



# **Laser Marking System**

## **Software Operation Instruction**

**Revision: V1.4, March 2022**

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## 1. General

### 1.1. Profile of Software

The software provides the following functions:

- To develop and manage templates, parameters, and production line configurations
- To set the laser system

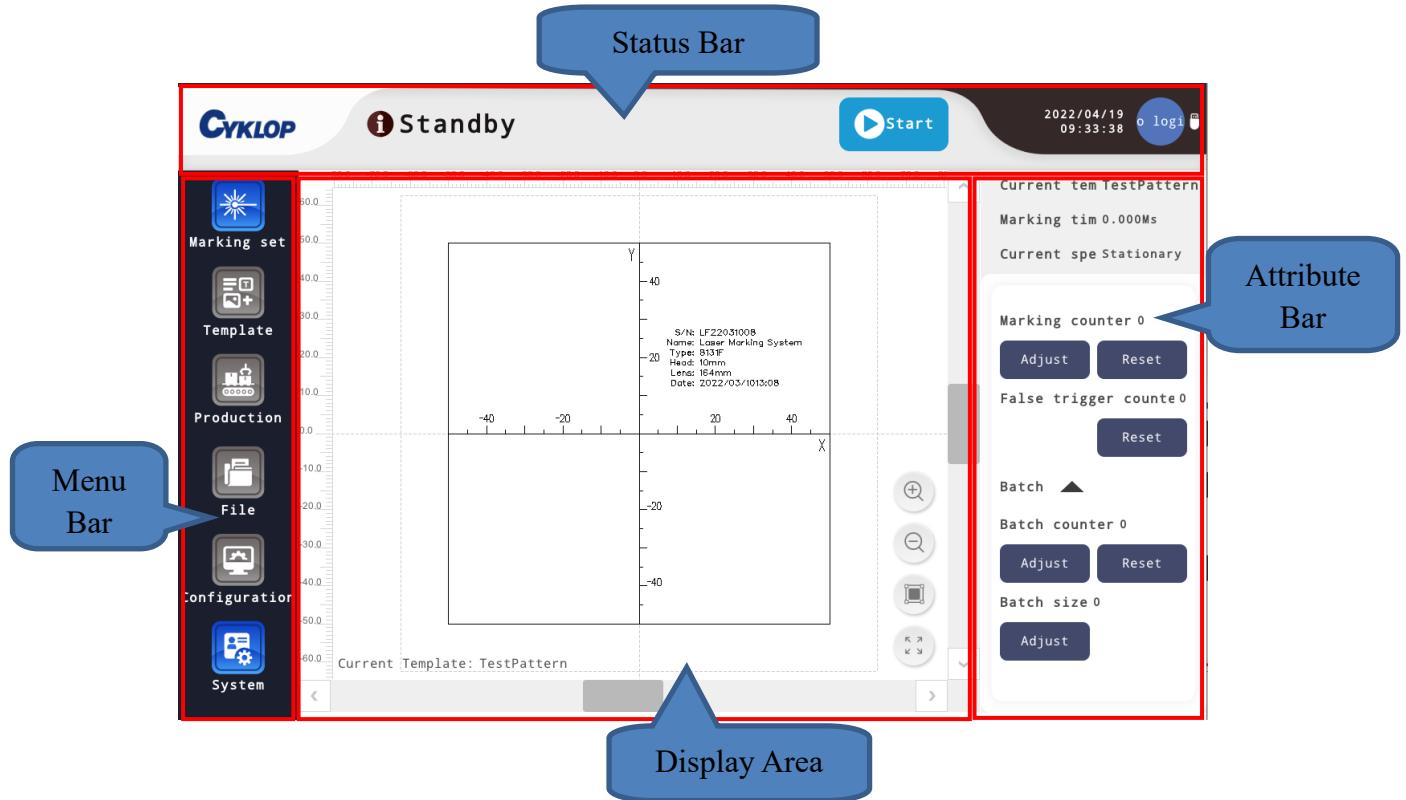
Various training courses will be held to help you master the technology and software for operation of the laser system. Please contact CYKLOP for details of the training programs.

**Important: Please store your data on a regular basis and make fail-safe backup for your data!**

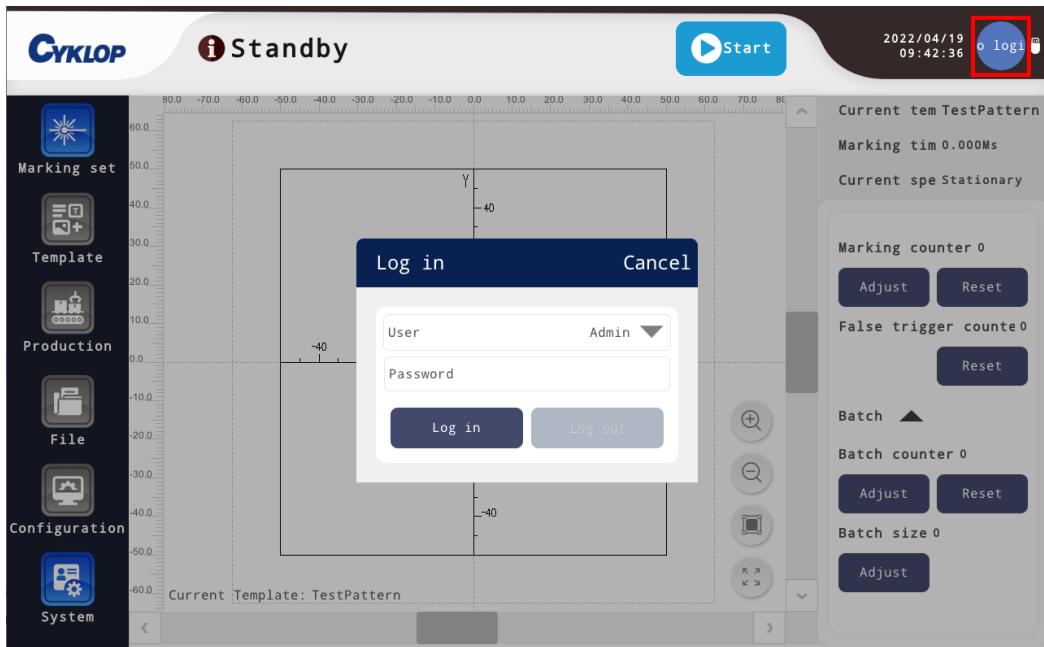
### 1.2. Notes to Manual

- In case of actual operation mode and function setting inconsistent with this Manual arising from the software upgrade, the software shall prevail.

## 2. Home



### 2.1. Log in

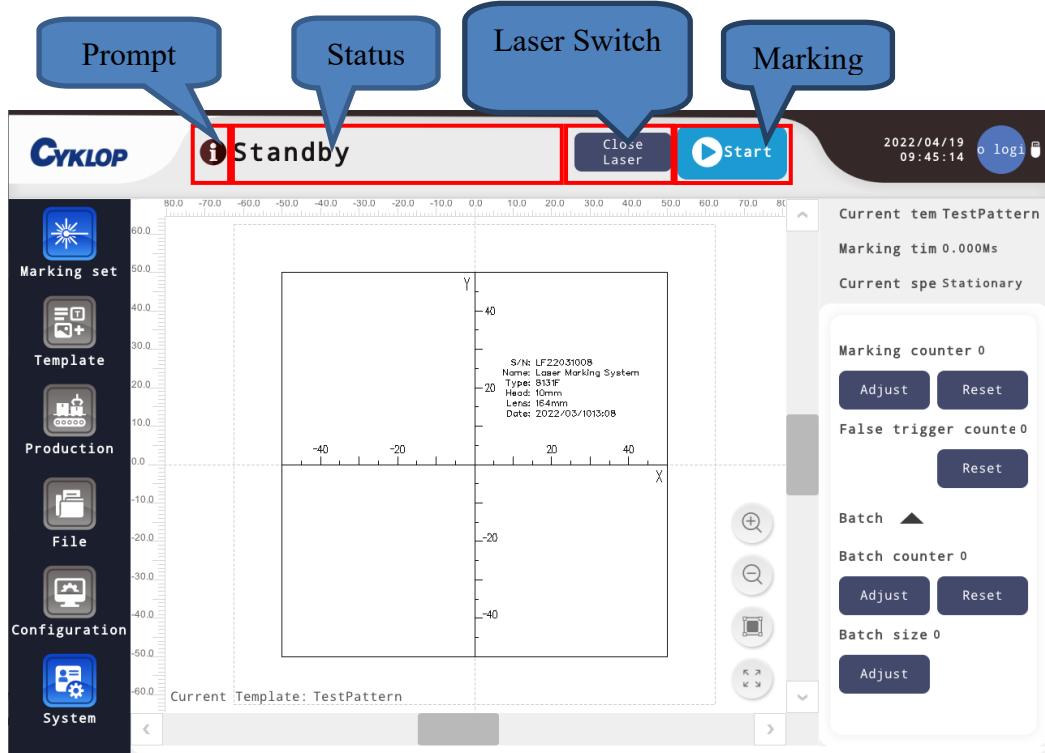


When the laser is started up, click the "Not Logged In" button in the upper right corner and enter the password "222222" to log in the administrator authority.

**Warning: For the sake of safety, please modify the password and save it properly after the administrator logs in for the first time.**

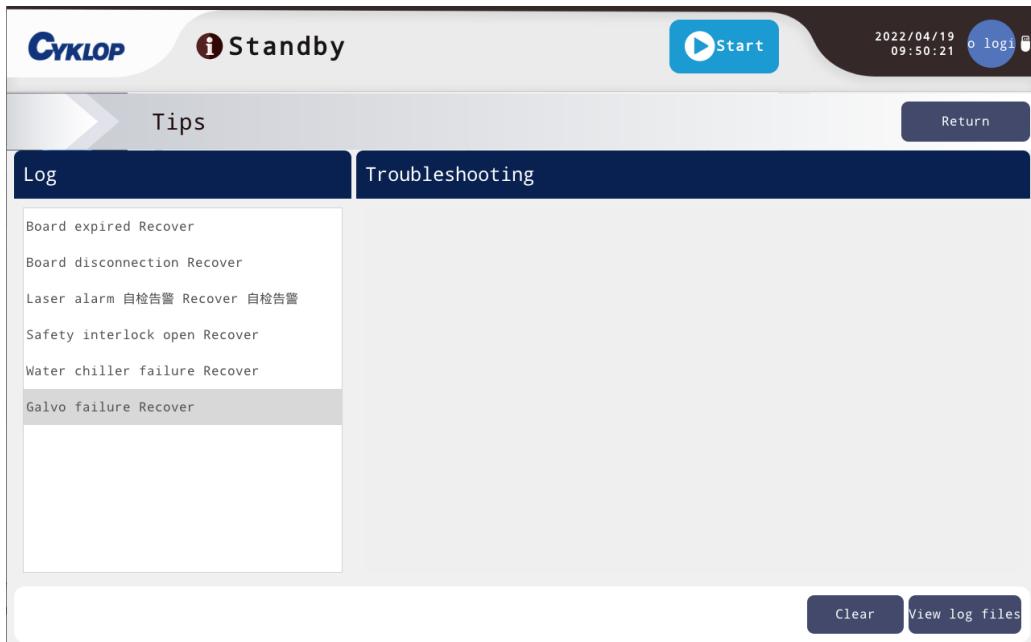
## 2.2. Running of Laser

In the display area of the “Status Bar”, the working status, fault information, laser switch, and marking start/stop control of the marking system will be displayed.



### 2.2.1 Prompt

Click **i** to view logs and fault prompts of the laser marking system.



## 2.2.2 Status

The working status of the marking system will be displayed in the status display area.

The working status is shown as follows:

<i>Running</i>	<i>Description of status</i>
Not connected	Indicate that the laser operating system detects no connection of board card.
Initialize	The laser system starts up.
Standby	The laser marking system is in standby state after the self-checking is completed.
Waiting for trigger	After clicking to start the laser system, the laser system is ready for marking.
Marking	The current marking content is marked on the product.
Interlock open	If the safety loop is disconnected (e.g. the guard door is opened), an in-progress marking is undone immediately. Marking can only be done when the safety loop is closed.
Warning	There is a fault. In order to enable the work to go on, a response must be made to such fault.
Fault	A serious fault occurs and as a result the machine is out of function. Such fault cannot be rectified by message response, and the laser operation cannot continue. In such case, the laser system must be shut down.

## 2.2.3 Power-on/off of Laser

Only the UV laser marking system has this display, which can be used to power on or power off the laser by means of serial port after the laser power is turned on; during the period there is a countdown

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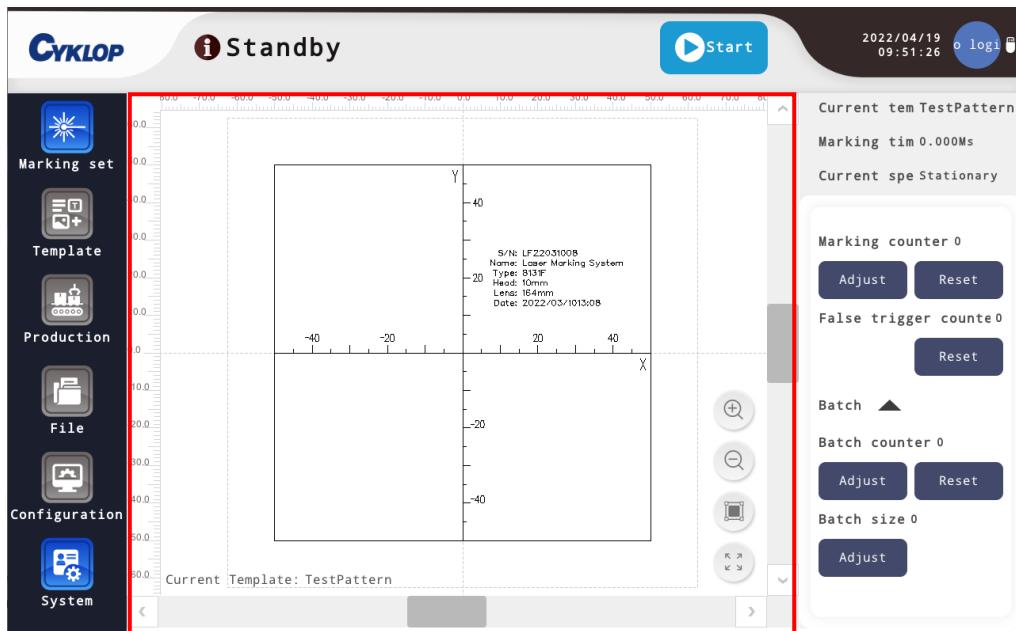
for power-on and off of the laser in the status display area.

#### 2.2.4 Start/Stop

Marking the currently template may be conducted with the “Start” button.

Immediately cancelling a marking in running may be conducted with the “Stop” button.

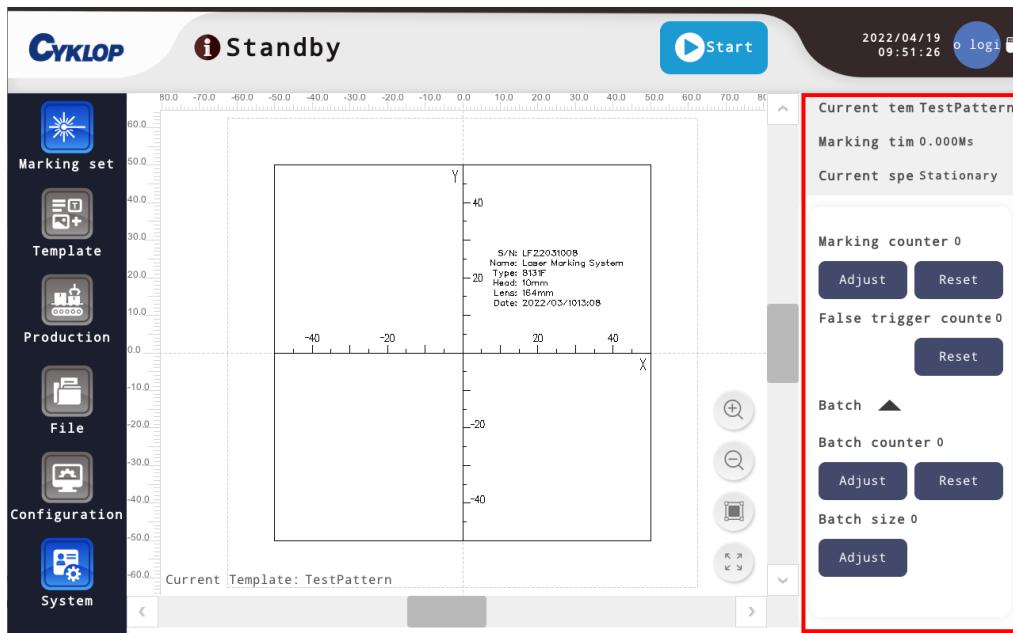
### 2.3. Display Area



To display in this area the last marked data (including the name of current template, preview data or graphic content, and the zoom button for preview data or graphics).

- Zoom in: To zoom in the preview display area with the origin of coordinates as the center.
- Zoom out: To zoom out the preview display area with the origin of coordinates as the center.
- Full-page display: To display the entire preview display area.
- Display all: To zoom in all data or graphics of the current template to cover the whole preview display area.

## 2.4. Home Attribute Bar



Current template: To display the name of the current template.

Marking time: To display the time required to mark the current template once (The display is refreshed after marking once).

Current speed: To display the static or set fixed speed, or the speed measured by the shaft encoder.

Marking counter: To display the number of all successful marking performed with the currently selected template. When selecting a different template, or restarting the laser system, the counter will be automatically set to 0.

Adjust: To change the number of current markings.

Reset: To reset the marking counter.

False trigger counter: To display the number of false triggers for the current template. When selecting a different template, or restarting the laser system, the counter will be automatically set to 0.

Reset: To reset the false trigger counter.

Batch counter: To display the number of all marking performed with the currently selected template.

When the batch size value is reached, the laser system will stop. This value can be edited when performing marking (e.g. to replace the product marked incorrectly). When selecting a different template, or restarting the laser system, the counter will be automatically set to 0. This counter becomes effective only after the batch size is defined. If the batch size value is 0, the batch counter cannot be reset or edited.

