# BRAVE KING LASER

## Laser Marking System

# Software Operation Manual

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# Contents

# Document Version State

| Version | Date | Responsible Person | Remarks |
|---|---|---|---|
| V1.0 | 2021.07 | Brave King Laser Mike | |
| | | | |

# Special Notice

1. Please read this section carefully before using this product.

2. This product is used to control the laser scanning system. If you have any questions, please contact our company in time.

3. Please turn on the laser power after the control board card and the vibrator power is turned on, otherwise it may cause damage due to uncontrollable laser beam.

4. Laser radiation will affect human health. This set of products does not provide safety protection accessories. Please be sure to comply with all relevant laser safety regulations before installation and operation.

5. Please avoid the board card from being damaged by moisture, dust, corrosive substances and foreign objects. When storing and using the board, please avoid electromagnetic field and static electricity damage.

# Chapter 1 Summary of SC1405 Scanning System

The system is equipped with the handheld scanning galvanometer, control board and operating software independently developed by our company, which can process metal materials such as stainless steel, carbon steel, aluminum, etc., which is convenient for multi-angle marking in narrow work scenes and is suitable for large equipment , On-site hand-held marking of heavy workpieces, such as large pipes, car frames, etc. The comprehensive performance indicators have reached international technical standards, and the specific characteristics are as follows:

◆ **Precise positioning**: The scanning galvanometer adopts high-performance scanning motor and international leading photoelectric sensor technology. The differential photoelectric sensor accurately detects the position of the motor rotor, with good linearity, small drift, high resolution and repeat positioning accuracy.

◆ **Easy to move**: The hand tool is light and convenient, and it can be moved anytime and anywhere to overcome the problem of small space.

◆ **Stable performance**: with independent research and development software, stable and smooth operation.

◆ **Humanized operation**: using a touch screen control system, the operation is simple and easy to use, supports two languages switching between Chinese and English, can be transmitted via USB cables, and handles multiple file formats such as QR codes and barcodes.

◆ **Wide range of applicable materials**: suitable for most metal materials, such as stainless steel, carbon steel, aluminum, iron, copper, zinc, etc.

◆ **Diversified application industries**: widely used in electronic components, hardware tool products, electrical products, consumer goods, sensors, auto parts, 3C electronics, handicrafts, precision equipment, gift accessories, medical equipment, high and low voltage electrical appliances, sanitary ware industries, Battery industry, IT industry and other fields.

# Chapter 2 SC1405 Technical Parameters

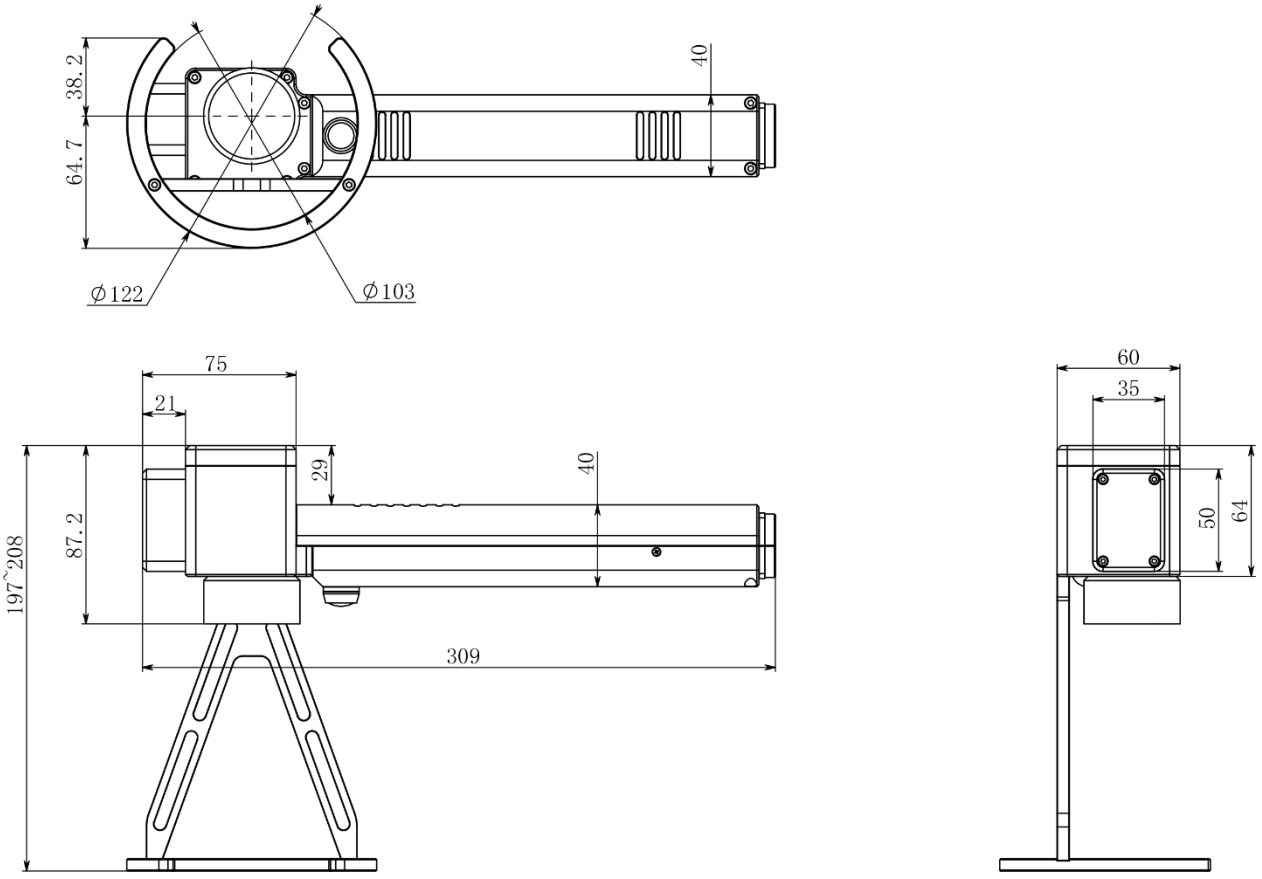
| | |
|---|---|
| **Speed** | |
| Marking Speed[(1)] | 4000mm/s |
| Positioning Speed[(1)] | 9000mm/s |
| Writing Speed[(2)] | 350cps |
| Step Response Time(1% of full scale) | 352us |
| Step Response Time(10% of full scale) | 440us |
| Tracking Error Time | ≤176us |
| **Precision and Error** | |
| Linearity | 99.9% |
| Repeatability (RMS) | ＜8μRad |
| Gain Error | ＜5mRad |
| Zero Offset | ＜5mRad |
| Long-term Drift Over 8 Hours | ＜0.5mRad |
| Scale Drift | ＜40PPM/℃ |
| Zero Drift | ＜15μRad/℃ |
| **Lens damage threshold** | |
| K9 matrix | 9.1J/cm^2 |
| Wavelength | 1064nm |
| **Power and Signal** | |
| Input Voltage | ±15VDC |
| Rated Current | 2A |
| Interface Signal | XY2-100 |
| Max Machinery Scan Angle[(3)] | ±11° |
| **Working Current, Temperature, Dimension** | |
| Working Temperature | 0℃--45℃ |
| Storage Temperature | -10℃--60℃ |
| Aperture | 7mm |
| Marking Format | 70×70mm/110×110mm |
| Galvanometer Scanner Dimension (LxWxH) | See Housing Dimension Drawing |
| Galvanometer Scanner Weight | ≈0.9Kg |

Note: The above data are tested after 30 min warm-up
(1) With F-theta objective, F=160mm, marking 2mm height single character
(2) With F-theta objective, F=160mm, marking 1mm height single character per second
(3) If any special requirement, customization is available. Factory default value is ±11°.

# Chapter 3 The Galvanometer Structure and Wiring

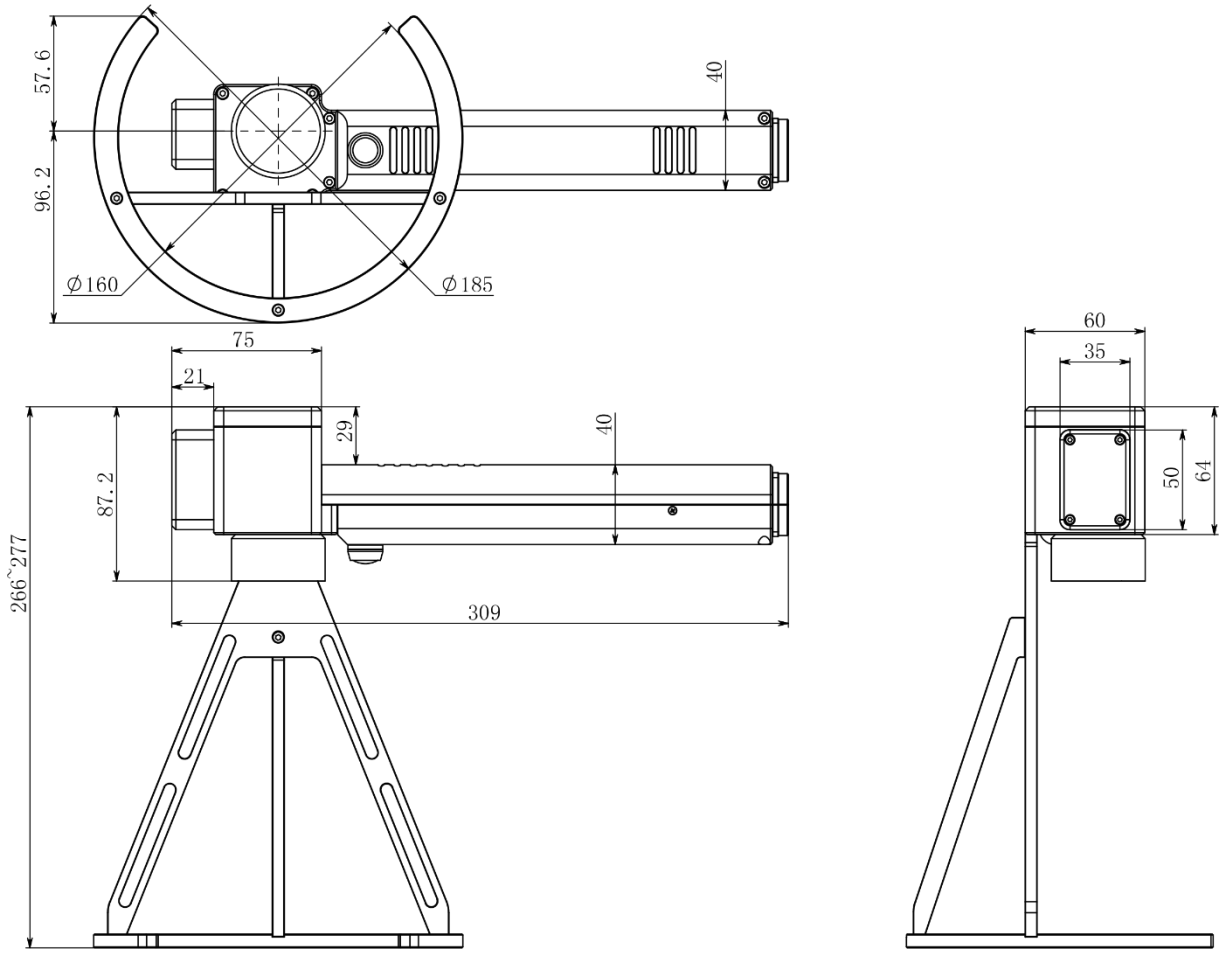
## 3.1 Hand-held Scanner Housing (Format: 70×70mm)

