displayed in the attribute toolbar.

Graphic attribute

Position Size

X -30.000 W 28.284

Y 40.000 H 28.284

Array Apply

Starting angle(°) 0.00

Scanning Angle (°) 360.00

☒ Clockwise

Figure 4-5 Circle attribute bar

Start angle: the angle of the starting point of the circular path relative to the center of the circle.

Scan angle: the angle corresponding to the arc.

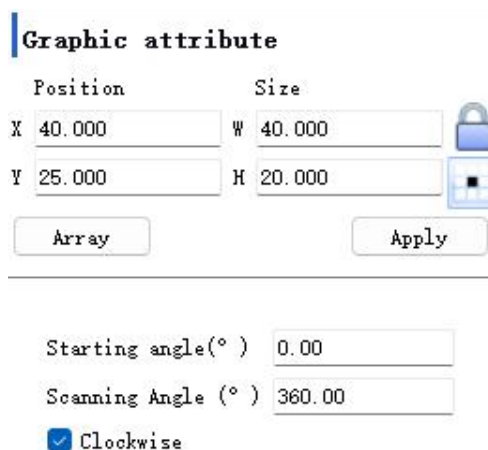
Clockwise: refers to the direction of the primitive path

4.6 Ellipse (E)

To draw an ellipse, select the Ellipse command in the Draw menu or click the icon .

Under the Draw Ellipse command, press the left mouse button and drag to draw an ellipse.

After selecting the ellipse, the ellipse properties as shown in Figure 4-6 will be displayed in the property toolbar.



Graphic attribute	
Position	
X	40.000
Y	25.000
Size	
W	40.000
H	20.000
Array	
Apply	
Starting angle(°)	
0.00	
Scanning Angle (°)	
360.00	
☒ Clockwise	

Figure 4-6 Ellipse property bar

Start angle: The angle of the starting point of the circular path relative to the center of the circle.

Scan angle: the angle corresponding to the arc.

Clockwise: refers to the direction of the primitive path.

4.7 Polygon (M)

To draw a polygon, select the Polygon command from the Draw menu or click the icon .

Under Draw Polygon, hold down the left mouse button and drag to draw a polygon.

After selecting a polygon, the polygon properties as shown in Figure 4-7 will be

displayed in the property toolbar.

Graphic attribute

Position		Size	
X	20.000	W	44.721
Y	-30.000	H	38.730

Array Apply

Number of sides: 6

Radius of rounded corners: 0.00

Figure 4-7 Polygon attribute bar

Number of sides: refers to the number of sides of the polygon, the minimum is 3.

Corner radius: refers to the radius of the corners of a polygon.

4.8 Text (F)

Relief software supports the direct input of text in the workspace. The text fonts include all fonts installed in the system, as well as the various fonts that come with Embossing. If you want to enter text, select the "Text" command in the Draw menu or click the icon .

Under the draw text command, press the left mouse button to create a text object. After selecting text, the text properties shown in Figure 4-8 will be displayed in the property toolbar.

Graphic attribute

Position		Size	
X	-70.000	W	26.252
Y	30.000	H	7.158

Array Apply

Type of font: TrueType Font

Font selection: Arial

 Fill
  Style
  Output

Text content

TEXT

☐ Enable Variable Text

Figure 4-8 Text property bar

If you need to modify the entered text, you can modify it directly in the text editing box.

Relief software supports four types of fonts (TTF fonts, SHX fonts, bitmap fonts).

After selecting a font type, the font list will list all fonts of the current type and other fonts installed independently. Figure 4-9 shows the TrueType font list.



Figure 4-9 TTF font list

Enable variable text: You can use dynamically variable text.

4.8.1 Text font parameter

The system pops up the dialog box shown in Figure 4-10.

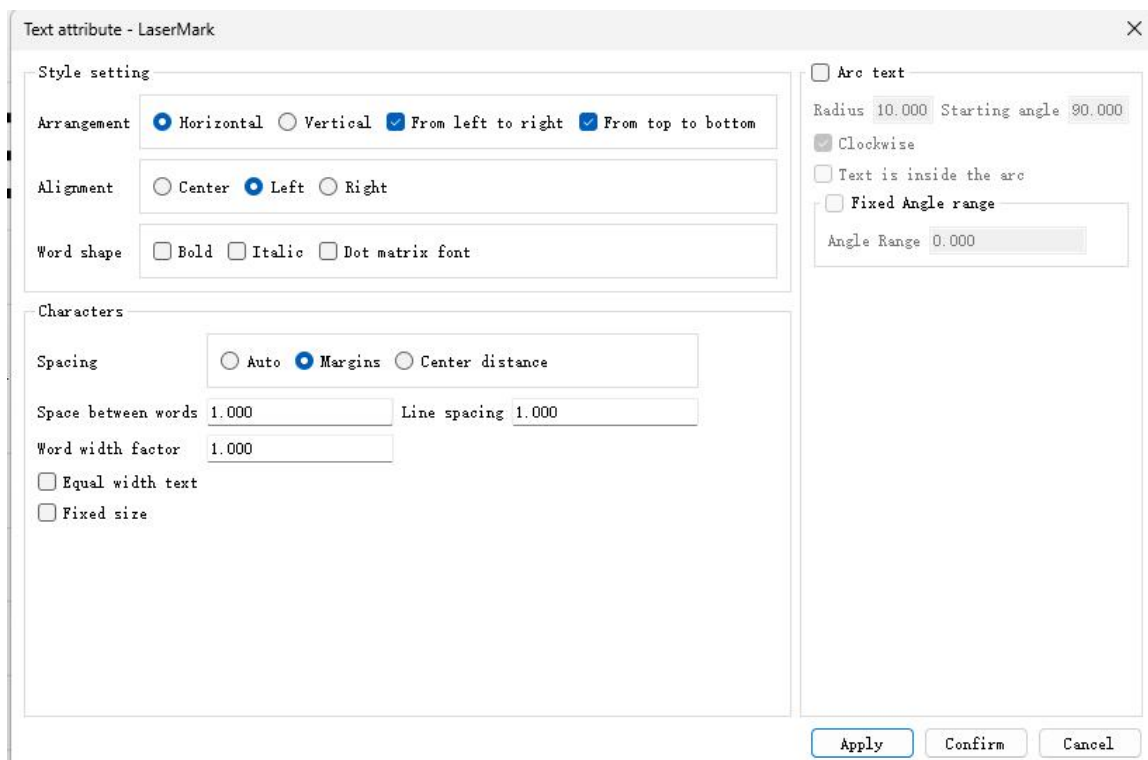


Figure 4-10 Font attributes

Alignment: "Left", "Center", and "Right" refer to the arrangement of the current text as left-aligned, center-aligned, and right-aligned respectively.

Bold and italic: You can select them individually or at the same time to change the appearance of the font.

Arrangement direction: horizontal means the text is arranged horizontally, vertical means the text is arranged vertically.

Monowidth text: means that all characters have the same width.

Font width coefficient: refers to the width coefficient of the font.

Word spacing: refers to the distance between characters.

Line spacing: refers to the distance between two lines of characters.

Fixed size: Enable using to set the text to a fixed size.

Arc text: Select ☒ Circular and the text will be arranged according to the user-defined arc radius.

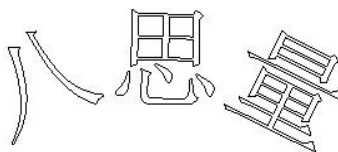


Figure 4-11 Arc text example

Radius: The radius of the circle around which the text will be arced.

Starting angle: refers to the angle basis for text alignment, with the leftmost side of the text as the starting basis for the angle. As shown in Figure 4-12:

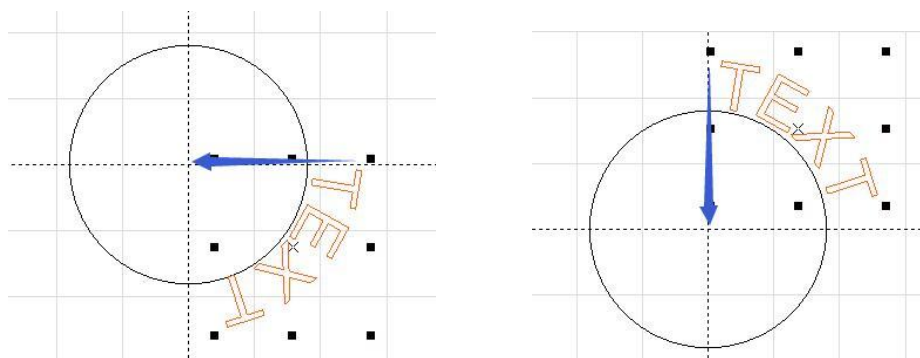


Figure 4-12 The left side is the base angle = 0, and the right side is the base angle = 90.

Fixed angle range: If you select this parameter, no matter how much text is entered, the system will shrink the text within the limited angle, as shown in Figure 4-13:

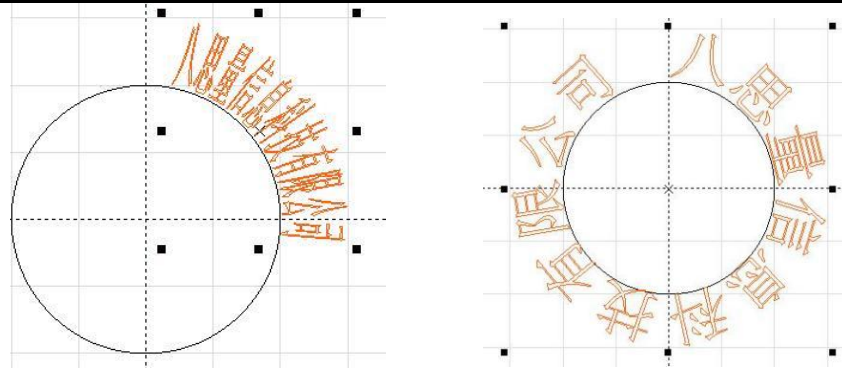


Figure 4-13: On the left side, the angle range limit is checked, and on the right side, the angle range limit is not checked.

Clockwise: Change the direction of text sorting. As shown in Figure 4-14:

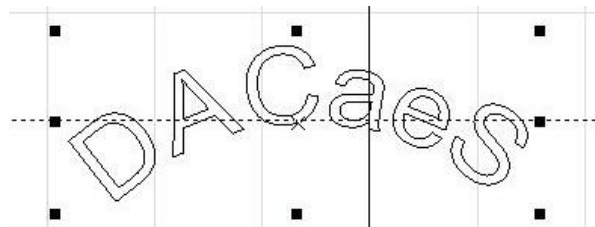


Figure 4-14 Reverse text

Text inside the arc: means placing the text inside the arc, as shown in Figure 4-15:

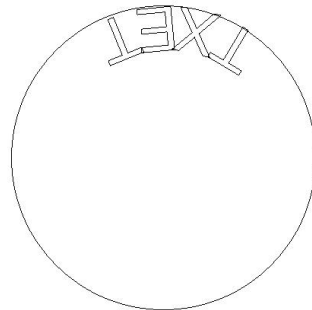


Figure 4-15 Text is located inside the arc

4.8.2 Variable text

After clicking ☒ Enable Variable Text, variable text can be enabled. Variable text means that the text can be dynamically changed according to user-defined rules during processing.

Users can add various variable text elements as needed, and the text elements can be sorted. After the user clicks to add a text element, the system will pop up the dialog box shown in Figure 4-16.

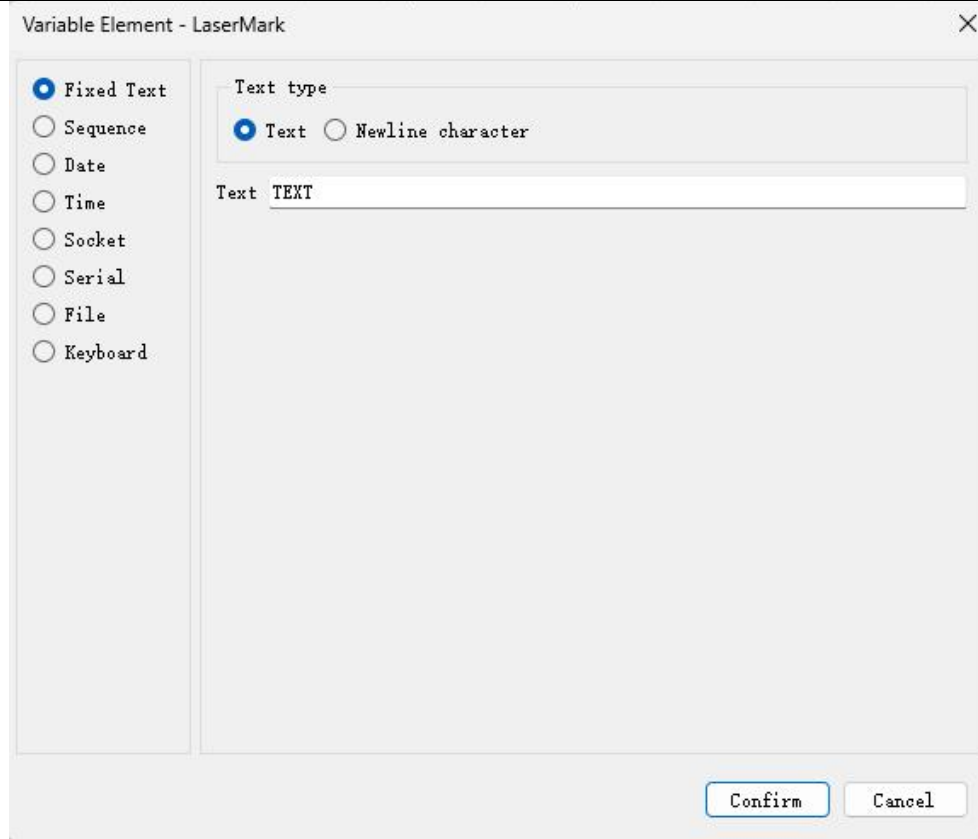


Figure 4-16 Text Element Dialog Box

Fixed text: elements in the text that remain unchanged during processing.

Serial number: An element that changes in fixed increments during machining.

Date: The system automatically obtains date information elements from the computer during processing.

Time: During the processing process, the system automatically obtains the element of time information from the computer.

Network port: During the processing process, the system reads the elements of the text to be processed through the network

Serial port: During the processing process, the system reads the elements of the text to be processed through the serial port.

File: During processing, the elements to be processed are directly read from the "TXT" "EXCEL" file.

Keyboard: During the processing process, the user inputs the text element to be processed from the keyboard.

4.8.3 Fixed text element

Fixed text refers to elements that are fixed during processing, as shown in Figure 4-17.

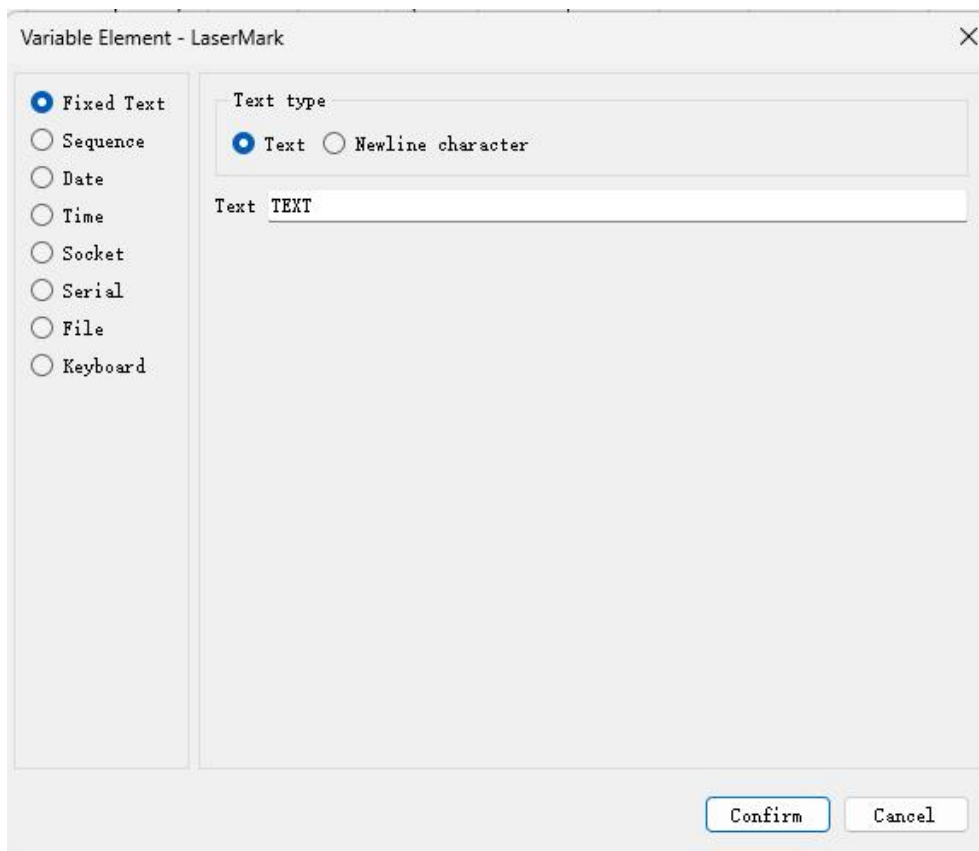


Figure 4-17 Fixed text element

Line break: used in the variable text function to solve the problem of multiple texts that need to be marked on separate lines. When applying, add a newline character between the two texts, and the software will automatically separate the text into lines based on the position of the newline character. If multiple texts need to be divided into multiple lines, just add a newline character after the text to be divided into lines.

4.8.4 Serial number element

The serial number element is a text element that changes in fixed increments during processing.

When the user selects the serial number element, the parameter definition of the serial number element is automatically displayed in the text element dialog box, as shown in Figure 4-18.

Figure 4-18 Parameter definition of sequence number element

Start serial number: refers to the first serial number to be processed currently.

Current serial number: refers to the serial number currently to be processed.

Final serial number: means that when the processed serial number is equal to the serial number value, the system automatically returns to the starting serial number.

Serial number increment: refers to the increment of the current serial number.

For example, when the current serial number increment is 1, and if the starting serial number is 0000, each serial number will be increased by 1 on the basis of the previous serial number, such as 0000, 0001, 0002, 0003...9997,9998,9999, when When the serial number reaches 9999, the system will automatically return to 0000.

For example, when the current serial number increment is 5, if the starting serial number is 0000, the serial number will be listed as 0000, 0005, 0010, 0015, 0020, 0025... Others can be deduced by analogy.

Each marking number: means that each serial number needs to be processed for the specified number before the serial number will be changed. Then after processing to the specified number, change the sequence number again, and this cycle continues.

Current marking number: refers to the number of times the current serial number has been processed. It automatically changes to 0 when the value is equal to each marking number.

Mode: refers to the base mode of the current serial number.

Filter the following serial numbers : After checking, the serial number with a fixed position of a specific value will not be marked, which means that the value ending in 4 will not be marked. * means any number.

Reset: You can customize the reset time or reset on every hour. At this time every day, the marked serial number changes to the starting serial number.

No cyclic marking : After checking, the marking task will stop after the set serial number is printed.

4.8.5 Date element

The date element is a text element in which the system automatically obtains date information from the computer during processing.

When the user selects the date element, the parameter definition of the date element is automatically displayed in the text element dialog box, as shown in Figure 4-19.

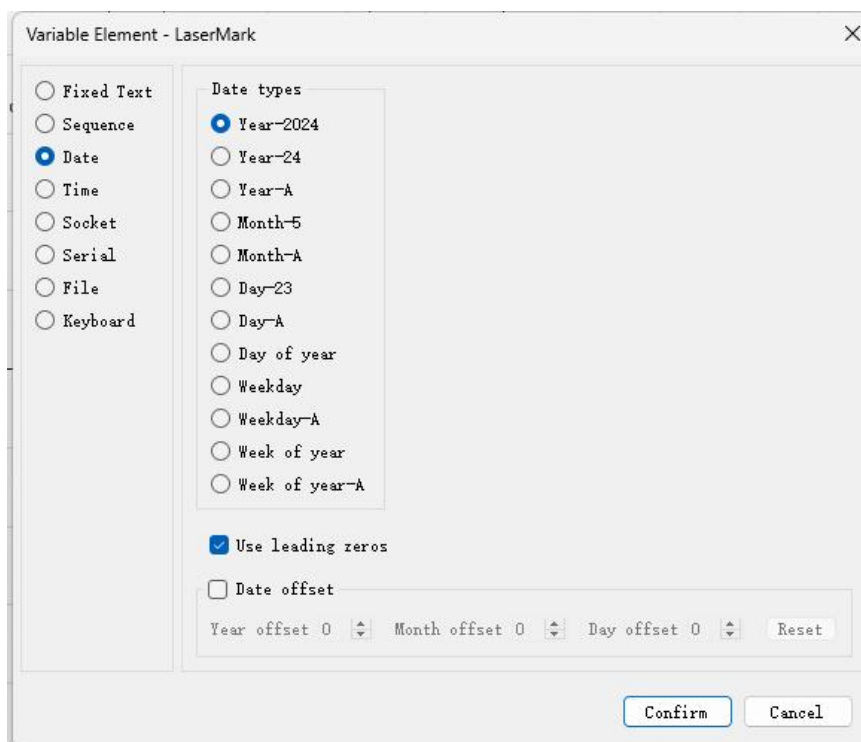


Figure 4-19 Parameter definition of date element

Year-2024: Use the year of the current computer clock as the corresponding text, in a 4-character format.

Year-24: Use the year of the current computer clock as the corresponding text, the format is 2 characters, and only take the last two digits of the year.

Year-A: Select a custom year as the corresponding text, the format is 2 characters, and only take the last two digits of the year.

Month-8: Use the month of the current computer clock as the corresponding text, the format is 2 characters.

Month-A: Select a custom month as the corresponding text, the format is 2 characters

Day-11: Use the day of the month of the current computer clock as the corresponding text, the format is 2 characters.

Day-A: Select a custom day as the corresponding text, the format is 2 characters

Day of day: Use the number of days from January 1st on the current computer clock as the corresponding text, with a format of 3 characters. (January 1st is 001, January 2nd is 002, and so on)

Week: Use the day of the week of the current computer clock as the corresponding text, the format is 1 character.

Week-A: Select the custom day of the week as the corresponding text, the format is 1 character

Week: Use the current computer clock as the current week in the year as the corresponding text, the format is 2 characters.

Week-A: Use the custom week of the year of the current computer clock as the corresponding text, with a format of 2 characters.

Date offset: When the system takes the date from the computer clock, the set offset date must be added to determine the date to be processed. This function is mainly used for processing workpieces with production dates and shelf life dates in food and other industries.