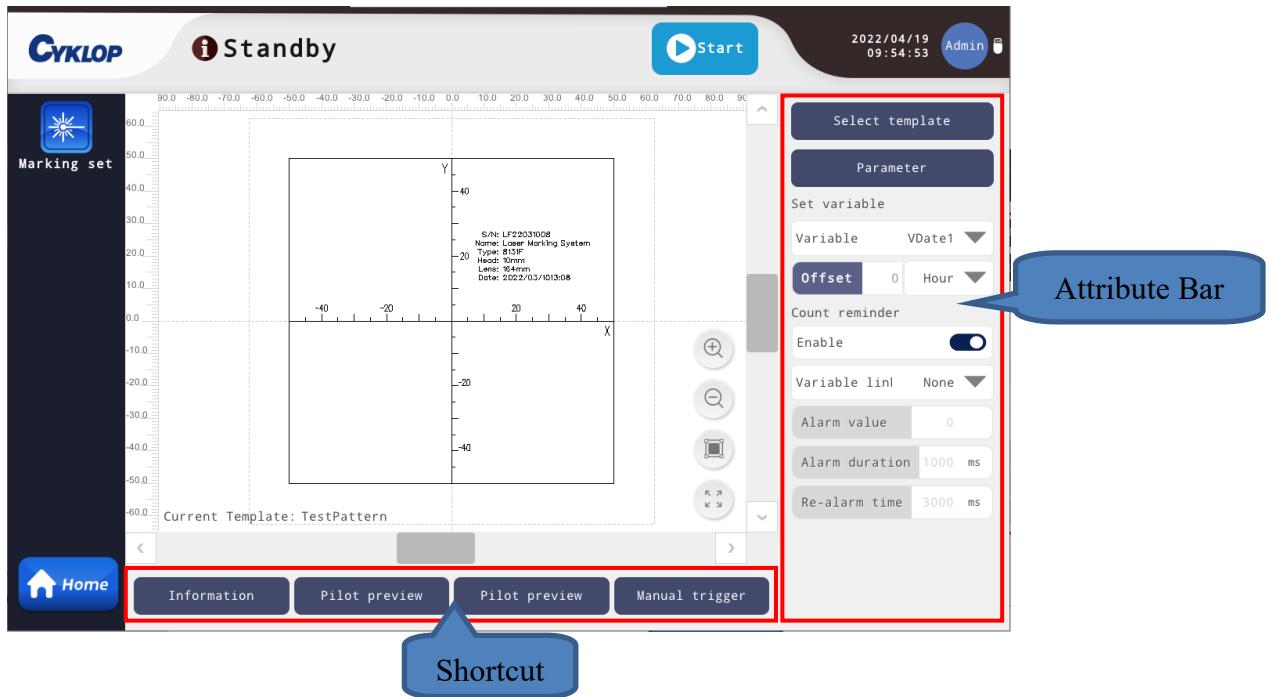
Adjust: To set the number marked among the number of markings as set by the current template.

Reset: To reset the batch counter.

Batch size: To display the batch size value of the current template. This value can be edited when marking. When pressing "Cancel", the new value is ignored and the previous value remains valid. When selecting a different template, or restarting the laser system, the counter will be automatically set to 0.

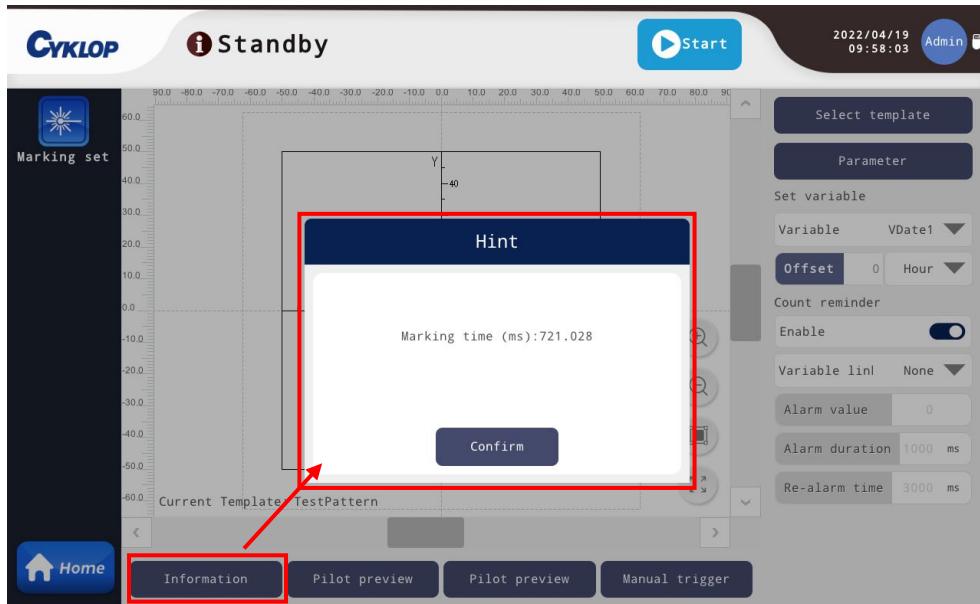
Adjust: To set the batch value.

### 3. Marking Set



#### 3.1 Marking Set Shortcut Bar

Information: To display the marking information of the current template (**Functions and figures to be added**)



Red light focusing:

By adjusting the height of the laser head position, to make the red light spot coinciding with the point, so as to achieve the preset focal length.

Pilot preview:

To guide the laser with the red light, so as to burn the current marking content to the position on the product.

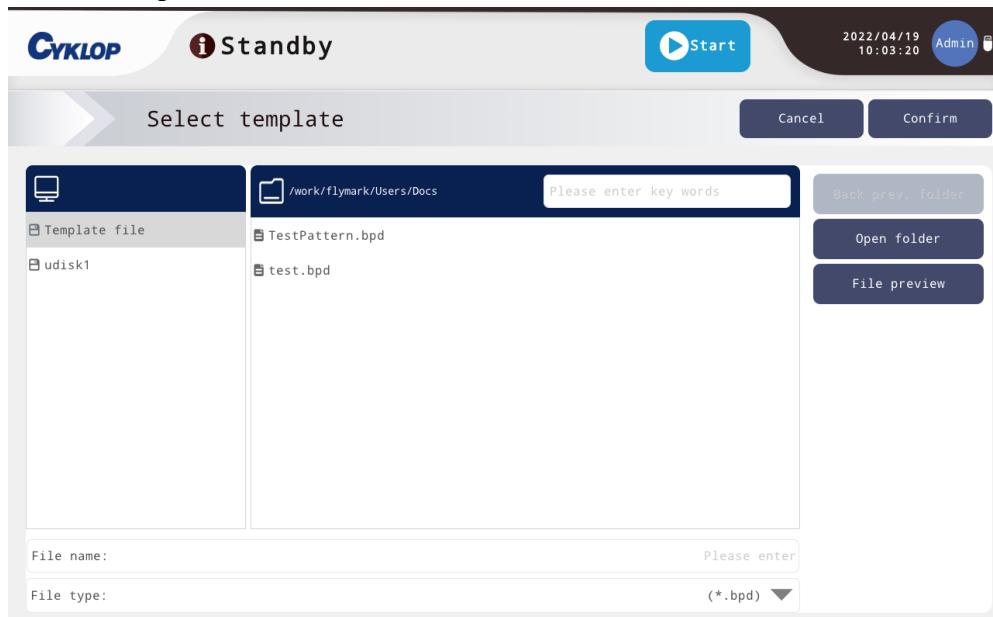
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Manual trigger: If the external trigger is used as the trigger mode, click manual trigger to jog and mark the current marking content once.

## 3.2 Marking Set Attribute Bar

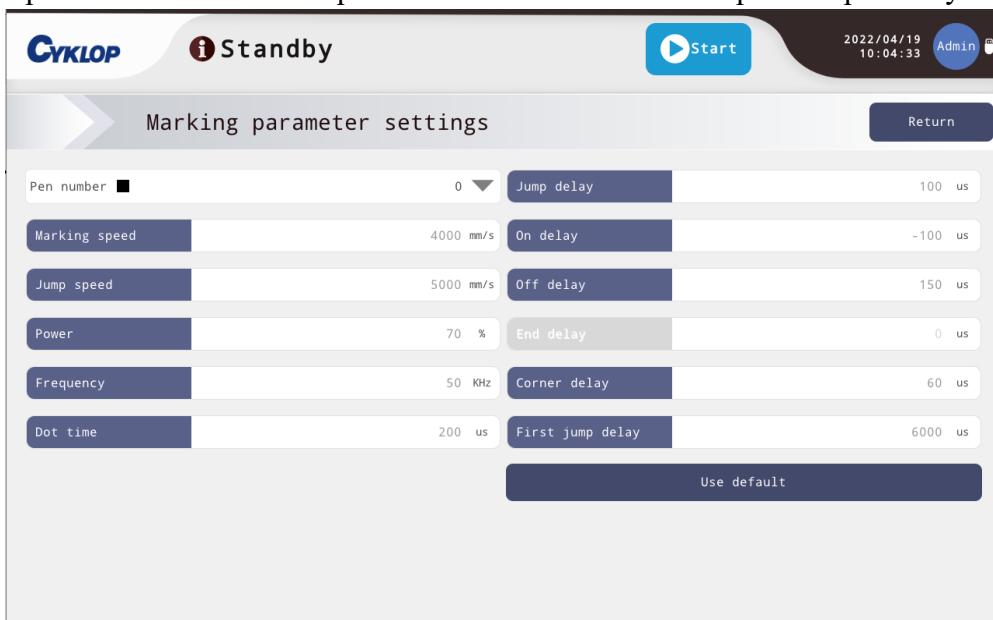
### 3.2.1 Selecting Template

You can select the template to be marked here



### 3.2.2 Marking Parameters

You can set parameters for different pen numbers in the current template respectively.



Each template may have up to 15 pen numbers, each of which may be assigned different laser parameters (See the “Marking Parameters” Section in the “Template” Chapter).

### 3.2.3 Setting Variables

You can change the value of variables in the template, such as serial number, time, and so on. This area is displayed only if the selected template has variables!



Here you can modify the displacement values of all variables in the template. By “Cancel”, you can undo the changes made by you; by “Confirm”, they will be transmitted to the laser system and marked.

*Prompt: The changes made here are stored only in the scratch pad memory of the laser system by “Confirm”, resulting in no change to the template itself.*

Select the variable you want to modify and enter the modified data in the input area.

You can make modifications as follows:

External data: You are required to modify the external data. The possible maximum number of characters is set when creating the text segment of the “External Data” (See the Section “External Text” in the Chapter “Template Interface”). You can also set the number of characters less than the maximum number.

You can use the alphanumeric keyboard below by clicking with your fingers in the “External Data” input field.

With this keyboard, you can modify the external text easily:



The following functions are available:

← or → : With such keys, it is possible to move the cursor by one bit to the left or right in the text.

Confirm: Click this button to apply the modifications and display the new text in the “Preview” window.

Cancel: Click this button to abandon the input.



: Collapse the on-screen keyboard.

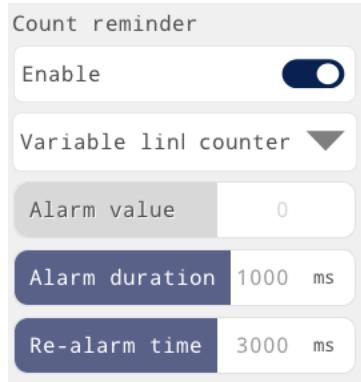
The functions of all other keys are the same as those of the normal computer keyboard.

Displacement of a date field: Please modify the deviation of a date field. You can enter a positive or negative value, and you can also select day, month, or hour as the unit.

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Displacement of a time field: Please modify the deviation of a time field. You can enter a positive value or a negative value, and you can also select hour, minute, or second as the unit.

### 3.2.4 Counting Alert



Give off an alert when the selected counter reaches the cumulative value as specified.

Enable: You can set whether to enable the counting alert function.

Associated serial number: To select the associated serial number, marking counter, or batch counter to be alerted.

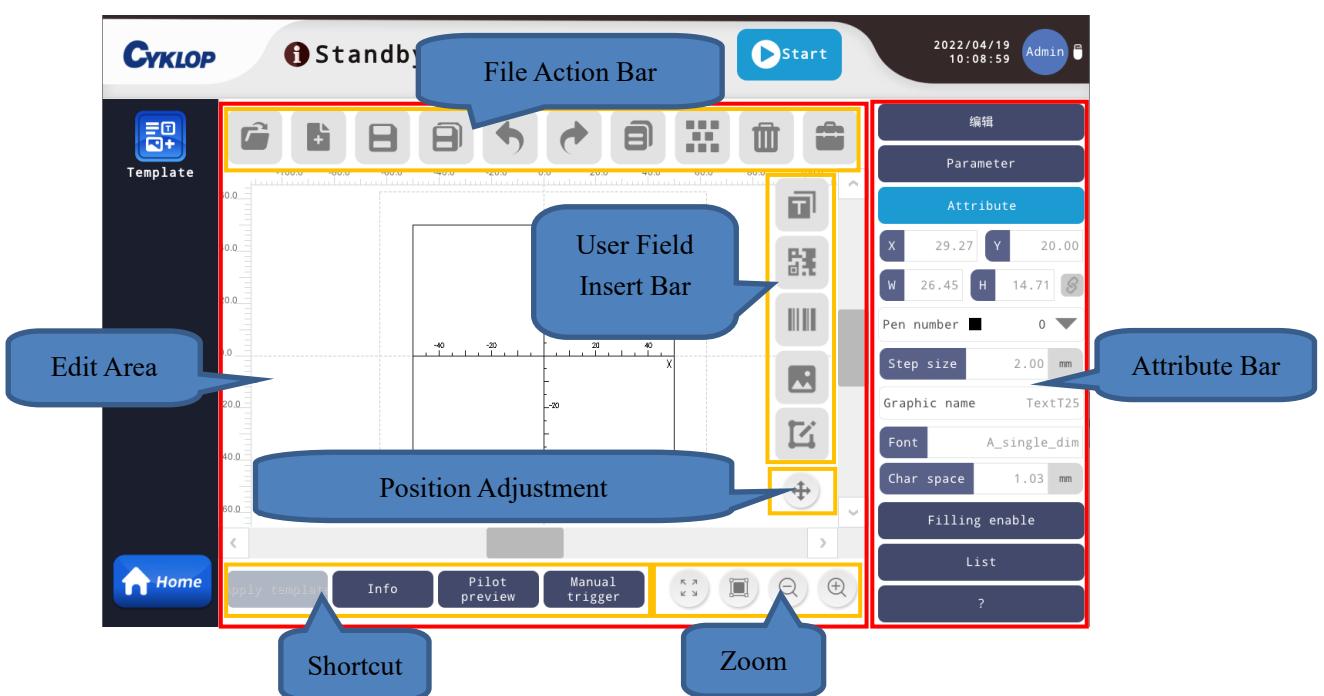
Alarm value: To set the value to be alerted which is effective for marking counter and serial number.

Alarm duration: To set the duration of alert.

Time of re-alarm: To set the interval between the first alert and the second alert. Set as 0 so that the second alert will not be given.

## 4. Template

This screen is used to create or edit the template to be marked.



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## 4.1. Edit Area

Available marking area (The size depends on the settings in the “Configuration > Galvo Setting > Working Area” item).

Tip: For static marking, ensure that all the marking content is in the marking area.

## 4.2. File Action Bar

 Open: To open an existing template. Please select a template from the list in the selection window and click “Confirm” to open the template so selected.

 New: To create a new template. Please enter the name of the new template in the dialog window, and click “Confirm” to open the new template.

 Save: To save the current template to the database.

 Save as: To save the current template to the specified location in a different name.

 Undo: You can undo a number of steps when carrying out the operation of primitive editing.

 Repeat: To repeat the steps undone.

 Copy: To copy the primitive selected in the template, and the system will automatically copy a new primitive with the offset value (2, 2) based on the original primitive.

 Array: To make matrix arrangement of the primitive selected in the template.

 Delete: To delete the primitive selected in the template.

 Tools: A collection of tools used to edit the primitive selected in the template.

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#### 4.2.1 Tools



Left-align: To left-align all the primitives selected in the template (subject to the left-most primitive).

Right-align: To right-align all the primitives selected in the template (subject to the right-most primitive).

Top-align: To top-align all the primitives selected in the template (subject to the primitive on the top).

Bottom-align: To bottom-align all the primitives selected in the template (subject to the primitive on the bottom).

Horizontal even distribution: To make horizontal even distribution of all the primitives selected in the template.

Vertical even distribution: To make vertical even distribution of all the primitives selected in the template.

Vertical centerline alignment: To make vertical centerline alignment of all the primitives selected in the template.

Horizontal centerline alignment: To make horizontal centerline alignment of all the primitives selected in the template.

Horizontal mirroring: To mirror all the primitives selected in the template with the vertical centerline of the selected box.



Vertical mirroring: To mirror all the primitives selected in the template with the horizontal centerline of the selected box.



Group: To group all the primitives selected in the template into a new primitive object while remaining the original attributes of such primitives. Just like any other primitive object, the primitive object so grouped can be selected, copied, pasted, moved, rotated, and zoomed, and the object attribute can be set for the primitive object so grouped.



Ungroup: To restore the grouped objects to the single state before the grouping.

#### 4.3. Template Shortcut Bar

Apply template: To apply the template in editing to the current marking system.

Information: To display the current template marking information.

Red light preview: To guide the laser with the red light, so as to burn the current marking content to the position on the product.

Manual trigger: If the external trigger is used as the trigger mode, click manual trigger to jog and mark the current marking content once.

#### 4.4. Zoom



Zoom in: To zoom in the preview display area with the origin of coordinates as the center.



Zoom out: To zoom out the preview display area with the origin of coordinates as the center.

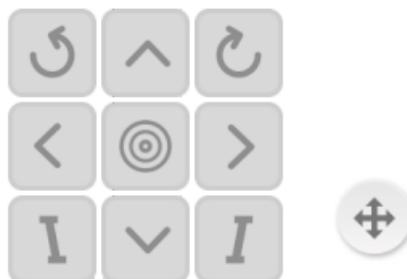


Full-page display: To display the entire preview display area.



Display all: To zoom in all data or graphics of the current template to cover the whole preview display area.

#### 4.5. Position Adjustment



Displace or transform primitive: Click on the icon to expand or collapse.



Rotate to left: To rotate the primitive selected in the template to left by an offset value.  
(Offset value is determined by “Attribute> Step Size”)



Rotate to right: To rotate the primitive selected in the template to right by an offset value.  
(Offset value is determined by “Attribute> Step Size”)



Move up: To move the primitive selected in the template up by an offset value.  
(Offset value is determined by “Attribute> Step Size”)



Move to left: To move the primitive selected in the template to left by an offset value.  
(Offset value is determined by “Attribute> Step Size”)



Move down: To move the primitive selected in the template down by an offset value.  
(Offset value is determined by “Attribute> Step Size”)



Move to right: To move the primitive selected in the template to right by an offset value.  
(Offset value is determined by “Attribute> Step Size”)



Center: To move the primitive selected in the template to the origin of coordinates.



Tilt to left: To tilt the primitive selected in the template to left by an offset value.  
(Offset value is determined by “Attribute> Step Size”)



Tilt to right: To tilt the primitive selected in the template to right by an offset value.  
(Offset value is determined by “Attribute> Step Size”)

## 4.6. User Field Insert Bar

In the user field insert bar you can find all the objects as necessary to develop templates. The attributes of each selected object will be displayed and can be modified in the attribute columns.