## 3.2 Housing Dimension Drawing (Format: 70×70mm)



## 3.3 Hand-held Scanner Housing (Format: 110×110mm)

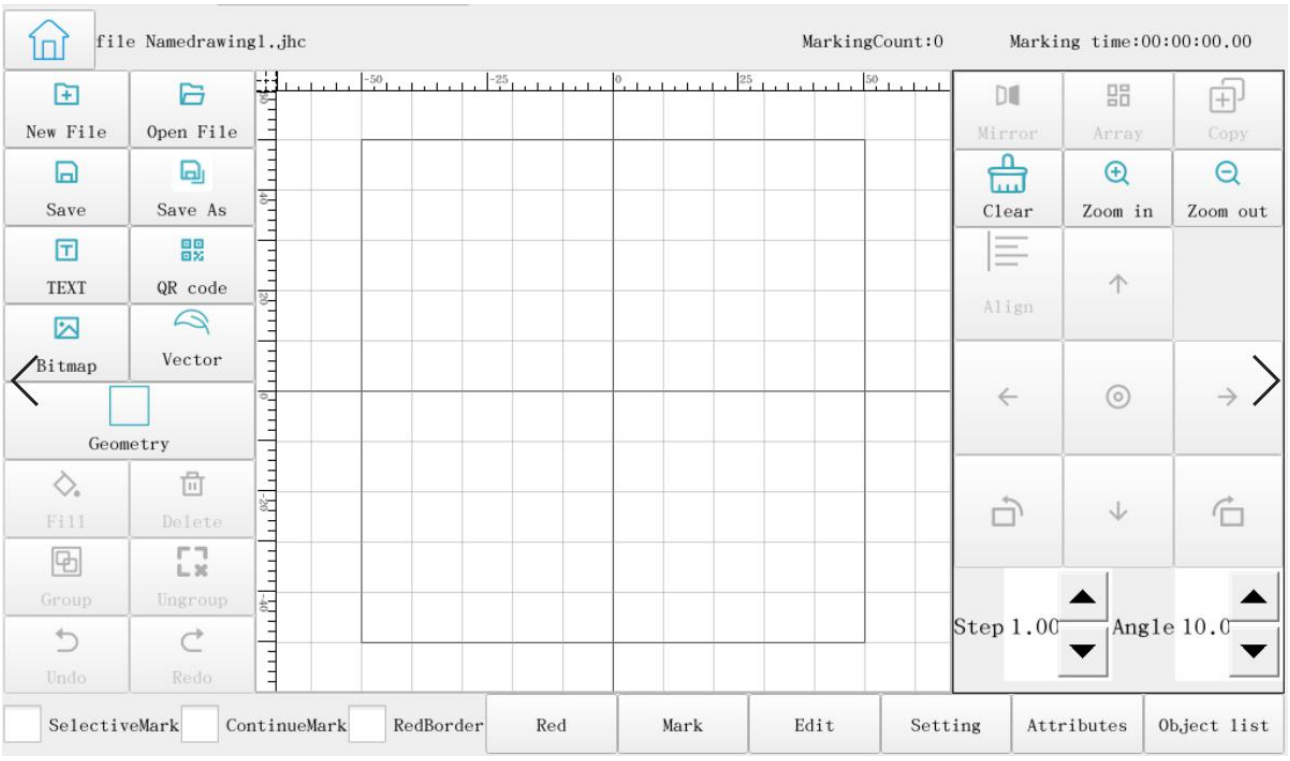
## 3.4 Housing Dimension Drawing (Format: 110×110mm)



# Chapter 5 Software Introduction

## 5.1 Software startup interface and main interface


**Startup interface**




**Software main interface**

# 5.2 Toolbar button description

## 5.2.1 Create a new file

The toolbar icon is 

, create a new workspace for drawing. When you select "New File", the software will close the file you are currently editing and create a new file at the same time. If the file you are currently editing is not saved, the software will prompt you whether to save the file.

## 5.2.2 Open file

The toolbar icon is 

, open a saved file, and "Open File" is used to open a file saved on the hard disk. When you select "Open File", a file opening dialog box will appear, asking you to select the file you want to open.

## 5.2.3 Save

The toolbar icon is 

, overwrite the original file, and "Save" saves the graph being drawn with the current file name.

## 5.2.4 Save as

The toolbar icon is 

, set the file name, "save as" is used to save the currently drawn graph as another file name, both of which realize the function of saving the file, when you click "save as", a dialog box will appear, select the location to save.

**Note:** If the current file already has a file name, when you click "Save", you will directly save the drawing you are currently drawing with the file name, otherwise a file dialog box will pop up, asking you to select the path to save the file and set the file name . "Save As" is different from this. Regardless of whether the current file has a file name or not, when you use "Save As", the system will pop up a file dialog box asking you to confirm the save path and file name.

## 5.2.5 Text

The toolbar icon is 

, add a TEXT text in the middle of the drawing area.

### 5.2.6 QR code

The toolbar icon is 

, add a QR code in the middle of the drawing area.

### 5.2.7 Bitmap

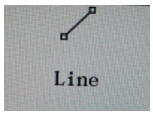
The toolbar icon is 

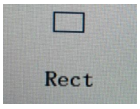
, read the image file, click "bitmap", you can add the image content in the specified file to the drawing area. The software supports the import of files in bmp and jpg formats. After the image content is imported, click the left mouse button in the drawing area, and the image you choose to import will appear. After clicking Import Image File, a dialog box as shown in the figure will appear. At this point, you can select the image you want to import, and click Open after selecting.

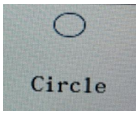
### 5.2.8 Geometry

The toolbar icon is 

, and geometric figures include straight lines, rectangles, and circles.

- Straight line: The icon on the toolbar is 

, and a straight line can be drawn.
- Rectangle: The toolbar icon is 

, and a rectangle can be drawn.
- Circle: The icon on the toolbar is 

, and a circle can be drawn.

### 5.2.9 Vector graphics

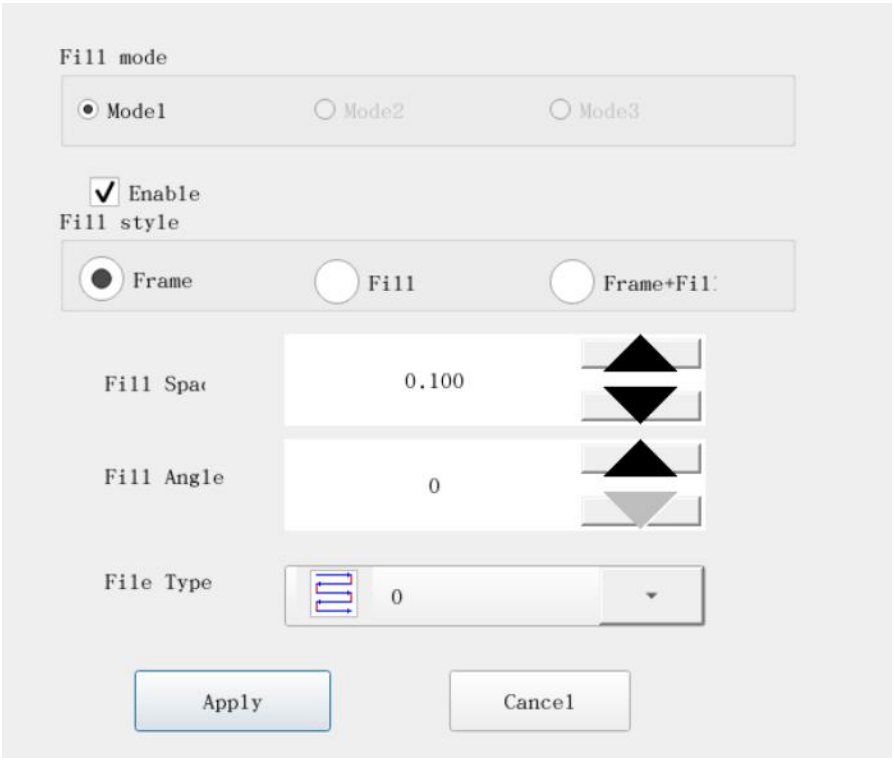
The toolbar icon is 

, read the vector file, click "vector", you can add the image content in the specified file to the drawing area. The software supports file import in dxf, plt, and ai formats. After the vector content is imported, there is no need to click the left mouse button in the drawing area, and the graphics will appear directly in the drawing area. After clicking "vector", a dialog box as shown in the figure will appear, which is the same as importing an image file. After selecting the file, click Open to complete the file import.


### 5.2.10 Fill

The toolbar icon is 

, fill the selected closed graphics. Click "Fill" and the interface as shown in the figure below will appear. To use the filling function, you need to check "Enable".

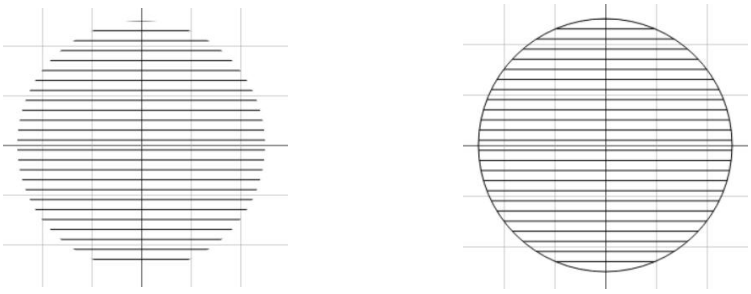



- Border: It is not filled.
- Filling: Fill the closed graphics.

● Border + Filling: Indicates whether to display and mark the outline of the original graphic. That is, whether the filled figure retains the original outline.

● Filling interval: the interval between the filling lines, the value is 0.001-10. (Set according to actual spot)

● Filling angle: the angle between the filling line and the positive X axis, the value is 0-180° .



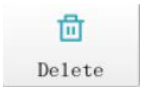
As shown in the figure, the left side is Filling, the right side is Border + Filling

● Filling type: The filling type is divided into one-way filling and two-way filling.

● One-way filling: the toolbar icon is  , and the filling line is always filled from left to right.

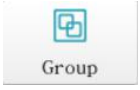
● Two-way filling: the toolbar icon is  , the filling line is filled from left to right first, then from right to left, and the rest is filled in a loop.

## 5.2.11 Delete

The toolbar icon is 

, remove the selected graphics in the drawing area.

## 5.2.12 Combination

The toolbar icon is 

, "Combination" is to remove all the selected objects from the attributes of the original object and combine them together as a new polyline object. The combined graphic object can be selected, copied, pasted, and set just like other graphic objects. Object attributes.

### 5.2.13 Dissolution

The toolbar icon is 

, "Dissolve" is to restore the combined objects to individual polyline objects.

### 5.2.14 Undo

The toolbar icon is 

, clear the operation content of the previous step. During the graphical editing operation, 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.

### 5.2.15 Redo

The toolbar icon is 

, restore the content of the previous step. After undoing the current operation, you can use the "Redo" function to restore the canceled operation. This is one of the most commonly used functions for editing.