Reset: Resets the date offset value.

4.8.6 Time element

The time element is a text element in which the system automatically obtains time

information from the computer during processing.

When the user selects the time element, the parameter definition of the time element is automatically displayed in the text element dialog box, as shown in Figure 4-20.

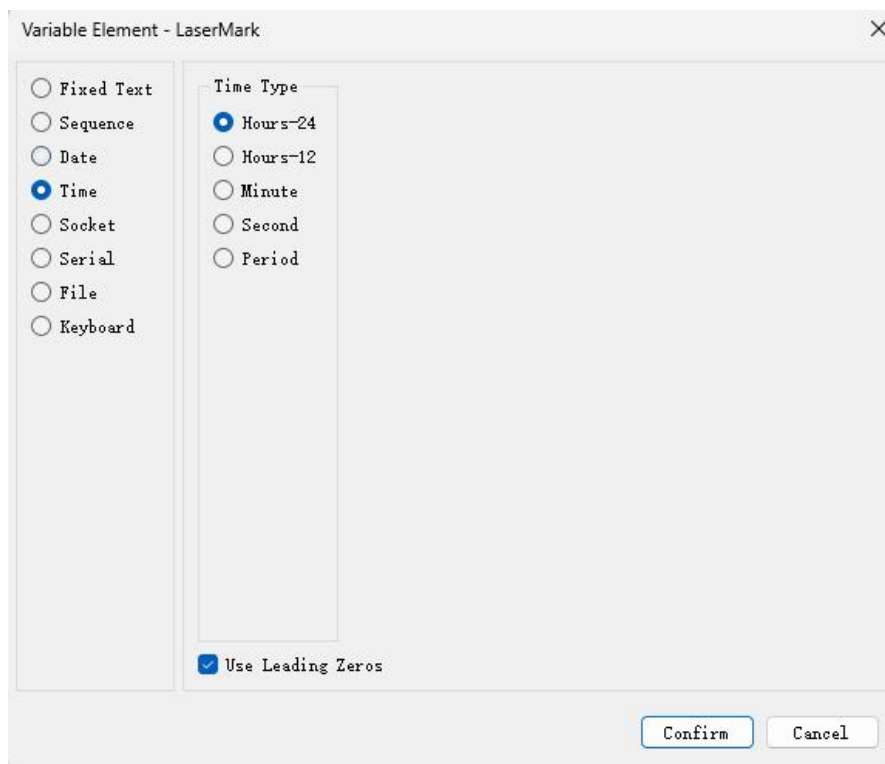


Figure 4-20 Parameter definition of time element

Hour-24: Use the hour of the current computer clock as the corresponding text, and the time format uses 24-hour clock.

Hour-12: Use the hour of the current computer clock as the corresponding text, and the time format uses the 12-hour clock.

Minutes: Use the minute of the current computer clock as the corresponding text.

Seconds: Use the seconds of the current computer clock as the corresponding text.

Time period: Divide 24 hours a day into 24 time periods, and users can customize a text for each time period. This function is mainly used for processing workpieces that require shift information.

4.8.7 Network port element

The network port element is an element that the system automatically reads text from the network through the computer network port during processing.

Note: The network port mentioned in this article refers to the network interface that uses TCP/IP protocol communication. When the user selects the network communication element, the parameter definition of the network communication element will automatically be displayed in the text element dialog box, as shown in Figure 4-21.

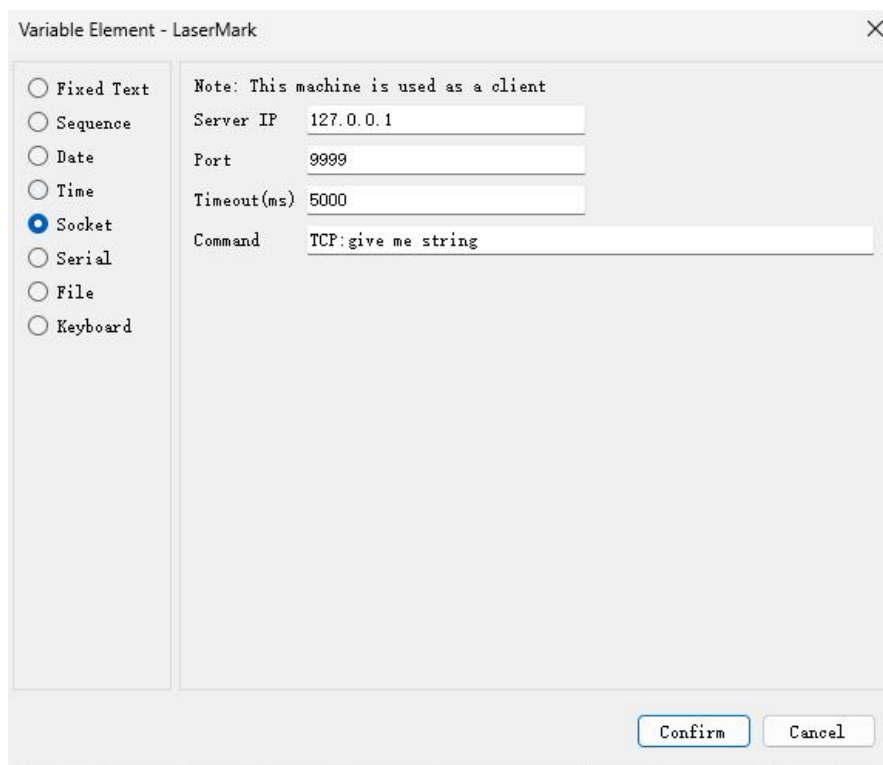


Figure 4-21 Network port elements

Server IP: Select the IP address of the computer on the network from which data needs to be read.

Port: Select the port number used for network communication.

Command: When the system processes this text object, the system will send this command string to the computer with the specified IP address through the network port, and request the specified computer to send out the string that currently needs to be processed. The system will wait for the specified computer to respond. After the specified computer answers, the system will automatically process the returned text.

Stay connected when data source is enabled: Keeps communication undisconnected.

Timeout setting: You can set the timeout period for connecting to the specified IP address and receiving data.

4.8.8 Serial port element

The serial communication element is an element in which the system automatically reads text from peripheral devices through the computer serial port during processing. When the user selects the serial communication element, the parameter definition of the serial communication element will be automatically displayed in the text element dialog box, as shown in Figure 4-22.

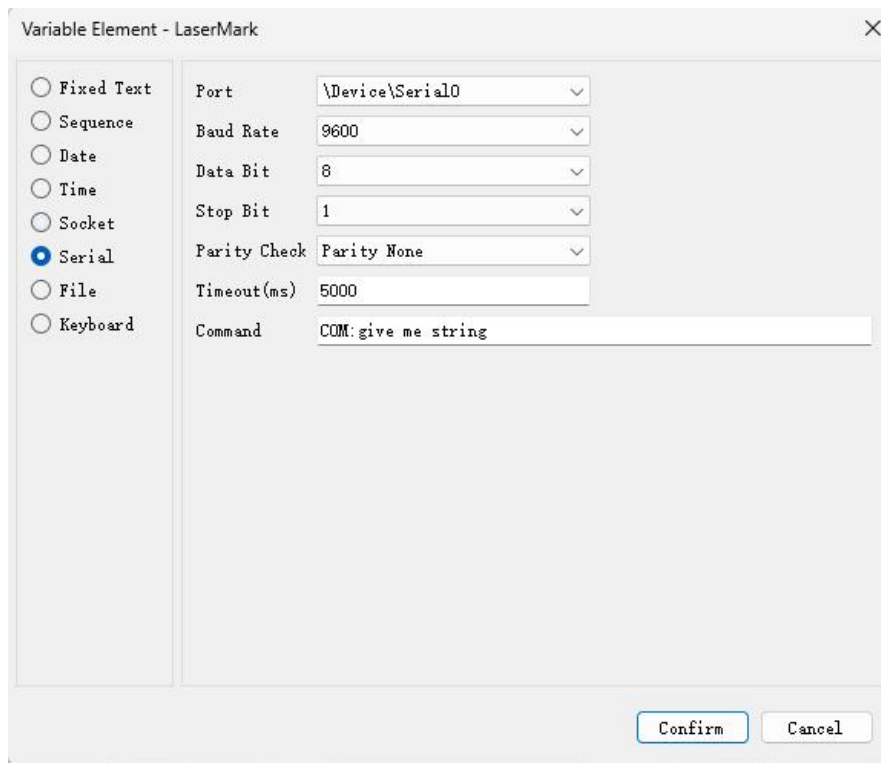


Figure 4-22 Serial communication

Port: Select the serial port number used to connect the computer to external devices. Only valid port numbers will be displayed.

Baud rate: Select the baud rate used for serial communication.

Data bits: Select the number of data bits used in serial communication.

Stop bits: Select the number of stop bits used in serial communication.

Parity: Select the number of parity bits used in serial communication.

Command: When the system processes this text object, the system will send this command string to the external device through the current serial port, requesting the external device to send out the string that currently needs to be processed. The system will wait for the external device to respond before returning. External After the device answers, the system will automatically process the returned text.

4.8.9 Document element

TXT: When TXT is selected, the content shown in Figure 4-23 will be displayed, requiring the user to set the associated file and the line number of the text currently to be processed.

Loop reading: When processing reaches the end of the text file, the line number is reset to 0, and processing starts again from the first line.

Read the entire file each time: When processing a text file, read the entire file directly.

Variable Element - LaserMark

☐ Fixed Text ☒ TXT ☐ EXCEL

☐ Sequence

☐ Date

☐ Time

☐ Socket

☐ Serial

☒ File

☐ Keyboard

File path >>

Line number

Increment

Number of marks per line

Number of marked

☐ Loop reads

☐ Read the entire file each time

Confirm Cancel

4-23 File elements

EXCEL: When the Excel file system is selected, the content shown in Figure 4-24 will be displayed, requiring the user to set the file name, field name and line number of the text currently to be processed.

File name: refers to the text of the first row of all columns of Sheet 1 in the Excel file table. During processing, the system will automatically take out the text to be processed from the corresponding column.

Variable Element - LaserMark

☐ Fixed Text ☐ TXT ☒ EXCEL

☐ Sequence

☐ Date

☐ Time

☐ Socket

☐ Serial

☒ File

☐ Keyboard

File path >>

Line number

Field number

Increment

Number of marks per line

Number of marked

☐ Loop reads

Confirm Cancel

Figure 4-24 EXCEL

4.8.10 Keyboard element

The keyboard element is used by the user to input the text to be processed from the keyboard. When the keyboard element is selected, the system will display the content shown in Figure 4-25 and ask the user to set the keyboard element parameters. Tip: When the system encounters keyboard variable text during processing, the content in the input dialog box will pop up, requiring the user to input the text to be processed. At this time, the user directly manually inputs the text to be processed.

The screenshot shows a dialog box titled "Variable Element - LaserMark". On the left, there is a list of element types: Fixed Text, Sequence, Date, Time, Socket, Serial, File, and Keyboard. The "Keyboard" option is selected with a blue radio button. The main area of the dialog is divided into two sections. The top section is labeled "Prompt" and contains the text "Please input string". Below this, there are three checkboxes: "Fixed number of characters", "Limit the minimum input value", and "Limit the maximum input value". The "Fixed number of characters" checkbox is checked, and its corresponding input field shows the value "10". The "Limit the minimum input value" checkbox is unchecked, and its corresponding input field shows the value "0". The "Limit the maximum input value" checkbox is unchecked, and its corresponding input field shows the value "9999". At the bottom right of the dialog, there are two buttons: "Confirm" and "Cancel".

Figure 4-25 Keyboard element settings

Fixed characters: The number of manually entered contents is required to be the same as the set number of characters.

Limit the minimum input value: You can set the minimum input value

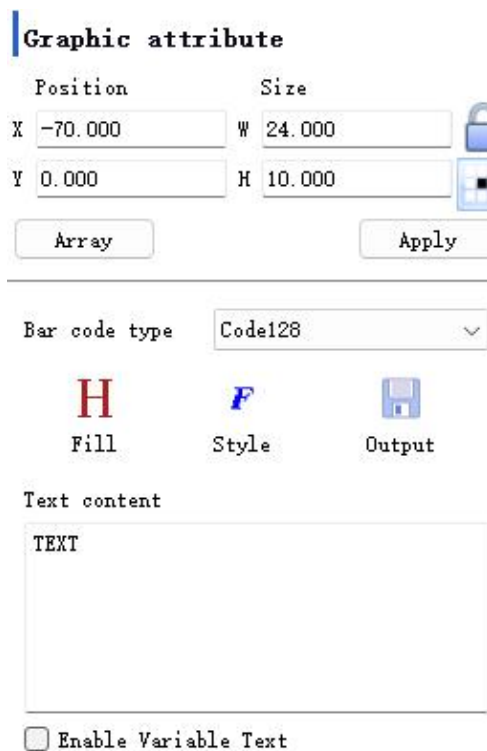
Limit the maximum input value: You can set the minimum input value

The keyboard element function is often used in situations where the content to be processed needs to be input in real time during processing. Suppose the customer currently needs to process a batch of workpieces, and each workpiece is printed with a barcode. During processing, the user needs to use a barcode scanner to read the content of the barcode from the workpiece in real time, and then use a laser to mark it on the designated position of the workpiece. This You can then use the keyboard element functionality. When the system pops up a dialog box requiring text input during processing, the operator uses a barcode scanner to scan the barcode on the workpiece. The barcode scanner will automatically input the read content into the dialog box and automatically close the dialog box. Then the system will automatically Start processing the content you just read.

4.9 Barcode

To draw a barcode, select the "Barcode" or "QR Code" command in the draw menu or click  the or icon . Then left-click on the canvas where you want to place the barcode, that is, a barcode will be generated at the clicked location.

After selecting a barcode, the barcode properties shown in Figure 4-26 will be displayed in the property toolbar.



The image shows a software interface for configuring a barcode. It is titled "Graphic attribute" and is divided into several sections:

- Position and Size:** Contains input fields for X (-70.000), Y (0.000), W (24.000), and H (10.000).
- Buttons:** Includes "Array" and "Apply" buttons.
- Bar code type:** A dropdown menu currently set to "Code128".
- Fill, Style, and Output:** Three icons representing different attributes: a red "H" for Fill, a blue "F" for Style, and a floppy disk icon for Output.
- Text content:** A text area containing the word "TEXT".
- Enable Variable Text:** A checkbox that is currently unchecked.

Figure 4-26 Barcode attribute bar

Barcode type: Select the desired barcode type.

4.9.1 One-dimensional barcode

This kind of barcode is composed of "bars" and "spaces" arranged one after another. The barcode information is transmitted by the different widths and positions of the bars and spaces. The amount of information is determined by the width and accuracy of the barcode. The barcode The wider it is, the more "bars" and "spaces" it contains, and the greater the amount of information. This barcode technology can only store information in one direction through the arrangement and combination of "bars" and "spaces", so it is called "one-dimensional barcode". Figure 4-27 shows the parameter settings in the interface when

you select a one-dimensional barcode and click  .

Bar code attribute - LaserMark

Code 128 is a high-density linear bar code standard that can encode all ASCII character sets, including numbers, letters, symbols and Control character



201806

Bar code attribute

Upper margin 0.00 Lower margin 0.00

Left margin 0.00 Right margin 0.00

Module width 0.30

☐ Fixed size

X 10.00 毫米

Y 10.00 毫米

☐ Reversal

☐ Plain code attributes

Font selection Arial

Pen No. 0

Font size 3.00

Space between words 1.00

X Offset 0.00

Y Offset 0.00

☐ Fill

Fill

☐ Custom text

#Character?Delete%Validation/Line Feed

Apply Confirm Cancel

Figure 4-27 Parameters of one-dimensional barcode

Top margin: refers to the distance between the barcode and the top edge after inversion.

Bottom margin: refers to the distance between the barcode and the bottom top edge after inversion.

Left margin: refers to the distance from the top left edge of the barcode after inversion.

Right margin: refers to the distance from the barcode to the top right edge after inversion.

Reverse: refers to whether to reverse processing. Some materials are light-colored after laser marking, so this switch must be selected at this time.

Module width: refers to the width of each small block of the barcode.

Clear code attribute: Display the corresponding TTF font clear code attribute when the barcode is issued.

Font selection: Select clear font TTF type.

Pen number: clear pen number parameter index.

Font size: The size of the clear code.

Character spacing: the character spacing of plain code.

X offset: The offset of the clear code in the X direction.

Y offset: The offset of the clear code in the Y direction.

Custom text: You can display the text that needs to be displayed through commands.

#-Represents the character displaying the current position, ? - represents deleting the character at the current position, %- represents displaying the position number of the character at the current position, /- displays the string in a new line. For example, as shown in Figure 4-28:

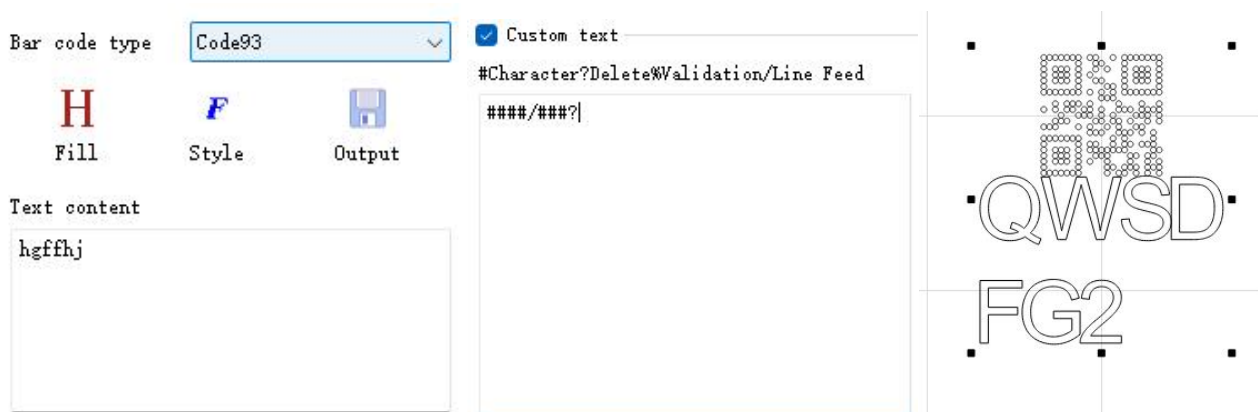


Figure 4-28 Customized display text

Note: The clear code attributes of QR codes are consistent with those of one-dimensional barcodes, so they will not be explained again

4.9.2 2D barcode



Qr code attribute - LaserMark

QR code is a two-dimensional code symbol system that can store various types of information such as numbers, letters, text, URLs, images, etc

Bar code attribute

Version: Automatic Error correction level: Automatic

Mask: Automatic Mode: Fill

Proportion: 100 Blank points: 0

X-point multiple: 1 Y-point multiple: 1

☐ Reversal ☐ Fixed size

☒ Whether bow shaped path X: 10.00 毫米 Y: 10.00 毫米

☐ Explicit attribute

Font selection: Arial Pen No.: 0 Font size: 3.00 Space between words: 1.00 X Offset: 0.00 Y Offset: 0.00

☐ Fill

☐ Custom text

#Character?Delete*Validation/Line Feed

Fill

Apply Confirm Cancel

Figure 4-29 QR-Code barcode example and QR code parameter settings

Version: 2D barcode matrix version, including 21x21, 25x25, etc.

Error correction level: refers to the error tolerance for damaged or blurred 2D barcodes when identifying 2D barcodes.

Mode: Select the mode that forms the 2D barcode graphic. Dot mode, circle mode, rectangle mode, line mode, etc.

Scale: Set the size of the small graphics that make up the 2D barcode, and the adjustment range is from 1-100.

White space points: After checking, an area will be left empty in the center area of the 2D barcode according to the set white space ratio, which is mostly used to place company LOGO, pictures, etc.

X point multiple: Set the multiple of the small graphics that make up the 2D barcode in the X direction.

Y point multiple: Set the multiple of the small graphics that make up the 2D barcode in the Y direction.

4.10 Bitmap

Select the "Bitmap" command in the Draw menu or click the icon.



Figure 4-30 Loaded bitmap

The bitmap formats currently supported by the system are: Bmp; jpg; png.

After inputting the bitmap, the property toolbar displays the image parameters as shown in Figure 4-31.

Graphic attribute

Position		Size	
X	20.000	W	86.699
Y	-10.000	H	57.827

File >>

☐ Reversal

☒ Manual mode

Contrast 0.00

Brightness 0.00

Gamma 0.00

☐ Fixed DPI

X Y

Image processing

Mode

Threshold value

Mark parameter

☒ Bidirectional scanning

Dot time (us)

☐ Adjustment power

Figure 4-31 Image parameters

4.10.1 Reversal

The color value of each point in the current picture is inverted, and the formula used is $pxNew = 255 - pxOld$, as shown in Figure 4-32.



Figure 4-32 Image inversion example

4.10.2 Manual mode

Contrast: Refers to the degree of contrast between light and dark parts of the image on the fluorescent screen.

Brightness: refers to the brightness of the image on the fluorescent screen.

Gamma correction: Also called gamma nonlinearization or gamma encoding, it is used to perform nonlinear operations or inverse operations on the brightness of light or three-color stimulus values in movies or imaging systems.

4.10.3 Fixed DPI

The concept of DPI is the number of pixels per inch, and 1 inch is equal to 25.4 millimeters. When the DPI value is higher, the image will be printed clearer and the processing time will be longer; otherwise, the image will be blurry and the processing time will be shorter. The DPI does not need to be fixed and the default DPI value is used.

4.10.4 Image processing

Mode selection: The mode for processing pictures. You can choose from three modes: preview, grayscale, and dot, as shown in Figure 4-33.

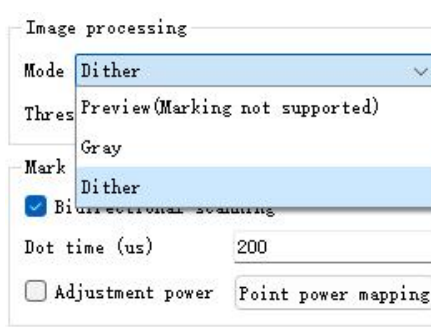


Figure 4-33 Mode selection

4.10.5 Bidirectional scanning

It means that the scanning direction of the picture during processing is two-way scanning back and forth. This method can increase the marking speed to a certain extent.

4.10.6 Dotting time

Dotting time: The time it takes for the laser to dot each pixel. Modify this value to adjust the bitmap marking speed in dotting mode.