Text



QR Code



Pattern



Barcode



Plotting (To be expanded)



Square



Circular



Point

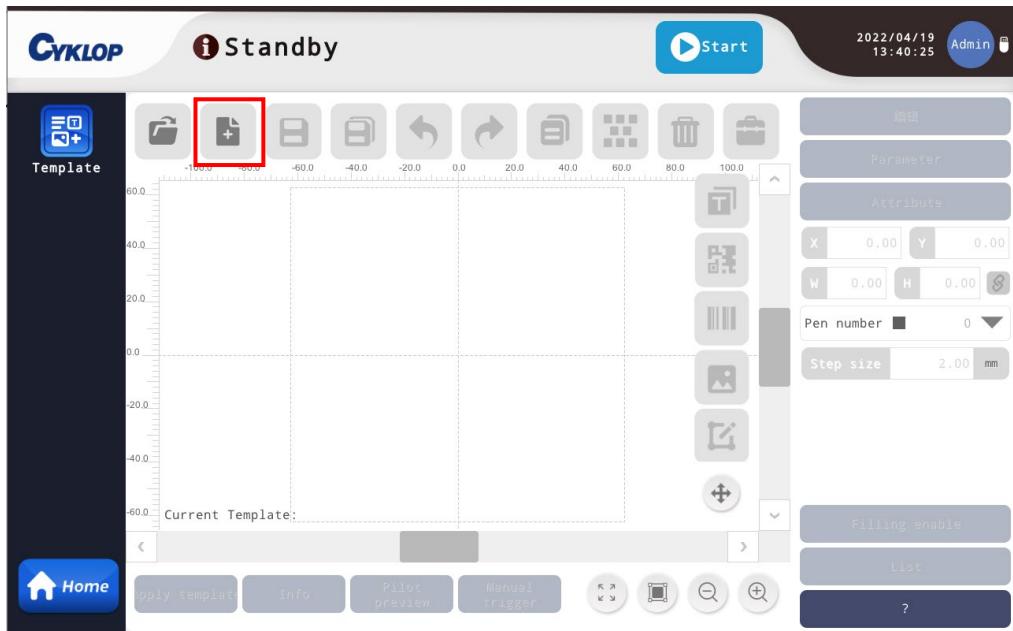


Straight line

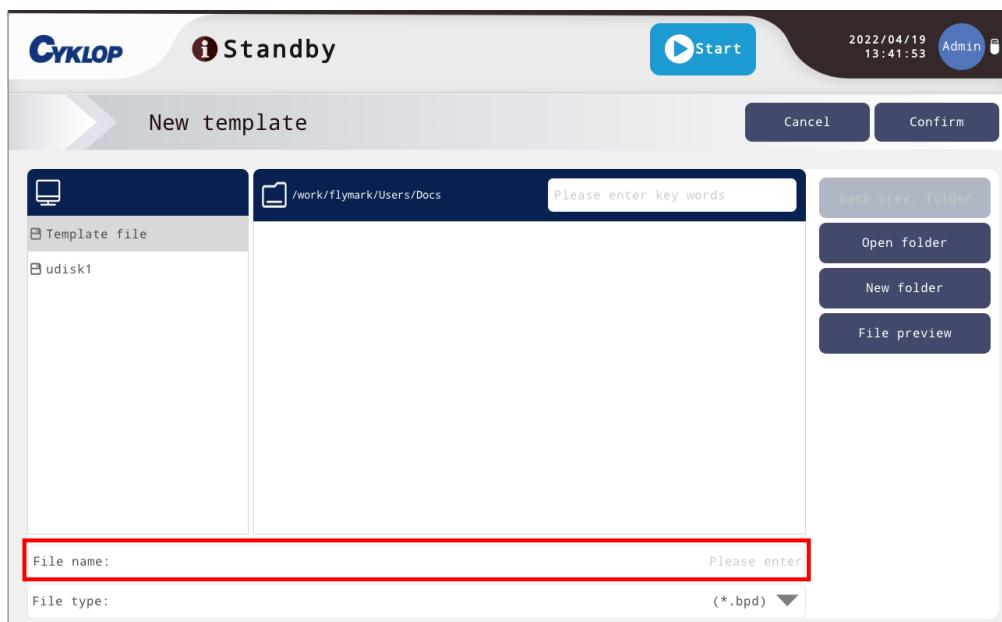


Dotted line

## 4.7. Text



Please click the button to create a new template.



Please enter the name of the template to be created in the “File Name” area, for example, “test”.

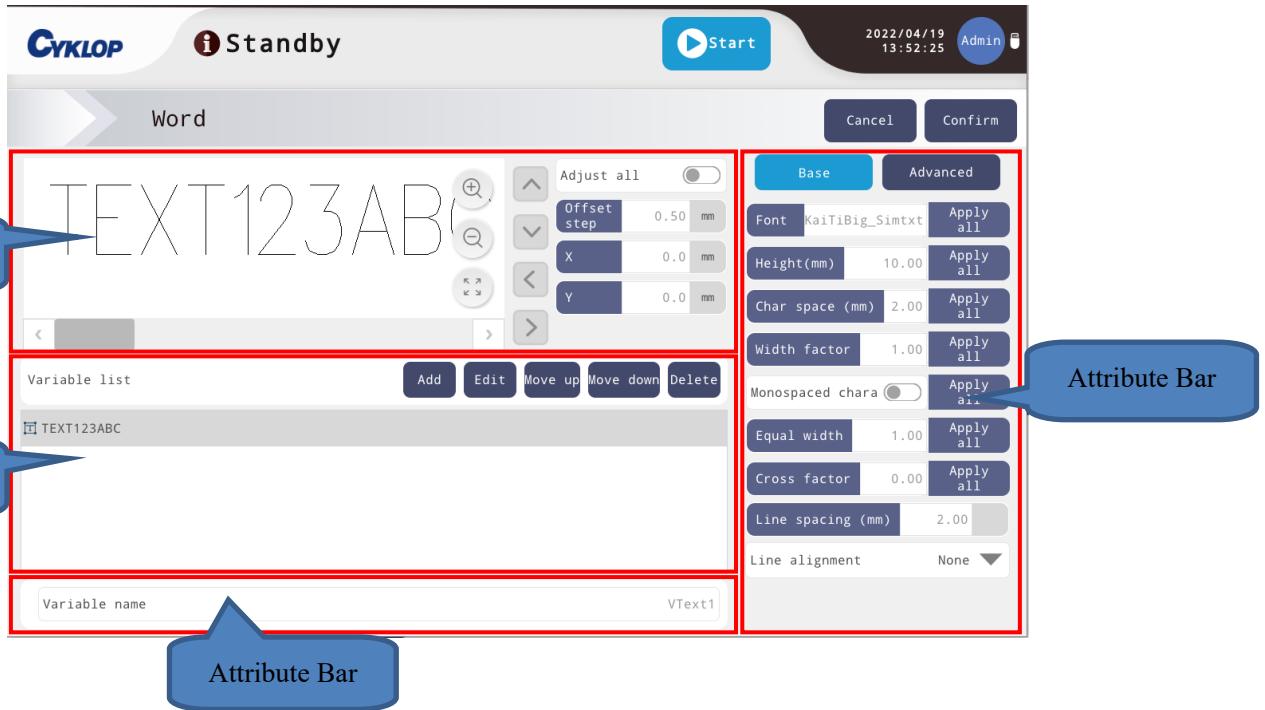


Click “Confirm” to get a new blank template. The name of the current active template will be displayed in the lower left corner of the edit area.



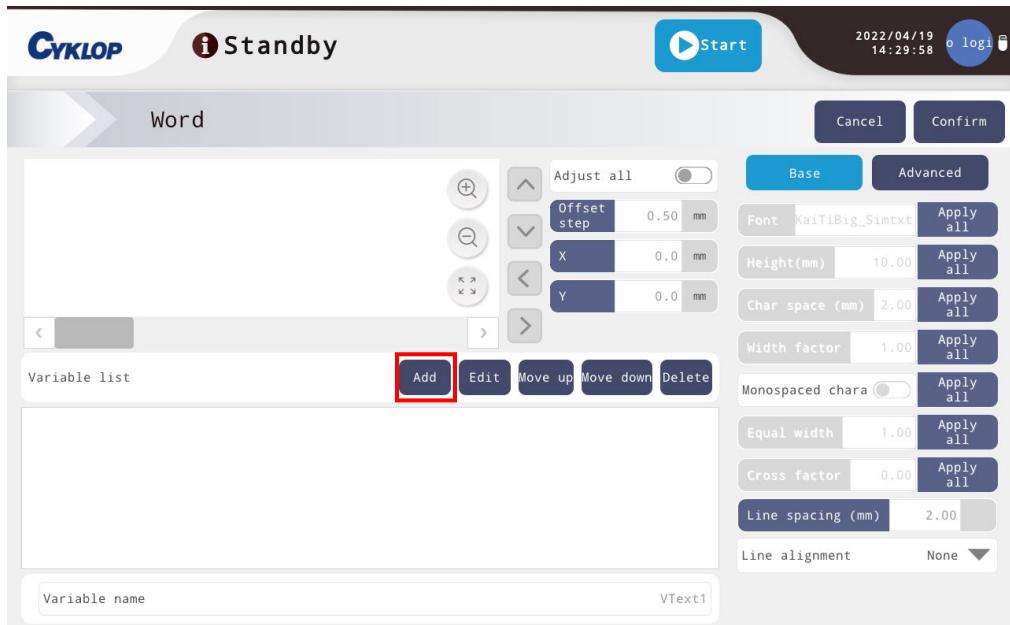
### Entry of text and variables

 Click the button. The system will insert text at the origin of the marking area, and the “Text” dialog box is popped out.

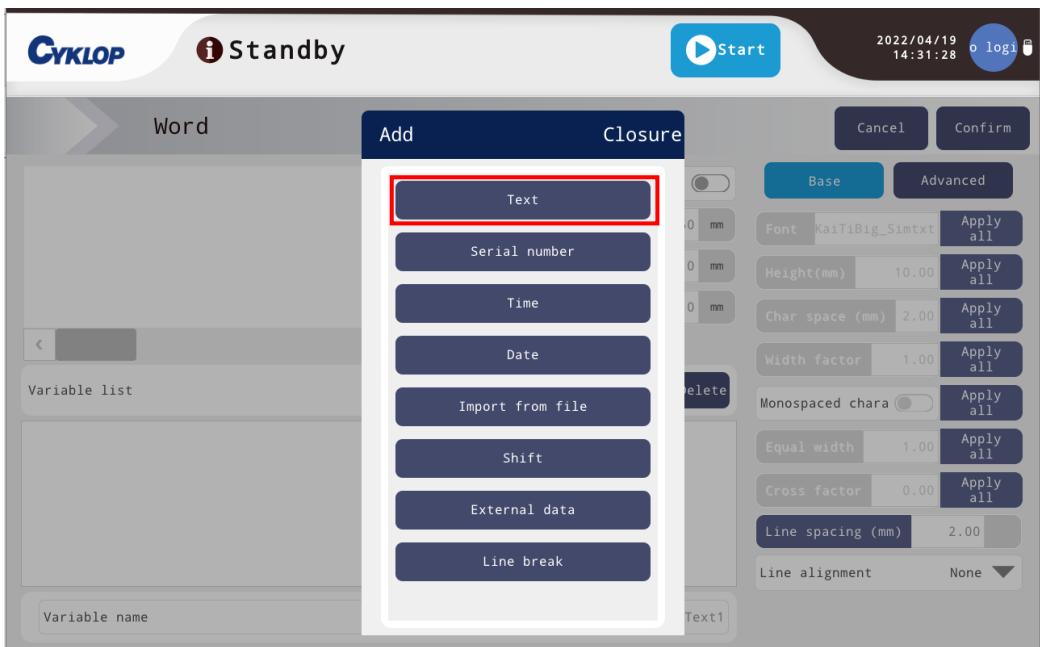


## 4.7.1 Text Editing

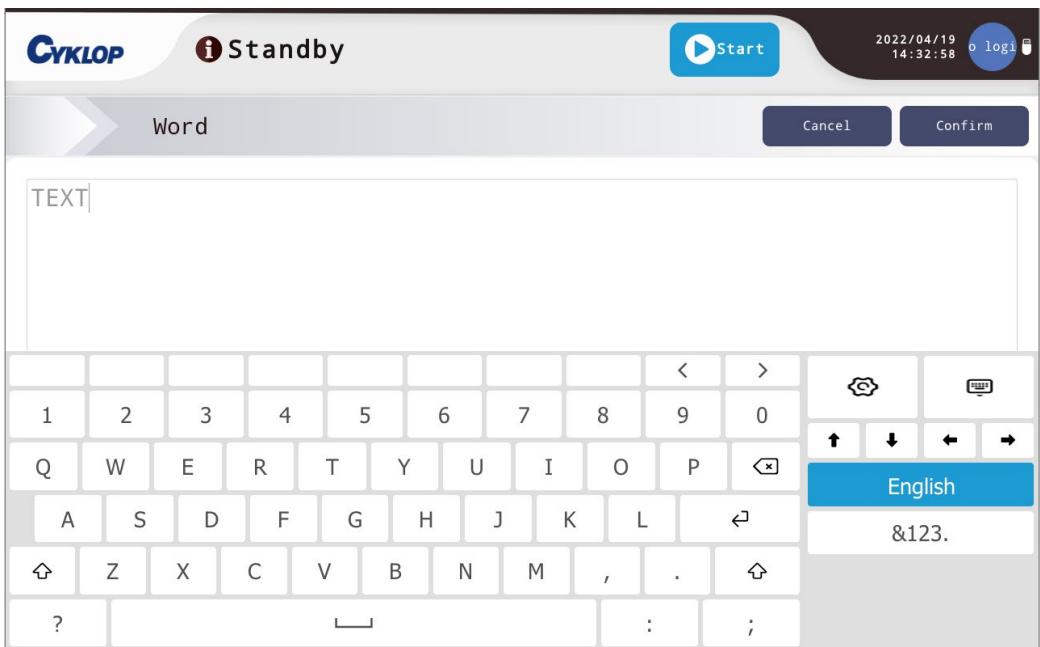
### 4.7.1.1 Fixed Text



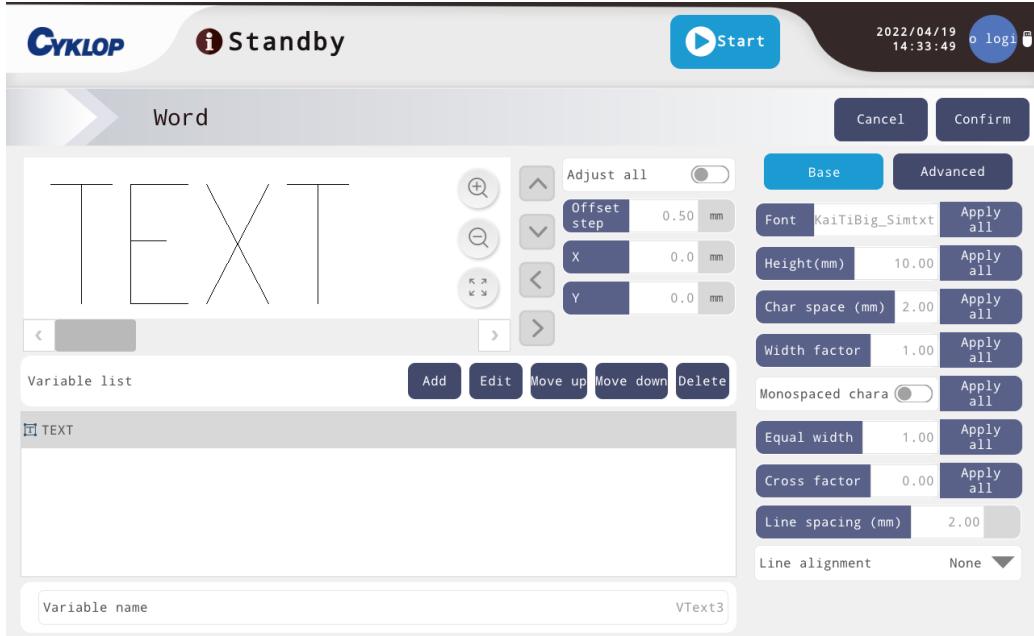
Click the “Add” button



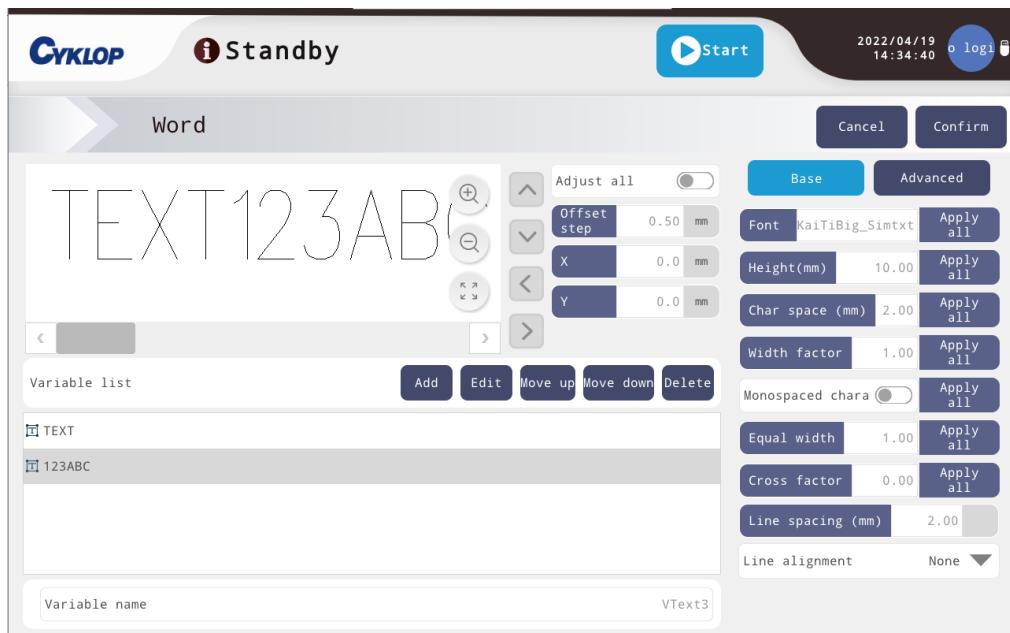
Select to add a “Fixed Text”.



Select the text to be added in the textbox, for example the “TEXT”.



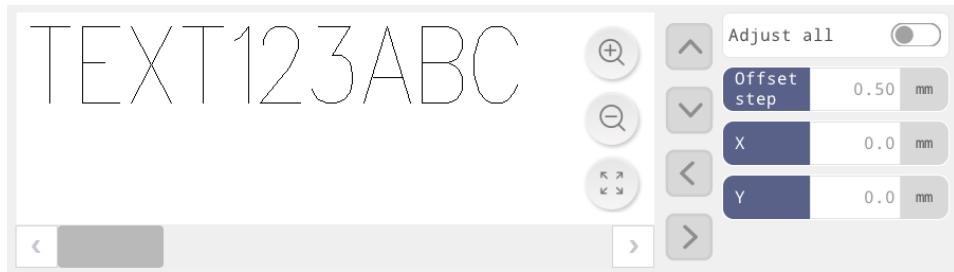
Click “Confirm” to return and confirm the new content. When pressing the “Cancel”, the new content is ignored and the previous content remains valid.



Repeat the above steps to enter multiple text character fields (not limited to fixed text).