### 5.2.16 Mirror

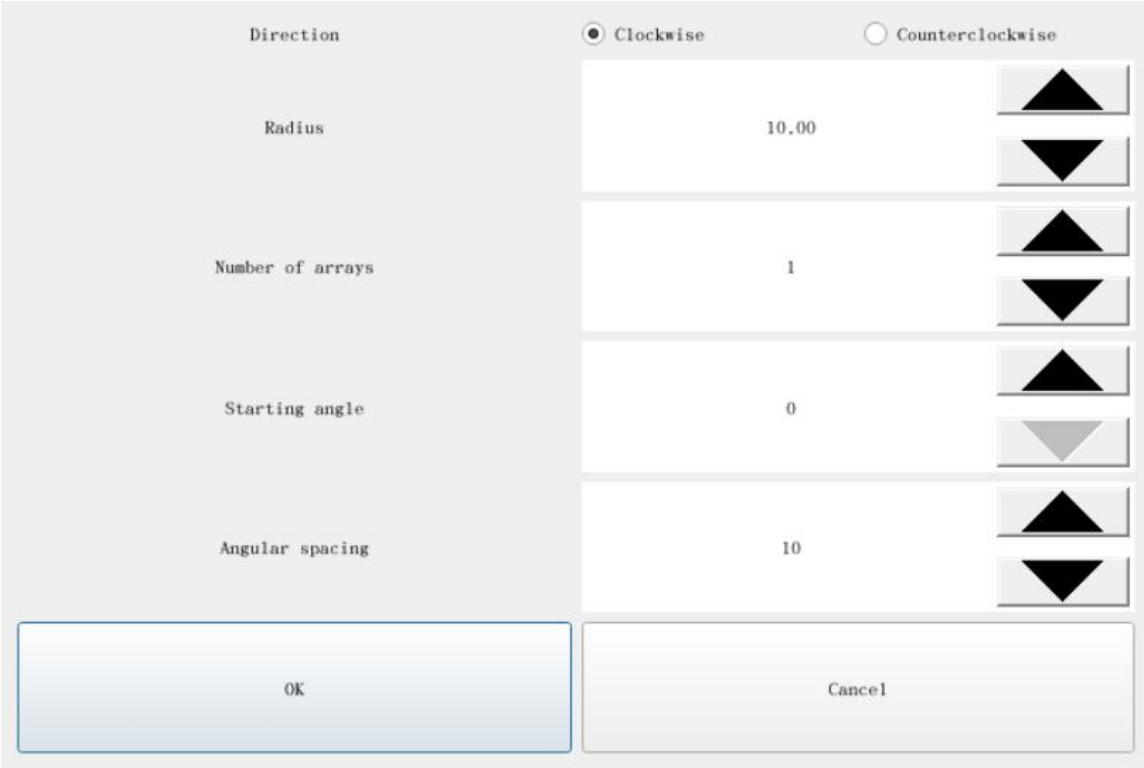
The icon in the toolbar is 

, and the mirror transformation command can perform two transformations, horizontal mirroring and vertical mirroring, on the graph.

### 5.2.17 Array

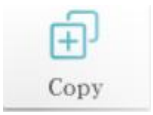
The toolbar icon is 

, the array is divided into two forms: circular array and rectangular array. For rectangular arrays, you only need to fill in the number and spacing in the X and Y directions and click OK. The editing of circular arrays is slightly more complicated. When the shape is displayed, the edit dialog box will appear as shown in the figure.




- Direction: the arrangement direction of the figure array.
- Radius: the distance between the center of the array graphic and the center of the circle.
- Array number: the number of graphics after the array.
- Start angle: the angle of rotation of the array object.
- Angle spacing: the angle between the centers of two adjacent graphics after the array.

### 5.2.18 Copy

The toolbar icon is 

, copy the original graphics, copy the selected graphics object to the system clipboard while retaining the original graphics object.

### 5.2.19 Align

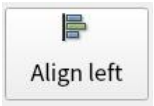
The toolbar icon is 

, and the graphics are arranged in a fixed way. When more than two objects are selected in the workspace, this menu is used to align the selected objects on a two-dimensional plane. There are a total of the following alignment methods: Align right, Align left, Horizontal alignment, Vertical alignment, Align the top edge, Bottom aligned, Equal high, Equal width, Equal height and equal width, Vertically centered,

horizontally and vertically centered.

● Align right: The icon on the toolbar is 

, align the right edges of all objects.

● Align left: the toolbar icon is 

, align the left edges of all objects.

● Horizontal alignment: the toolbar icon is 

, align the vertical center lines of all objects.

● Vertical alignment: the toolbar icon is 

, align the horizontal center lines of all objects.

● Align the top edge: the toolbar icon is 

, keep all objects aligned at the top edge horizontally.

● Bottom aligned: The toolbar icon is 

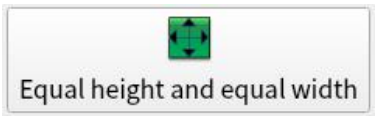
, keep all objects aligned at the bottom edge horizontally.

● Equal high: the toolbar icon is 

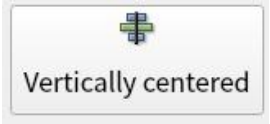
, keep all objects equal in height.

● Equal width: The toolbar icon is 

, keep all objects equal in width.

● Equal height and equal width: the toolbar icon is 

. Keep all objects equal in height and width.

● Vertically centered: The toolbar icon is 

. Align the horizontal center lines of all objects.

● Horizontally centered : The toolbar icon is 

. Align the vertical

center lines of all objects.

### 5.2.20 Zoom in

The toolbar icon is 

, zoom in on the edited image.

### 5.2.21 Zoom out

The toolbar icon is 

, reduce the edited image.

### 5.2.22 Selective mark

The toolbar icon is 

, after selecting this item, click "Mark" to output only the selected graphics in the drawing area.

### 5.2.23 Continue mark

The toolbar icon is 

, after this item is selected, click "Mark" to continuously cycle output until the "Stop" button is clicked to stop the output. Otherwise, click "Mark" once and it will output once and stop immediately.

### 5.2.24 Red border

The toolbar icon is 

, after selecting this item, click "Mark" to output in the form of red light.

### 5.2.25 Red light

The toolbar icon is 

. Click this button to output all graphics or the rectangular envelope of the selected graphics in the form of red light.

### 5.2.26 Mark

The toolbar icon is 

, click "Mark", the laser will start to work according to the selected mode.

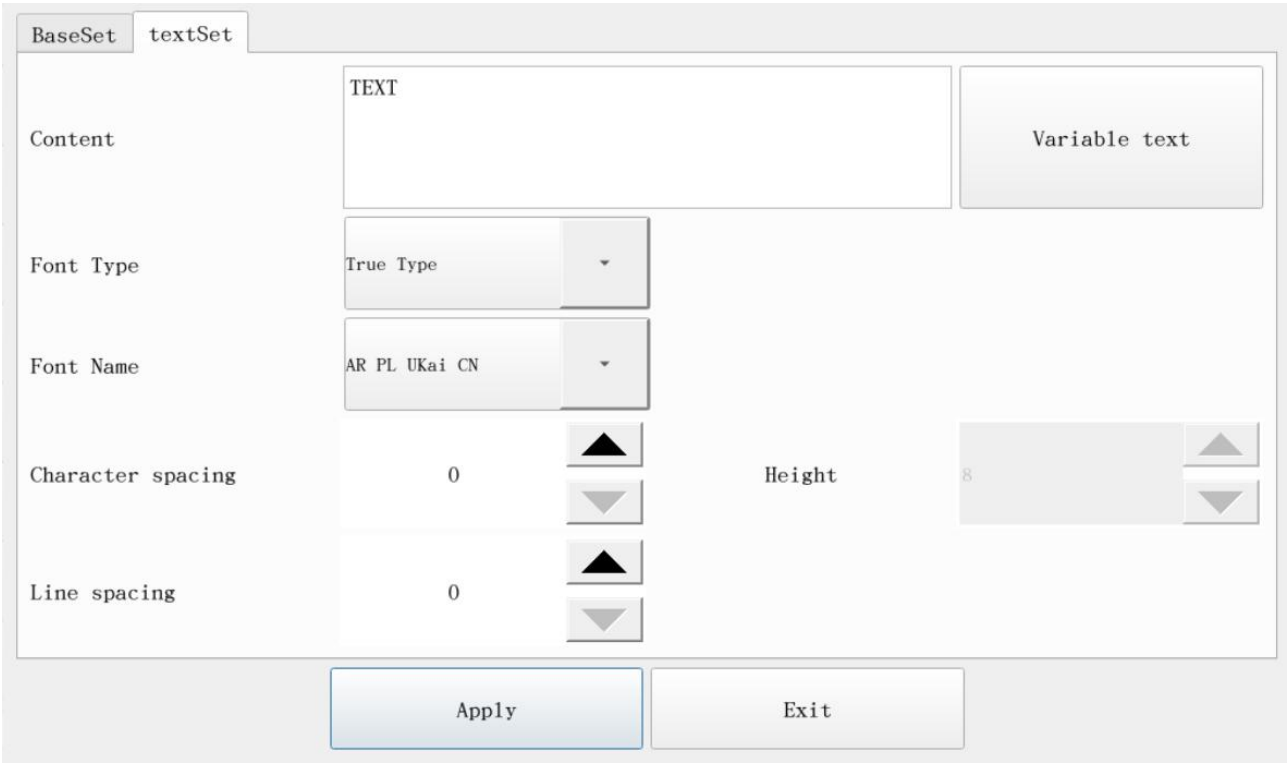
### 5.2.27 Edit

The toolbar icon is 

, edit the drawn text, geometry, bitmap, vector diagram, and two-dimensional code.

### 5.2.27.1 Edit text

After selecting the text, click "Edit" and the interface as shown in the figure below will appear.




● Position X: Indicates the X coordinate of the currently selected object. This coordinate can be specified as the coordinate of the lower left corner of the object or the coordinate of the center position of the object.

● Position Y: Indicates the Y coordinate of the currently selected object. This coordinate can be specified as the coordinate of the lower left corner of the object or the coordinate of the center position of the object.

● Size X: Indicates the width of the currently selected object.

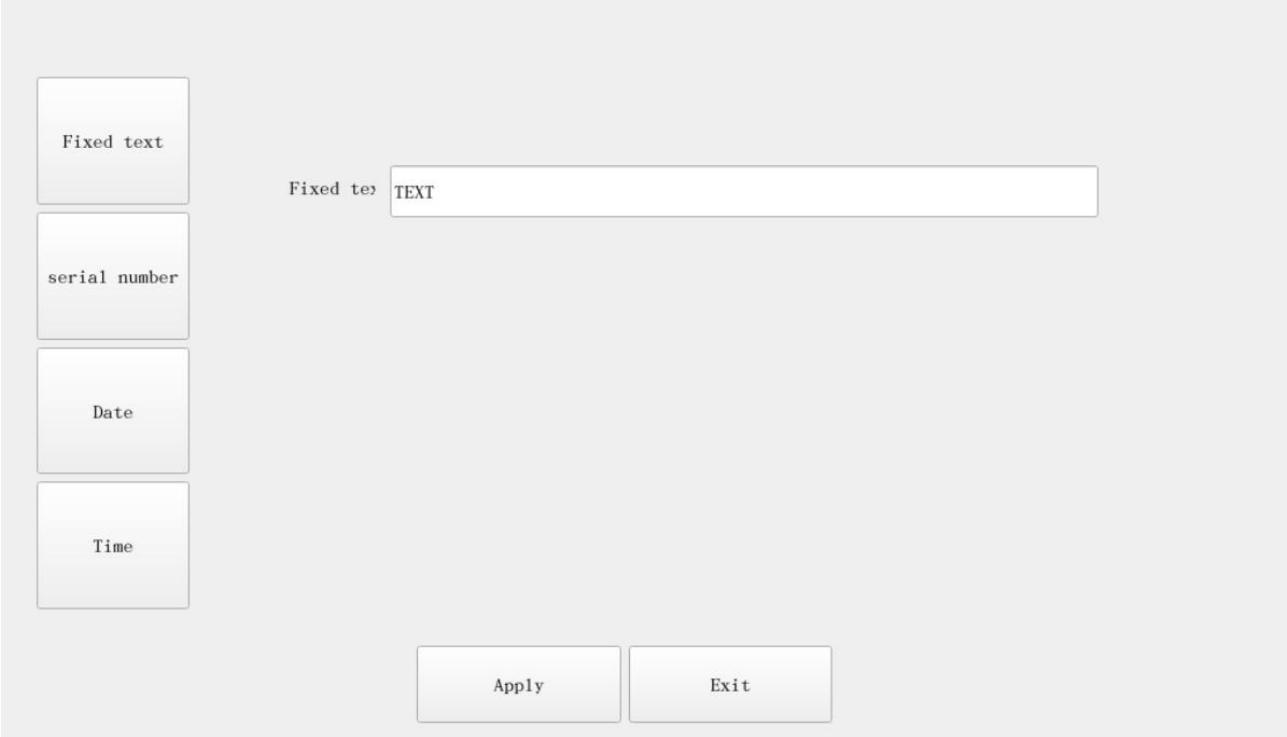
● Size Y: Represents the height of the currently selected object.