4.10.7 Point power mapping

Different pixels map different dot power. The maximum value in the interface is to set the maximum power. Click the maximum value and then press reset to generate a new mapping table; in the same way, you can set the minimum value or set a specific value. After setting, press the reset button to regenerate the mapping table. The effect is shown in Figure 4-34.

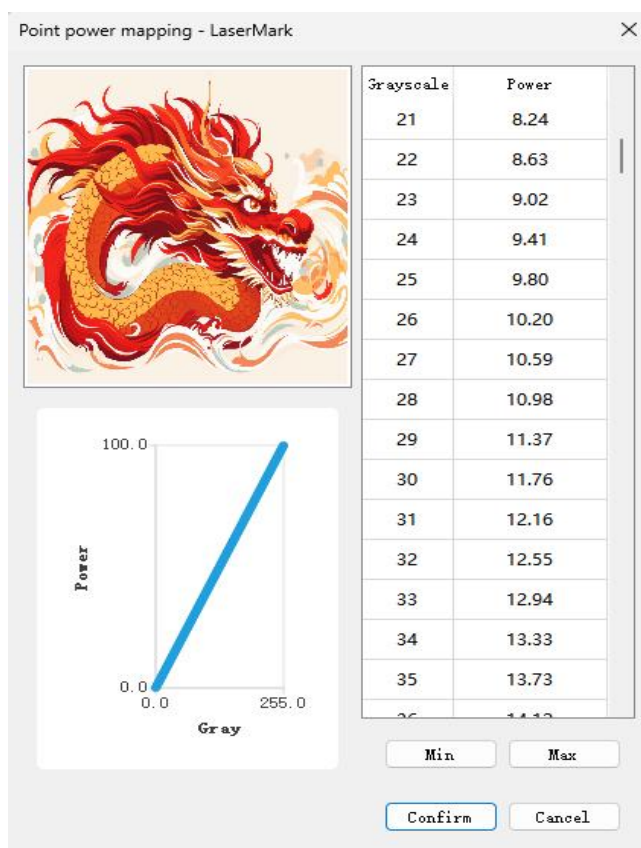


Figure 4-34 Point power mapping

4.11 Vector file

If you want to import a vector file, select the "Vector File" command in the draw menu or click the icon .

The bitmap formats currently supported by the system are: .PLT, .DXF. Figure 4.35 shows the vector image import result.

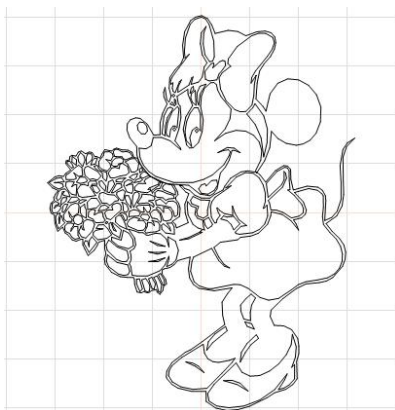


Figure 4-35 Vector image import example

4.12 Graphic selection

If no other command is currently running, the icon appears pressed, indicating that the current command is selected. In other words, you can press the space bar (default) to quickly switch to the graphics selection function. At this point, you can use the mouse to click an object in the workspace to select it. The software has an automatic snapping function. When you move the mouse in the workspace, if the pointer moves next to a certain curve, you can select the object by left-clicking.

You can also select objects by moving the mouse while holding down the left mouse button. At this time, a dotted box will appear in the area where the mouse passes. Objects completely enclosed within the dashed box will be selected.

When you use the Selection command, the Selection Command toolbar appears and you can perform certain operations. As shown in Figure 4-36:



Figure 4-36 Select command toolbar



Indicates that all objects in the current document are selected.



Indicates that all objects except the currently selected object are selected.



Delete the currently selected object.



Indicates that the current object is locked and you cannot perform any editing operations on it. At this time, some lock icons will appear around the object.



Indicates that the currently selected locked object is released.



Indicates that all locked objects are unlocked.



Indicates placing the currently selected object to the origin.



Indicates selecting objects by pen number.



Indicates that the currently selected object will be mirrored horizontally.



Indicates that the currently selected object will be mirrored vertically.



Shows or hides the drawing path of the current graphic.



Indicates that the currently selected object is displayed.

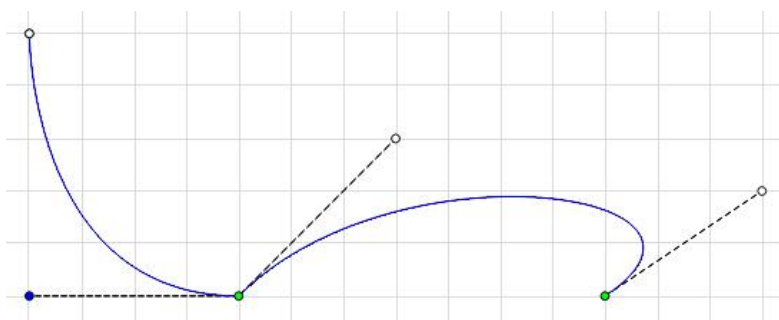


Indicates that the currently selected object is hidden.

4.13 Node editing

The graphics drawn by the relief software are all vector graphics, so you can adjust the shape of the graphics by modifying the feature points of the graphics.

If you want to use the node editing function, select the icon  in the drawing toolbar. Use the mouse to click on the object in the workspace, and the object will display all its nodes. Nodes are represented by open squares, the larger of which represents the starting point of the curve. At the same time, the node editing toolbar will appear. As shown in Figure 4-37.



a) Node of object



b) Node editing tool

Figure 3-37 Node editing

-  : Click any non-node point on the curve with the mouse, and a black solid circle will appear at that point. Select the "Add" command to add a node at this point.
-  : Click any node on the curve with the mouse and the node will be blackened. Select the "Delete" command and the node will be deleted.
-  : When two nodes are very close to each other, use the mouse to drag the two nodes and select the "Merge" command, then the two nodes will be merged into one node.
-  : Click any node on the curve with the mouse, and the node will be blackened. Select the "Separate" command, and the node will be separated into two independent nodes.
-  : Click any point between two adjacent nodes on the curve and select the "Straight Line" command, then the curve (may be a straight line, arc or curve) between the two nodes will be converted into a straight line.
-  : Click any point between two adjacent nodes on the curve and select the "Arc" command, and the curve between the two nodes will transform into an arc.
-  : Click any point between two adjacent nodes on the curve and select the "Curve" command, and the curve between the two nodes will transform into a curve.
-  : Click any node on the curve with the mouse and select the "cusp" command, then the node will become a cusp and the curve will have a larger turning point.
-  : Click any node on the curve with the mouse and select the "Smooth" command, then the node will become a smooth curve with a smaller turning point.
-  : Click a node with the mouse and select the "Symmetry" command, and the curves near the left and right of the node will be symmetrical.

-  : Select the "Direction" command, the starting point and end point of the curve are exchanged, and the direction of the curve is turned.
-  : Select the "Close" command, and the curve will be automatically closed.
-  : Drag the mouse to select more than two nodes, select the "Align" command, and the node alignment dialog box will pop up. You can select the alignment method of these nodes and align them according to the top, bottom, left, or right.

Note: Text objects and fill objects cannot edit nodes; however, path text can edit the nodes of a path.

5 EDIT MENU

The "Edit" menu implements graphic editing operations. See Figure 5-1.

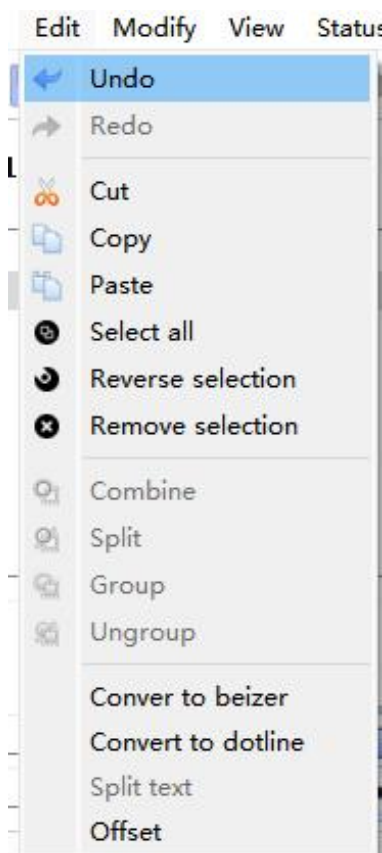


Figure 5-1 "Edit" menu

5.1 Undo (U) and restore (R)

When performing graphic editing operations, 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 last operation; after undoing the current operation, you can use the "Restore" function to restore the canceled operation. This is one of the most commonly used functions for editing work.

The toolbar icon corresponding to the "Undo" menu is , and the toolbar icon corresponding to the "Restore" menu is . Like most software, both operations have shortcut keys Ctrl+Z and Ctrl+Y.

5.2 Cut (T), copy (C) and paste (P)

"Cut" will delete the selected graphic object and copy it to the system clipboard, and then use the "Paste" function to copy the graphic object in the clipboard to the current graphic. "Copy" copies the selected graphic object to the system clipboard while retaining the original graphic object.

The shortcut keys corresponding to "cut", "copy" and "paste" are Ctrl+X, Ctrl+C and Ctrl+V respectively.

The position and offset of the pasted graphic from the original graphic are determined by the paste displacement in the general parameters of the system parameters.

5.3 Select all and reverse selection

"Select All" selects all elements in the current document at one time.

"Inverse selection" is to select all elements in the current document except the currently selected ones.

5.4 Delete

"Delete" deletes the currently selected element.

5.5 Combination and separation combination

"Combine" removes the attributes of the original objects from all the selected objects

and combines them together as a new curve object. This combined graphic object can be selected, copied, and pasted like other graphic objects, and the object properties can be set. For example, the original graphics are circles or rectangles, and the "combined" graphics are processed as curves. After the "separate combination" process, they will be converted into curves.

"Separate Group" will restore the combined objects into individual curve objects.

The toolbar icon corresponding to the "Combine" menu is , and the toolbar icon corresponding to the "Separate Combination" menu is . The shortcut keys corresponding to "Combine" and "Separate Combination" are Ctrl+L and Ctrl+K.

5.6 Groups and separate groups

"Group" will retain the original attributes of the selected graphic objects and combine them together as a new graphic object. This combined graphic object can be selected, copied, and pasted like other graphic objects, and object properties can be set.

For example, if the original graphic is a circle or rectangle, but the graphic after "grouping" is still processed according to the properties of the original graphic, if it is processed by "separate group", it will be restored to the original object, and its properties will remain unchanged.

"Detach Group" restores the objects of the group to the state before the collection.

The toolbar icon corresponding to the "Group" menu is , and the toolbar icon corresponding to the "Detach Group" menu is . The shortcut keys corresponding to "Group" and "Detach Group" are Ctrl+G and Ctrl+U.

5.7 Convert to curve

Remove the attributes of the selected graphic object and convert it into a curve object.

5.8 Convert to dashed line

Convert vector graphics into dotted line graphics for marking, as shown in Figure 5-2 below:

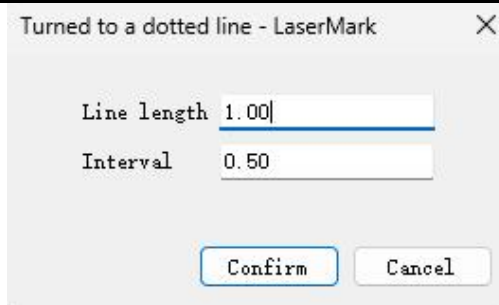


Figure 5-2 "Convert to dashed line" window

You need to set the short line length and line spacing yourself, and then click "OK" to convert the vector graphic into a dotted line graphic.

5.9 Separate text

Splits a character text string into multiple text objects containing only one character.

5.10 Filling

Fill can fill the specified graphics. The filled shape must be a closed curve.

The toolbar icon corresponding to the "Fill" operation is . After selecting Fill, the Fill dialog box will pop up, as shown in Figure 5-4.

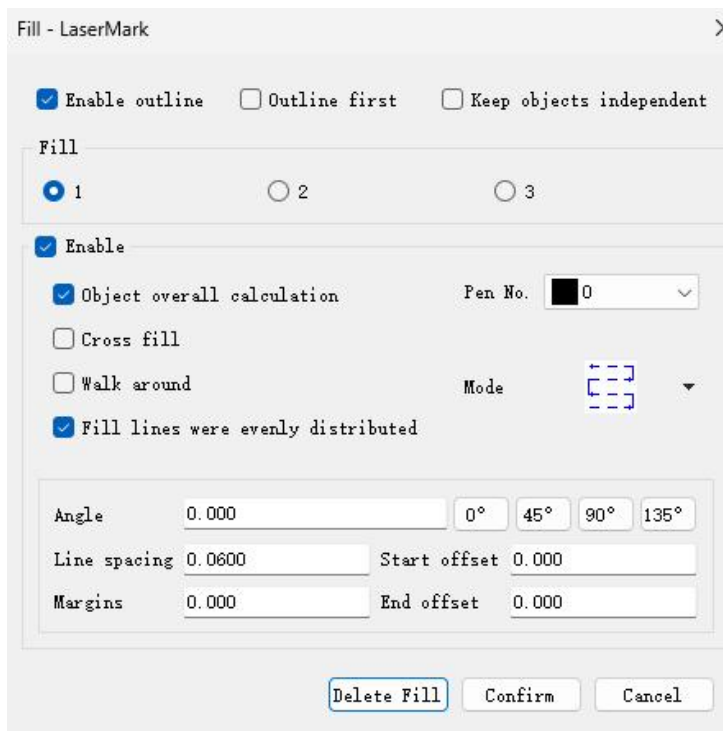


Figure 5-4 Fill dialog box

Enable outline: Indicates whether to display and mark the outline of the original graphic. That is, whether the filled shape retains its original outline.

Contour priority: means that when the contour is enabled, the contour is marked first and then the fill line is marked.

Filling 1, 2, 3: means that four sets of unrelated filling parameters can be used for filling operations at the same time. Each type of filling can support processing with five different filling types (the four filling types include: return filling, one-way filling, two-way filling, optimized arc filling and optimized two-way filling, detailed description below.)

Enable: Whether to allow the current filling parameters to be valid.

Overall object calculation: This is an optimized option. If this option is selected, all objects that do not include each other will be calculated as a whole when performing filling calculations. In some cases, the processing speed will be increased. (If this option is selected, it may cause a reduction in computer computing speed), otherwise each independent area will be calculated separately.

For ease of description, we now take a special example to illustrate this feature.

Example: Draw three independent rectangles in the workspace, with a fill line spacing of 1mm and a 0-degree fill.

(1) Uncheck "Calculate the entire object": the processing order in the object list will be followed during processing.

Mark its fill lines in sequence, that is, mark the fill pattern of one object first and then mark the next one. As shown in Figure 5-5:

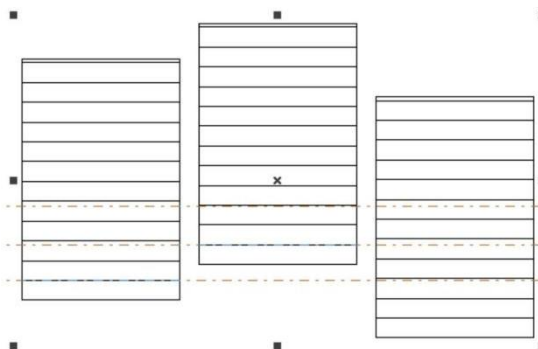


Figure 5-5 Uncheck the overall calculation of the object

(2) Check "Compute the entire object": mark all the filling lines at once during processing.

Fill lines of the same row in several objects are marked together. As shown in Figure 5-6:

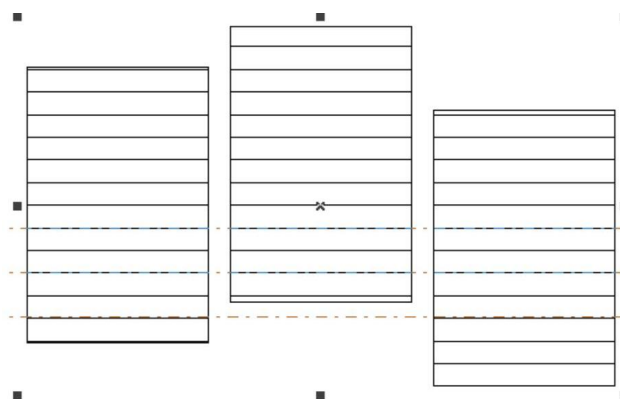


Figure 5-6 Check the overall calculation of the object

Go around the edge once: refers to adding an outline graphic around the periphery of the filling line after the filling calculation is completed.

Cross filling: perform another 90° filling based on the original filling, as shown in Figure 5-7.

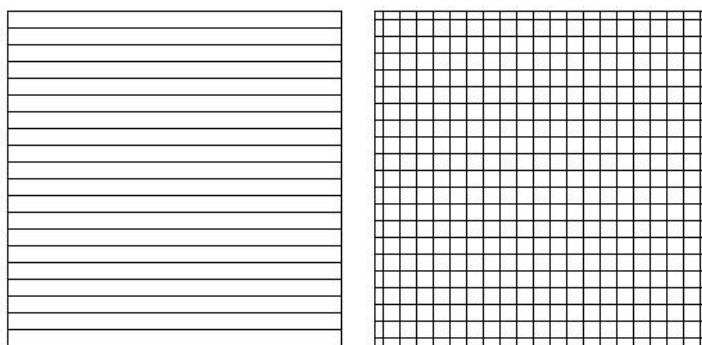


Figure 5-7 The left side shows cross-filling unchecked, and the right side shows cross-filling checked.

Fast filling: Optimized for runway-shaped and annular filling marking. As shown in Figure 5-8

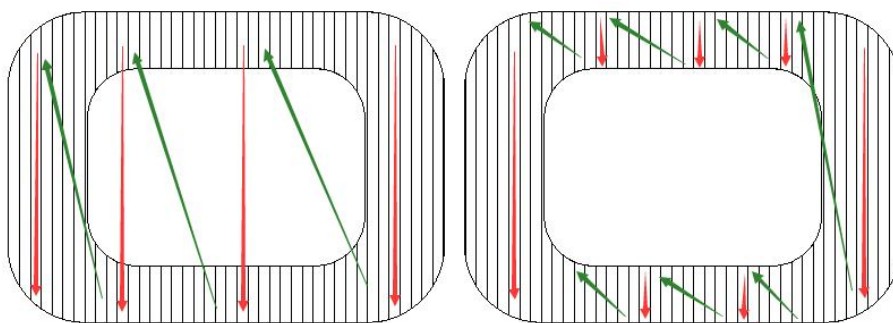


Figure 5-8 The left side of shows the marking effect without quick filling checked.

The right side shows the marking effect with quick fill checked.

Keep objects independent: After checking, multiple objects will be filled together and they will still be multiple objects.

Filling method:



One-way fill: Fill lines are always filled from left to right. As shown on the left in Figure 5-8.



Bidirectional filling: The filling line is first filled from left to right, then from right to left, and the rest is filled in a loop. As shown on the right side of Figure 5-9.

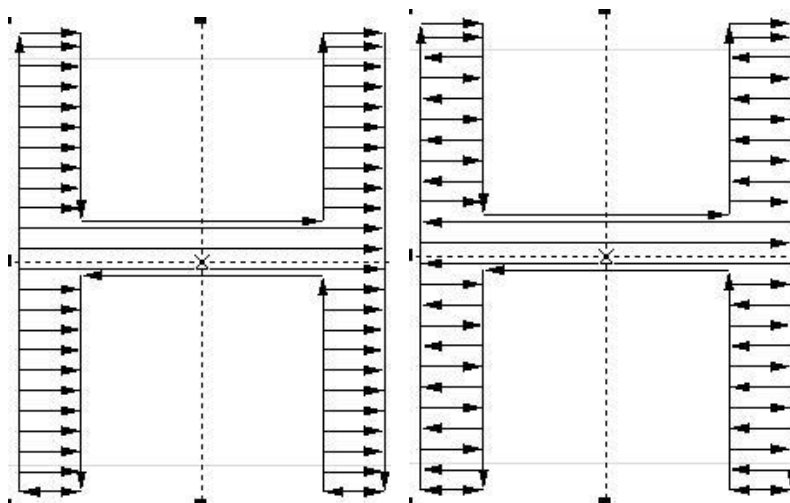


Figure 5-9: One-way filling on the left, two-way filling on the right



Circular fill: The fill line is a circular offset filling of the object outline from the outside to the inside. As shown on the left in Figure 5-10.



Optimized bidirectional fill: Similar to bidirectional fill, but connecting lines are generated between the ends of the fill lines. As shown on the right side of Figure 5-10.

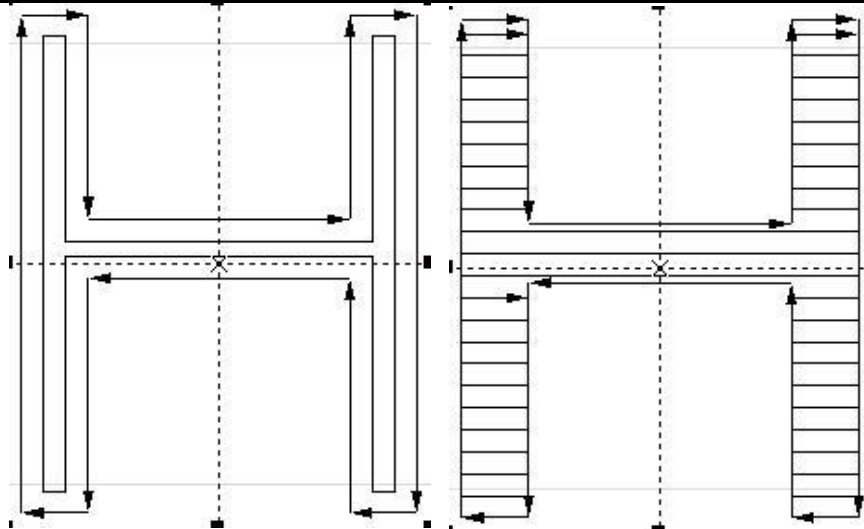


Figure 5-10: Ring filling on the left, optimized bidirectional filling on the right



Optimized bow filling: similar to bow filling, the blank areas of the object will still be filled. As shown in Figure 5-11:

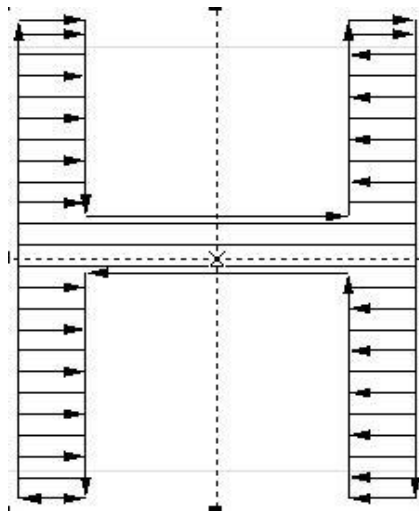


Figure 5-11 Optimizing arch filling

The above five filling types can be switched by clicking the button  with the mouse, and can be set or changed conveniently and quickly according to the actual desired effect.