**Note:** If the line breaks are not inserted, the new character field will follow the previous character field by default. Subsequently, you can use the editing tool in the list of variables to make adjustment such as sorting and line breaking.

#### 4.7.1.2 Text Preview



Zoom in: To zoom in the preview display area with the upper left corner of the preview area as the origin.

Zoom out: To zoom out the preview display area with the upper left corner of the preview area as the origin.

Display all: To zoom in all character fields of the current text to cover the whole preview display area.

Adjust all: If this function is disabled, adjust only the character fields selected in the “List of Variable” below. If it is enabled, adjust all character fields in the “List of Variables”.

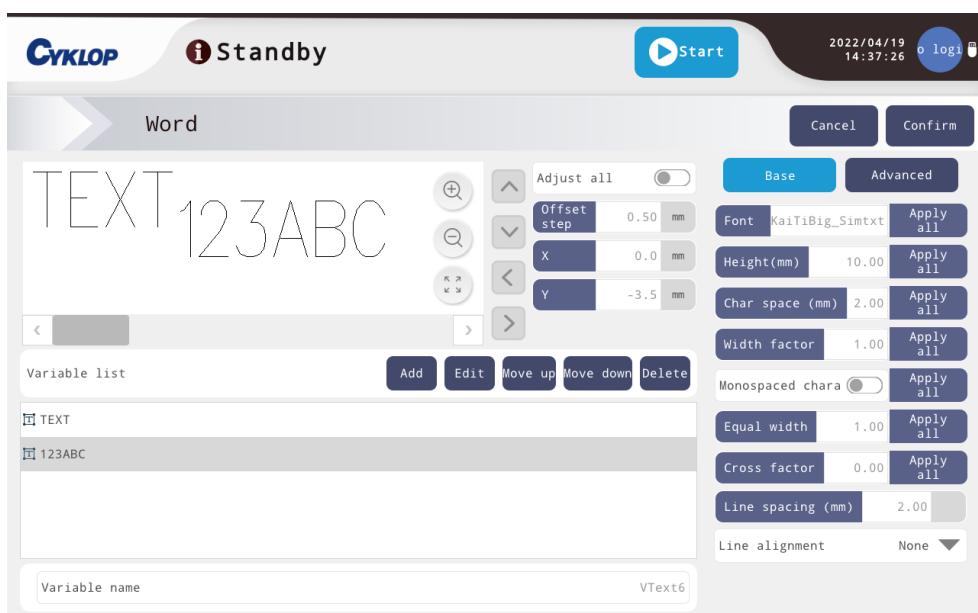
Offset step size: The set value determines the single offset distance when moving the character field.

Move up: To move the primitive selected in the template up by an offset value.

Move to left: To move the primitive selected in the template to left by an offset value.

Move down: To move the primitive selected in the template down by an offset value.

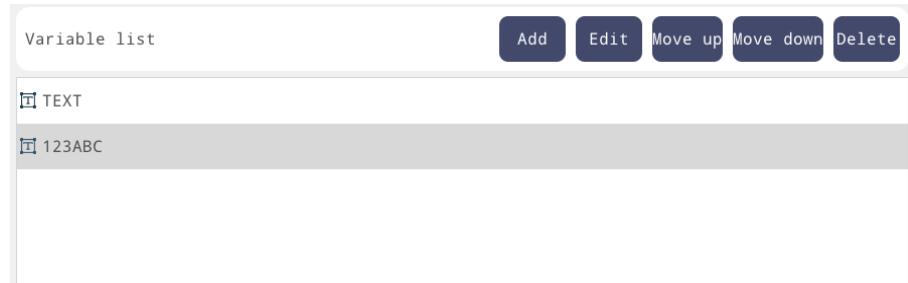
Move to right: To move the primitive selected in the template to right by an offset value.



---

**Prompt:** Controlling the movement of a single character field allows for typesetting of more complex character fields.

#### 4.7.1.3 List of Variables



In this area, all the character fields of the text inserted are set out.

The gray part indicates the character field selected.

Add: To add the new character fields, such as fixed text, serial number, time, date, import from file, shift, external data, line break, etc.

Edit: To edit the character field selected.

Move up: Each click will move the character field selected up by one position. If the character field is already located at the front end, it does not take effect.

Move down: Each click will move the character field selected down by one position. If the character field is already located at the tail end, it does not take effect.

Delete: To delete the character field selected currently.

#### 4.7.1.4 Attribute Bar

##### 4.7.1.4.1 Base Attribute



Font: To set the font for the character field selected.

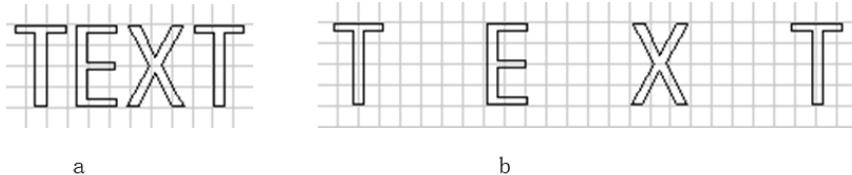
Click "Font" to preview the font.



**Set as default font:** To set the selected font as the default font. Thereafter, the character field after such setting will be displayed in the default font.

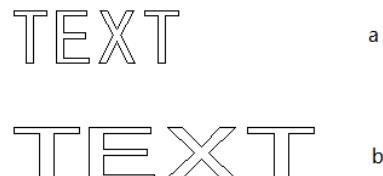
**Height:** To set the font height of the character field. Click “Confirm” to return and confirm the new value. After pressing the “Cancel”, the new value is ignored and the previous value remains valid.

**Character spacing:** To set the distance between characters.



(a indicates the text with spacing of 1, and b indicates the text with spacing of 10. The background grid size is 2mm per grid)

**Character width coefficient:** To arrange the characters according to the set character width.



(a indicates the text with character width of 1, and b indicates the text with character width of 2.)

**Monospaced character:** Whether to enable the monospaced character function.

---

TEXT 123ABC	TEXT 123ABC
a	b

(a indicates the text when monospaced character is not enabled, and b indicates the text when monospaced character is enabled)

Character width: To arrange the characters according to the set placeholder width.

123ABC	a
123ABC	b

(a indicates the text with the character width of 0.5, and b indicates the text with the character width of 0.3)

Cross point coefficient: The cross point blank coefficient

TEXT	a
TEXT	b

(a indicates the text with the cross point coefficient of 0, and b indicates the text with the cross point coefficient of 0.1)

By setting the cross point coefficient, it is possible to effectively avoid the primitive cross point being marked as a coincident point.

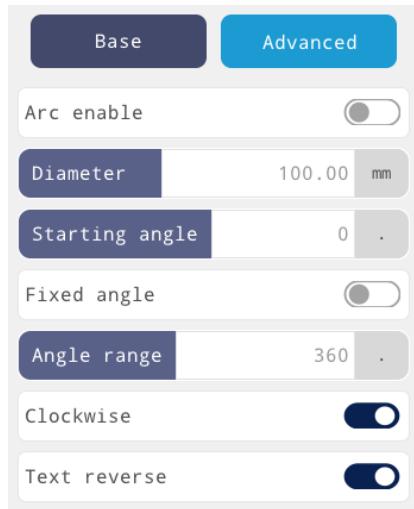
Line spacing: It means the distance between two lines of characters.

Line alignment mode: To select the alignment mode of the text

TEXT 123ABC	TEXT 123ABC	TEXT 123ABC	TEXT 123ABC
Left-aligned	Right-aligned	Center-aligned	Justified alignment

Apply All: When clicking “Apply All”, this parameter will take effect on the text of all elements in the primitive.

#### 4.7.1.4.2 Advanced Attributes

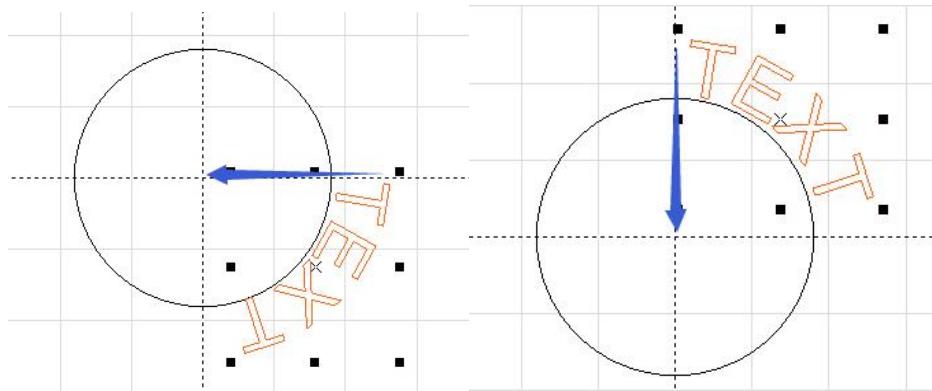
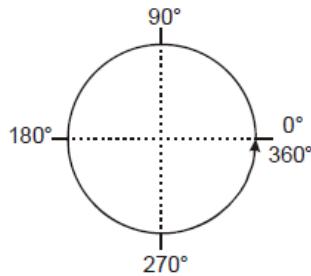


Enable arc marking: Whether to enable the arc marking mode for the current text.

Diameter: The diameter of the arc mark. For multi-line text, the diameter must be consistent with the product of the number of lines and the font size.

Starting angle: It means the reference angle for text alignment, which is the angle included between the leading character and the center of the circle and the X-axis.

Definition of angle:



The Figure on the left shows the reference angle =0°, and the Figure on the right show the reference angle =90° (counterclockwise)

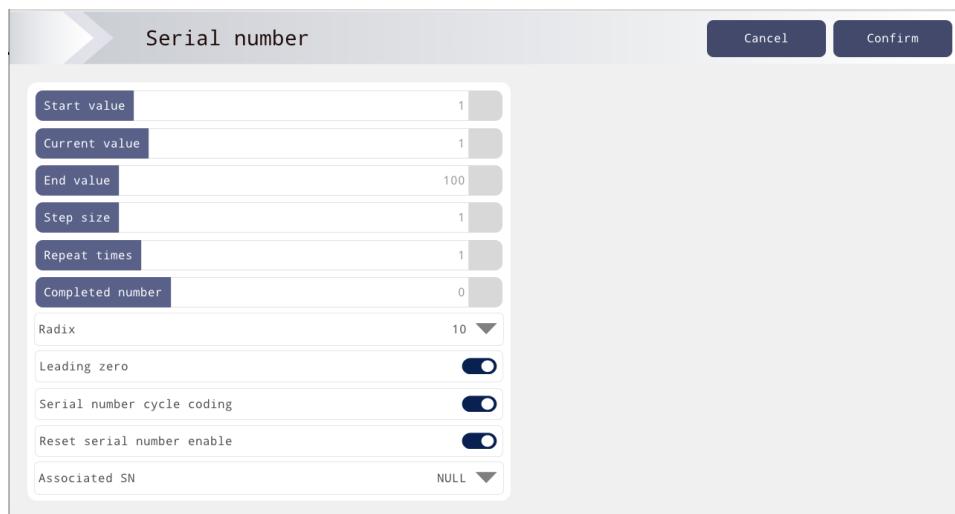
**Fixed angle:** Whether to use a fixed angle range.

**Angle range:** If this parameter is selected, the system will constrain the text within the limited angle no matter how much text is entered.

**Clockwise:** To ring-shape the character string and then arrange clockwise.

**Reverse text:** Whether to mirror the character string in the Y-direction of the character string.

#### 4.7.1.5 Serial Number



Starting serial number: The numeral of the serial number at the start

Current serial number: The numeral of the current serial number

Ending serial number: The number of digits of the serial number; if the serial number to be processed is equal to the value of such serial number, the marking at this serial number shall be ended.

Step size: It means the step pitch data between single serial numbers. Enter a positive number for the ascending serial number and a negative number for the descending serial number.

Repeated quantity of a serial number: It means the number of products marked with the same serial number.

Completed quantity of a serial number: It means the number of markings with the current number. 0 indicates that it is not marked.

Number system: It indicates the number system of such serial number. The default options include decimal system, hexadecimal uppercase and hexadecimal lowercase

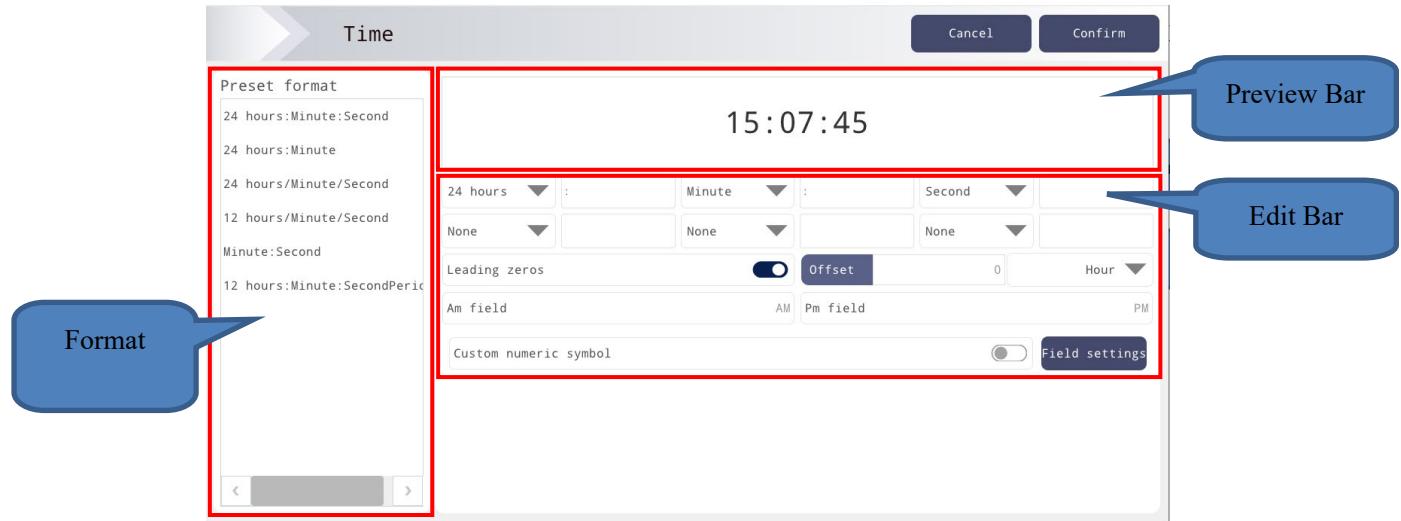
Leading zero: If this parameter is not selected, only the actual value of the serial number will be displayed. If this parameter is selected, zero will be used to complete the serial number if the serial number is insufficient to set the number of digits.

Cyclic code of serial number: Whether to mark automatically from the starting serial number when the marking of the ending serial number is completed

Enable reset serial number: Whether to enable the serial number reset function

#### 4.7.1.6 Time

Here you can insert the clock time field in the template so that the current system clock time is available to marking. You can also set a difference value from the current system time.



##### Format

You can choose a preset time format, or define your own time format in the edit bar.

If you want to use the preset time format, click on the list field above. The list field in the edit bar will display the unit for the time field. In the preview window, the current time will be displayed in the time format selected.

##### Preview bar

The preset format you selected or the self-defined format you are editing will be displayed here.

##### Edit field

Leading zero: Whether to display the time complement “0”.

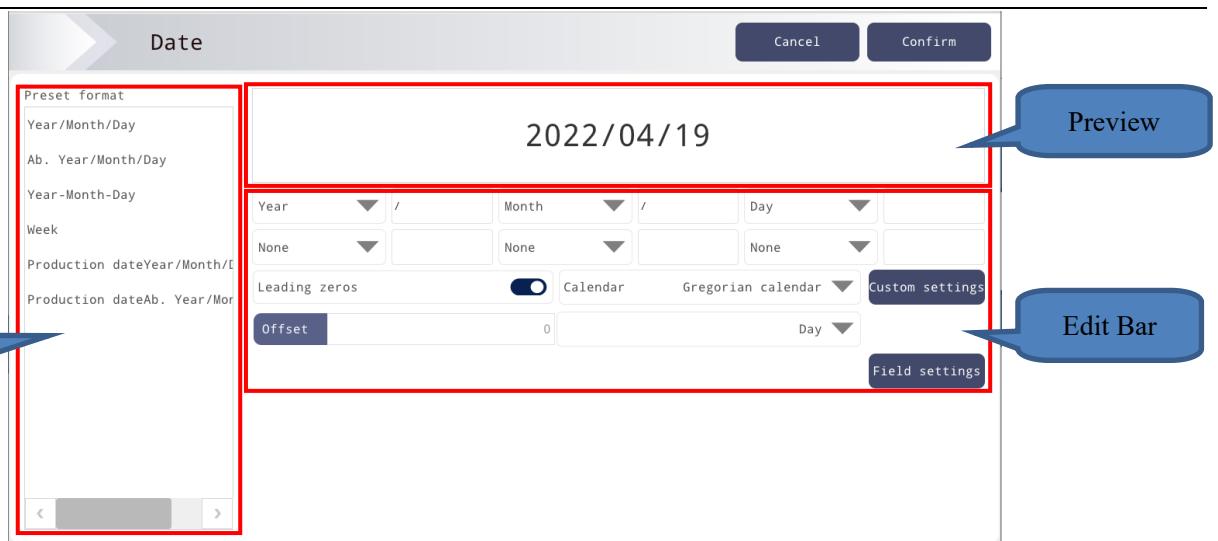
Self-define field: Select the element to be defined in the drop-down box, and enter the content of the element in the input box.

Forenoon/afternoon field: A day is divided into two period of time including forenoon and afternoon. The users can self-define a text for each period of time.

Offset: You can add and remove a fixed time interval for the current time. Enter the number required in the number field, then click on time data such as second, minute or hour (only one time data is supported; when you select the second time data, the first time data is automatically zeroed).

#### 4.7.1.7 Date

Here you can add the date field in the template so that the current system date is available to the marking. You can also set a difference value from the system date.



## Format

You can choose a preset date format, or define your own date format in the edit bar.

If you want to use the preset date format, click on the list field above. The list field in the edit bar will display the unit for the date field. In the preview window, the current date will be displayed in the date format selected.

## Preview bar

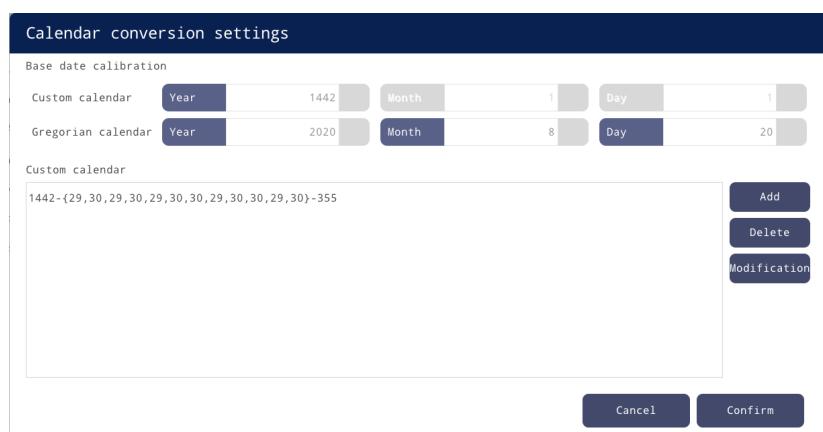
The preset format you selected or the self-defined format you are editing will be displayed here.