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

● Text: Edit the text content, you can use variable text. Click "Variable Text" and the interface as shown in the figure below will appear.

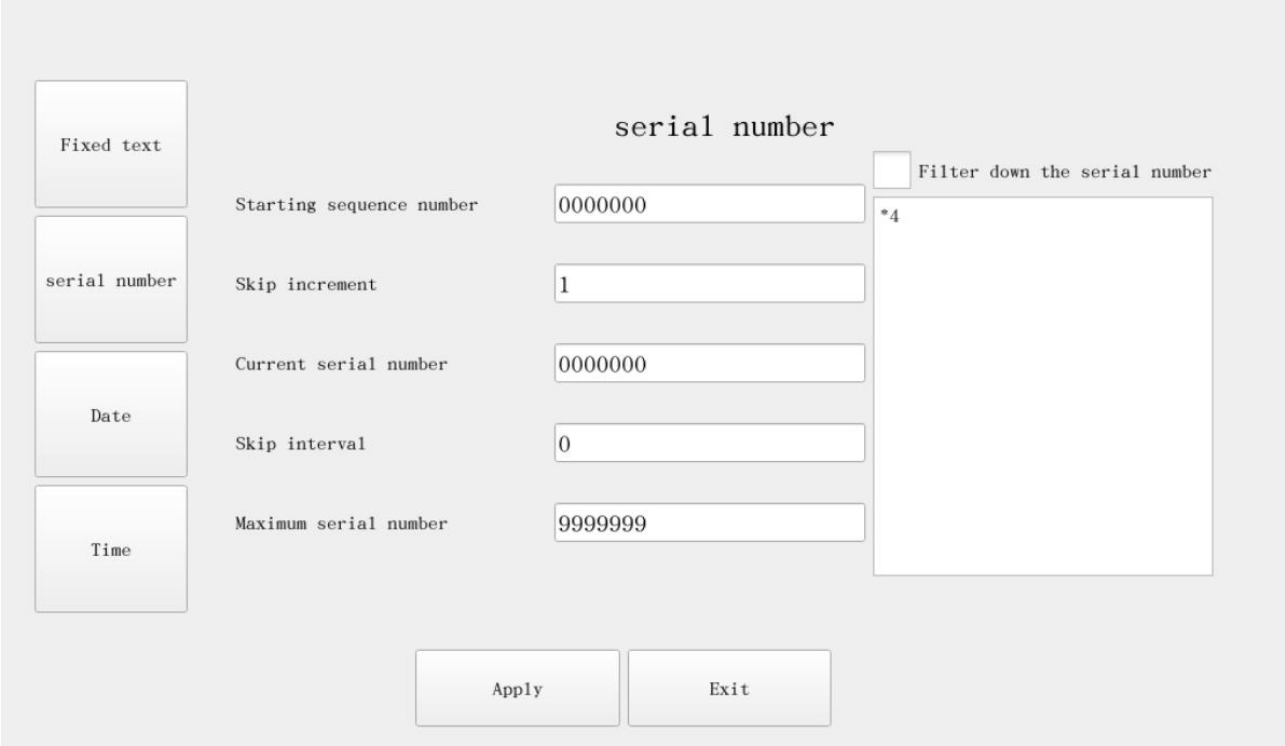

① **Variable text**

After checking the text of the enabled variable, click "Add" and the interface as shown in the figure below will appear. Variable text includes fixed text, serial number, date, and time.



1) Fixed text: Fixed elements in the text during processing, the content of the text is fixed, and does not change with the output, you can edit the content of the fixed text in the content area.

2) Serial number: For elements that are changed in fixed increments during processing, and for elements that are changed in fixed increments during processing, set a starting serial number. After each output, the serial number will be updated and the new serial number will be updated. It is: Starting sequence number + skip number increment. If the skip number interval is greater than 1, each sequence number will be updated after outputting the number of times.




※ Starting serial number: Refers to the first serial number to be processed currently.

※ Skip number increment: The number of increments each time the serial number is marked. If the skip number increment is set to 2, then each time the serial number is engraved, the increment will be 2.

※ Current serial number: Refers to the serial number currently to be processed.

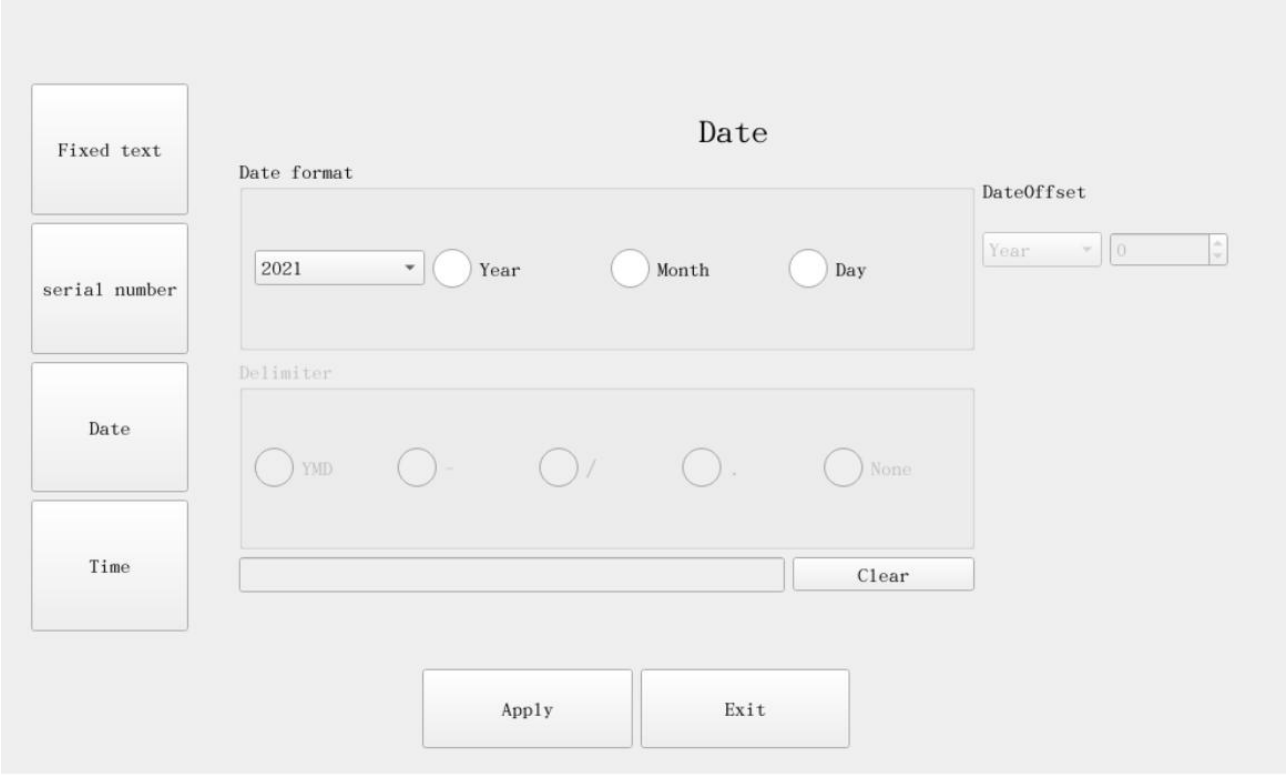
Hop number interval: The interval between adjacent sequence numbers. If the hopping number increment is set to 1, the hopping number interval is 3, and the starting sequence

number is 2, the sequence number becomes 3 when the output is the third time.

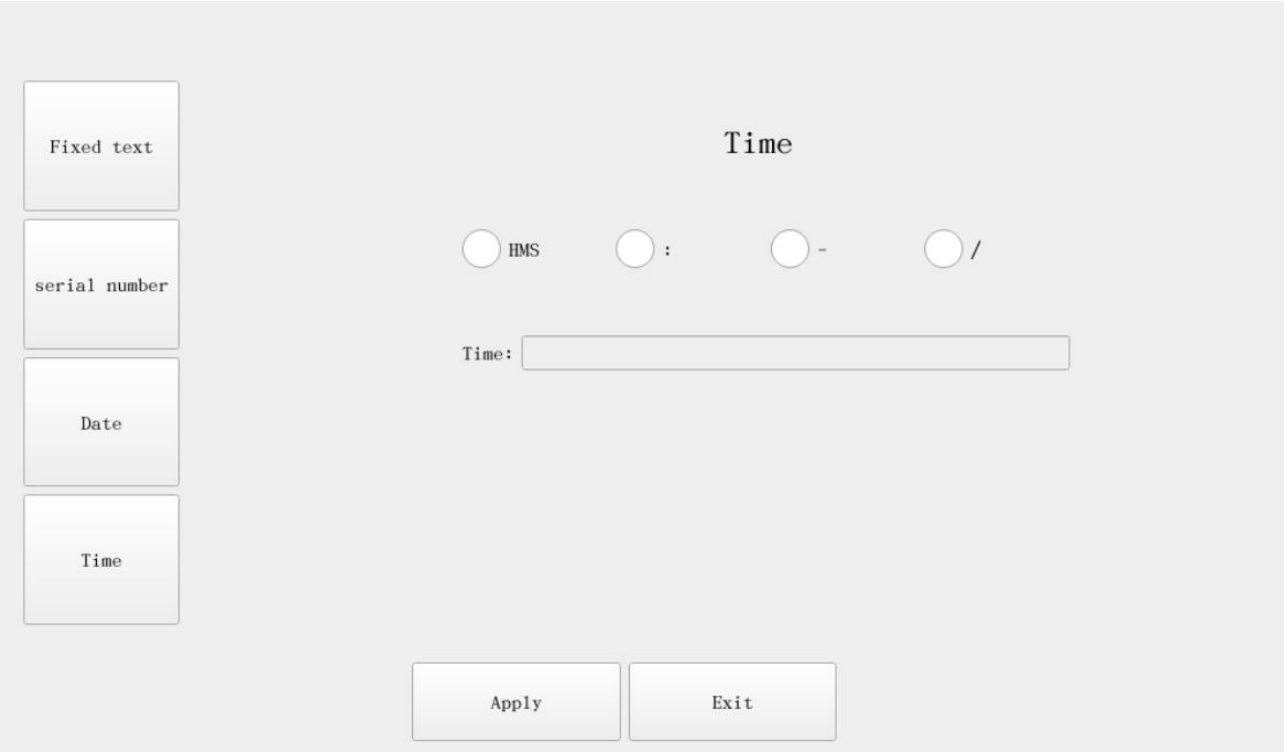
※ Skip number interval: the interval between adjacent serial numbers. If the hopping number increment is set to 1, the hopping number interval is 3, and the starting sequence number is 2, the sequence number becomes 3 when the output is the third time.

※ Maximum serial number: When the processed serial number is equal to the serial number value, the system automatically returns to the starting serial number.

3) Date: During the processing, the system automatically fetches the elements of date information from the computer, and the output content is the current computer date. When the date changes, the text content also changes.