Pen number: Select to display the pen number used for filling.

Angle: refers to the angle between the fill line and the X-axis. Figure 5-13 shows the filling pattern when the filling angle is 45 degrees.

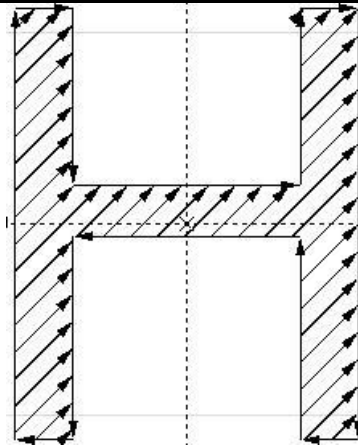


Figure 5-13 The filling angle is 45 degrees

Line spacing: refers to the distance between adjacent lines of filled lines.

Margin: the distance between the border and the fill line

Start offset: refers to the distance between the first fill line and the border.

End offset: refers to the distance between the last fill line and the border.

[Note: When filling text, the line spacing of the filling should not be too large. If it is too large, the filling effect will not be visible.]

6 MODIFY MENU

The commands in the modification menu perform simple modification operations on the selected objects, including array, transformation, shaping, trimming, alignment and other operations. As shown in Figure 6-1.

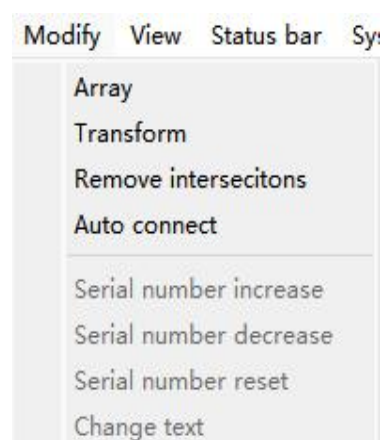


Figure 6-1 Modify menu

6.1 Array

When you click the "Array" command, the dialog box shown below will pop up, as shown in Figure 6-2.

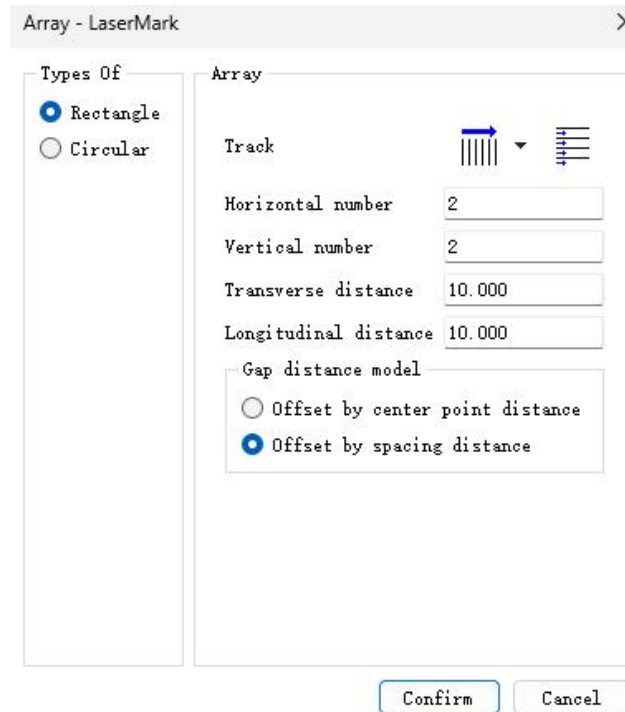


Figure 6-2 Array operation dialog box

Matrix: Indicates that the graphics will be arranged in a rectangle after array.

Circular array: Indicates that the graphics will be arranged in a circle after arraying.



: Indicates that the graphics after the array are arranged individually from left to right, and also determines the processing order.



: Indicates that the graphics after the array are arranged in a bidirectional cycle from left to right and then from right to left, and also determines the processing sequence.

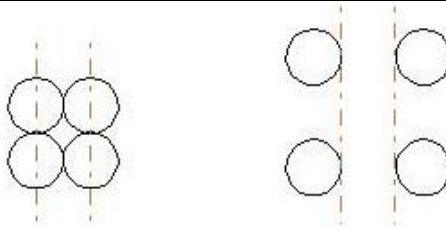
Horizontal number: The number of arrays in the X direction when arraying.

Vertical number: The number of arrays in the Y direction when arraying.

Horizontal spacing: the distance between X-direction graphics after the array.

Vertical spacing: the distance between Y-direction graphics behind the array.

Calculated by offset distance: Graphic spacing is calculated by offset distance. As shown in Figure 6-3(a).



Calculated according to the distance between graphics: The spacing between graphics is calculated based on the distance between graphics. As shown in Figure 6-3(b).

If you select the array mode as circular array, the dialog box shown in Figure 6-4 will appear:

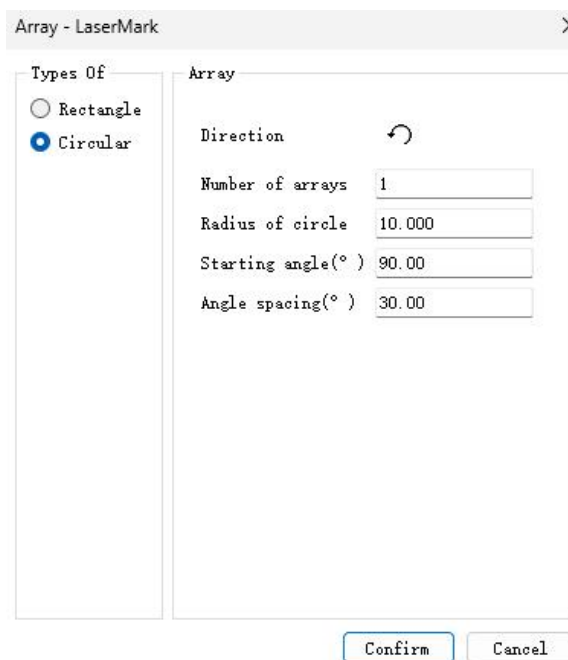


Figure 6-4 Circle array operation dialog box



: Indicates the arrangement order of the graphics after the array, whether it is arranged clockwise or counterclockwise, which also determines the marking order.

Parts: Indicates how many identical graphics you need to array the selected graphics into.

Radius: refers to the radius of the circle where the graphics will be arranged in a circle after the array.

Starting Angle: Determines the starting angle of the graphics after the array.

Angle spacing: The angular spacing of the graphics after the array.

6.2 Transformation

When the user clicks the transform command, the system pops up the dialog box shown in Figure 6-5.

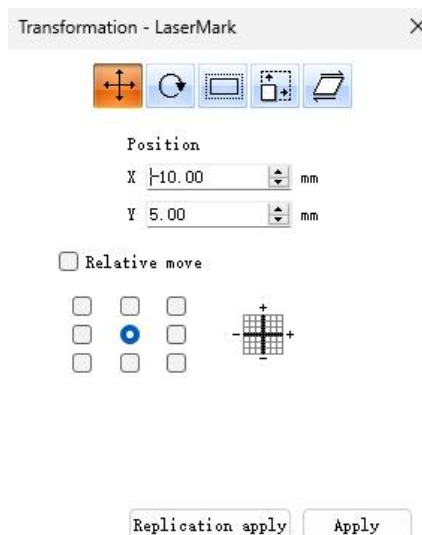


Figure 6-5 Transform operation dialog box

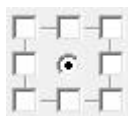
6.2.1 Move



Represents movement transformation. The movement transformation command can translate the currently selected object.

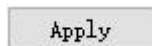
Position: Indicates the coordinates of the base point of the currently selected object.

In the case of absolute coordinates, this function is equivalent to the X and Y functions in the object label of the property toolbar in Chapter 2.

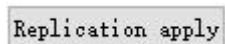


Indicates the base point position of the currently selected object.

Relative center: Indicates that the position coordinates are the center coordinates.



: Move the selected object to a new location.



: Copies the currently selected objects and moves them to a new location.

6.2.2 Rotary



Represents rotation transformation. The rotation transformation command can

rotate the currently selected object.

When the user clicks the transform command, the system pops up the dialog box shown in Figure 6-6.

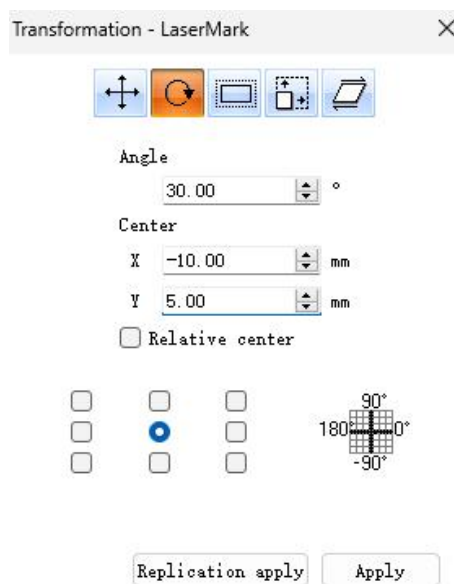
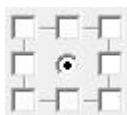


Figure 6-6 Rotation operation dialog box

Angle: Indicates the angle of rotation of the currently selected object.

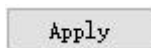
Center: Indicates the coordinates of the base point of the currently selected object.

In the case of absolute coordinates, this function is equivalent to the X and Y functions in the object label of the property toolbar in Chapter 2.

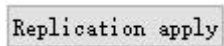


Indicates the base point position of the currently selected object.

Relative center: Indicates that the position coordinates are relative coordinates.



Rotate the selection to its new position.



Copies the currently selected object and rotates it to its new position.

6.2.3 Mirror



Indicates mirror transformation. The mirror transformation command can mirror the currently selected object.

When the user clicks the mirror command, the system pops up the dialog box shown in Figure 6-7.

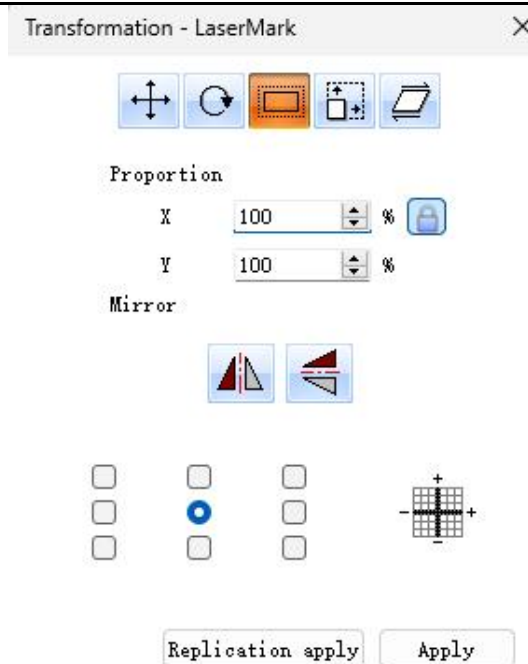


Figure 6-7 Mirror operation dialog box

Scale: Indicates the scaling ratio of the currently selected object in the XY direction after mirroring.

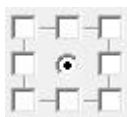


Indicates that the currently selected object should be mirrored horizontally.

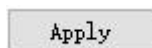


Indicates that the currently selected object should be mirrored vertically.

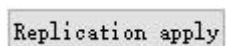
Horizontal mirroring and vertical mirroring can be enabled at the same time. In actual applications, please enable the corresponding mirroring function as needed, and make sure that unnecessary functions are not pressed.



Indicates the base point position of the currently selected object.



Mirror the selection to a new location.



Copies the currently selected objects and mirrors them to a new location.

6.2.4 Zoom



Represents scaling transformation. The scaling transformation command can scale the currently selected object.

When the user clicks the zoom command, the system pops up the dialog box shown in Figure 6-8.

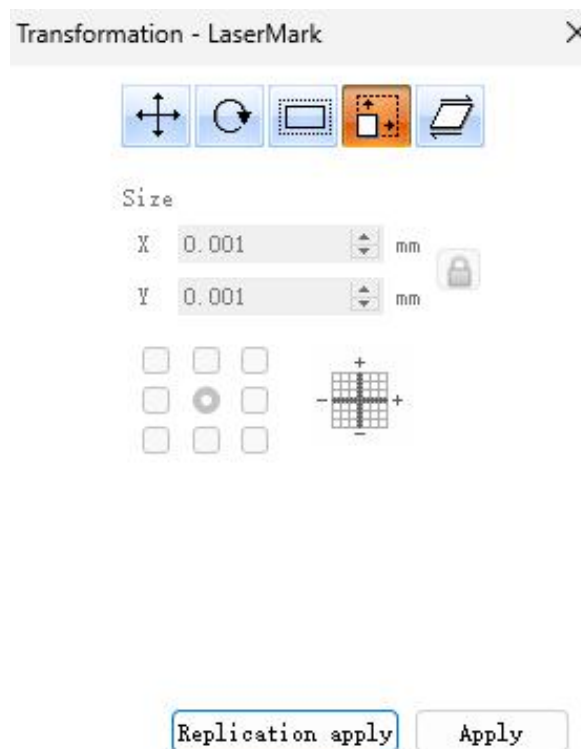
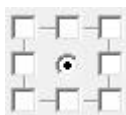


Figure 6-8 Zoom operation dialog box

Size: Indicates the scaled size of the currently selected object.

This function is equivalent to the size function in the object tab of the property toolbar in Chapter 2.



Indicates the base point position of the currently selected object.

Apply

Scale the selection to its new location.

Replication apply

Copies the currently selected object and scales it to its new location.

6.2.5 Tilt



Represents tilt transformation. The tilt transformation command can tilt the currently selected object.

When the user clicks the tilt command, the system pops up the dialog box shown in Figure 6-9.

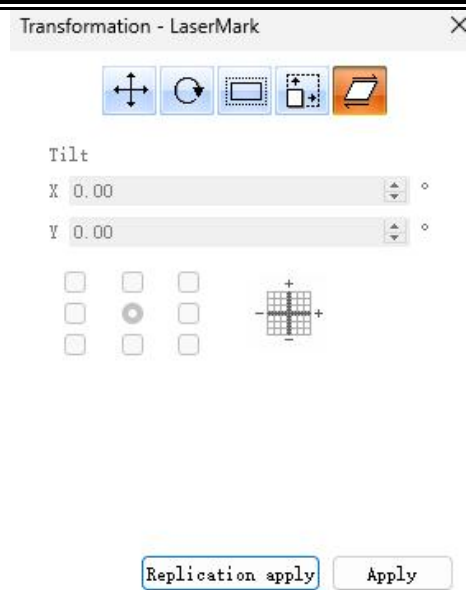
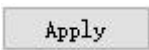


Figure 6-9 Tilt operation dialog box

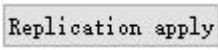
Tilt: Indicates the tilt angle of the currently selected object.



Indicates the base point position of the currently selected object.



Tilt the selection to its new position.



Duplicates the current selection and tilts it to its new location.

6.3 Remove intersection point

When the user clicks the automatic connection command, the system pops up the dialog box shown in Figure 6-12.

Automatic connection distance: When the distance between the first and last points of two selected graphics is less than this parameter, the two curves will be connected into one curve.

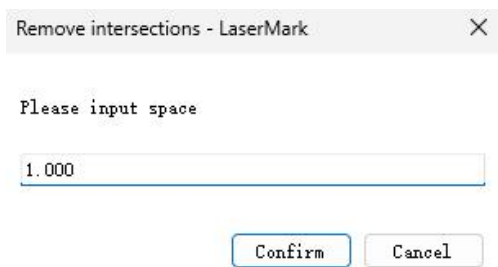
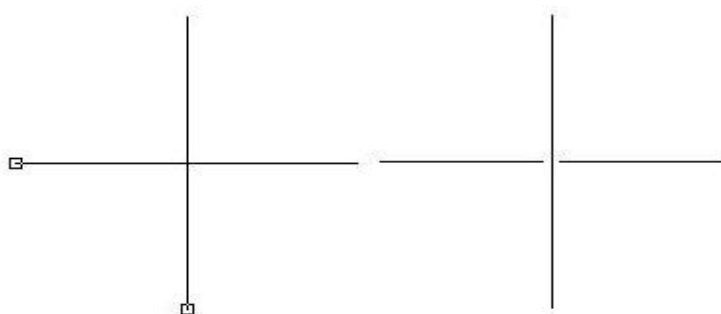


Figure 6-10 Automatic connection dialog box

Cutting length: refers to the length of the intersection line we set to remove, as shown in Figure 6-10 above. Figure 6-11 below gives an example:



(a) Before removing intersection points (b) After removing intersection points

Figure 6-11 Example of removing intersection points

6.4 Automatic connection

When the user clicks the automatic connection command, the system pops up the dialog box shown in Figure 6-12.

Automatic connection distance: When the distance between the first and last points of two selected graphics is less than this parameter, the two curves will be connected into one curve.

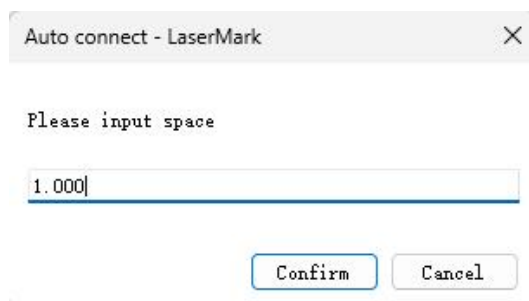


Figure 6-12 Automatic connection dialog box

6.5 Sorting

Select this command in the Modify menu or select  on the main interface. Draw multiple objects and click to sort. The direction of the blue arrow in the work area indicates the current marking order. A sorting icon appears above the main interface, as shown below:



Figure 6-13 Sorting icon

6.6 Alignment

When you select more than two objects in the workspace, the Alignment menu becomes available. This menu is used to align the objects you select on a two-dimensional plane. There are several ways to align:



Align Left: Align the left edges of all objects.

Align right: Align the right edges of all objects.

Vertical centerline alignment: Align the vertical centerlines of all objects. In the above three alignment methods, all objects only move in the horizontal direction.

Align Top: Align the top edges of all objects.

Bottom Alignment: Align the bottom edges of all objects.

Horizontal center line alignment: Align the horizontal center lines of all objects. In the above three alignment methods, all objects only move in the vertical direction.

Center point alignment: Align the center points of all objects to coincide with each other. The alignment may cause the object to move both horizontally and vertically.

Graphic isometric function: Select the object graphics and click Horizontal or Vertical Equivalency, the graphics will be in the order of the object list column, and the distance between them will be equal.

Note: The basis of alignment is the first selected object among all the objects you select. All other objects are moved based on it. When you use it, click the first object with the mouse first and then drag it. If you select multiple objects or press "Ctrl" to click multiple objects, the first selected object will be used as the basis.

7 VIEW MENU

The View and Status menu is used to set various options for the view in the relief software, as shown in Figure 7-1.

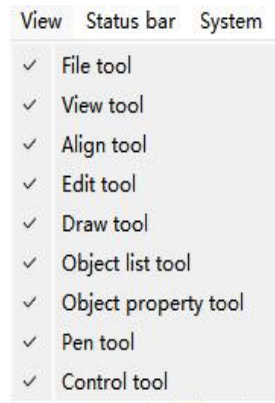


Figure 7-1 View menu

7.1 Observation

The toolbar corresponding to the observation operation is corresponding to five different modes.



Zoom in on the current view.



Zoom out of the current view.



All objects in the current workspace fill the entire view area for observation.



The currently selected object fills the entire view area for observation.



The current workspace fills the entire view area for observation.

7.2 Display rulers, grid points and auxiliary lines

Displays horizontal and vertical rulers, grid points and guide lines.

7.3 Snap grid

The snap to grid function allows the points you draw to be automatically positioned on the grid points of the workspace.

7.4 Snap auxiliary lines

The Snap to Guides feature allows you to automatically snap objects to guides when you move them.

7.5 Capture object

With the object capture function, when performing certain operations, the software will automatically find feature points such as vertices, midpoints, nodes, circle centers, and intersection points on the object.

8 STATUS BAR

Embossing software provides multiple toolbars that implement different functions. You can choose to display or hide them through the options in the status menu. When there is a "√" in front of the corresponding submenu item in the View menu, it means that the corresponding toolbar or status bar is visible. If not, it means that the toolbar or status bar is hidden.

9 SYSTEM

9.1 System parameter (P)

The "System Parameters" submenu is used to set system parameters. Select the "System Parameters" menu, and the dialog box shown in Figure 9-1 will pop up. In this dialog box, you can set various parameters such as general software parameters, displayed colors, workspace related parameters, and user management.