## Edit field

Leading zero: Whether to display the time complement “0”.

Self-define field: Select the element to be defined in the drop-down box, and enter the content of the element in the input box.

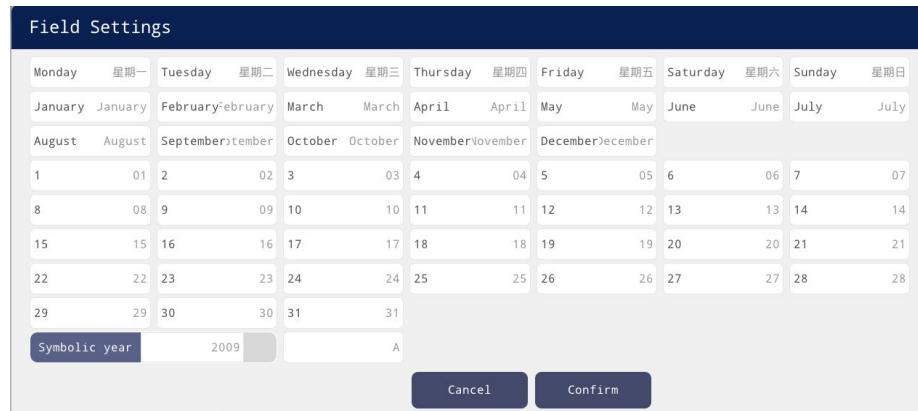
Calendar: Select Gregorian calendar or self-define the calendar.



**Offset:** You can add and remove a fixed date interval for the current date. Enter the number required in the number field, then click on date data such as hour, day or month (only one date data is supported; when you select the second date data, the first date data is automatically zeroed).

**Self-define numerical symbols:** Select whether to enable self-defined numerical symbols, which shall be used together with the “Field Setting”.

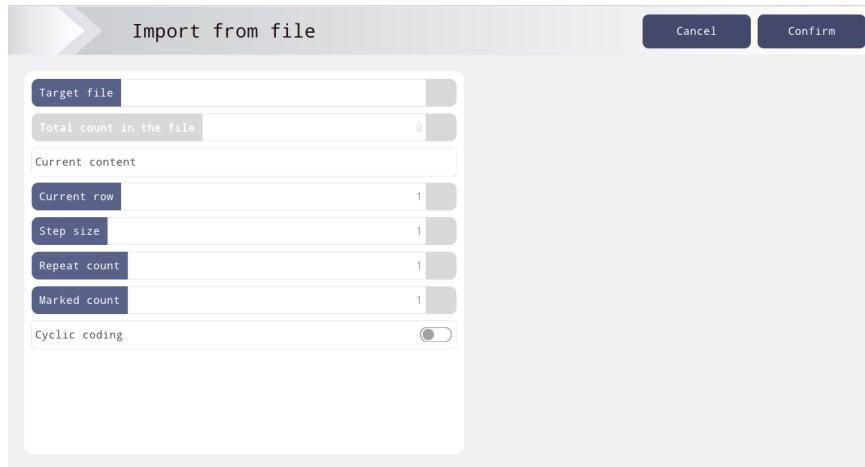
**Field setting:** It is possible to self-define the display of week, month, year, and numeral.



**Prompt:** You can self-define the format of numerals, such as replacing them with “Farsi” numbers.

#### 4.7.1.8 Import from File

Import content of marking from other files



**Target file:** Select the file to be imported, and only the files in “.txt” format are supported.

**Total number of lines of file:** After the target file is selected, the system will automatically calculate the total number of lines of the file to be imported.

**Current content:** Display the content of current line of the target file.

**Current number of line:** You can select the number of line to be displayed and mark from the current number of line.

**Step size:** Perform the increment in the number of lines of marking.

**Number repeated:** The content of the target line shall be marked to the specified number before the content of the next line is marked.

---

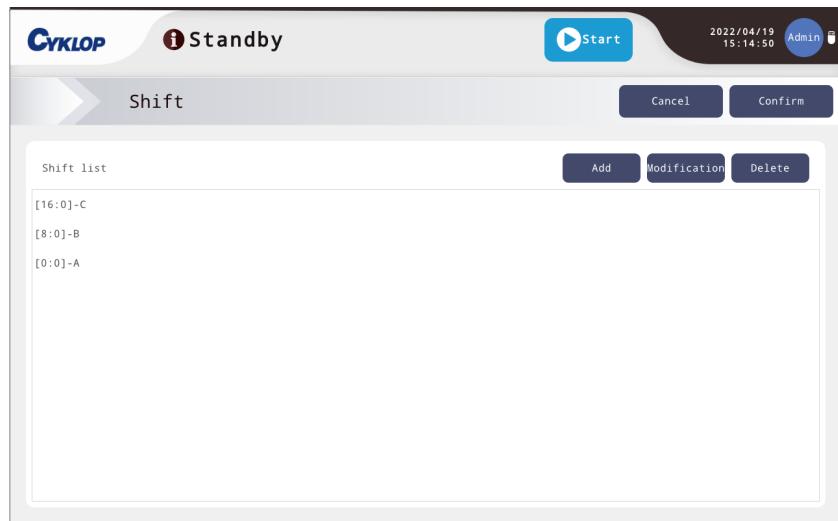
Number completed: It indicates the number of markings in the current line. 0 indicates that it is not marked.

Cyclic marking: Whether to start marking automatically from the initial line number after marking the full content of the file.

#### 4.7.1.9 Shift

The shift code is designed to burn different texts on the products within different periods of time every day.

It can be used, for example, to add markers for the shifts of production in the marking.



##### Add

With “Add”, you can develop a new shift code.

In this window, you can add the starting time and code of the shift.



##### Modify

With “Modify”, you can change the starting time and code of the shift selected.

#### 4.7.1.10 External Data

With external data, you can define a changeable text box. The content of this field can be transmitted to a specified external data channel through a serial port or network port.



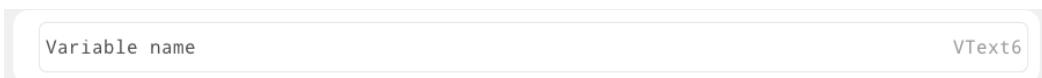
At present, there are five data channels available for external data.

#### 4.7.1.11 Line Break

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

Prompt: If you want to insert a space between two variable text elements, you can insert it as “Fixed Text”.

#### 4.7.1.12 Marking Content Output Setting (root)



**Variable Output Enabled:** Whether to output variable content

**File Output Enabled:** Whether to output file content

**Timestamp Enabled:** Whether to output time and date

**Output Marking Content to File:** Output the content of the modified primitive to the file as specified after each marking

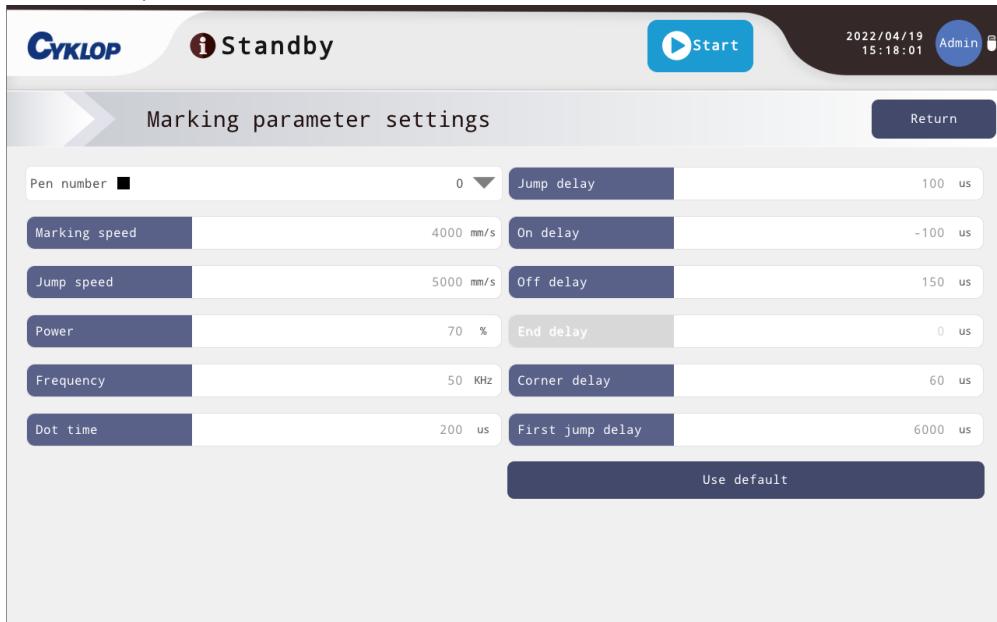
**Name of Variable:** To name the individual variables in this primitive

### 4.7.2 Marking Parameters

The marking parameters are designed to ensure the consistency of the laser parameters with your products, while these parameters are related to the constituent materials of the product and the marking

method. Marking parameters are set for certain materials or products, for example, paper or plastic. You can set parameters for different pen numbers in the current template respectively.

Prompt: The setting method in this dialog window depends on the type of laser system to be connected (FIBER, UV, or CO2).



Pen number:

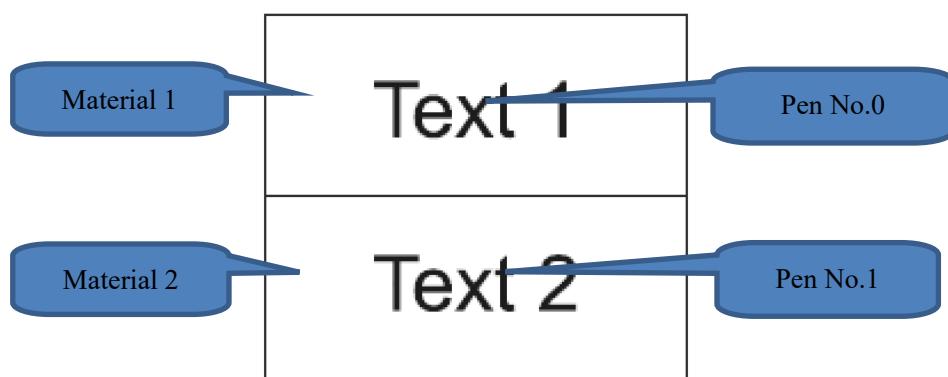
Corresponding to the 16 pens in the primitive attribute bar, each template has 16 pens numbered from 0 through 15. The pen number is distinguished by color and numeral. Each color and numeral represents a parameter, and different colors are used only to distinguish different marking parameters, but are not the color marked with laser.

The default value is pen 0 represented in black.

When you create a new template or add new primitive, the last pen number used shall be used by default.

The template object is classified by different pen numbers so that the marking can adapt to different marking conditions. This adaptation is necessary if you are marking a product made from various materials, or if you are using different font qualities.

*Example: You want to mark a product with the upper part made of material 1 and the lower part made of material 2.*



*In order to enable marking to adapt to materials, use Pen No.0 for text 1 and Pen No.1 for text 2.*

---

*When selecting the parameters for this template, 2 pen numbers are used, and set for different materials 1 and 2.*

#### Marking speed:

It specifies the speed at which the laser beam travels on the surface of the product during marking. (Range 1~15000mm/s)

The default value is 2000mm/s.

When adjusting the marking speed, attention shall be paid to the corresponding relationship with the power and frequency. The faster speed will result in the higher frequency with the direct impact on the work efficiency. The larger the value is, the less time is needed for marking; the smaller the value is, the longer time is needed for marking.

#### Jump speed:

It specifies the speed at which the laser beam moves from one line to the next line; in such case, the laser beam is turned off. (Range 1~15000mm/s)

The default value is 6000 mm/s.

This parameter is mainly used to control the jump speed between the strokes when marking the primitives, i.e. the speed at which the galvanometer moves to the starting dot of the next primitive or the starting dot of the next stroke after marking the last dot of a stroke, during which the laser is not emitted.

This parameter, together with “Marking Delay” and “Jump Delay”, can adjust the starting effect of character during marking.

#### Power:

Set the laser output power by adjusting the value of current. (Range 0~100%)

The default value is 70%.

While the other parameters remain unchanged, the higher value means the larger energy output, resulting in the heavy chromaticity and deep trace of marking effect.

#### Frequency:

The frequency can be adjusted within a fixed range (which varies from laser to laser and is preset before delivery).

The larger value indicates that there are more light spots arranged in a more closely way in unit length. The suitable light spot spacing is beneficial to effect adjustment. To generate a route to draw the dotted line, a lower value may be used.

While the other parameters remain unchanged, the lower the frequency is, the higher the peak power is, and the better direct gasification effect is achieved; the light energy effect manifested at higher frequency is closer to average power, that is, it is reflected as more thermal effect.

#### Dot time:

The time taken to mark each dot. (Range 1~10000μs)

The default value is 100μs.

The larger the value is, the longer the time of single light spot in unit length is, which is often used in dot matrix font or dot matrix QR code.

While the other parameters remain unchanged, the longer the time, the higher the power, the more obvious effect on the material.

#### Jump delay:

It specifies the time delay for starting the marking of next line after a jump. (Range 0~1000μs)

The default value is 100μs.

If the time delay is set too small, the light leak will occur, and there will be missed dot between the ending of the last stroke and the starting of the next stroke. The too high value setting will affect the time of marking, depending on the material.



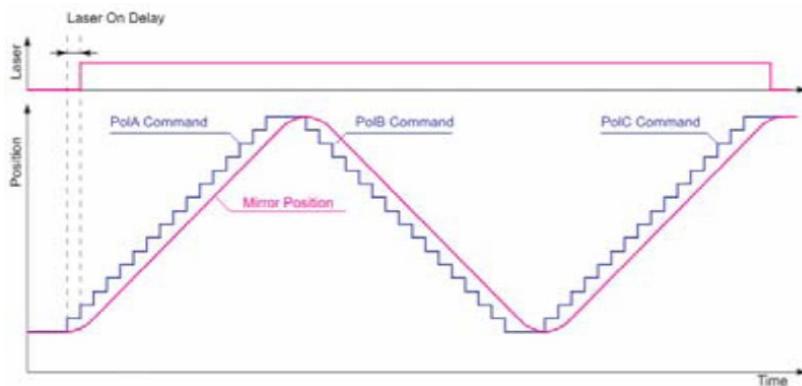
#### Laser on delay:

Set the delay time to wait after starting of a vector and before switching on the laser system. (Range -1000~1000μs)

The default value is -100μs.

While the galvanometer jumps from the current stay point to the starting position of the next primitive, the response of the galvanometer to the position signal will lag behind the time of the signal sent by the system, so it is necessary to delay the switch-on of the laser to wait for the galvanometer to jump to the corresponding position before emitting the laser. This setting is related to the response time of the laser. In general, the value should be adjusted to a positive value, but when the laser emission response time of the laser is greater than the response time of the galvanometer, the value should be adjusted to a negative value, which indicates that the laser emits light in advance.

By setting the appropriate light switch-on delay parameter, it is possible to remove the “match head” appearing at the beginning of marking, but the too large light switch-on delay setting will cause the missing pen in the starting segment.



#### Laser off delay:

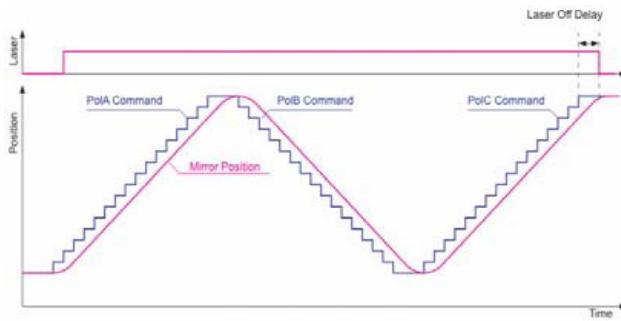
Set the time when the laser is switched on after the end of a vector. (Range 0~1000μs)

The default value is 150μs.

If the galvanometer selected moves quickly enough or the marking speed is adjusted to a sufficient lower speed, the value can be set to a smaller one.

Because the response time of the laser to the “Laser Switch-off” command is shorter than that of the galvanometer to the “Final Position” command, it is necessary to delay the switch-off of the laser to wait for the galvanometer to move to a responsive position. This setting is related to the marking speed, so it shall be consistent with the marking speed you set.

By setting the appropriate light switch-off delay parameter, it is possible to remove the non-closing appearing at the end of marking, but the too large light switch-off delay setting will cause the “match head” in the ending segment.



#### Laser on lag:

There should be a time difference between the galvanometer and the laser when executing commands. In general, the galvanometer is about 100μs slower than the laser. This parameter is used to make compensation. (Range 0~1000μs)

The default value is 200μs.

If the galvanometer selected moves quickly enough or the marking speed is adjusted to a sufficient lower speed, the value can be set to a smaller one.

Because the response time of the laser to the “Laser Switch-off” command is shorter than that of the galvanometer to the “Final Position” command, it is necessary to delay the switch-off of the laser to wait for the galvanometer to move to a responsive position. This setting is related to the marking speed, so it shall be consistent with the marking speed you set. (The difference with delay jump is that there is no need to extend the marking time.)

#### Corner delay:

The delay time between vector segments during marking. (Range 0~1000μs)

The default value is 20μs.

By setting appropriate corner delay parameter, it is possible to remove the rounded corner when marking right angles, but if the too large corner delay is set, the marking time will increase, and there will be “coincident dot” at the corner.

#### First jump delay:

For the first jump during marking, an additional delay is added on the basis of the original jump delay, i.e. the time when the galvanometer receives the signal for the first time and jumps to the first stroke. (Range 0~10000μs)

The default value is 6000μs.

If the galvanometer selected moves quickly enough or the marking is adjusted to a sufficient lower speed, the value can be set to a smaller one.

Because the response time of the laser to the “Laser Switch-off” command is shorter than that of the galvanometer to the “Final Position” command, it is necessary to delay the switch-off of the laser to wait for the galvanometer to move to a responsive position. This setting is related to the marking speed, so it shall be consistent with the marking speed you set.