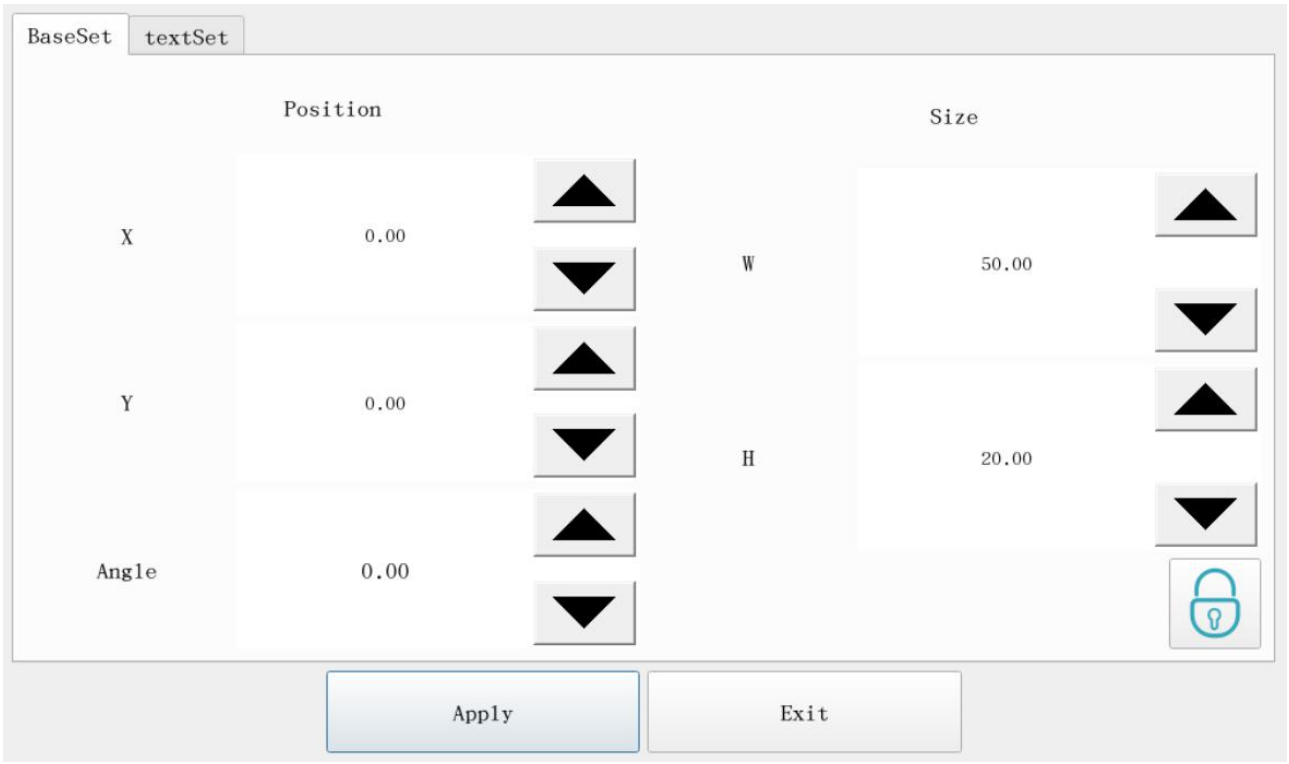

4) Time: During processing, the system automatically fetches time information elements from the computer, and the output content is the current computer time. Each time it is output, the text content is updated to the current time.




- Font type: There are two font types in this software: True Type font and Single Wire font.
- Font name: There are many font names to choose from under each font type. After you select the font type and font name, click Apply.
- Character spacing: The spacing distance between each character.
- Height: The height of the text.
- Line spacing: The spacing distance between each line of text when there are multiple lines of text.

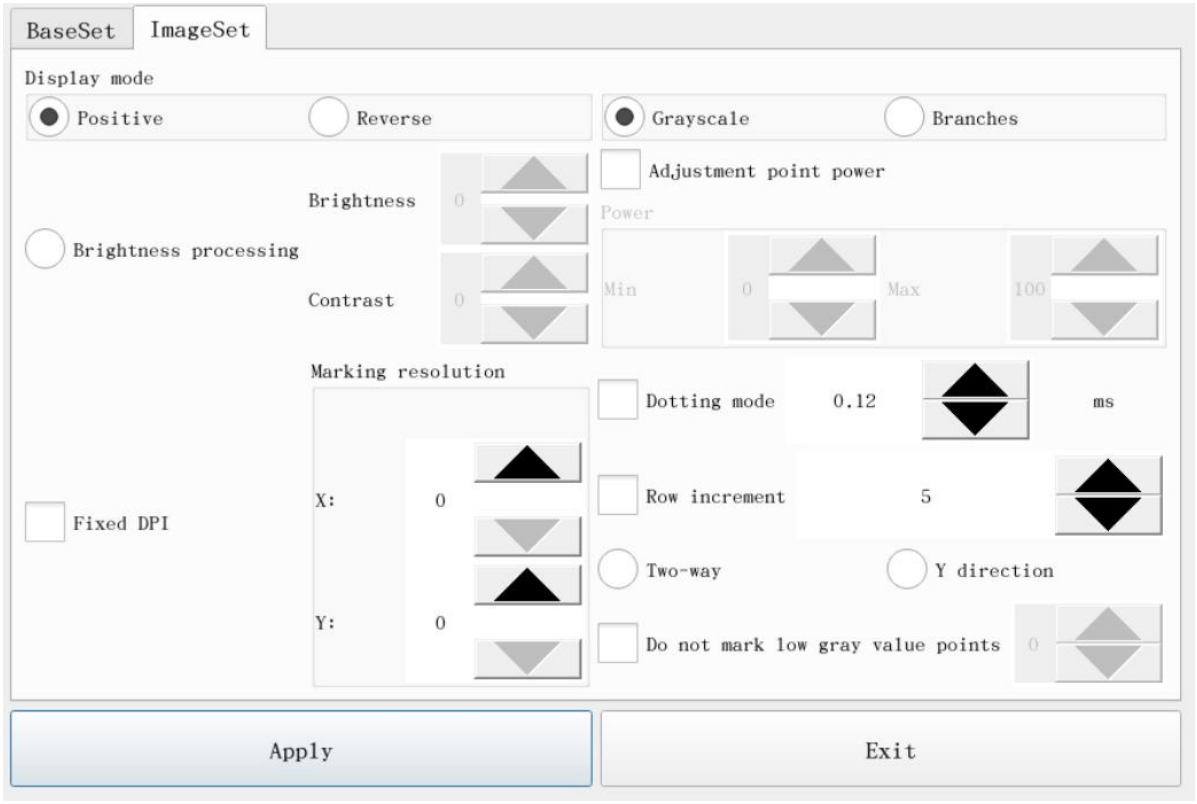
#### 5.2.27.2 Edit Geometry

After selecting the geometry, click "Edit" and the interface as shown in the figure below will appear.




### 5.2.27.3 Alignment graphics editing

After selecting the bitmap, click "Edit" and the interface as shown in the figure below will appear.



When the display modes are forward and reverse, the image changes as shown in the figure below.

Forward (left), reverse (right)

**Grayscale**: Convert color graphics to grayscale images.

**Dot**: Similar to the "halftone pattern" function, it uses black and white two-color images to simulate grayscale images, and uses black and white two-color images to simulate different grayscale effects by adjusting the density of dots. The effect is shown in the following figure.

The left picture is the original picture, the right picture is the dot picture

**Brightness processing**: change the brightness and contrast of the current image.

**Adjust point power**: refers to whether the laser adjusts the power according to the gray level of the pixel when processing each pixel of the bitmap.

**Fixed DPI**: similar to the resolution of the picture. Since the DPI value of the input original bitmap file is not fixed or we are not clear, you can set a fixed DPI value through "Fixed DPI", which can be set in the X and Y directions respectively. The larger the DPI value, the denser the dots, the higher the image accuracy, and the longer the processing time.

**Marking resolution**: The resolution of the displayed image will vary according to the size of

the image.

**Dot mode**: refers to whether the laser is always on when processing each pixel of the bitmap, or whether each pixel is on for a specified time.

**Line increment**: When processing bitmap, it is to scan line by line, or scan data every few lines after scanning one line. In this way, sometimes the processing speed can be speeded up when the precision is not high.

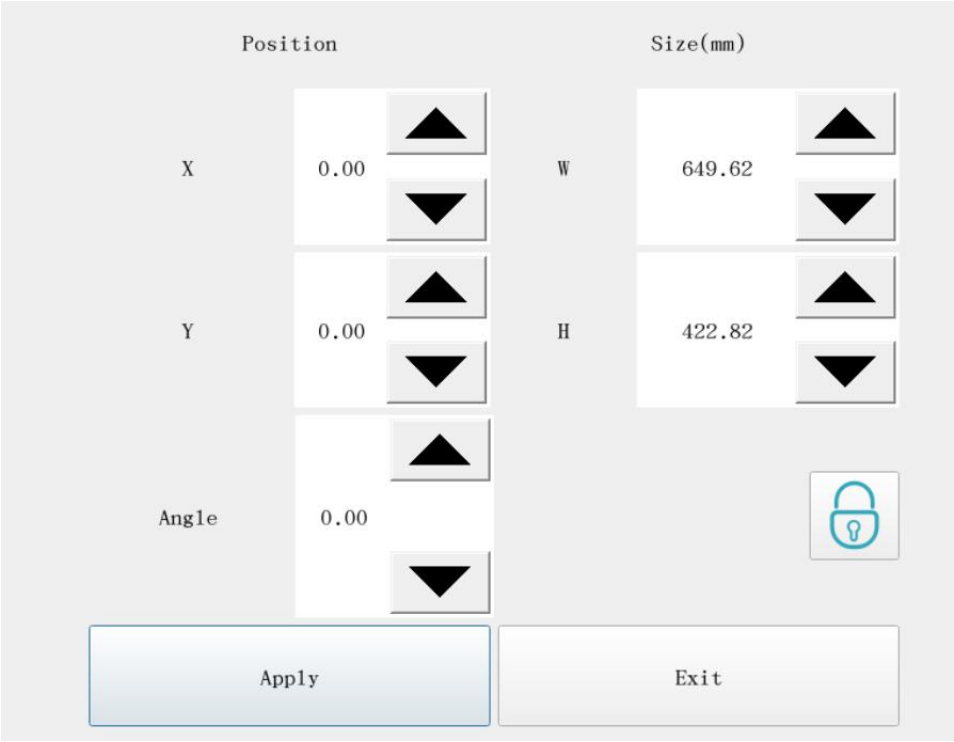
**Bidirectional**: The scanning direction of the bitmap during processing is bidirectional scanning back and forth.

**Y direction**: When processing bitmaps, scan column by column in the column direction.

**Do not mark points with low gray value**: When processing bitmaps, do all the points be printed or only the points with gray value higher than a certain value, so that sometimes the processing speed can be speeded up when the accuracy requirements are not high.Set a specific gray value in the box on the right.