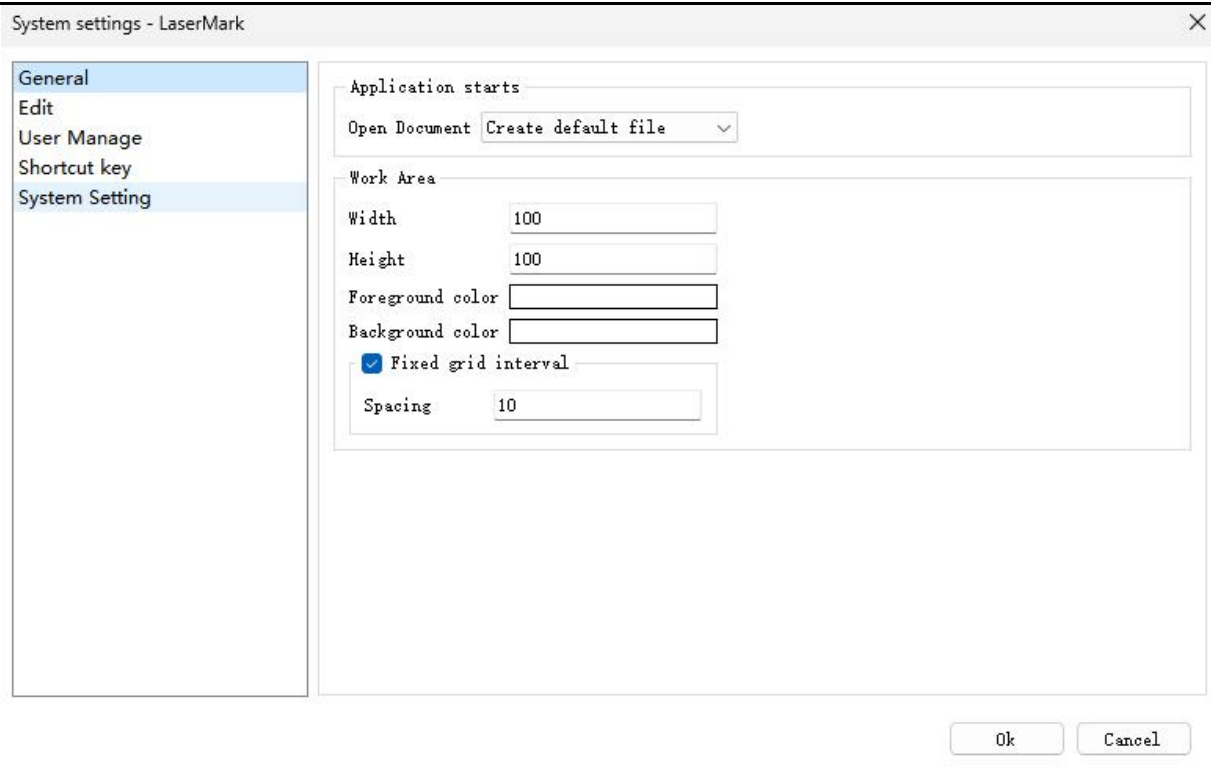


Figure 9-1 "System Parameters" window

9.1.1 General

In the general parameters, some common parameters are mainly set.

Open document when program starts: open last file/create default file

Work area: size, background color, grid spacing, etc.

9.1.2 Edit

Used to set various parameters of the operating area, users can define them according to their own style. Set the properties of the workspace. As shown in Figure 9-2.

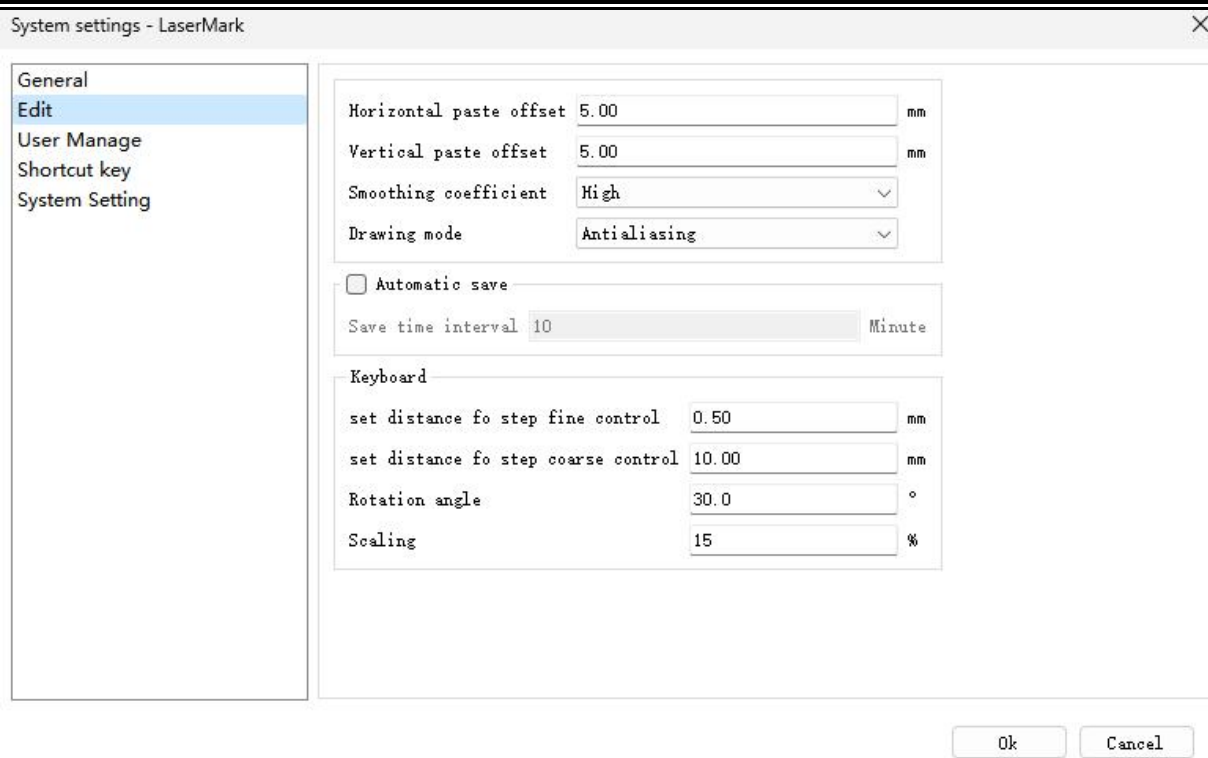


Figure 9-2 Edit settings

9.1.3 User management

Add and delete users; set user permissions; set passwords for user logins.

The user management interface is shown in Figure 9-3.

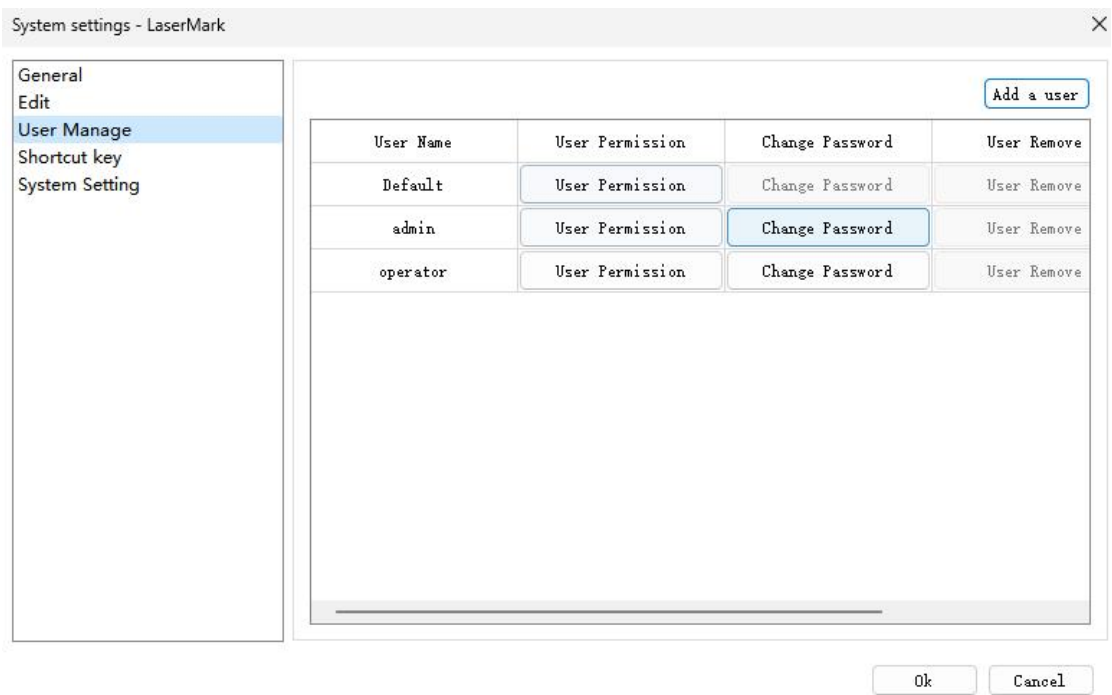


Figure 9-3 User management

9.1.4 Shortcut key

The buttons for shortcut operations of setting functions are shown in Figure 9-4:

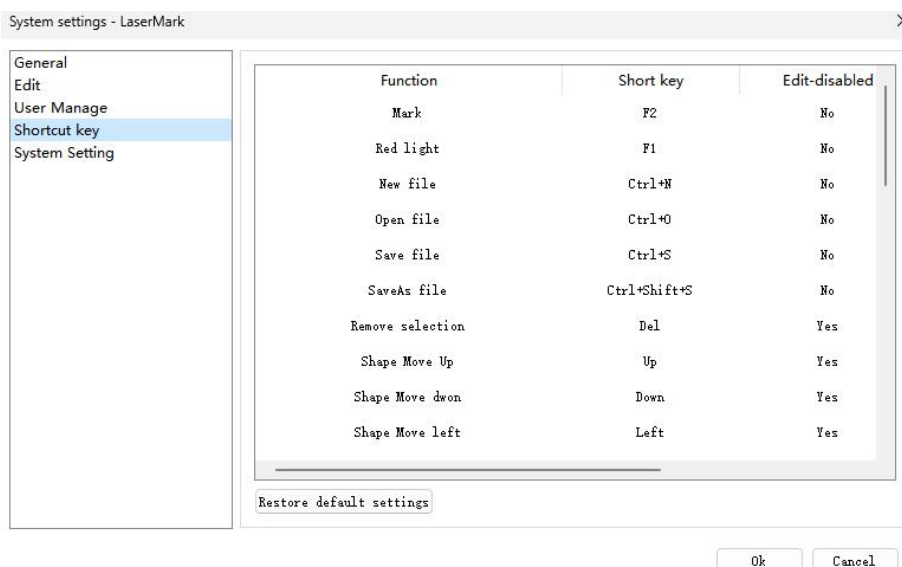


Figure 9-4 Custom shortcut keys

9.1.5 System setting

Language: Displays the language packs installed on the current computer. The interface language used by the relief software can be modified here. The selections made here will take effect the next time you start the software.

Device: Select the device according to the interface type.

The interface is shown in Figure 9-5.

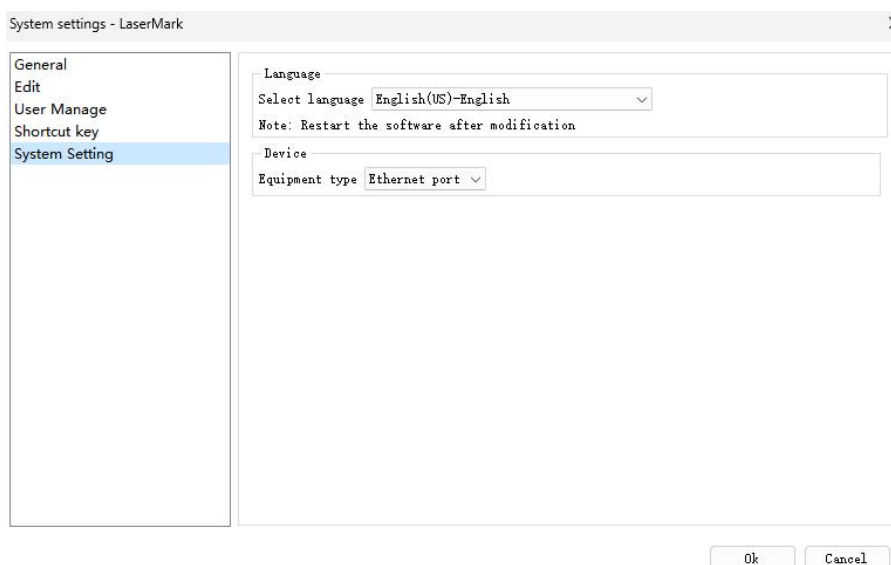


Figure 9-5

10 GALVANOMETER CORRECTION

Used in situations where accuracy is required. Situations with high requirements on correction effect and efficiency.

After nine-point calibration, the number of calibration points can be gradually increased to perform multi-point calibration.

For relevant parameter settings before correction, select from the marking parameter bar on the right side of the main interface to open the parameter settings. Determine the field lens range, taking 130mm as an example, and change the area size parameter to 130. Set the direction of the galvanometer, as shown in Figure 10-1;

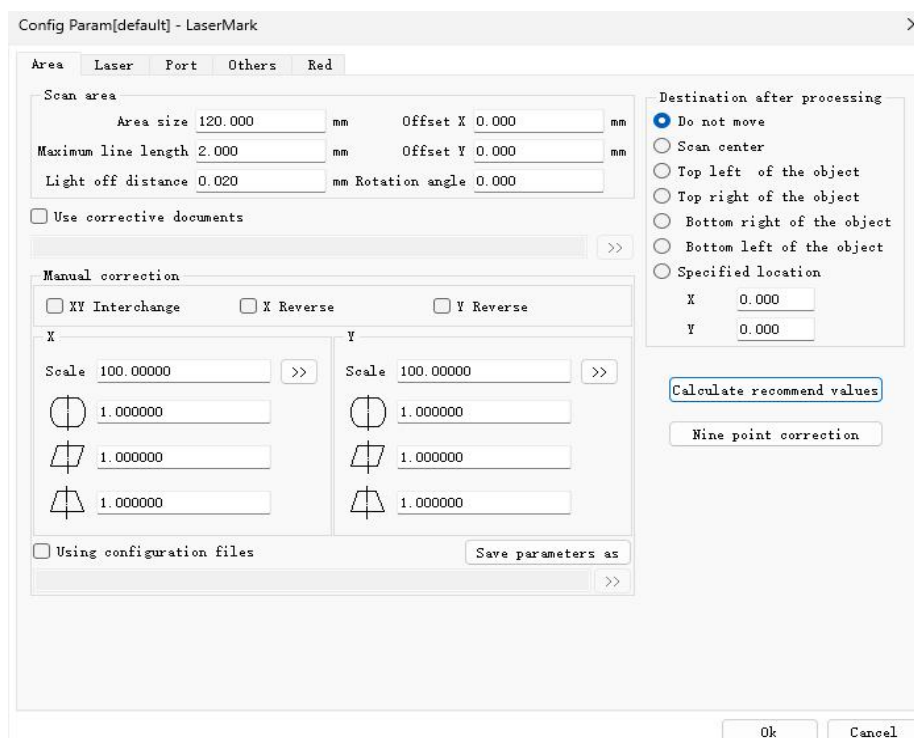


Figure 10-1 Parameter settings

10.1 Start correction (nine-point correction)

Enter "Nine-point calibration" from the menu and enter the nine-point calibration operation interface, as shown in Figure 10-2.

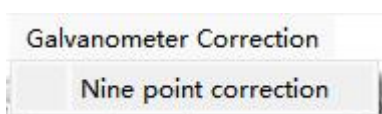


Figure 10-2 Entering nine-point correction

The nine-point calibration interface is shown in Figure 10-3:

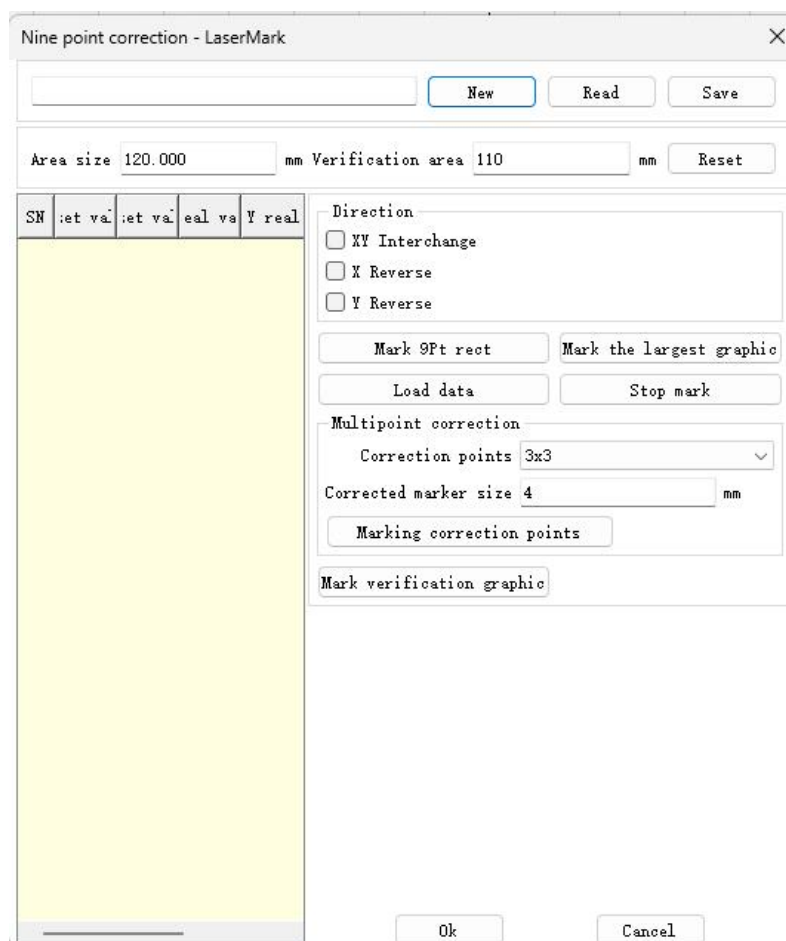


Figure 10-3 Parameter settings

10.2 Confirm working dimension

Click "Mark Largest Shape" to mark the largest rectangle, and measure the distance between the intersection of the x-axis and the rectangle and the distance between the intersection of the y-axis and the rectangle. The working area size is smaller than and close to the smallest of the two distances.

For example, if the distance between the two intersections of the x-axis and the rectangle is 118mm, and the distance between the two intersections of the y-axis and the rectangle is 122mm, then you can choose a value less than 118mm and close to 118mm as the size of the working area (such as 116mm), this ensures that there will be no size compression at the remote points during correction.

After the maximum format is determined, for example, the maximum size is 135mm, the area size can be set to 130mm, which can be set in the parameter interface.

10.3 Determine the test area

In the calibration interface, set the calibration area to about 0.8 times the area size. For a working size of 130mm, it can be set to $130 \times 0.8 = 104$. To facilitate calculation, it can be set to 110 or 100. Here it is set to 110mm, as shown in Figure 10 -4 shown.

Area size 120.000 mm Verification area 110 mm

Figure 10-4 Setting the verification area

10.4 Marking the 9-point correction pattern

Set the calibration area to 100mm, set the calibration points, and reset.

Click "Mark Calibration Figure" to mark the following figure (x, y are used to illustrate the direction of the figure and will not be actually marked). Note that the direction and position of the short line segment and the triangle in the upper left corner must be as shown in the figure below. If they are consistent, adjust the XY swap, X reverse, and Y reverse parameters of the main interface until the marked shape has the same direction as the shape above, as shown in Figure 10-5.

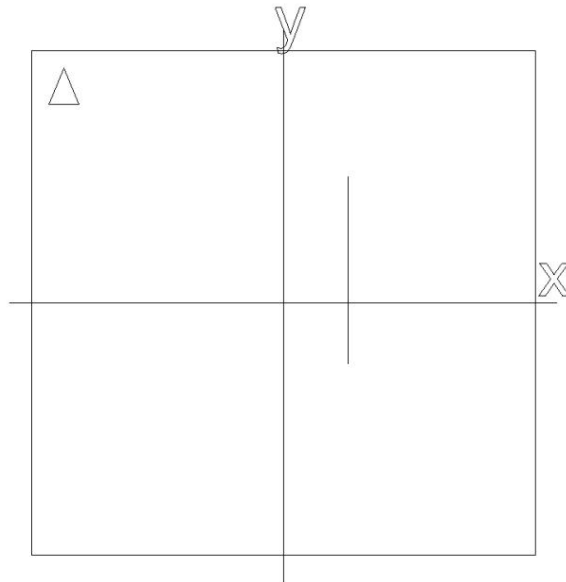


Figure 10-5 Correction graph

When measuring the coordinates of a point, minimize the measurement error. Measure the coordinate values of the 9 points in the picture above in sequence, based on the center point (point 5). The sequence numbers are as shown in Figure 10-6:

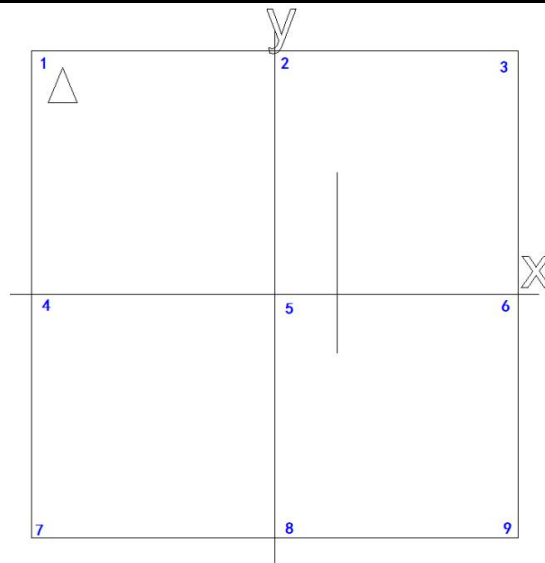


Figure 10-6 Measurement sequence number

Using the cross center line (the straight line passing through point 5 as the coordinate axis) as the benchmark, measure the coordinate values of 9 points in sequence and record them. The measurement method is that one side of the vernier caliper coincides with the X-axis or Y-axis of the cross center line, and the other side coincides with the point to be measured. At this time, the reading is the correction value. Or use two-dimensional measurements. Take the first point correction value as an example in Figure 9-5: (You can consider measuring 3 times and taking the average to be more accurate)

Populate the measured values into columns 4 and 5 of the data table. The 2nd and 3rd columns are the set distances, and the 4th and 5th columns correspond to the actual marking distances. Note that the measured values are positive and negative.

Click "New" to save as a new file.

After saving, you can click "Mark Verification Pattern" to mark the corrected pattern, as shown in Figure 10-7:

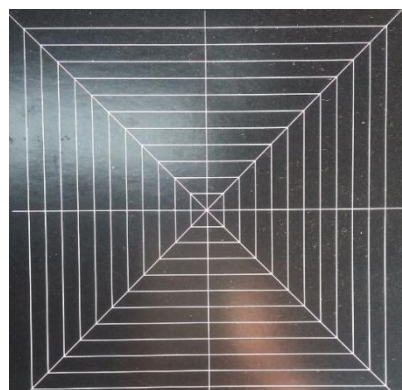


Figure 10-7 Marking verification pattern

10.5 Multi-point calibration

If the effect after nine-point correction is not satisfactory, you can further perform multi-point correction. For example, for further 5*5 point correction, in the multi-point correction area, select 5x5, set the mark size, and click "Mark Calibration Points" to use the existing correction result (there is already a 3x3 dot matrix correction here) to mark. Carve a 5x5 dot matrix, as shown in Figure 10-8.