Use the default value:

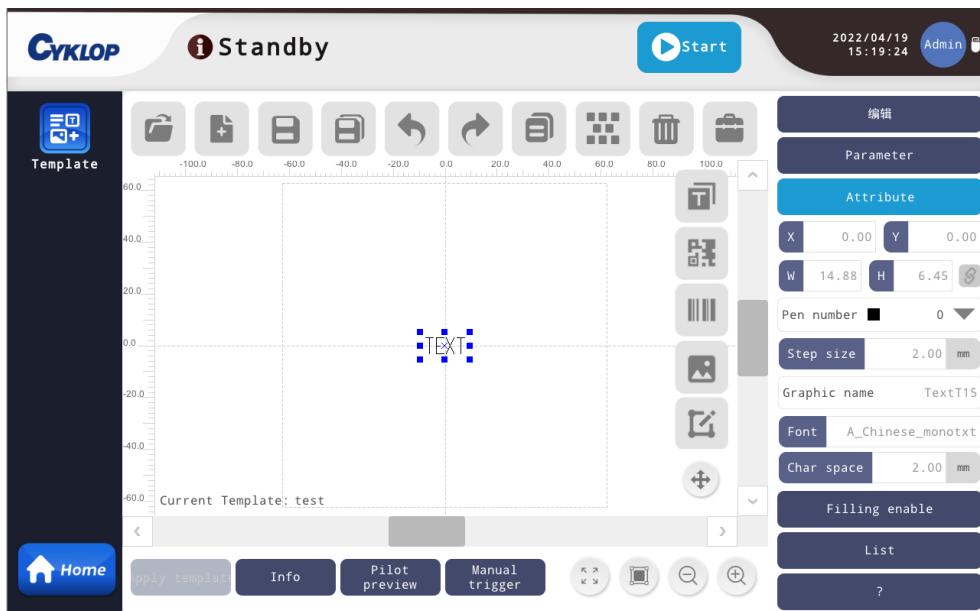
Replace the current parameter configuration with the default parameter configuration.

Pen Parameter Set Value Comparison Table

	Too Large	Too Small	Negative Value
Marking Speed	The marked strokes are not fine enough, sparse, and no depth, and the marking speed is fast	The marked strokes are fine, dense, and deep, and the marking speed is slow	No
Laser on Delay	Resulting in missing stroke in the starting segment	The “match head” coincident dot occurring at the beginning of marking	Yes*
Laser off Delay	Resulting in coincident dot of “match head” at the ending segment	There is no-closing occurring after marking is completed	No
Jump Speed	The processing time of empty stroke is short, the total marking time is reduced, but the strokes may be connected, and the galvanometer movement is unstable	The processing time of empty stroke is long, the total marking time is increased	No
Jump Delay	The galvanometer has been fully turned and remains for a period of time before processing the next stroke, increasing the marking time	Before the galvanometer is fully turned, the system starts to process the next stroke. There are scattered dots at the beginning of the stroke, and the jittering will occur at the starting stroke	No
Corner Delay	Resulting in the increase of marking time, and the coincident dot at the corner	The rounded corner occurring when marking right angle	No
Ending Delay	There is coincident dot at the corner, increasing the time of marking	At high speed, the ending segment of the effective vector locus is incomplete and prone to deformation	No

\*: The negative value indicates that the laser emits laser ahead of time

### 4.7.3 Text Attribute



Attribute: To display the relevant attributes of the primitive selected to edit such primitive

X 0.00 A 0.00

To display the coordinates of the center point of the primitive selected in the edit area of the template.

W 14.88 H 6.45

To display the width and height of the primitive selected. When appears, if you adjust the width, the height will also zoom in or out proportionally, vice versa. When , you can adjust the width and height separately.

Pen number ■ 0 ▾

To set the pen number of the primitive selected, and the preset marking parameters of such pen number are applied to the primitive selected.

Graphic name TextT15

The default name of the primitive selected. You can also change the name of the primitive selected in this field.

Font A\_Chinese\_monotxt

The font of the primitive selected. You can also change the font of the primitive selected in this field.

Char space 2.00 mm

The character spacing of the primitive selected. You can also change the character spacing of the primitive selected in this field.

### 4.7.4 Edit

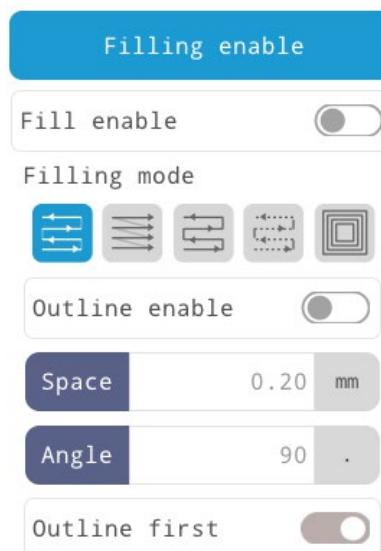
Click button to edit the text selected.

The editing screen is shown as follows:

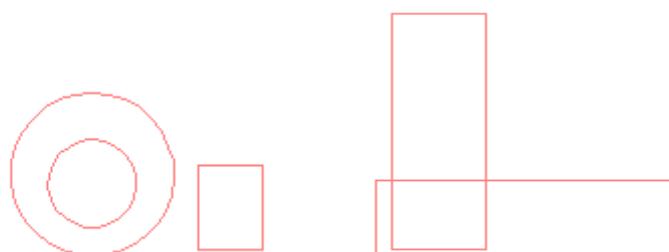


#### 4.7.5 Filling

With filling, it is possible to carry out the filling operation for text or graphics. The text or graphics to be filled must be the closed curve.



If you select multiple objects for filling, such objects can be nested or unrelated with each other, but no two objects can have an intersection.



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*Filling object (The left-handed figure can be filled, but the right-handed rectangles are intersected, so the filling result may not be as expected)*

**Filling enabled:** Whether to allow the current filling parameters to become valid.

**Filling mode:**



: Two-way filling: To fill in the line from left to right first, and then from right to left, and then fill the rest in a cyclic way.



: One-way filling: To fill in the line always from left to right.



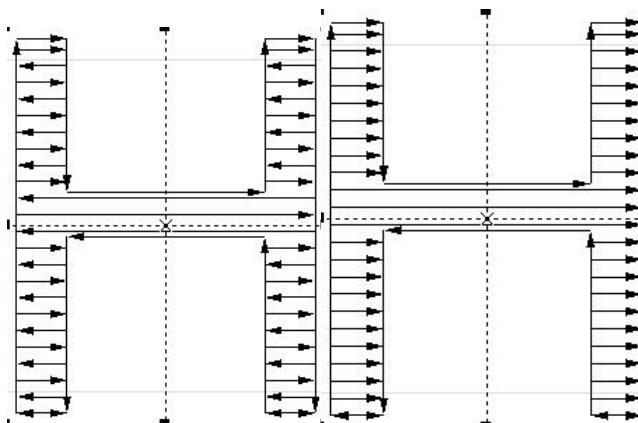
: Bow-shaped filling, similar to two-way filling, but with connecting line between the ends of the filling lines.



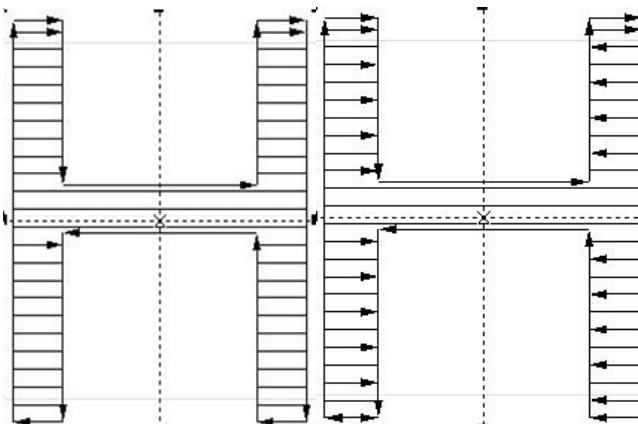
: Optimized bow-shaped filling, similar to the bow-shaped filling, but jump to the place where the object is blank for filling.



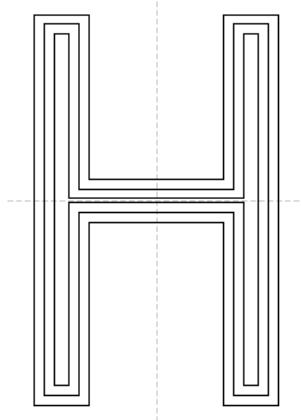
: Clip-shaped filling, fill in the line of object contour from outside to inside in a cyclic and offset way.



*The left figure shows the two-way filling, and the right figure shows the one-way filling*



*The left figure shows the bow-shaped filling, and the right figure shows the optimized bow-shaped filling*

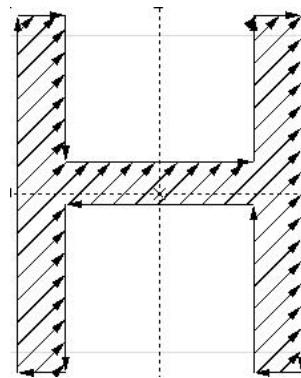


*Clip-shaped filling*

Contour enabled: Indicating whether to display and mark the contour of the original graphics, that is, whether to retain the original contour in filled graphics.

Spacing: The distance between the adjacent filling lines.

Angle: The angle included between the filling line and the X axis. The figure shows the filling graphics at the filling angle of 45 degrees.



*Filling Angle of 45°*

Contour preferred: Indicating that the priority is given to marking of the contour line.

#### 4.7.6 List

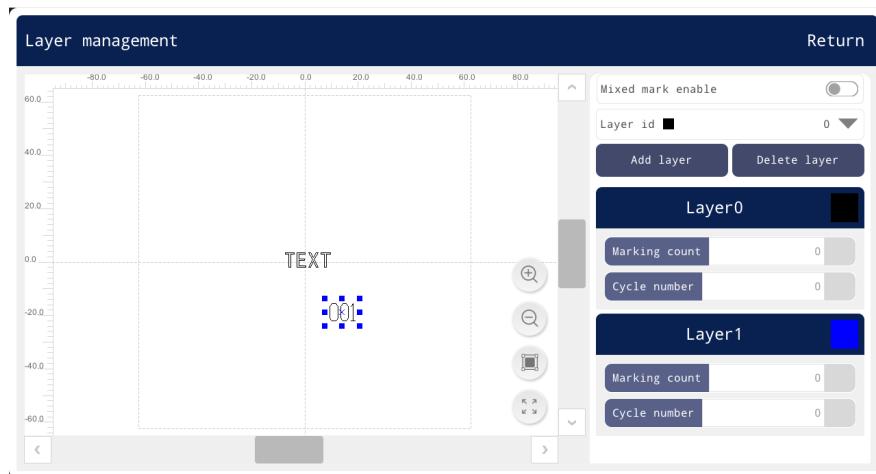
To display the order, name, and content of all current primitives.



Move up/down: To rearrange the position of the primitive selected in the list. In static marking, the priority will be given to marking of the primitives with high ranking.

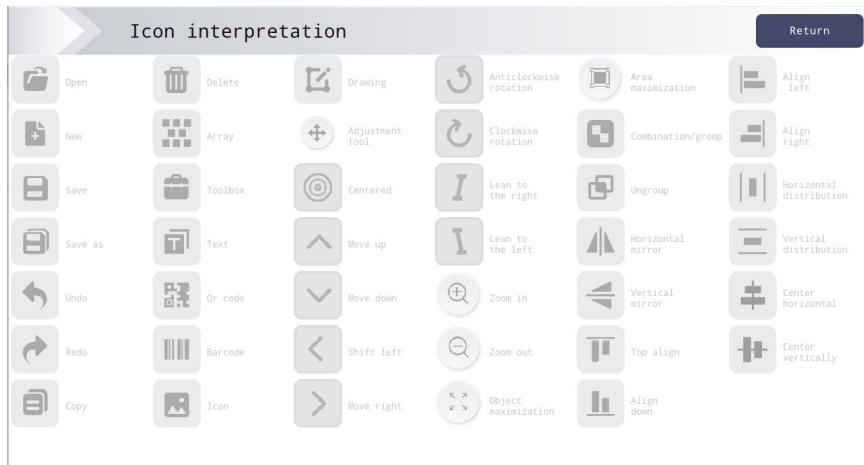
Rename: To change the name of the primitive selected.

#### 4.7.6.1 Layer Management

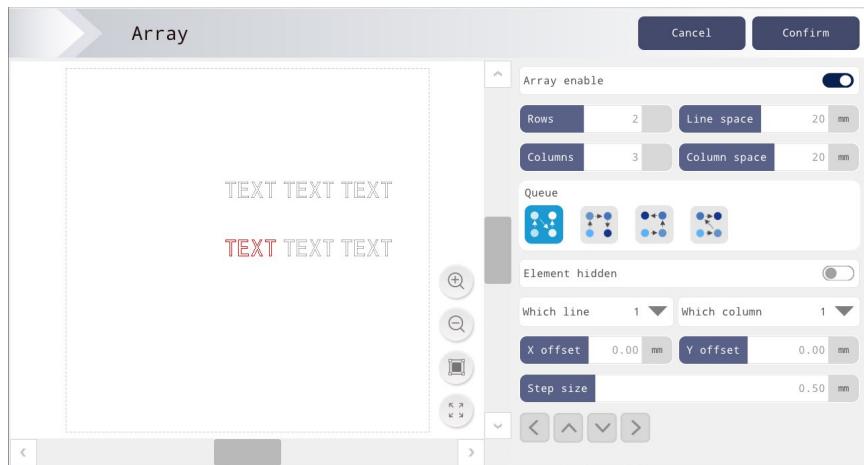


#### 4.7.7 Definitions of Icons

In the template editing screen, click the  button to set out the meanings of all icons in the template editing screen.



#### 4.7.8 Array



Array enabled: Whether to allow the current array parameters to take effect.

The original elements are shown in the lower left corner of the preview area (marked in red).

Number of lines: The number of arrays in the Y direction when making array.

Number of columns: The number of arrays in the X direction when making array.

Line spacing: The distance between the primitives in Y direction after making array.

Column spacing: The distance between the primitives in X direction after making array.

Order: To select the order in which the sub-primitives are processed.

In lines or columns, or continuing (zigzag) or restarting (jump).

Element hiding: Whether to hide the sub-primitives selected.

*Prompt: The hidden elements are not visible in the preview area, and you need to select the hidden elements by "Line/Column No.".*

Line / Column No.: To select the primitive to be operated currently.

---

X/Y offset: To set the position of the current primitive.

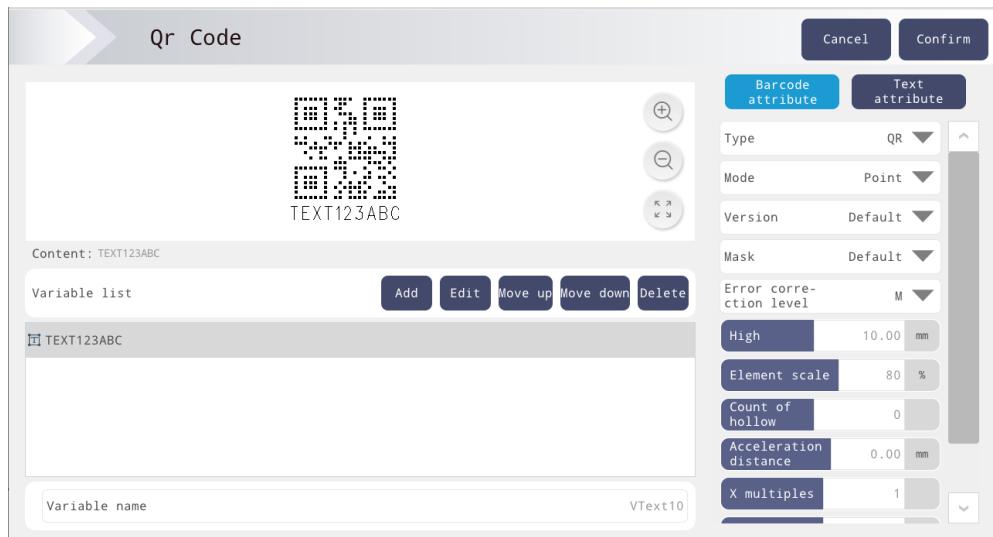
Step size: To set the step size of the arrow key.

< > : To move primitive selected currently.

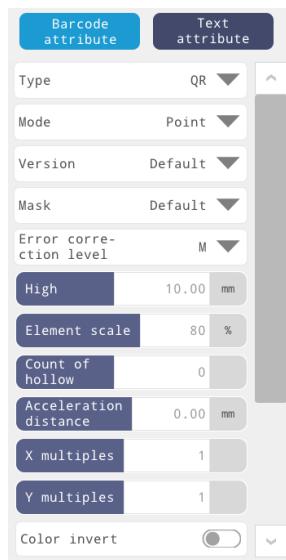
Zoom in/out: To zoom in and out the preview area.

## 4.8 QR Code

The procedure for adding QR code is similar to that for adding text primitive. For details, please refer to the description in text section.



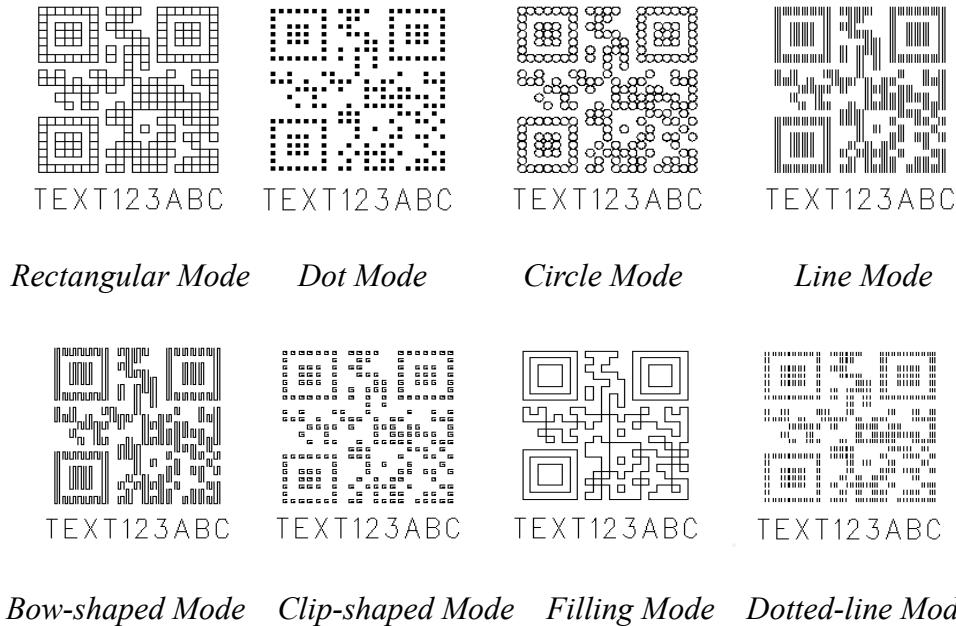
### 4.8.1 Barcode Attribute



Code type: To select the type of QR code. At present, we provide 6 types in total, including QR-Code, Data Matrix, Aztec-Code, MicroQR-Code, Dotcode and Han Xin-Cod.

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Mode: To select the way to compose QR code pattern; there are eight modes including rectangular mode, dot mode, circle mode, line mode, bow-shaped mode, clip-shaped mode, filling mode and dotted-line mode.



Version: To select the version of QR code. (The version is “Default”, and it will be automatically selected depending on the amount of contents of QR code).

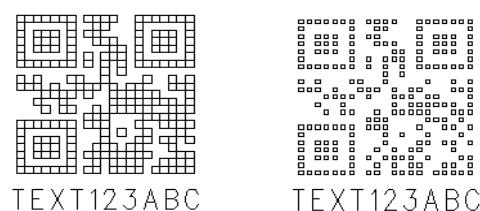
Mask: To equalize the proportion of black and white blocks on QR code pattern.