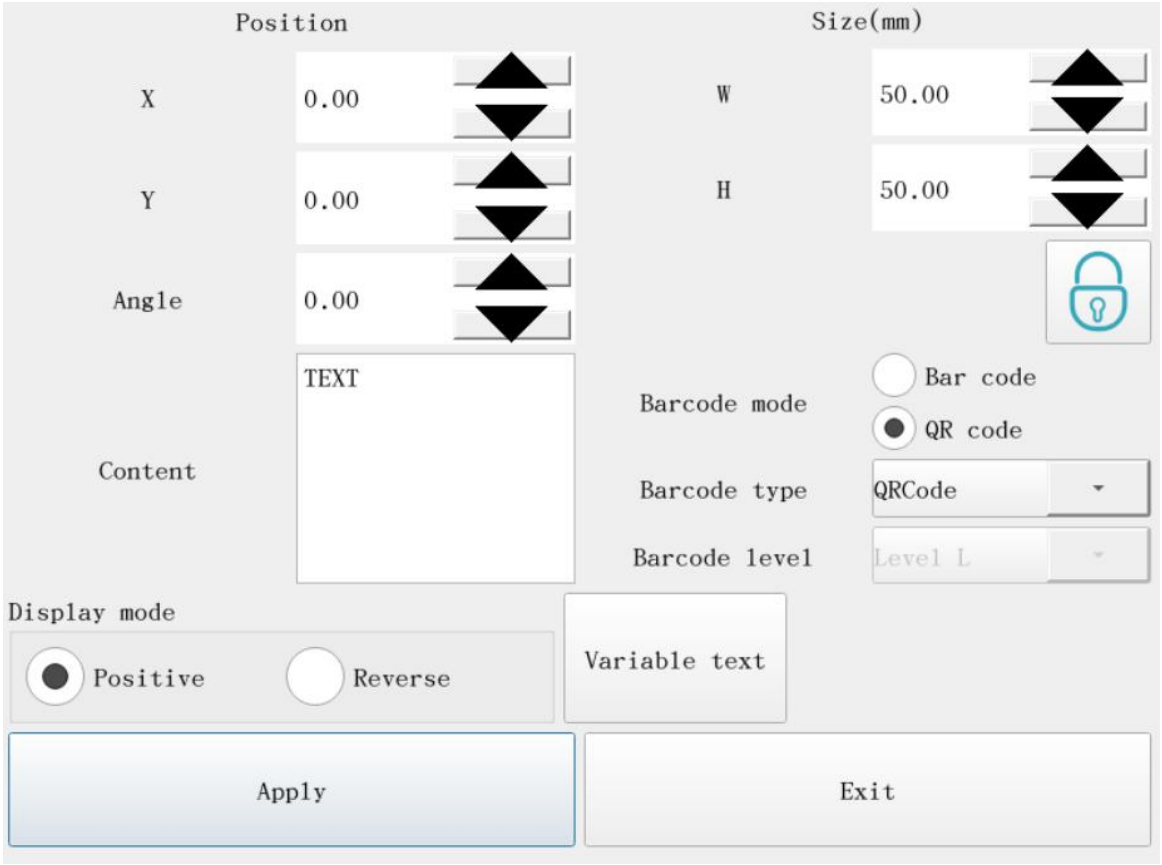
### 5.2.27.4 Edit vector graphics

After selecting the vector diagram, click "Edit" and the interface as shown in the figure below will appear.



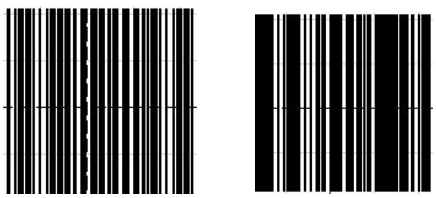
### 5.2.27.5 Edit the QR code

After selecting the QR code, click "Edit" and an interface as shown in the figure below will appear.



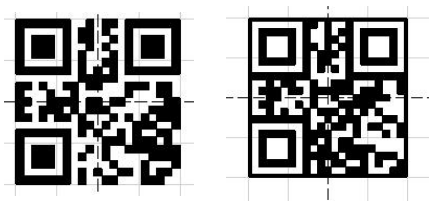

There are two modes of barcode, namely barcode and QR code.

The display mode is divided into two types: forward and reverse. Reverse refers to whether the processing is reversed. If the color of the marking content is similar to the color of the marking material, select reverse.



Forward (left) Reverse (right)

The two-dimensional code can also be reversed. The operation is the same as that of the barcode. Click Reverse and click Apply.



Forward (left) Reverse (right)

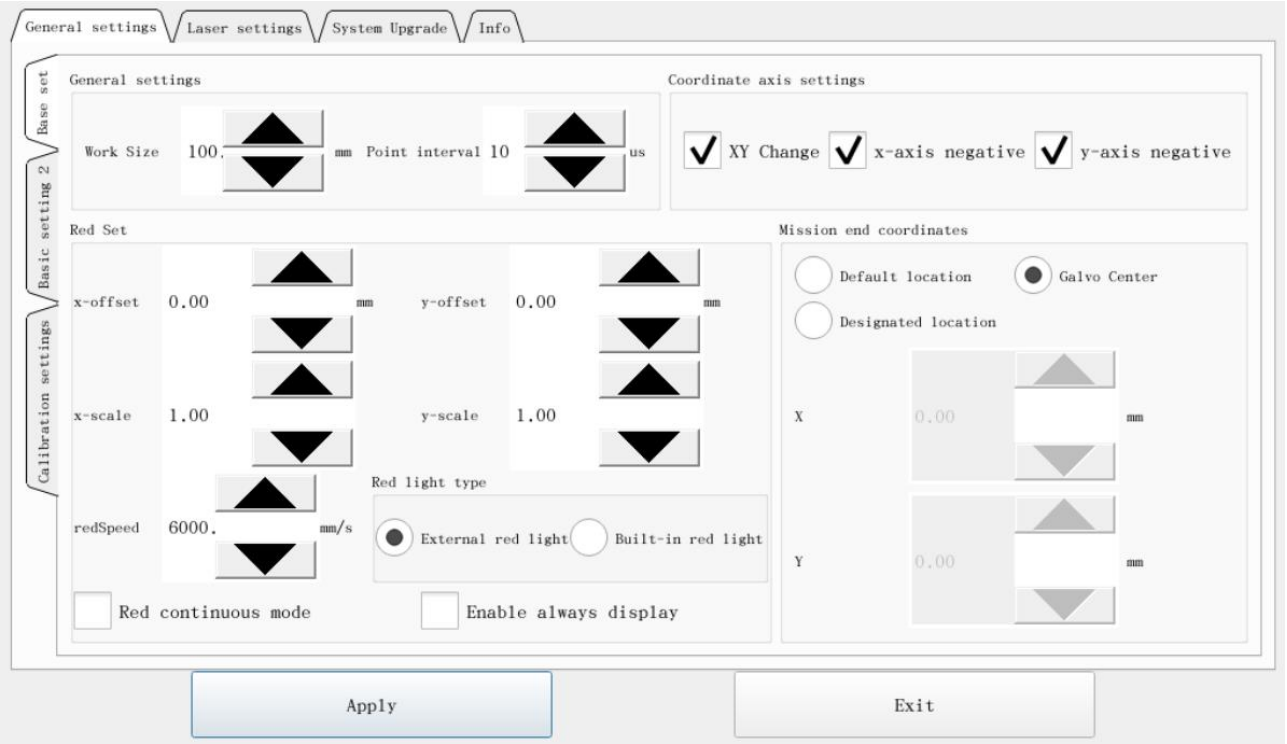
※ Text: Scanned content of barcode and QR code.

## 5.2.28 System Settings

The toolbar icon is System settings , including general settings, laser settings and system upgrades. General settings include basic settings, basic settings 2 and calibration settings.

### 5.2.28.1 General settings

The general setting interface is shown in the figure below.




● Area range: the effective range of marking, the default is 110mm, and the range is 60mm ~ 900mm.

● Horizontal offset: adjust the horizontal center (laser output) position of the galvanometer,

the adjustable range is -60mm～60mm.

● Longitudinal offset: adjust the vertical center (laser output) position of the galvanometer, the adjustable range is -60mm～60mm.

● Horizontal ratio: the ratio of the horizontal size of the red light output to the theoretical size.

● Longitudinal ratio: the ratio of the longitudinal size of the red light output to the theoretical size.

● Red light speed: Red light scanning speed.

● Red light continuous mode: After checking this function to enable, return to the software interface and click "Mark", the following dialog box will appear, which will appear after each marking, and the red light preview will always exist.


● Enable constant display: After checking, the red light will always appear in the middle of the format.

● Red light type: There are two kinds of external red light and built-in red light.

● Coordinate axis settings:

① XY axis interchange: After selecting, the XY axis will be interchanged when outputting.

② X-axis negative direction: the X-axis will be negative when outputting after selection.

③ Y-axis negative direction: the Y-axis will be negative when outputting after selection.

● Task termination coordinates: there are three options for the position where the red light stays after the marking task is over.

① Default position: the red light stays at the position where the marking task ends.

② Designated position: You can directly input the XY value to determine the position where

the red light stays after the marking is completed, ranging from -450mm to 450mm.

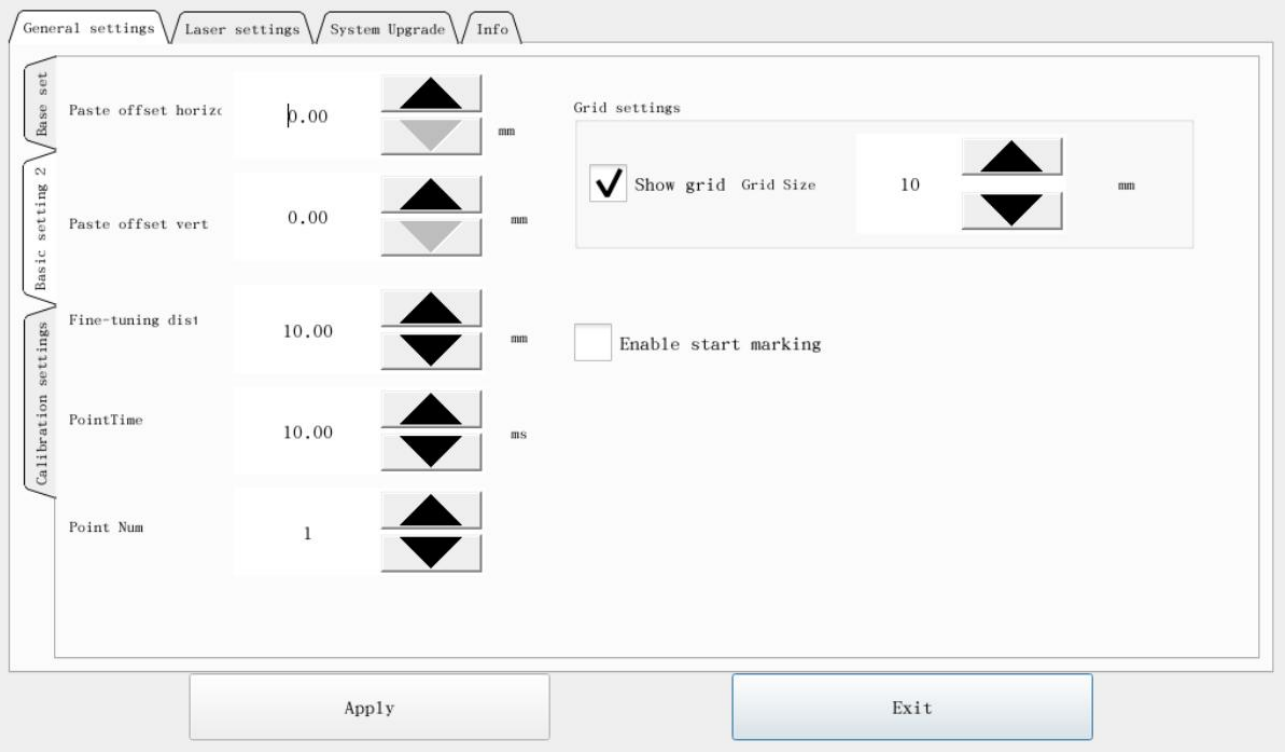
④ Galvanometer center: After marking, the red light stays at the center of the galvanometer.

- Point interval: the interval distance between each point when marking.

Note: After the above parameters are set, click Apply to take effect.

### 5.2.28.2 Basic Settings 2

The basic setting interface is shown in the figure below.