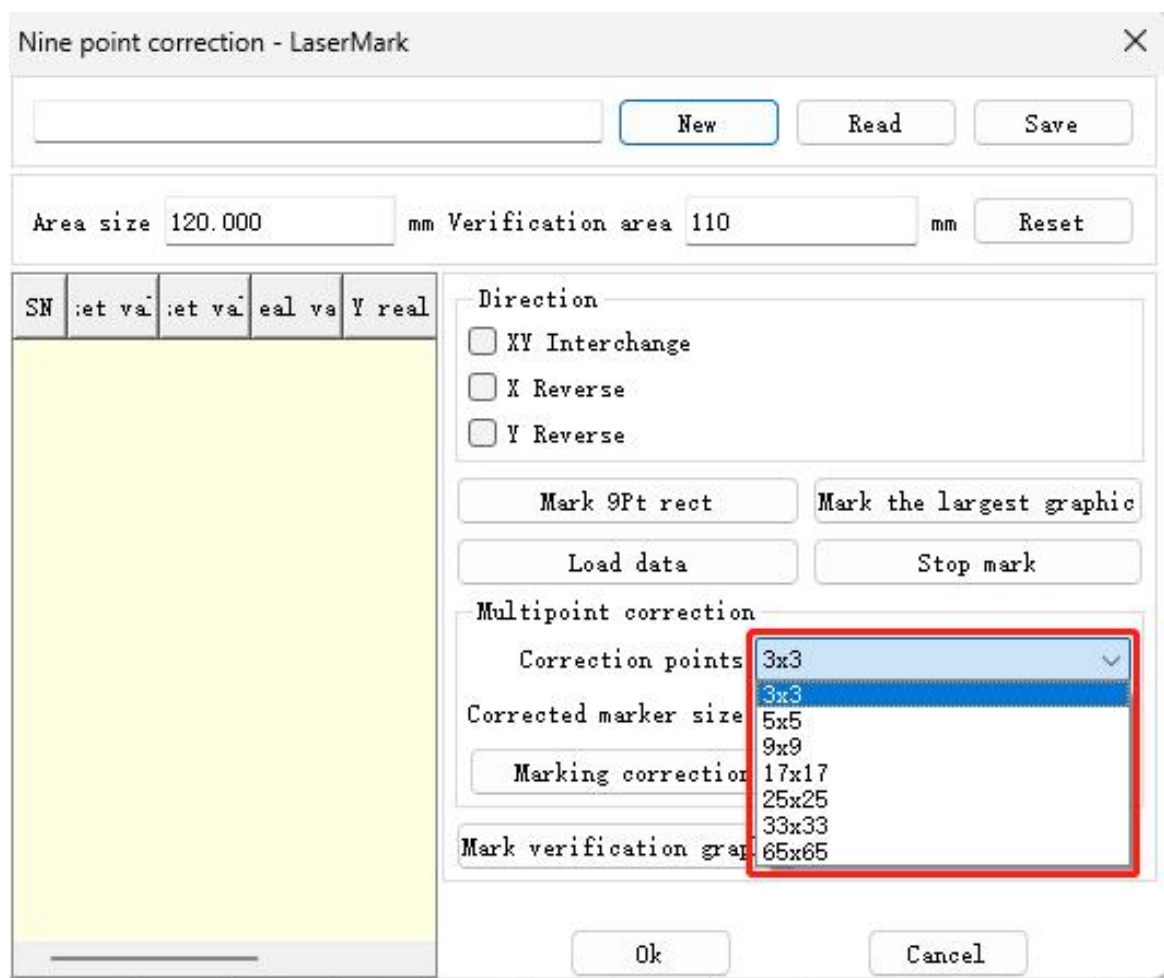


Figure 10-8 Multi-point correction

Click "Reset" to enter/copy the measured values into the two right columns of the table.

Click "Save" to save the calibration results to the calibration file.

Multi-point correction can be gradually stacked (ie according to 3x3, 5x5, 9x9, 17x17, 65x65), or jump correction (3x3, 9x9, 65x65), but 3x3 dot matrix calibration is required.

10.6 Use calibration file

Use the correction file in the configuration parameters, as shown in Figure 10-10. Check Use correction file and select the corresponding xxx.cor file.

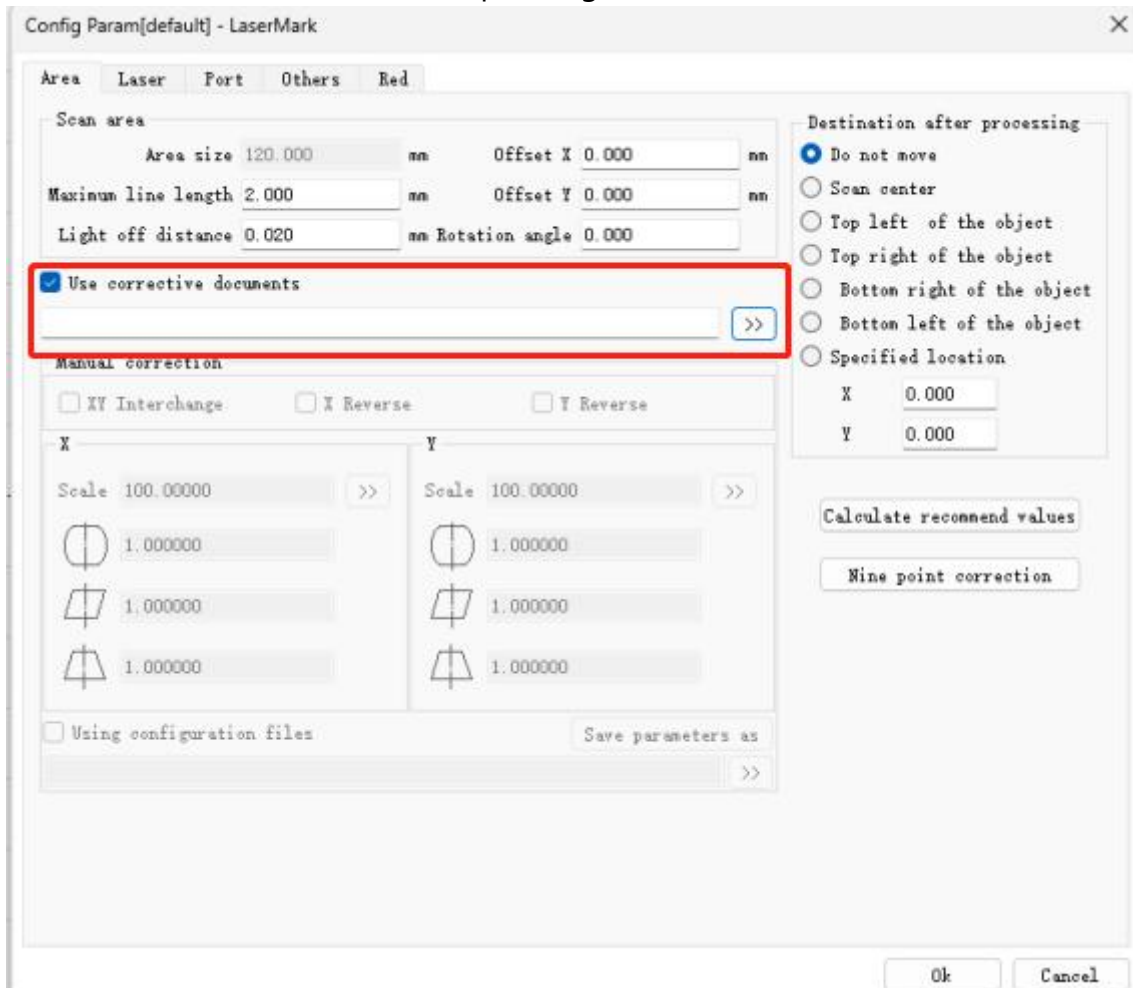


Figure 10-10 Using calibration files

11 PEN NUMBER PARAMETER MANAGEMENT

As shown in Figure 11-1 is the pen number parameter management column.

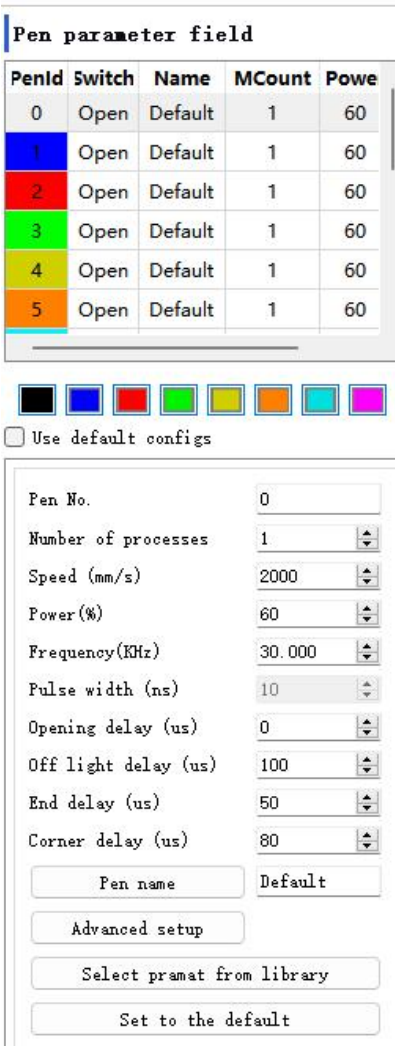


Figure 11-1 Pen number parameter column

Each file in the relief has 16 pens, corresponding to the top 16 pens in the processing attribute column. The pen numbers range from 0 to 15, among which pen number 0 is the default pen parameter (the default parameter pen number is modifiable) .



: Indicates whether the current pen will be processed.

Color: Indicates the color of the current pen. This color is displayed when the object corresponds to the current pen number.

When the user right-clicks the mouse in the current list, the right-click menu shown in Figure 11-2 will pop up.

2	Open	Default	1	60	
3	Open	D			
4	Open	D			
5	Open	Default	1	60	
6	Open	Default	1	60	

Figure 11-2 Right-click menu

Select Column...: Set the content displayed by pen parameters in each column.

Apply to selected objects: Apply the current pen number to the selected entities. (Or you can select the object first and then double-click the pen number name to switch the object to the pen number.)

Set as default parameters: Set the current pen number as the default pen number parameter of the current document.

Basic parameter area:

Current pen number: Which group of processing parameters is currently used. In relief, the concept of "pen" is equivalent to a set of set processing parameters.

Parameter name: This is the pen number name, which can be customized.

On: Whether to use this pen.

Processing number: The number of processing times for each object in one marking is equal to the number of processing in its processing parameters

Speed: Indicates the marking speed of the current processing parameters

Power: represents the power percentage of the current processing parameters, 100% represents the maximum power of the current laser.

Current (YAG): Indicates the laser current used by the current processing parameters.

Frequency: Indicates the frequency of the laser for the current processing parameters.

MOPA pulse width: the time the laser turns on during the laser pulse cycle.

Q pulse width: Q pulse width The high level time of the Q pulse of the laser.

Light-on delay: the delay time for the laser to turn on when marking starts. Setting appropriate lighting delay parameters can eliminate the "match head" that appears at the beginning of marking, but if the lighting delay parameters are set too large, it will lead to the phenomenon of missing pens in the initial section. It can be a negative value, and a negative value means that the laser emits light in advance.

Light off delay: the delay time for laser to turn off at the end of marking. Setting appropriate light-off delay parameters can eliminate the non-closing phenomenon that occurs when marking is completed, but if the light-off delay is set too large, a "match head" will appear at the end of the segment. Cannot be a negative value.

End delay: Under normal circumstances, it takes a period of response time after the light-off command is issued until the laser is completely turned off. Setting an appropriate end delay is to give the laser sufficient light-off response time, so that the laser can be completely turned off. The purpose of the next marking is to prevent light leakage and spot throwing.

Corner delay: the delay time between each segment when marking. Setting appropriate corner delay parameters can remove the rounded corner phenomenon that occurs when marking right angles, but if the corner delay setting is too large, the marking time will increase, and there will be focus phenomena at the corners.

Marking step distance: the distance of each step in step distance mode.

Inter-step delay: The delay time between each step.

Pen Number Parameter Manager: Used to manage pen numbers globally and for each document.

Advanced parameter area:

Jump speed: Set the jump speed corresponding to the current parameter.

Jump position delay: jump position delay value.

Minimum jump delay: the minimum delay time when the galvanometer jumps.

Maximum jump delay: the maximum delay time when the galvanometer jumps.

Maximum jump distance: the maximum distance for the galvanometer to jump from one point to another.

Acceleration distance: Properly setting this parameter can eliminate the phenomenon of uneven marking at the beginning of marking.

Dot time: When there are points in the object, the light emitting time of each point.

Vector dotting mode: Forcefully define the fixed number of pulses emitted by the laser when processing each point.

Dither: Valid when checked. It is mainly used when marking single lines and needs to thicken the lines, which can save time and improve efficiency.

Diameter: The diameter of the spiral circle when dithering is marked, that is, the line width marked using dithering mode.

Spacing: The distance between the centers of two adjacent circles during jitter marking. Set the appropriate value according to the size of the point where the laser acts on the surface of the object. If the spacing is set too large, the marked lines will have shading, and if the spacing is set too small, the marking time will be increased.

12 EQUIPMENT PARAMETERS

12.1 Regional parameter

The device area parameters are shown in Figure 12-1:

Config Param[default] - LaserMark

Area Laser Port Others Red

Scan area

Area size 120.000 mm Offset X 0.000 mm

Maximum line length 2.000 mm Offset Y 0.000 mm

Light off distance 0.020 mm Rotation angle 0.000

☐ Use corrective documents

Manual correction

☐ XY Interchange ☐ X Reverse ☐ Y Reverse

X Scale 100.00000 >>

Y Scale 100.00000 >>

☐ Using configuration files Save parameters as >>

Destination after processing

☒ Do not move

☐ Scan center

☐ Top left of the object

☐ Top right of the object

☐ Bottom right of the object

☐ Bottom left of the object

☐ Specified location

X 0.000

Y 0.000

Calculate recommend values

Nine point correction

Ok Cancel

Figure 12-1 Regional parameters

Area size: the actual maximum marking range corresponding to the galvanometer.

Offset X: Indicates the X-direction distance by which the galvanometer center is offset

from the field lens center.

Offset Y: Indicates the Y-direction distance by which the center of the galvanometer is offset from the center of the field lens.

Angle: Adjust the angle of the galvanometer.

Maximum line length: The maximum length of line segments that can be split into graphics. It is used to split line segments in advance when sending data to improve marking accuracy.

Using calibration files: refers to using the calibration files generated by external calibration programs to calibrate the galvanometer.

XY swap: Swap the coordinate axes corresponding to the original galvanometer signal 1 and signal 2.

X reverse/Y reverse: used to set the reverse direction of the galvanometer output.



Indicates barrel or pincushion distortion correction coefficient, the default coefficient is 1.0 (parameter range 0.8-1.2).



Represents the parallelogram correction coefficient, the default coefficient is 1.0 (parameter range 0.8-1.2).



Represents the trapezoidal correction coefficient, the default coefficient is 1.0 (parameter range 0.8-1.2).

Ratio: scaling ratio, the default value is 100%. When the actual size marked is different from the size shown in the software, this parameter needs to be modified. When the actual size marked is smaller than the design size, increase the value of this parameter; when the actual size marked is larger than the design size, decrease the value of this parameter.

Note: If the laser galvanometer is deformed, the deformation must be adjusted first before adjusting the expansion and contraction ratio.

Save parameter as: Save the current distortion correction coefficient.

Use configuration file: read the saved distortion correction coefficient.

When setting the scale, you can press it directly. At this time, the dialog box shown in Figure 12-2 will pop up. You can enter the size set in the software and the actual marking size measured, and the software will automatically calculate the scaling ratio.

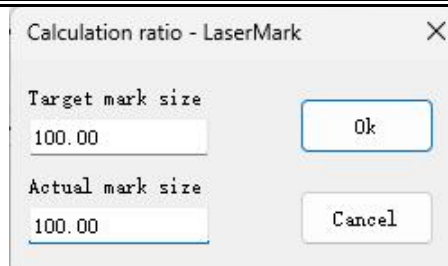


Figure 12-2 Setting scale parameters

Equal ratio method: whether to use equal bisectors to calculate the scaling ratio during correction.

Go to the specified position after processing: Set the galvanometer to move to the specified position after the current processing is completed.

Calculate recommended values: Enter theoretical values and measured values and click to automatically generate recommended values, as shown in Figure 12-3.

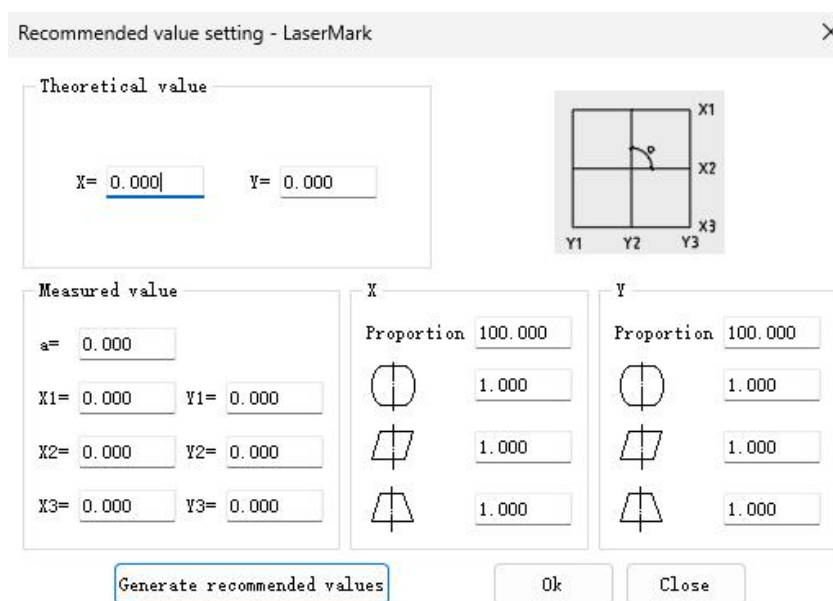


Figure 12-3 Recommended values

Theoretical value: the size of the drawn rectangular box

Actual measurement: The actual size obtained by measuring the marked rectangular frame.

Generate recommended values: Recommended values can be automatically generated after clicking.

OK: Click OK to automatically generate the generated recommended values into the regional parameters.

X direction, Y direction:

Proportion: Automatically generate the recommended proportion value based on the input theoretical value and recommended value.



Automatically generate barrel or pincushion distortion correction coefficients, the default coefficient is 1.0 (parameter range 0.8-1.2).



Automatically generate parallelogram correction coefficients, the default coefficient is 1.0 (parameter range 0.8-1.2).



Automatically generate trapezoidal correction coefficients, the default coefficient is 1.0 (parameter range 0.8-1.2).

12.2 Laser control parameter

Equipment laser parameters, please adjust according to the actual parameters and application conditions of the laser equipment. As shown in Figure 12-4 to Figure 12-9.

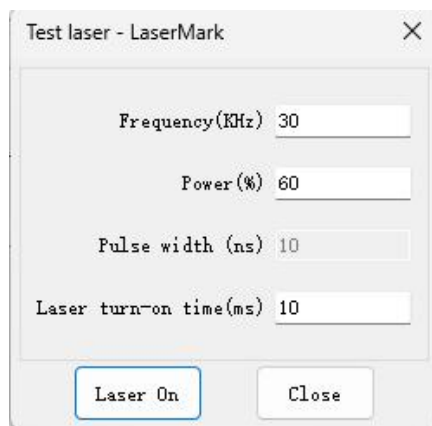


Figure 12-4 Test laser interface

Frequency (kHz): Laser light frequency.

Power: laser output power.

Pulse width: Laser light signal pulse width.

Laser turn-on time (ms): the light emission time after the test laser is turned on.

Turn on laser: Turn on the laser to emit light. After the light emitting time reaches the set laser on time, it will stop emitting light.

Close: Close the test laser window.

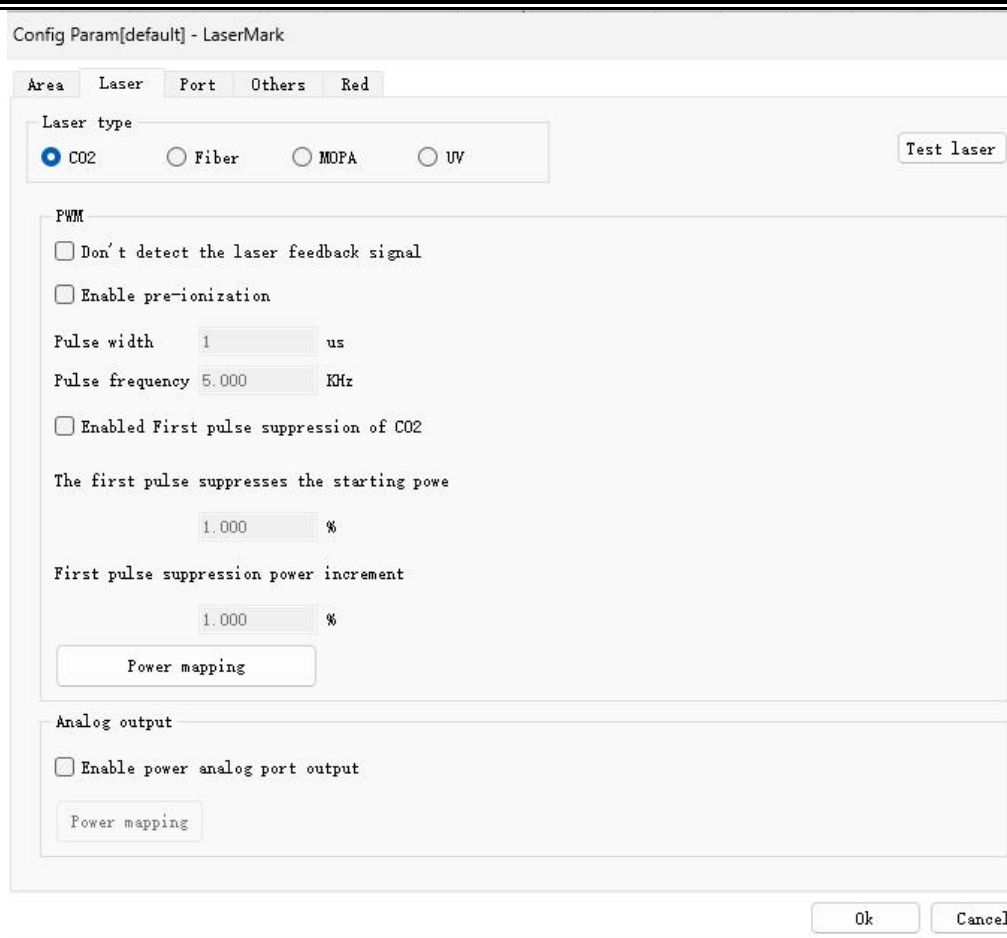


Figure 12-5 CO2 laser parameter setting interface

Laser type: Select the laser type according to the laser equipment: CO2, YAG, Fiber, MOPA, UV.