Error correction level: To select the error correction level of QR code.

The higher the error correction level is, the less data that can be stored (QR code in the same version); and the higher the dominant error correction level is, the higher the reading efficiency of QR code is (The missing part of QR code may be larger, and it will be normally identifiable and readable). L, M, Q and H indicate the level from low to high successively.

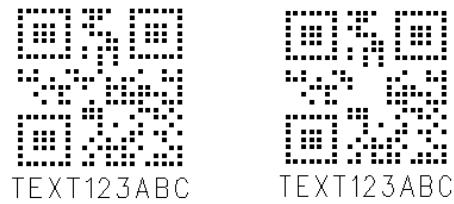
Height: To set the side length of QR code, in mm.

Ratio of element: To set the percentage of the size of graphics composing QR code.



*The left figure shows the element ratio of 100%, and the right figure shows the element ratio of 50%*

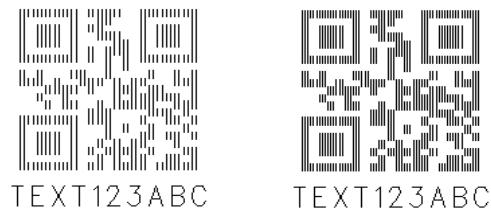
Amount vacated: To set the size vacated at the center of QR code.



*The left figure shows the amount vacated of 0, and the right figure shows the amount vacated of 5*

Accelerating distance: By setting this parameter properly, it is possible to eliminate the uneven dotting at the starting section of marking.

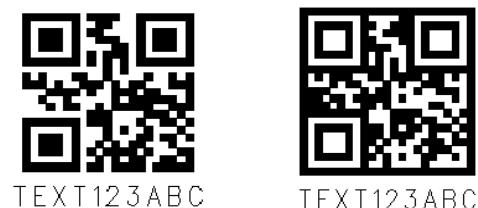
X/Y magnification: The magnification factor of QR code dot matrix.



*The left figure shows X magnification of 2, and the right figure shows Y magnification of 3*

Reverse: By default, the laser marks the code font itself. If “Reverse” is checked, the reverse baseplate portion will be marked.

Prompt: Some materials are light colored after the marking with laser, so this switch must be selected in such case.



*The left figure shows the normal condition, and the right figure shows the reverse condition*

#### 4.8.2 Text Attribute



Text enabled: Whether to display the content of the current QR code under QR code.

Font: To set the font for displayed text of QR code.

Height: To set the font height of the character field.

Word spacing: To set the distance between characters.

X/Y offset: To set the position of the text below QR code.

Character width coefficient: To arrange characters according to the set character width.

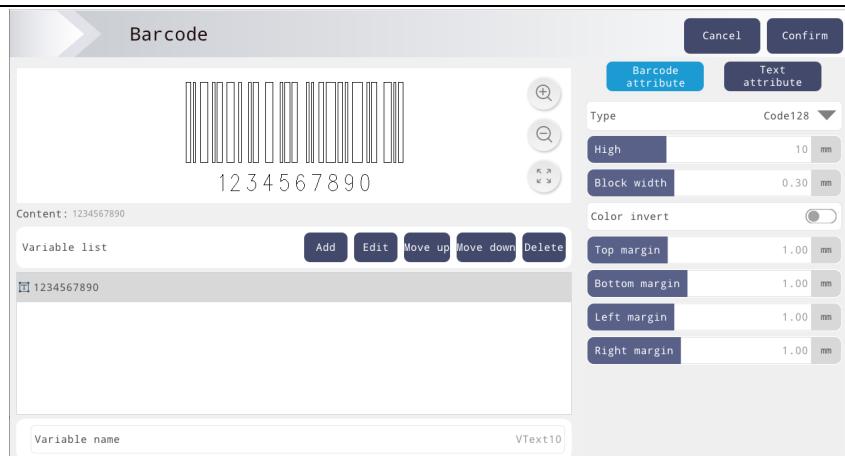
Monospaced character: Whether to enable the monospaced character function.

Character width: To arrange the characters according to the set placeholder width.

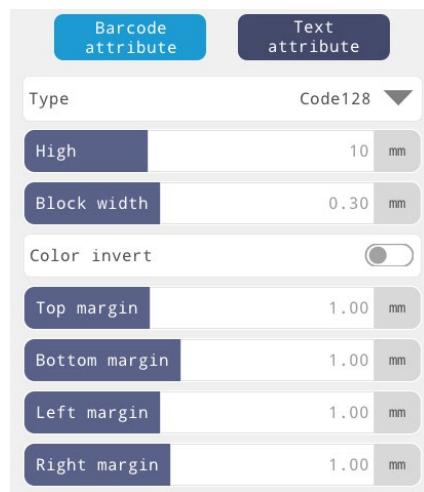
Keyword: To enter "#", "/", and "?" and select to display the text in part.

#### 4.9 Barcode

The procedure for adding barcode is similar to that for adding text primitive. For details, please refer to the description in text section.



#### 4.9.1 Barcode Attribute

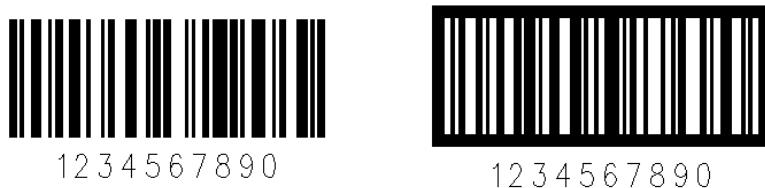


Type: To Select the type of barcode. We currently provide 12 types of barcode, including Code39, EAN13, Code128, Code93, Code28A, Code128B, Code128C, GS1-128, PDF417, ITF14, CodeBar2 and UPCA.

Height: To set the height of the barcode.

Module width: To set the standard module width of the barcode.

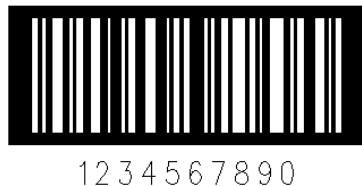
Reverse: By default, the laser marks the code font itself. If “Reverse” is checked, the reverse baseplate portion will be marked.



*The left figure shows the normal condition, and the right figure shows the reverse condition*

---

Top margin/bottom margin/left margin/right margin: The spacing between the barcode and the top/bottom/left/right border when “Reverse” is selected.

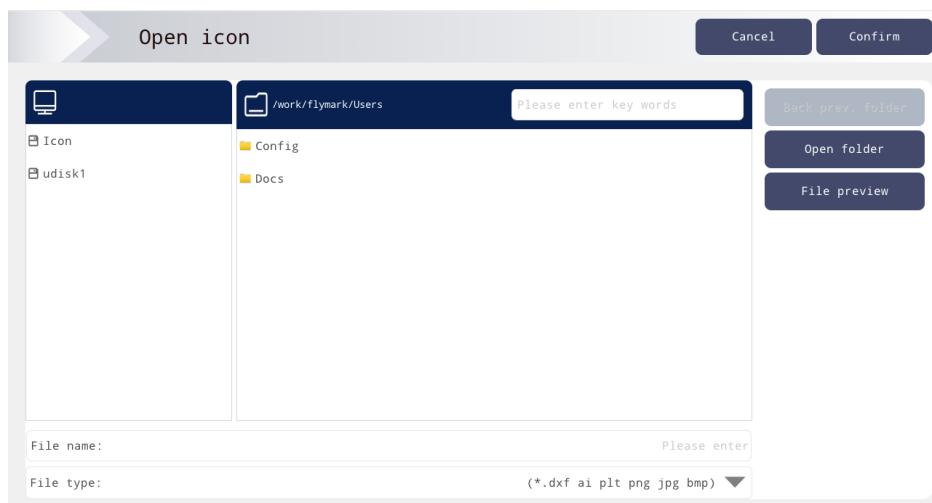


*Top margin/bottom margin of 1, left margin/right margin of 2*

#### 4.9.2 Text Attribute

The text attribute of the barcode is the same as that of QR code (See Section 4.8.2 “Text Attribute” in Chapter 4.8 “QR Code”).

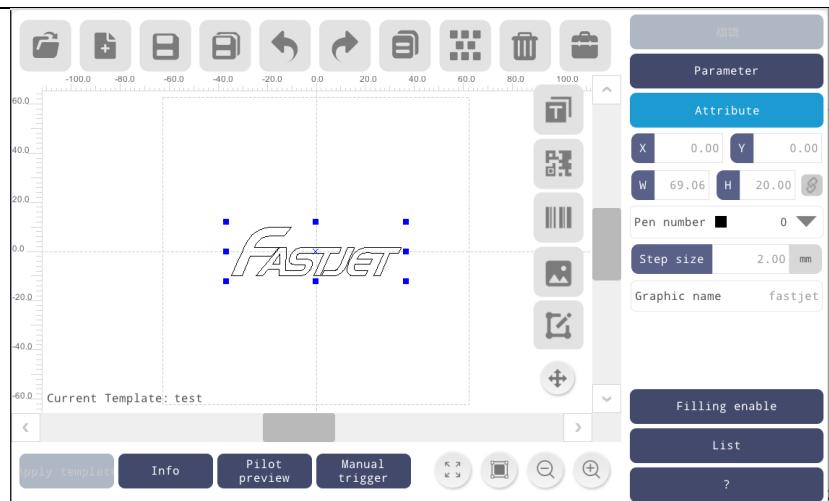
### 4.10 Icons



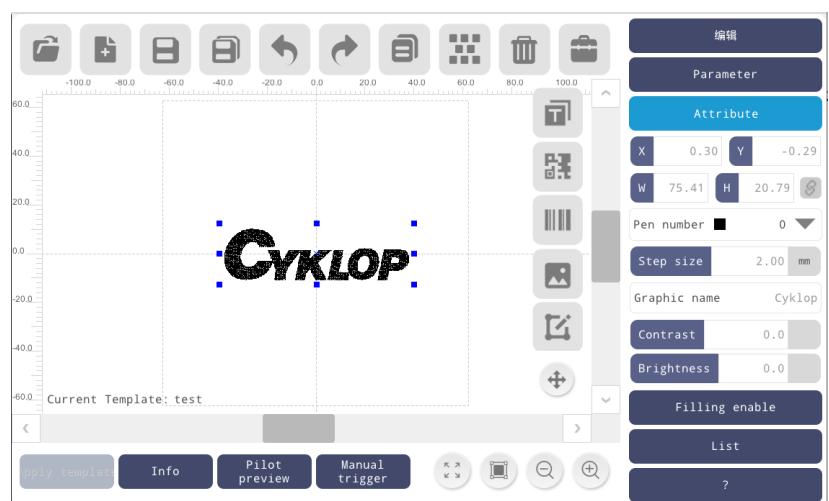
To import vector graph or bitmap

At present, the vector graphs in DXF, PLT, and AI formats, and the bitmaps in JPG, PNG, and BMP formats are supported

Prompt: It is allowed to import from the icon library or directly from the USB flash disk (If importing directly from USB flash disk into the template, the system will automatically generate a backup in the icon library).



After importing the vector graph, it is possible to position and fill such vector graph (depending on whether the graph curve is closed or not).



After importing the bitmap, it is possible to position and edit such bitmap.



**Reverse:** By default, the laser marks the bitmap itself. If “Reverse” is checked, the reverse baseplate portion will be marked.

**Contrast/Brightness:** The parameter that defines the shadow boundary of the bitmap.

**Fixed DPI:** The fixed DPI for importing bitmap (Default value: 20\*20).

**X DPI/Y DPI:** To set the user-defined DPI.

---

**Important:** An excessively high DPI will increase the system processing burden, which is manifested as a long loading time.

## 4.11 Geometry



Create geometry: To draw straight lines, circles, dots, and dotted lines, and to locate, edit, and fill them.

*Prompt: Filling of straight lines, dotted lines and dots is not supported.*



: To draw a square or rectangle.



: To draw a circle or ellipse.



: To draw a straight line.



: To draw a dot.

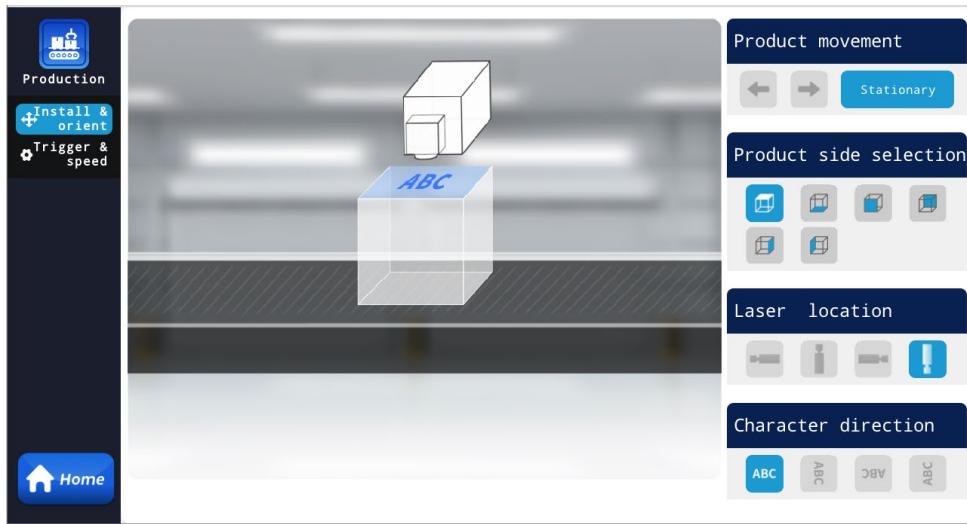


: To draw a dotted line.

## 5. Production Line

Here you can set whether your product moves in the process of marking, how to measure such movement, and how to adjust the trigger pulse. All of these settings are aggregated into a production line configuration, and specified in a template just like parameters.

## 5.1 Installation and Direction



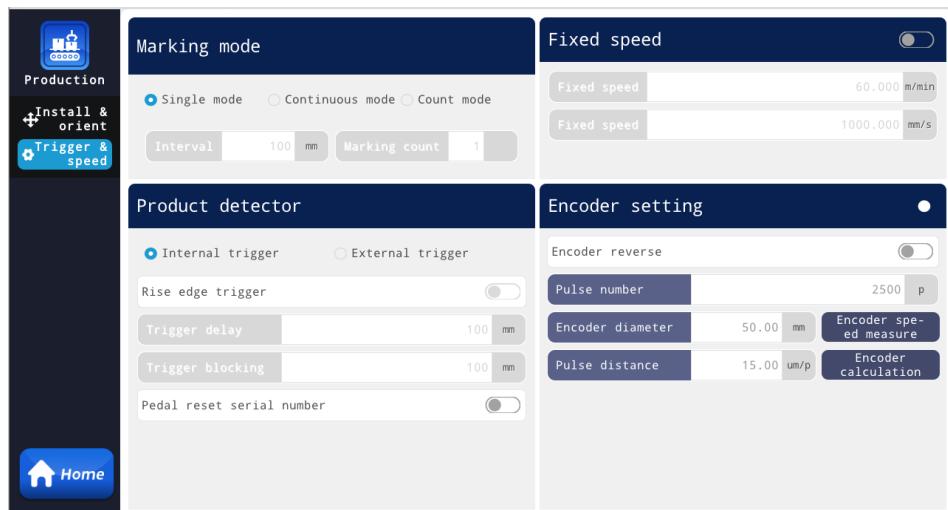
Production movement: To select the movement direction or static marking of the current production line according to the actual situation.

Selection of product side: To select the marking side of the current product according to the actual situation. (Either left or right side of the product, which will take effect only in static marking.)

Position of laser: To select the installation position of the laser according to the actual situation. (If the steering arm accessory is provided, the installation direction of the galvanometer shall prevail.)

Character direction: To select the direction of the currently marked template character according to the actual situation.

## 5.2 Trigger Setting



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### 5.2.1 Marking Mode

Single mode: To make marking once if it is triggered once.

Continuous mode: To make marking continuously at the set interval if it is triggered once, until receiving the stop signal.

Counting mode: To make marking continuously in one cycle at the set interval and times if it is triggered once.

Interval: It means the section that the product must pass through before the next marking is released; or it is expressed as a parameter that sets the interval between two marking contents (Calculating the distance from the first message header to the second message header).

Times of marking trigger: To set the number of times of marking after trigger (i.e. the times of marking if it is triggered once).

### 5.2.2 Product Detector

Internal/external trigger: Whether to use external sensors. If the external sensors such as electronic eye shall be used, it is required to set this item as “External Trigger”.

Rising edge trigger/falling edge trigger: If the marking process is started by an external signal, you can set whether to use the rising edge or the falling edge as the trigger signal.

Starting distance: It means the section that the product passes through after the starting trigger pulse is sent and before the marking is made. This section is the distance between the center of the laser system marking area and the product marking center. This is the section that the product must pass through before reaching the scanning head directly after the trigger pulse is sent out. If “Static” is selected, the time between the starting trigger pulse and the marking is ms.

Trigger signal blocking section: To specify the distance or time in which the subsequent trigger pulse will not be received after receiving the first trigger pulse from the product.

Pedal reset serial number: Whether to enable pedal switch to reset serial number. If the online resetting of the serial number is required in the process of marking, it is allowed to connect its signal to the corresponding input terminal of the board card and set this parameter as “On”.

Default value: Off.

Note: The photoelectric switch (photoelectric sensor) is short for photoelectric proximity switch, which is classified into NPN type and PNP type. It uses the blocking or reflection of the detected object against the light beam, and selects the power circuit from the synchronizing circuit, so as to detect whether the object exists or not. The board card is mainly related to the response time parameter of the photoelectric switch. Please select the one with short response time when selecting the photoelectric switch.

Classification and use: The diffuse reflection type is suitable for the detected object with a bright surface or a high reflective rate. The mirror reflection type is suitable for the object that can block light completely. The correlation type is suitable for opaque object. The groove type is more suitable for the

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workpiece in high-speed motion. The fiber type is suitable for relatively distant detection object. Please select the type of photoelectric switch according to your own needs.

### 5.2.3 Fixed Line Speed

Whether to enable the fixed production line speed. This parameter is effective only when “Product Movement” in “Installation and Direction” is registered as movement and is interlocked with “Encoder Enabled”.

The product moves at a constant speed in the process of marking.

This parameter provides two units of measurement including “m/min” and “mm/s”; set either of such two units of measurement, and the other one will be automatically converted.

### 5.2.4 Encoder Setting

The product moves in the process of marking. Because the speed of movement is not stable, the encoder can be used to measure it.

Whether to enable the encoder. This parameter is effective only when “Product Movement” in “Installation and Direction” is registered as movement and is interlocked with “Encoder Enabled”.

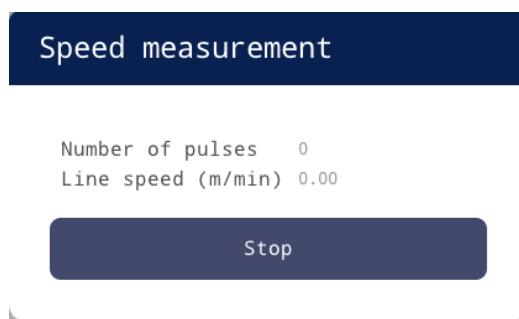
Reverse encoder: Whether to enable the reverse encoder function. Only if the speed is positive can the product be correctly marked. The speed setting direction can be adjusted by this parameter.