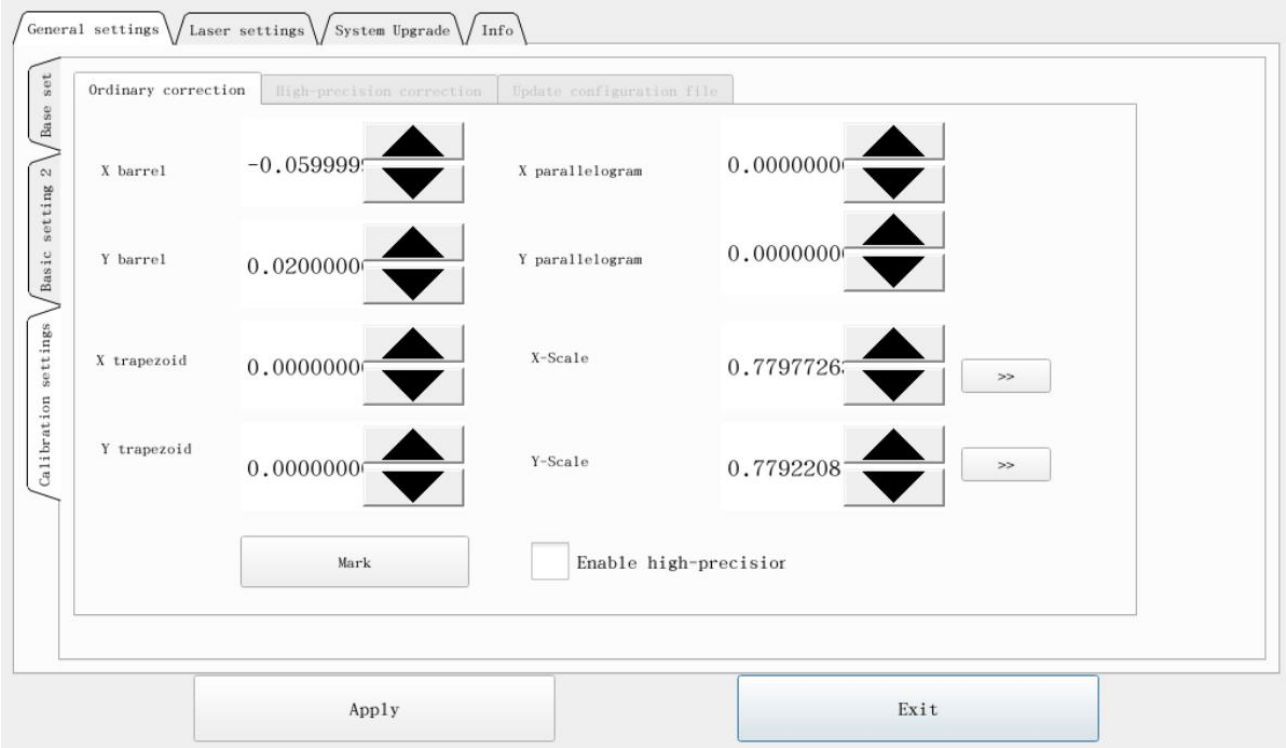



- Horizontal paste offset: relative to the original object, the position of the graphics in the x direction changes after copying and pasting.
- Vertical paste offset: Compared with the original object, the position of the graph in the y direction changes after copying and pasting.
- Fine-tuning distance: adjust the position of the graph by modifying the fine-tuning value.
- Doing time: control the time used by the laser to hit each dot.
- Dotting times: set the number of dots.
- Grid size: The grid size of the drawing area, the adjustable range is -1mm～50mm.
- Enable start marking: After checking this option, you can directly step on the pedal to

mark without clicking "mark".

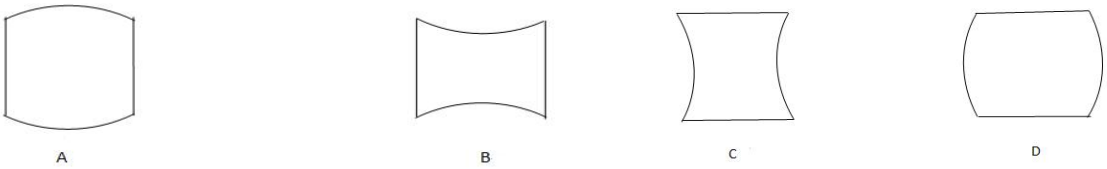
### 5.2.28.3 Calibration settings

The calibration setting interface is shown in the figure below.

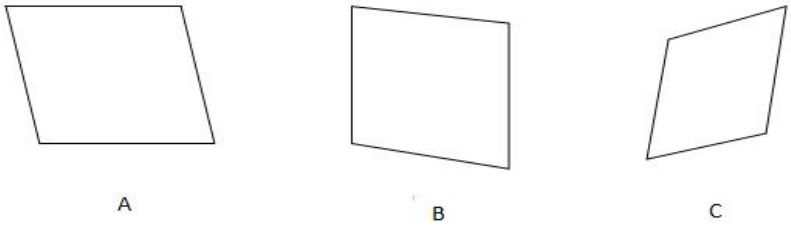



After setting the rectangle size, click "Mark" to mark the rectangle. Observe whether there is any deformation in the drawn rectangle (there are generally three types of deformation: barrel-shaped pincushion, trapezoid, and parallelogram). The deformations are X-axis and Y-axis deformations. The deformation can be corrected by adjusting the parameters of the X-axis and Y-axis directions.

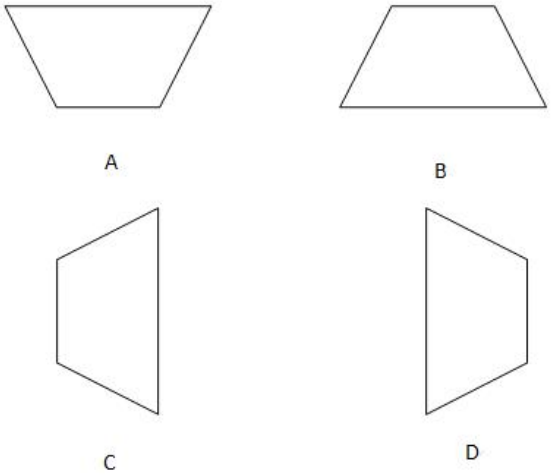
The parameter setting can be positive or negative, the positive or negative of the value represents the correction trend, and the absolute value of the value represents the strength of the correction. Increasing the absolute value of the set data can enhance the strength of the correction. If the adjustment is found to be excessive, it can be appropriately reduced.



As shown in the figure above, the barrel-shaped pincushion deformation, where A and B are Y-axis deformation, A is the deformation coefficient is too small, B is the deformation coefficient is too large; C and D are the X-axis deformation, C is the deformation coefficient is too large, D The deformation coefficient is too small. The correction parameter setting range of barrel pincushion is -0.5 ~ +0.5.




The figure above shows the parallelogram deformation, where A is the deformation in the X direction, B is the deformation in the Y direction, and C is the deformation in both the X and Y directions. The setting range is -1 ~ +1.

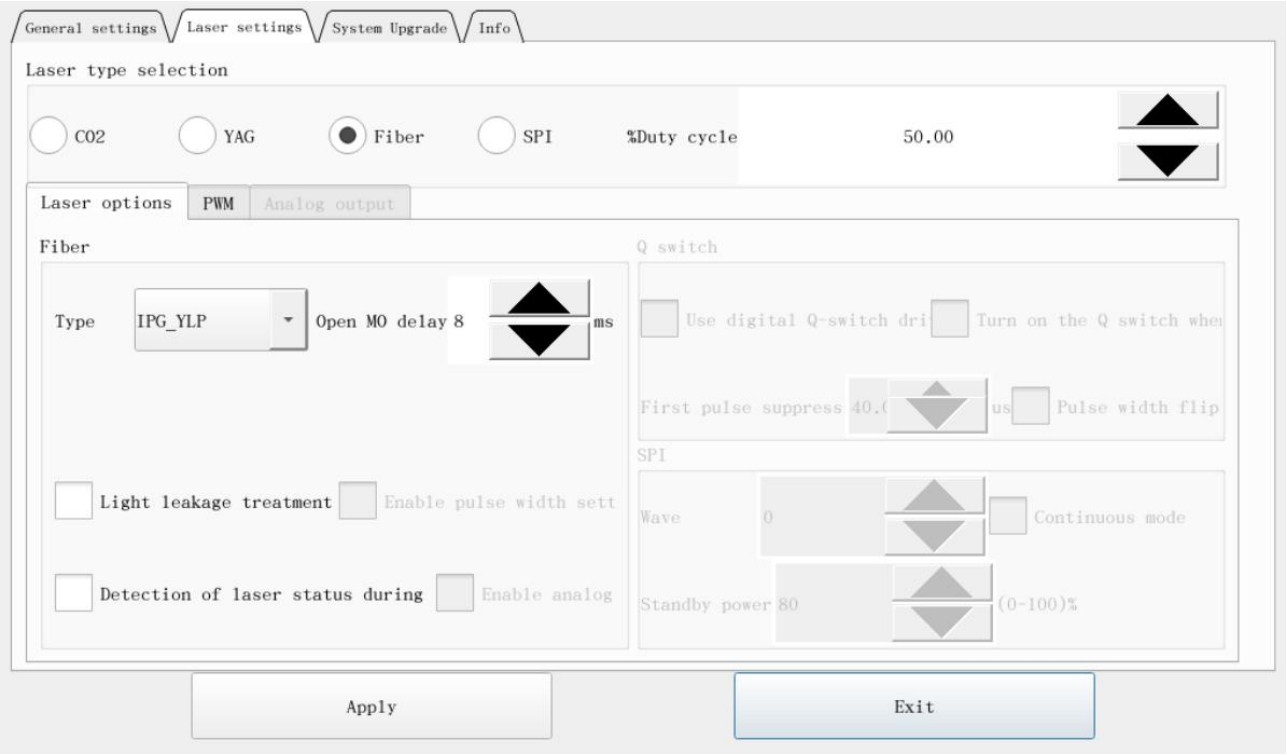



As shown in the figure above, A and B are trapezoidal deformations on the X axis, where A is the trapezoidal deformation coefficient is too small, B is the trapezoidal deformation coefficient is too large; C and D are the trapezoidal deformations on the Y axis, where C is the trapezoidal deformation coefficient is too large , D is the trapezoidal deformation coefficient is too small, the setting range is -1 ~ +1.

After the correction is completed, perform the size correction. Manually measure the actual size of the X-axis and Y-axis directions of the marking figure, and then click the gray box after the X scale and Y scale, fill in the theoretical size and the actual size, and click "Confirm", Get the scale value, (you can also clear the scale and reset) the calibration work is completed, click "Apply" and then exit.

### 5.2.28.4 Laser settings

The laser setting interface is shown in the figure below.




**① Selection of laser type**

When selecting the laser type, it must be the same as the actual laser type. This software provides four lasers, including CO2, YAG, Fiber, and SPI.

**CO2**: Indicates that the current laser type is CO2 laser.

**YAG**: Indicates that the current laser type is YAG laser.

**Fiber**: Indicates that the current type of laser is a fiber laser.

**SPI**: Indicates that the current laser is an SPI fiber laser.

**② PWM**

**Enable PWM output**: enable the PWM signal output of the control card.

**Maximum PWM signal**: the maximum frequency of the PWM signal.

**Minimum PWM signal**: The minimum frequency of the PWM signal.

**Enable pre-ionization**: enable the pre-ionization signal.

**Pulse width**: The pulse width of the pre-ionization signal.

**Maintenance frequency**: the pulse frequency of the pre-ionization signal.

**Enable CO2 ultra-pulse mode**: After checking, the dot spacing will appear in the processing parameters. The software will calculate the galvanometer speed according to the set dot spacing, and use this speed for marking to make the distance between the marked points meet Set up.

**Enable laser extension output**: enable laser extension signal output.

③ **Analog output**

**Enable power analog output**: enable the signal output of the power analog port of the control card.

**Enable frequency analog output**: enable the frequency analog signal output of the control card.

**Frequency mapping**: Set the ratio of the user-defined frequency to the actual corresponding frequency.

**Enable analog first pulse suppression**:

MaxV: The highest voltage for first pulse suppression.

MinV: The lowest voltage for first pulse suppression.

T1: The ramp time for the first pulse to change from low voltage to high voltage or from high voltage to low voltage.

T2: When the time interval of the light signal is less than the time set by T2, there will be no first pulse suppression output. When the time interval of the light signal is greater than the time set by T2, there will be first pulse suppression output

 : Indicates that the high/low level of analog first pulse suppression is valid.

Let's use the figure below to analyze T1 and T2

Laser signal: 

Analog first pulse suppression signal: 

**Power mapping**: Set the ratio of user-defined power to actual corresponding power.

There are many types of fiber lasers, and the parameters that need to be set are selected according to the selected laser type.