Power mapping: PWM signal power mapping control, set the main interface to set the corresponding relationship between the PWM value corresponding to the power data and the actual output PWM value.

Do not detect the laser feedback signal: do not judge the laser feedback status signal, and will not alarm when the laser fails.

Enable pre-ionization: turn on/off the pre-ionization function.

Pulse Width: Set the pre-ionization pulse width.

Pulse frequency: Set the pre-ionization pulse frequency.

Enable CO2 first pulse suppression: Turn on/off the first pulse suppression function.

First pulse suppression starting power: The power of the first pulse of first pulse suppression.

First pulse suppression power increment: First pulse suppression starts from the first pulse, and the power increment of subsequent pulses.

Enable power analog port output: select whether to use analog output.

Power mapping: Analog signal power mapping control, set the main interface to set the corresponding relationship between the analog value corresponding to the power data and the actual output analog value.



Figure 12-6 YAG laser parameter setting interface

Enable villet first pulse suppression: start/stop the first pulse suppression function. The suppression time needs to be set when starting.

Open Q switch when the first pulse suppression ends: set the Q switch to open when the first pulse suppression ends.

Pulse width inversion: pulse width inversion.

Enable pulse width setting: turn on/off the pulse width setting in the pen parameters of the main interface.

Do not detect laser feedback signal: do not judge the laser feedback status signal, and there will be no alarm when the laser fails.

Enable current output: select whether to use analog output.

Power mapping: analog signal power mapping control, set the corresponding relationship between the analog value corresponding to the power data set on the main interface and the analog value of the actual output.

Config Param[default] - LaserMark

Area Laser Port Others Red

Laser type

☐ CO2 ☒ Fiber ☐ MOPA ☐ UV Test laser

PWM

Max PWM signal 200.000 KHz

Min PWM signal 20.000 KHz

Power mapping

Fiber

Types Of IPG-YLP

Switch

☐ Don't detect the laser feedback signal

☐ Light leakage treatment

Turn on the MO delay 8 ms

Ok Cancel

Figure 12-7 Fiber laser parameter setting interface

Maximum PWM signal: Set the upper limit of PWM signal output frequency.

Minimum PWM signal: Set the lower limit of PWM signal output frequency.

Power mapping: Set the corresponding relationship between the main interface setting power data and the actual output value.

Fiber type: Select the corresponding Fiber laser type.

Do not detect the laser feedback signal: do not judge the laser feedback status signal, and will not alarm when the laser fails.

Light leakage processing: Enable/stop the light leakage processing working mode. Turn off the MO signal every time the light is turned off.

MO opening delay: the time interval between MO opening and AP opening.

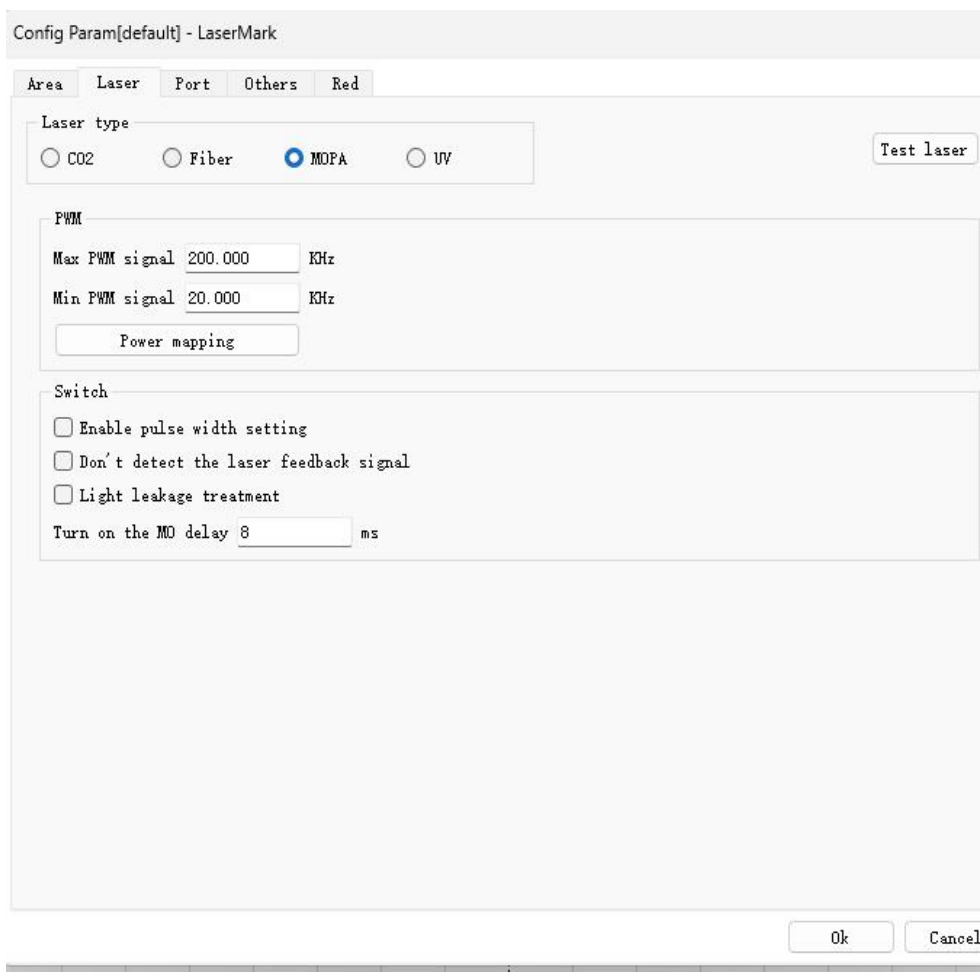


Figure 12-8 MOPA laser parameter setting interface

Maximum PWM signal: Set the upper limit of PWM signal output frequency.

Minimum PWM signal: Set the lower limit of PWM signal output frequency.

Power mapping: Set the corresponding relationship between the main interface setting power data and the actual output value.

Enable pulse width setting: Turn on/off the pulse width setting function.

Do not detect the laser feedback signal: do not judge the laser feedback status signal, and will not alarm when the laser fails.

Light leakage processing: Enable/stop the light leakage processing working mode. Turn off the MO signal every time the light is turned off.

MO opening delay: the time interval between MO opening and AP opening.

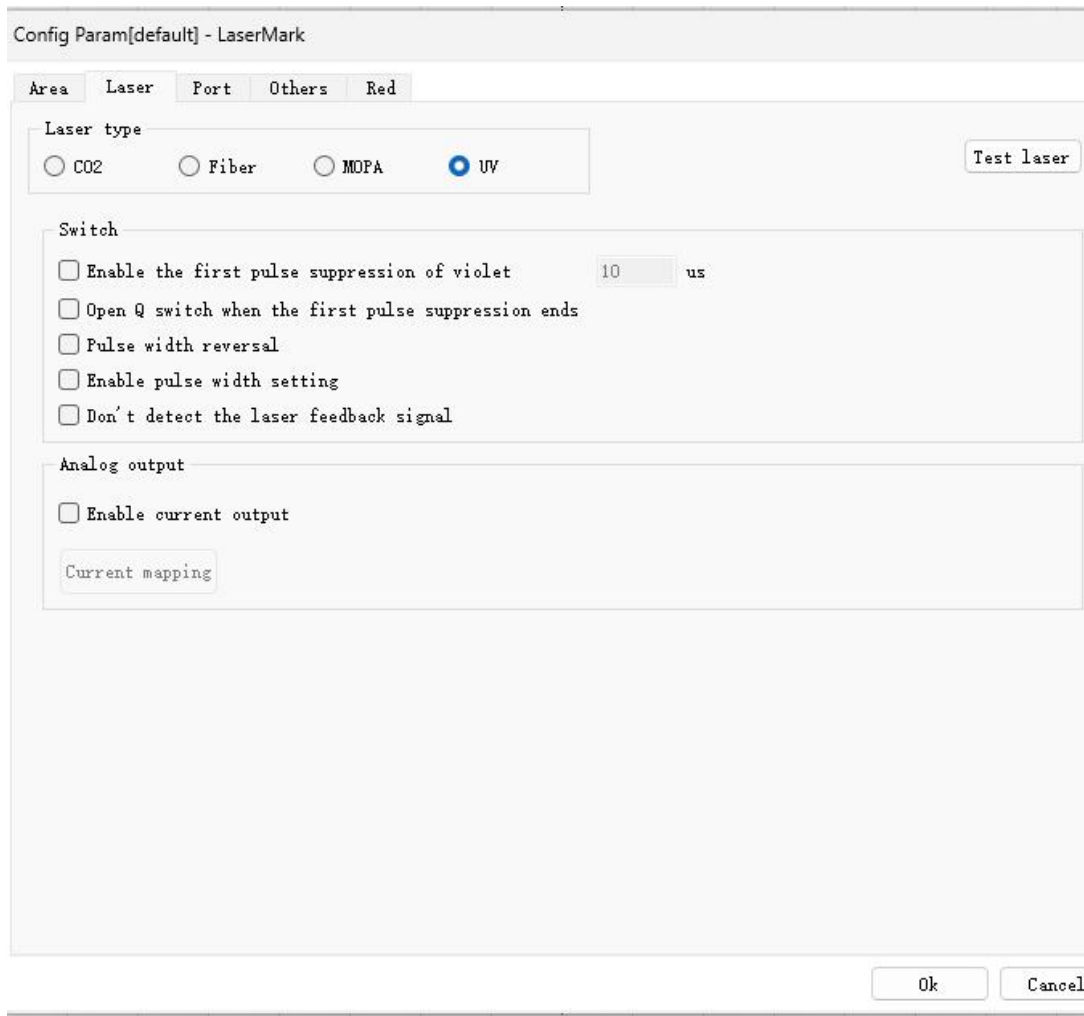


Figure 12-9 UV laser parameter setting interface

Parameter settings have the same function as YAG laser parameters.

12.3 Port parameter

The device port parameters are shown in Figure 12-10.

Figure 12-10 Device port parameter setting interface

Stop processing input port: Designate an input port as the stop processing port. When it is detected that the set port has a corresponding input during processing, the current processing will be terminated and a prompt message for stopping processing will pop up. And output a pulse of specified width at the set output port.

Door port: Check the port signal for opening and closing of the safety door. When the user opens the safety door, processing will automatically stop. Processing can only be performed when the safety door is closed. This is used to protect the operator from laser burns. The red light indication can continue when the door is open.

Laser power output port: This port can be used to control the laser power on and off.

Red light indication output port: When the system performs red light indication, it will output a high level to the designated output port.

Marking output port: When the system performs marking processing, it will output a high level to the designated output port.

Start marking port: When the system is not in the marking state, if the output of the specified input port is high level, the system will automatically start marking.

Marking end output IO: When the system completes marking, it will output a high level to the designated output port.

Start signal pulse mode: Check this option to indicate that the software processes the start signal in pulse mode. Even if it is a continuous level input, the software only reads one pulse. If unchecked, the input port will be processed as a continuous level.

IO trigger will only mark active documents: After checking, IO trigger will only mark active documents.

Hardware trigger: Checking this option means that the software will continuously send the content to be marked to the board, and the board will mark directly after receiving the IO port signal. This saves the time of requesting data from the software.

Filter time: The filter time set to prevent false triggering or clutter interference.

Laser alarm detection: Detect the laser status port. When the status port is different from the set normal status, or is the same as the abnormal status, a pop-up window will alarm. And output the specified width pulse at the set output port.

Laser alarm port setting: When the normal state is enabled, a normal state is set, and other states are judged to be abnormal states; when the abnormal state is enabled, an abnormal state is set, and other states are judged to be normal states.

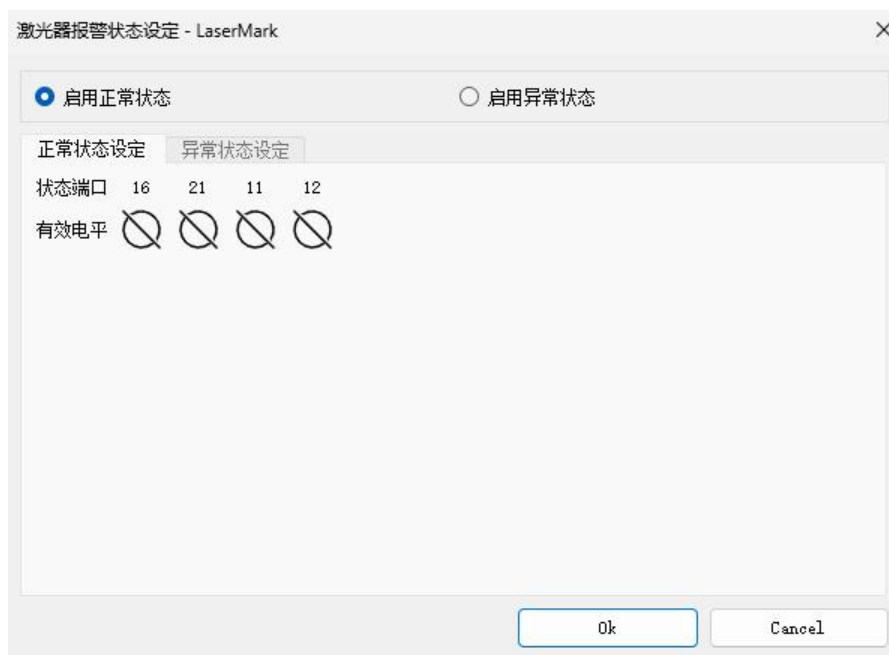
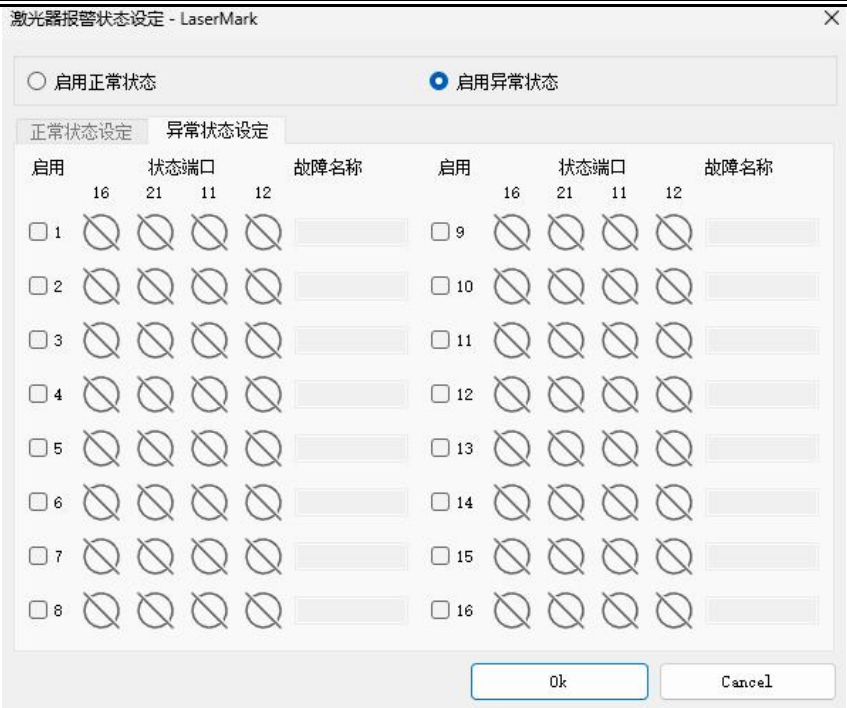
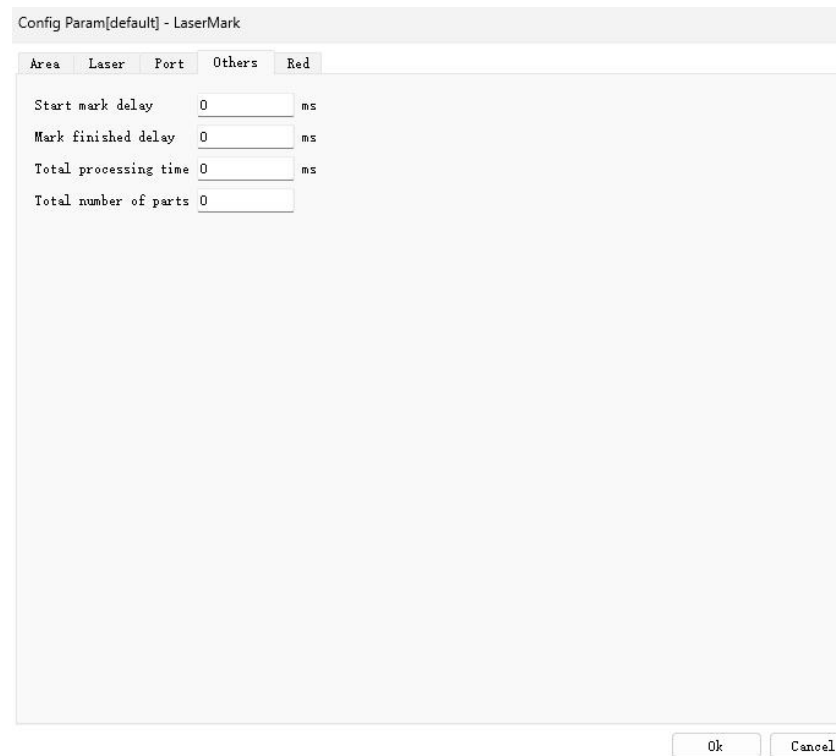


Figure 12-11 Laser alarm normal status setting interface



12.4 Others

Other parameter setting interfaces are shown in Figure 12-13.



Start marking delay: Each time you start processing, you need to delay the specified time before starting marking.

End marking delay: Each time you end processing, you need to delay the specified time before ending marking.

Total processing time: The total processing time of the equipment.

Total number of parts: The total number of parts processed by the equipment.

12.5 Red light indication

The red light related parameter setting interface is shown in Figure 12-14:

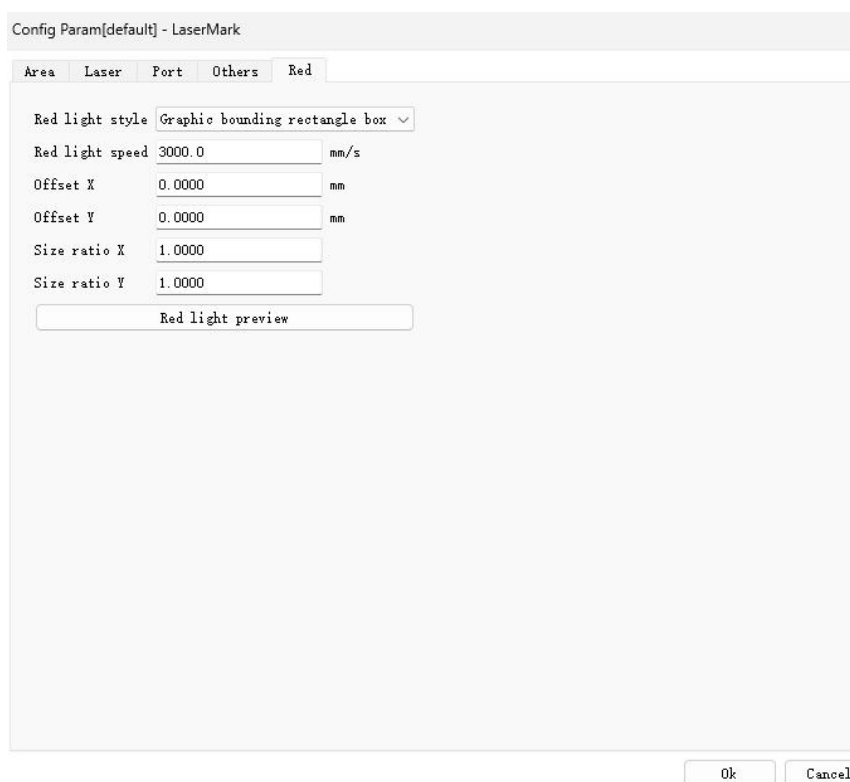


Figure 12-14 Red light indication

Red light style: used to select whether the red light displays the surrounding rectangular frame of the graphic or the outline of the graphic.

Red light speed: the moving speed of the galvanometer in the red light preview state.

Offset position: Indicates the offset position of the system's movement when the red light is indicated, and is used to compensate for the position error between the red light and the actual laser.

Size ratio: refers to the size deviation between red light and laser. Adjusting this parameter can make the laser and red light completely coincide.

Built-in red light mode: Select according to the actual red light configuration of the laser.

Red light preview: Preview the red light effect of the current setting.

13 3D MARKING

13.1 3D marking process

Import 3D model → 3D model slice → Modify slice attributes → Slice element filling → Select 3D processing mode → 3D processing

13.2 Model import

1) 、Click "STL" to import the 3D model in *.stl format.

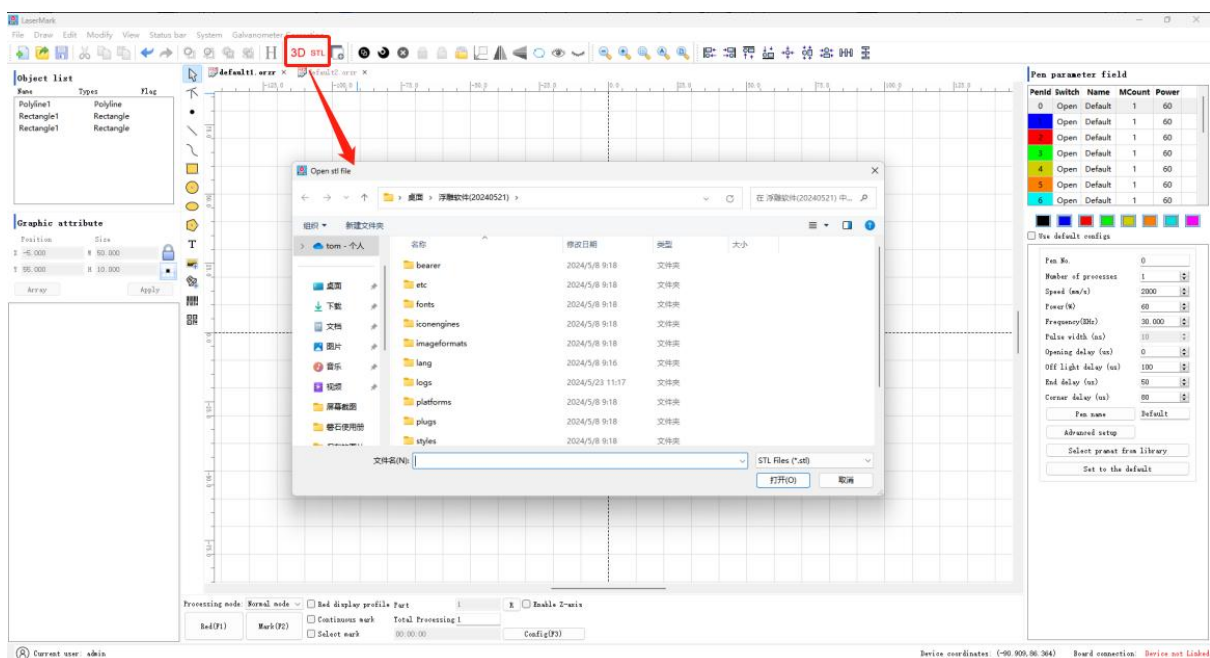


Figure 13-1 Model import

2) Click "3D" to switch the graphical interface display from 2D mode to 3D mode.

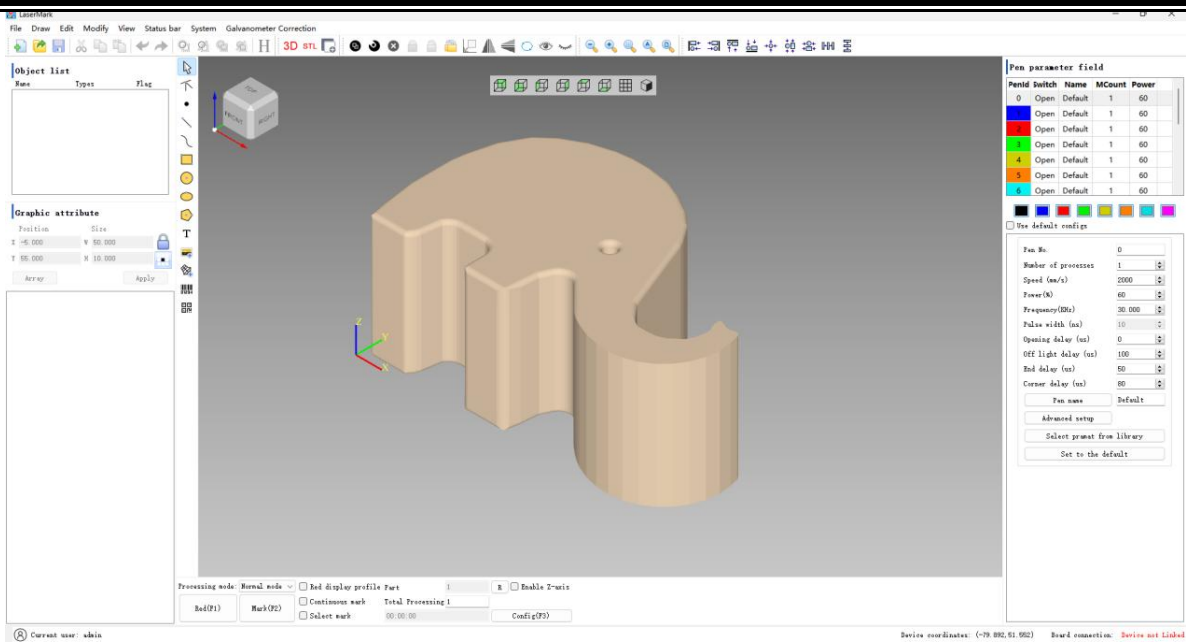


Figure 13-2 Model display

If you need to perform 2D marking, click "2D" and the graphical interface display will switch from 3D mode to 2D mode.

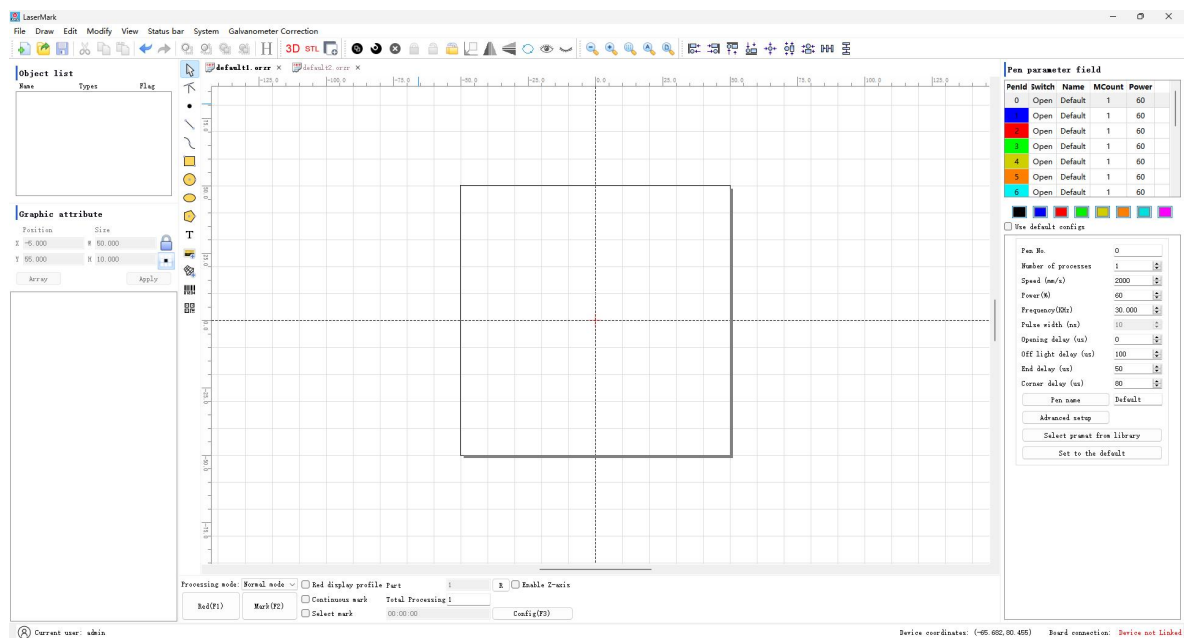


Figure 13-3 2D model

13.3 Model slicing

- 1) Click "Slice" on the 3D interface to pop up the slice setting window.

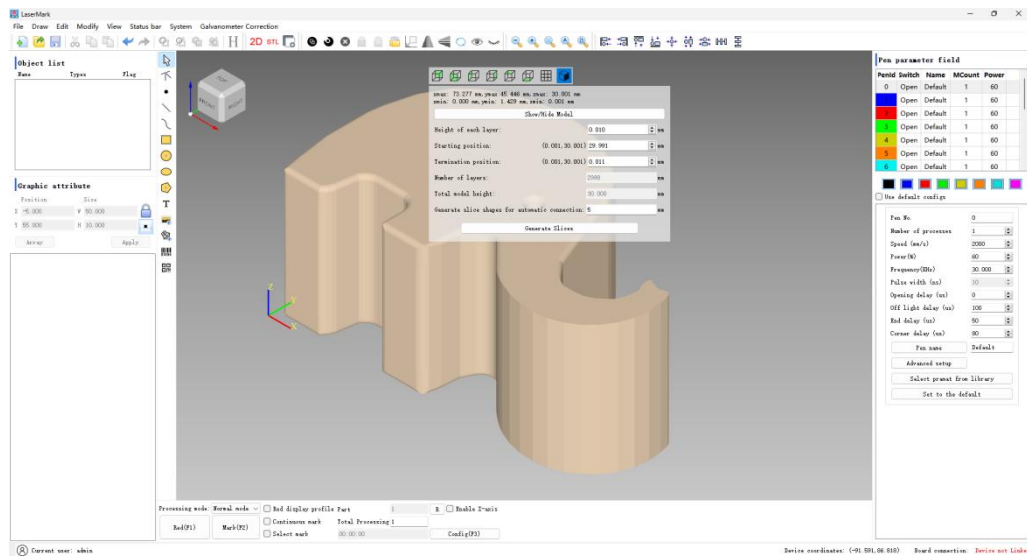


Figure 13-4 Slicing settings

- 2) After setting the parameters, click "Generate Slice" and the software will slice the 3D model and automatically switch to the 2D view interface after completion.

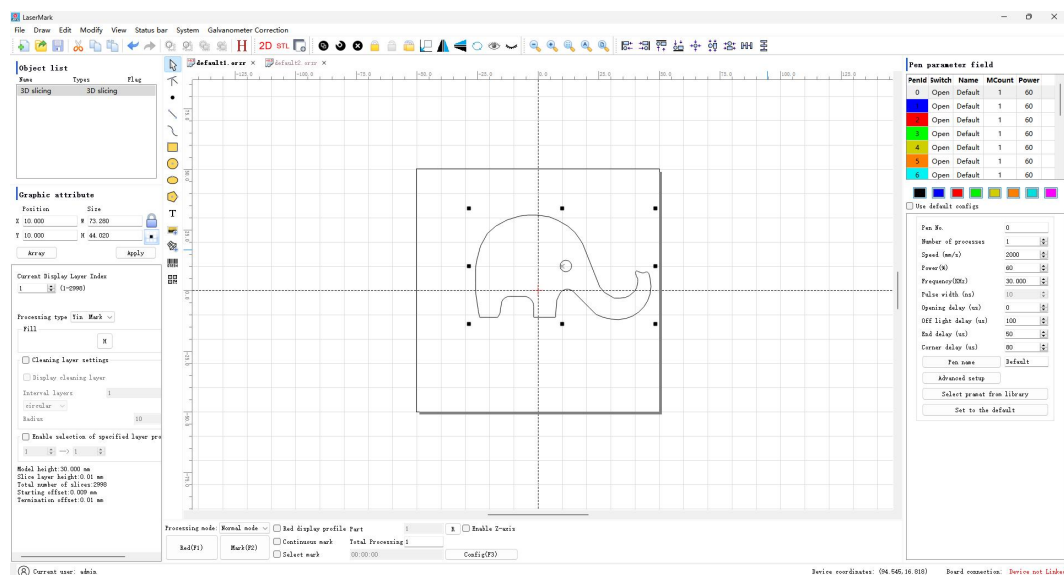


Figure 13-5 Slicing completed

Height of each floor: the height from each floor to the next floor.

Starting position: The Z-direction position of the first layer of slices generated. When set to the highest position of the model, the resulting slice has no primitives.

End position: Z-direction position of the last layer of slices generated.

Number of layers: The total number of slice layers generated based on the set layer height, starting position, and ending position.

Total model height: the height of the model (Z-direction dimension).

Show/hide model: Click to perform the hide model operation when the model status is displayed; click to perform the display model operation when the model status is hidden.

Generate slice: perform slicing operation after clicking.

13.4 Slice attribute modification

The attribute management of 3D slice primitives is shown in the figure 13-6.

Graphic attribute

Position		Size	
X	10.000	W	73.280
Y	10.000	H	44.020

Array Apply

Current Display Layer Index
1 (1-2998)

Processing type Yang Mark

Yangdiao Settings
circular
Radius 10

☐ Cleaning layer settings
☐ Display cleaning layer
Interval layers 1
circular
Radius 10

☐ Enable selection of specified layer primitive
1 → 1

Model height: 30.000 mm
Slice layer height: 0.01 mm
Total number of slices: 2998
Starting offset: 0.009 mm
Termination offset: 0.01 mm

Figure 13-6 Relief attributes

Position: The position of the model projection. You can move the primitive by modifying this parameter.

Size: The size of the model projection. You can change the size of the primitive by modifying this parameter.

Application: After modifying parameters such as position, size, outline, etc., you need to click the Apply button for the parameters to take effect.

Current display layer: Switch the path to display the current 2D view display layer according to the set number of layers.

Processing type: Convex carving or Concave carving.

Select the outer contour of the yang carving: select the outer contour of the convex carving.

Note: When setting the outline of the convex carving, it is necessary to set a size larger than the Z-direction projection of the model.

Fill: Path filling for each layer, all at once.

Cleaning layer settings: Set the cleaning outer contour, set the filling parameters of the cleaning layer separately, and set the number of cleaning interval layers.

Enable selected layer processing: select the specified layer for processing.

The slicing parameters are displayed at the bottom of the attribute parameters.

13.5 Processing parameter setting

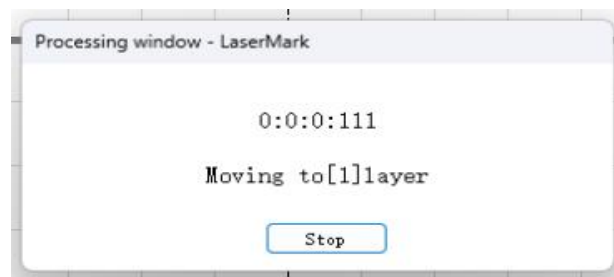


Figure 13-7 Marking status pop-up window

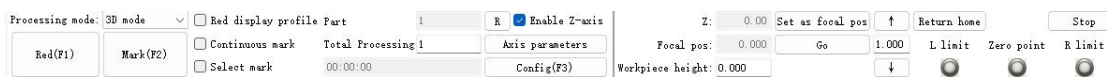


Figure 13-8 3D processing control

Processing model: 3D mode/normal mode can be selected. 3D primitive processing must select 3D mode, and 2D primitive processing must select 2D mode.

Red light: Display the red light of the current layer.

Marking: Start marking processing.

Marking status: Display the status bar in the above figure, including: moving to [N] layer,

engraving [N] layer, and cleaning [N] layer.

Axis parameters: Open the motion axis parameter configuration interface.

Parameters: Open the device parameter configuration interface.

Parts: The current number of parts that have been processed.

R: Clear the current part processing quantity to zero.

Total: The total number of processed parts.

Enable Z axis: Open the Z axis configuration toolbar.

Z: Current Z-axis real-time position.

Set as focal plane: Set the current Z-axis position as the focal plane.

Focal plane: The focusing position of the galvanometer.

GO: Move to the focal plane.

Workpiece height: the height of the processed material.

Return to zero: Z axis return point.

Stop: Stop Z-axis movement.

↑ : Move up the set distance.

↓ : Move down the set distance.

L limit Zero point R limit


: Display the status of the upper and lower limit and zero point sensors.

13.6 Axis parameter configuration

Used to set and maintain the parameters of the extended axis. Currently, up to 1 extended axis is supported, as shown in Figure 8-2.

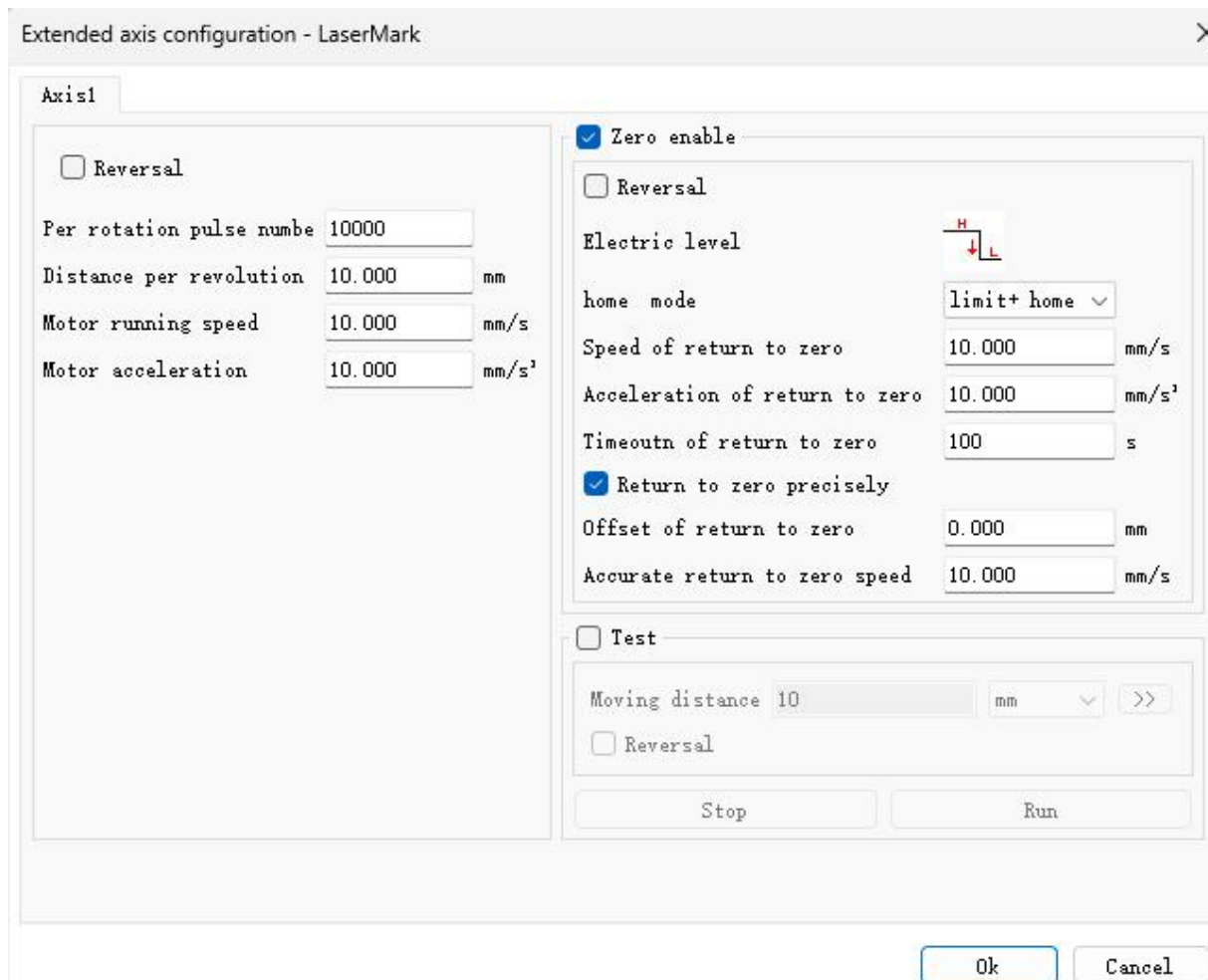


Figure 13-9 Axis parameter settings

Reverse: means the expansion axis moves in the opposite direction; when checked, it means the expansion axis is reversed;

Number of pulses per revolution: The number of pulses (subdivisions of the drive motor) required for the expansion axis motor to rotate once, which can be set according to the parameters of the motor.

Distance per revolution: The corresponding translation distance when the extension axis motor rotates once, in millimeters.

Minimum coordinate: The minimum coordinate that the expansion axis can move, in millimeters.

Maximum coordinate: The maximum coordinate that the expansion axis can move, in millimeters.

Motor starting speed: the set speed when the motor starts moving, unit pulse/second.

Motor running speed: the rotation speed of the motor during smooth movement, unit pulse/second.

Acceleration time: The time required for the expansion axis to accelerate from the minimum speed (starting speed of the motor) to running, in milliseconds.

Rotation axis: Whether to rotate the axis.

Reduction ratio: If the motor is directly connected to the rotating shaft, the reduction ratio is 1. If there is a reduction mechanism in the middle, it is the reduction ratio of the reduction mechanism.

Gap compensation: used to set the position interval compensation between independent graphics. For example, the interval set between two graphics is 10 mm. If the mark is 10.1, then the gap compensation bit - $(10.1 - 10) = -0.1$.

Zero point enable: Whether the current expansion axis has a zero point signal. When the extended axis does not enable the zero signal, the extended axis cannot establish an absolute coordinate system. At this time, the position needs to be manually adjusted so that each processing is performed at the same position. The system uses the current extended axis position as the default before each processing. the origin position.

If zero point is checked, the zero point will be automatically found when using the extended axis function. After finding the zero point, the extended axis will establish an absolute coordinate system. If the system does not find the zero point, it will not start the extended axis function normally until the time set by the "zero timeout" expires.

Level: whether the zero signal is high or low.

Zero return running speed: the movement speed of the extended axis when searching for the zero signal.

Zero return acceleration: the acceleration when the extended axis searches for the zero signal.

Zero return timeout: Set the time used by the extended axis to find the zero point. If this time is exceeded, the system will prompt "zero return timeout".

Accurate zero return: When checked, three signals are required to return to zero before

the zero return can be successful. If not checked, zero return is completed after receiving one signal.

Zero return offset: the offset value between the actual zero return position and the theoretical zero return position.

Test: Used to test the extended axis and calculate the distance per revolution.

13.7 3D processing

Step 1: Determine the focal plane. That is, move the Z-axis up and down to make the focus of the laser on the equipment processing area table, and then click the "Set as focal plane" button.

Step 2: And set the height of the workpiece. Make sure that when processing, the Z-axis can move the laser correctly to keep the focus at the required processing height.

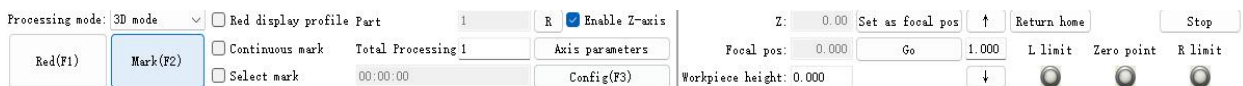
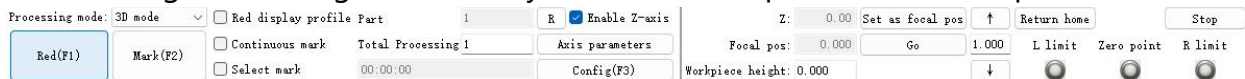


Figure 13-10 3D processing parameter settings

Step 3: After the settings are completed, select the 3D mode for the processing mode, then place the processing material under the galvanometer, determine the processing position through the red light, and finally click "Mark" to process the relief product.



14 ORDINARY MARKING

The marking dialog box is at the lower right of the relief interface, as shown in Figure 14-1, which is the processing dialog box.



Figure 14-1 Marking dialog box

Processing mode: Normal mode/3D mode can be selected.

Red light: Marks the center point of the figure to be marked, but does not emit laser light. Used to indicate the processing area to facilitate users to position the workpiece. This function is used for marking machines with red indicator light. You can execute this command directly by pressing the F1 key on the keyboard.

Marking: Start processing. Simply press the F2 key on the keyboard to execute this command.

Continuous processing: means processing the current file repeatedly without pausing in the middle.

Selective processing: Only the selected objects are processed.

Auto red light: Automatically display the red light of the currently selected primitive.

Red light outline: The red light shows the outline of the graphic element.

Parts: Indicates the total number of parts currently processed.

Total: Indicates the total number of parts to be processed currently, which is invalid in continuous processing mode. When not in continuous processing mode, if the total number of parts is greater than 1, processing will continue until the number of parts processed equals the total number of parts.

R: Clear the processed parts.