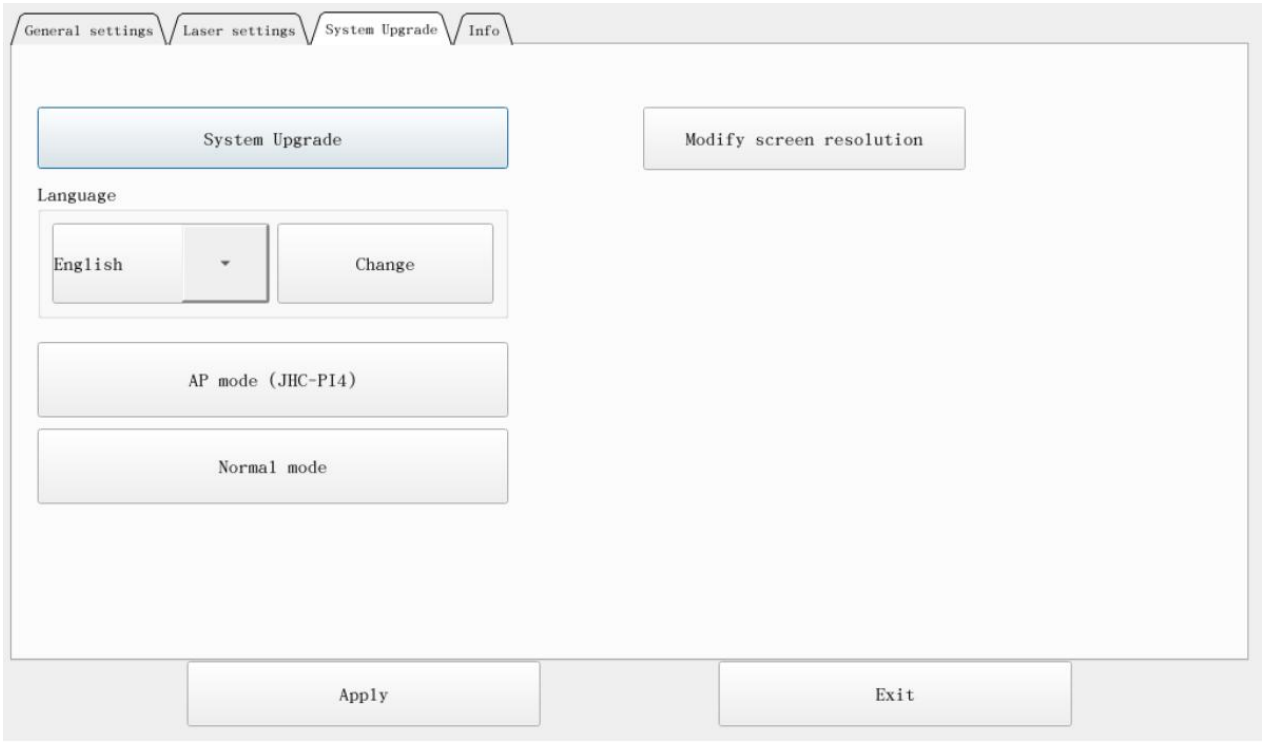
**Light leakage treatment**: After selecting this option, the laser will be optimized for light leakage.

**Enable pulse width setting**: enable pulse width setting signal.

**Check the laser status during processing**: check the status of the laser before marking. If checked, it will check whether the laser is abnormal before marking. If there is an abnormality, it will prompt. If it is not checked, the laser status will not be detected and marked directly.

### 5.2.28.5 System Upgrade

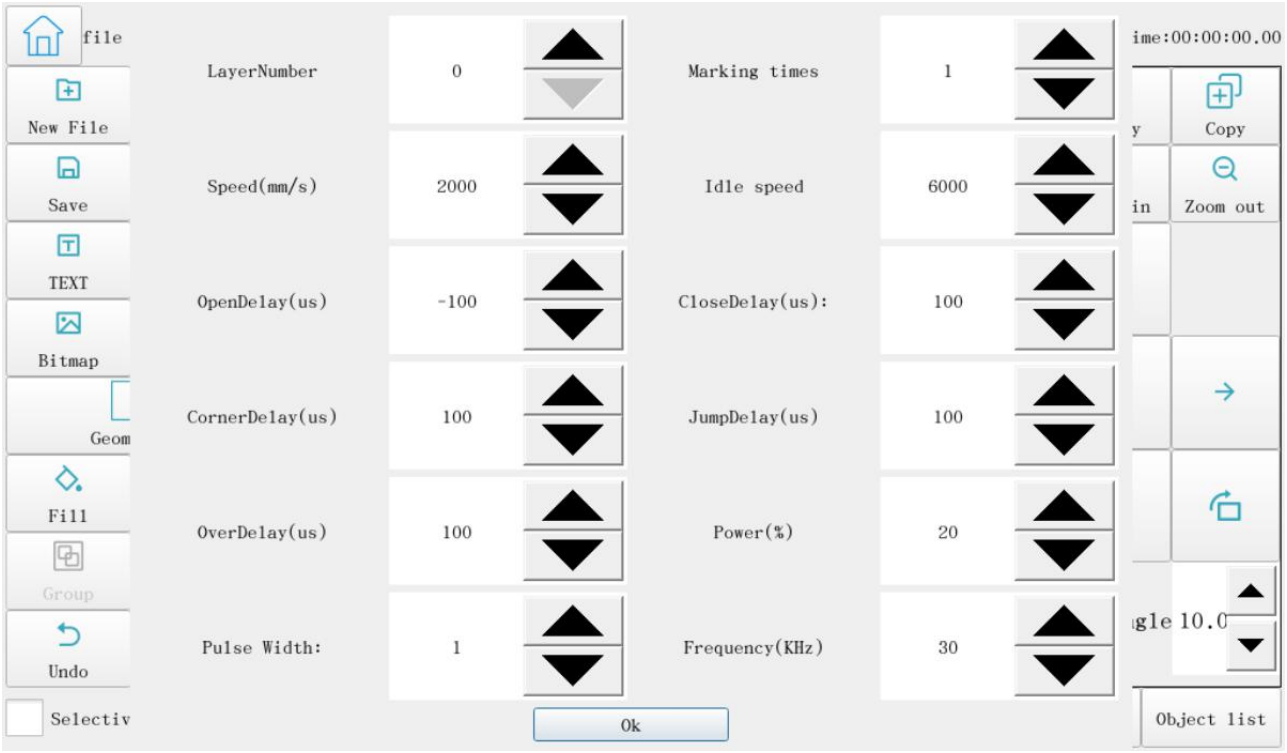
The system upgrade interface is shown in the figure below. Used to upgrade software and switch languages.



## 5.2.29 System Settings

The icon on the toolbar is 

, adjust the laser parameters. Click "Properties" and the interface as shown in the figure below will appear.




**Current layer number**: the layer where the object is located.

**Marking times**: the number of laser markings after clicking on the marking.

**Marking speed**: the running speed of the galvanometer in the state of laser light.

**Idle speed**: the moving speed of the galvanometer when the laser does not emit light.

**Turn-on delay**: the delay time of laser turning on at the beginning of marking. Setting appropriate turn-on delay parameters can eliminate the "match head" phenomenon that appears at the beginning of marking, but if the turn-on delay parameter is set too large, it will cause the The phenomenon of missing pen at the beginning can be negative.

Parameter is too large

Parameter is too small

Parameters are normal

**Light-off delay**: the delay time of laser turning off at the end of marking. Setting appropriate light-off delay parameters can eliminate the phenomenon of non-closing at the end of marking. However, if the light-off delay is set too large, it will cause "match head" phenomenon in the end section. Cannot be negative.

Parameter is too large

Parameter is too small

Parameters are normal

**Corner delay**: One stroke sends an end command, the next stroke sends a start command, and there is no empty stroke in the middle. At this time, due to the hysteresis of the galvanometer, it will take a while for the galvanometer to reach the designated position. If the parameter is too large, the galvanometer has been fully turned, and the laser does not stop emitting light at this time. At this time, the corner will be focused. If the parameter is too small, the galvanometer will not be fully turned, and the next segment will be marked. An arc appears.

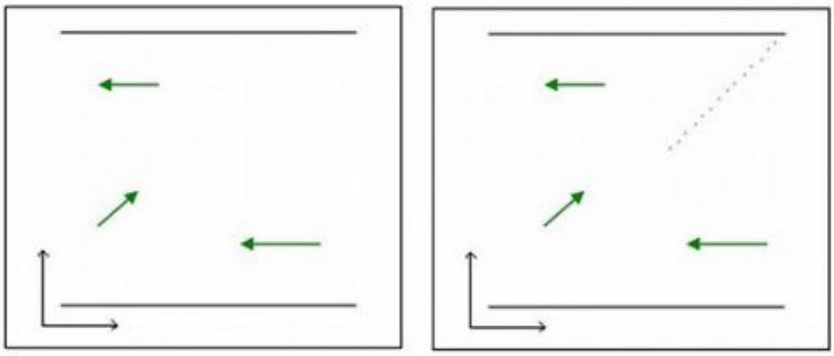
Parameter is too large

Parameter is too small

Parameters are normal

**Jump delay**: the time to wait for the galvanometer to reach the specified position. After the last command of the empty stroke is given, due to the hysteresis of the galvanometer, it will take a while to reach the specified position, so you must set this parameter and wait for the galvanometer to reach the specified position. If the parameter is too large, the galvanometer has been fully turned, And stay for a period of time before processing the next stroke, which

increases the marking time. If the parameter setting is too small, the galvanometer has not fully turned to the laser to emit light, and there will be scattered spots where the stroke starts.



Jump delay is normal Parameter is too small

**End delay**: the time to wait for the laser to turn off completely. After the light-off command is issued to the laser is completely turned off, the laser needs a period of response time. Setting an appropriate end delay parameter is to give the laser sufficient light-off response time to achieve the purpose of completely turning off the laser before performing the next marking. Appropriate end delay parameters can eliminate the "tailing" phenomenon that occurs during marking. But if the end delay is too large, the processing speed will be affected. Cannot be negative.

**Laser power**: the output power of the laser in the light-emitting state

**Pulse width**: Refers to the duration of time when the laser power is maintained at a certain value.

**Frequency**: refers to the number of times the laser emits light per unit time.

## 5.2.30 Object list

The toolbar icon is 

. All graphics being edited will be displayed in the object list. Click "Object List" and the interface as shown in the figure below will appear.


Image
Image
QRecord
Back

# Chapter 6 Self-checking and FAQ

Before starting up the whole system, please check carefully to confirm whether there is any problems, such as: plug virtual connection or without connection, two mirrors touched with each other, drive board signal input errors, etc. Only after finishing all checking, then you can turn on the power supply.

| Fault phenomenon | Reasons | Solutions |
|---|---|---|
| System has no any reactions | No power supply or the circuit did not connect well. | Check if the power supply is connected well |
| Red light keeps on with "KaBa" sound | Position limitation protection | Check if over input signal amplitude. If the signal is normal, please contact us. |
| Scan motor swings lightly after turning on | Too much interference or input signal circuit did not connect very well | Check the interference sources and the input signal circuit |
| Motor squeals after turning on, the drive board and motor overheat | Driver board and motors did not connect well/The mirrors or clips become loosen. | Check the wiring/ the mirrors and clips. |
| Mirror reflection power is weak | Light path is not aligned well | Align the light path of the marking machine; If the light path is normal, please contact us. |
| Marking graphics becomes one straight line | One motor cannot move normally | Checking the wiring connection between the motors, drive boards and control board |
| Waves exist in the marking line | Grounding problems/ Surrounded by strong interference sources/The Anti-interference ability of marking control board is poor | Check if the ground connection is well/Check if there is a strong interference source surrounded/ Check the position control signal of marking control board |
| Marking square becomes rhombus or one side not straight | Abnormal signal output from D/A board. | Replace D/A board, if not solved, please contact us. |

If you have any questions, please contact our Technical Services Department:

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