Number of pulses: The number of pulses given by the encoder after taking a full turn.

Diameter of encoder: The diameter of the external wheel of encoder.

Pulse distance: The distance traveled by the encoder wheel when it rotates by one pulse.

Encoder speed measurement: To measure and display the production line speed and direction measured by encoder.



Encoder calculation: Click the button to calculate the pulse distance automatically. Formula:  $(\pi * \text{Diameter of Encoder} * 1000) / (4 * \text{Number of Pulse})$ .

Note: The rotary encoder is a kind of photoelectric rotary measuring device, which converts the measured angular displacement directly into digital signal (high-speed pulse signal). The encoders are classified into incremental encoders and absolute encoders according to the principle of signal. We use

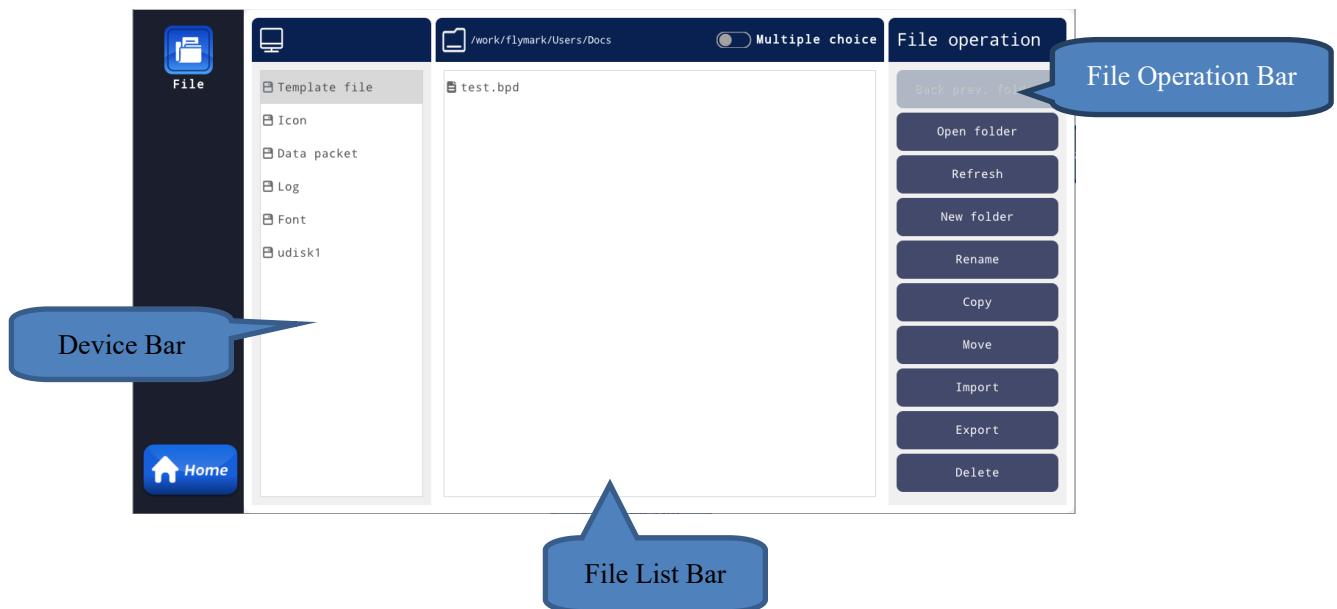
the incremental encoder, which can input the pulse signal output from the rotary encoder directly into PLC, and the high-speed counter of PLC is used to count the pulse signal, so as to obtain the measurement results. Different types of rotary encoders have different number of phases. Some rotary encoders output the pulse in phases A, B, and Z, and some other rotary encoders output phases A and B, and the simplest rotary encoder just outputs phase A. The single-phase output means that the output from the rotary encoder is a group of pulses, while the rotary encoder with dual-phase output outputs two groups of pulses with A/B phase difference of 90 degrees. Through such two groups of pulses, not only the rotating speed can be measured, but also the direction of rotation can be judged. Our board card is suitable for the dual-phase encoder with differential output.

The differential encoder with dual-phase output has the interfaces including VCC, GND, A, A-, B and B-. VCC means the power cord of the encoder, GND means the ground wire, and VCC and GND form a loop. A and B mean the incremental signals of the encoder respectively; A- and B- mean the inverted signal of A and B, respectively.

## 6. File

This screen is the database manager and can only be used at the user level of “Administrator”. The file manager can be used to add, delete and change all files.

Click the “File” button to enter the following screen; click the “Home” button to return to the Home.



### 6.1 Device File

User file: The place where the customer marking template is stored.

Icon: The place where the customer marking icon (vector graph and bitmap) is stored.

Code package: The place where the customer code package file is stored.

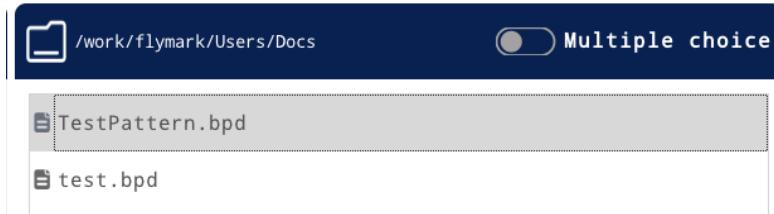
Log: The place where the operation log of the laser is stored.

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**Font:** The place where the font for marking of the laser is stored. A new font cannot take effect until the laser is restarted.

**Udisk1:** The U flash disk to be inserted.

## 6.2 File List Bar



In this area, the file path is shown; whether to enable file multiple-selection function; the file list display area of the device selected.

## 6.3 File Operation Bar

**Back to previous level:** To return to the previous menu of the current directory.

**Open folder:** To open and enter the selected folder.

**Refresh:** To refresh the current page.

**New folder:** To create a new folder in the current directory.

**Rename:** To rename the currently selected file or folder.

**Copy:** To copy the currently selected file or folder.

**Move:** To move the selected file or folder to the current directory.

**Import:** To import a file to the current directory.

**Export:** To export the currently selected file to a specified location.

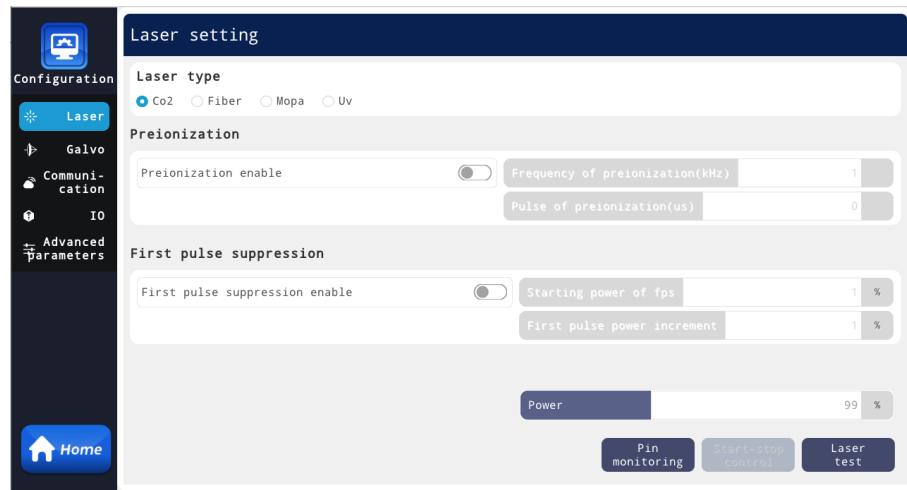
**Delete:** To delete the currently selected file or folder.

# 7. Configuration

## 7.1 Laser Setting

### 7.1.1 CO2

To configure parameters of CO2 laser. These parameters have been preset before delivery.



**Pre-ionization enabled:** To enable the pre-ionization signal. The CO2 lasers produced by some manufacturers, such as those produced by US SYNRAD Company, cannot operate normally without such signal.

**Pre-ionization frequency:** The pulse frequency of the pre-ionization signal.

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

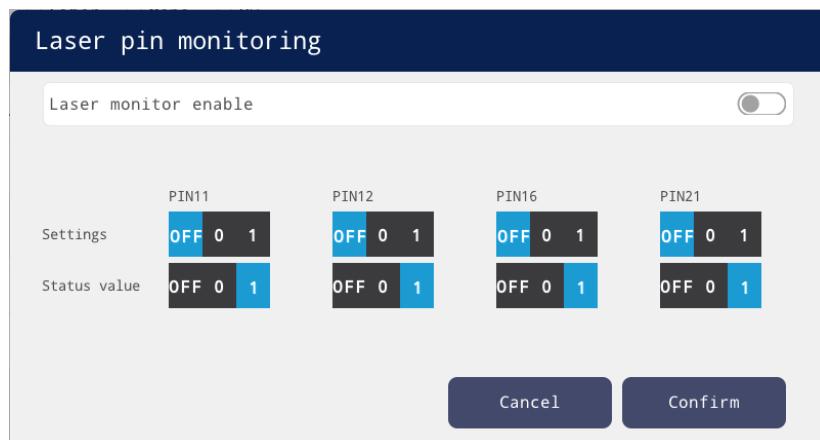
**First pulse suppression enabled:** To enable first pulse suppression. This function is used to solve the problem of “coincident first dot” when starting the marking due to strong laser power or long interval, and more laser energy accumulated when marking on the CO2 laser.

**Initial power of first pulse:** The level of initial power of the first pulse.

**Power increment of first pulse:** The power value of each pulse incremented up to the set power value.

**Power:** To set the power level of the testing laser.

**PIN monitoring:** To monitor the status of the laser; different values shall be set for different lasers, and such values have been preset before delivery.



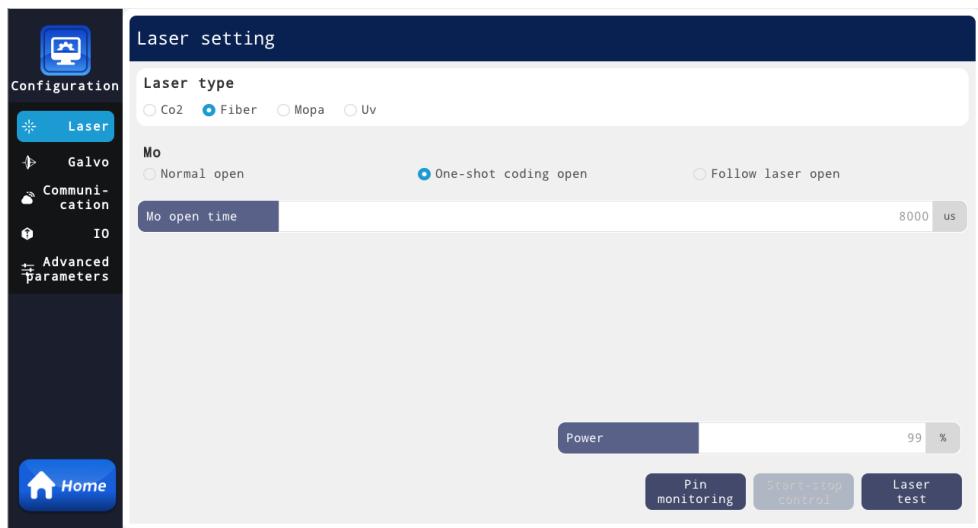
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Start and stop control: The start and stop control for specific laser (e.g. UV); it is possible to set relevant information.

Laser test: To test whether the laser can emit laser normally at the set power. It is often used to measure the maximum laser power.

### 7.1.2 Fiber

To configure the parameters of the fiber laser. These parameters have been preset before delivery.



#### MO parameters

**Normally open:** To enter the marking state; and MO signal is on until the marking is completed.

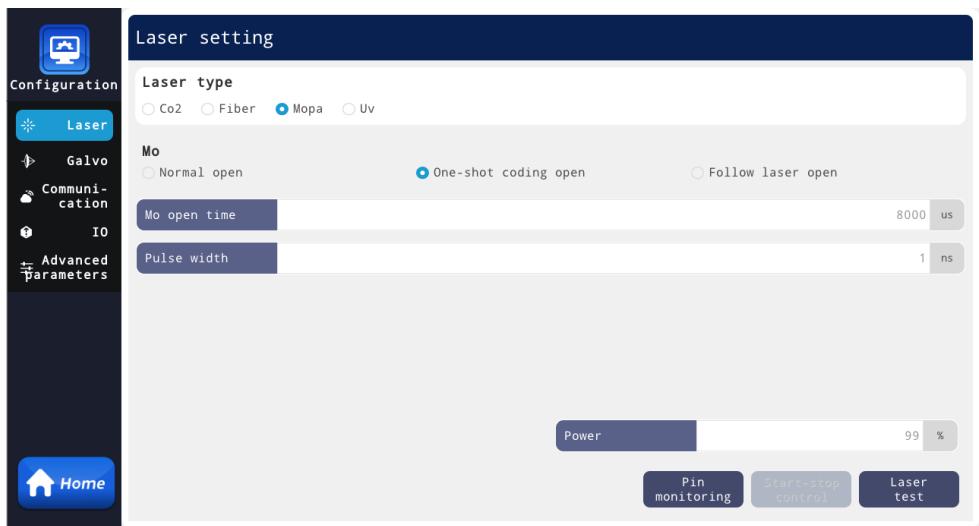
**Single inkjet on:** Related to the number of marking; it is switched on and off once when the marking is made once.

**Follower laser emission on:** MO signal will be switched on and off every time the laser is switched on and off.

**MO starting time:** The delay time of MO signal starting before the laser is emitted.

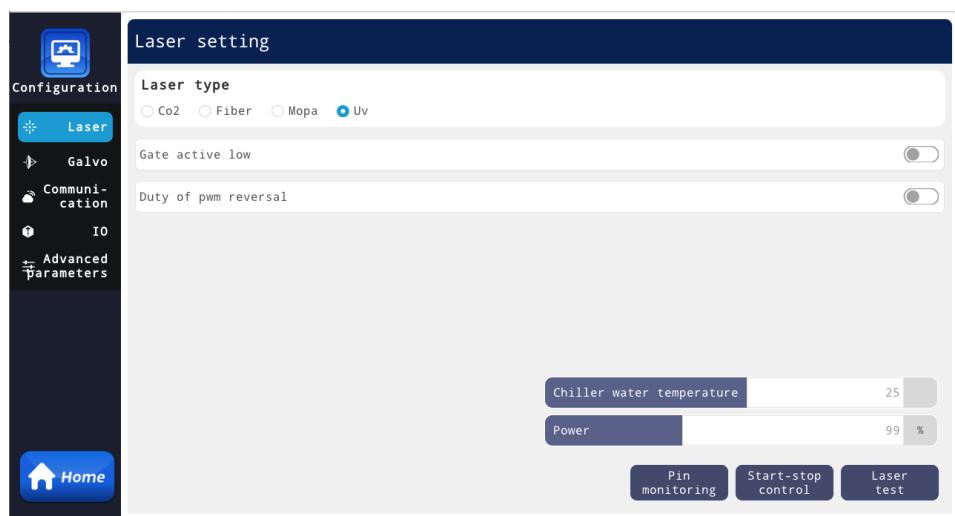
### 7.1.3 MOPA

To configure the parameters of the fiber Mopa laser. These parameters have been preset before delivery.



Pulse width: To set the pulse width of laser.

#### 7.1.4 UV



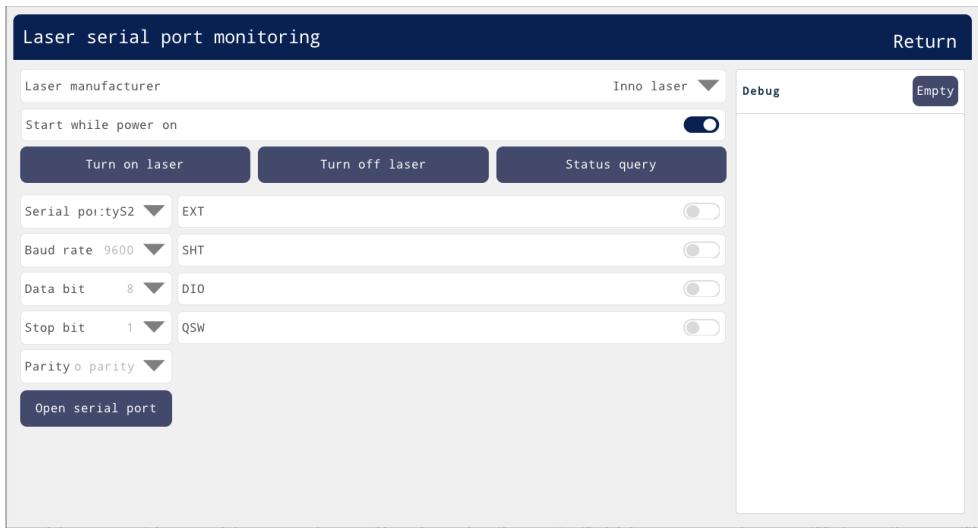
GATE low level active: Whether to enable the GATE signal low level active.

PWM duty cycle reverse: The high level of the PWM pulse changes to low level, and the corresponding low level changes to high level with shift of the corresponding phase angle, so as to meet the requirements for Q driver of the PWM low level active.

Chiller temperature: The set temperature of chiller entered in advance. This is the temperature required when UV laser is delivered.

#### Start and stop control

To set the start and stop mode of UV laser; the self-starting or the serial port starting is optional. This parameter is preset before the delivery.



## 7.2 Galvo Setting

According to the actual situation of galvo, field lens and red light, set the corresponding format, working area (the working area is smaller than the format), field lens correction coefficient, focus offset value and red light correction coefficient.



### 7.2.1 Galvo Correction

It is used to set the X/Y axis reference and the scope of the galvo.

**Format area:** To display the maximum marking range of the galvo.

**Format correction:** To mark a maximum rectangle to determine the maximum format area of the galvo.

**Working area:** To set the size of the working area.

**High-speed area:** To set the size of the maximum flight working area. The excessively large high-speed area may cause stroke distortion or even missing.

---

## Field lens correction coefficient

Reset: To reset the current correction parameters.

Barrel correction coefficient X/Y axis: To represent the barrel or pillow correction coefficient. The default coefficient is 1.0 (Parameter range: 0.5-1.5).

Tilt correction coefficient X/Y axis: To represent the parallelogram correction coefficient. The default coefficient is 1.0 (Parameter range: 0.5-1.5).

Trapezoidal correction coefficient X/Y axis: To represent the trapezoidal correction coefficient. The default coefficient is 1.0 (Parameter range: 0.5-1.5).

Offset correction X/Y axis: To adjust the deviation in size between the actually marked primitive and the expected primitive.

Scale: When setting the scale, press  directly to pop up the dialog box shown below. You can enter the size set in the software and the actual size marked by the measurement, and the software will automatically calculate the magnification scale.



## 7.2.2 Focusing Correction

X/Y offset: To set the offset of the red light focusing

## 7.2.3 Red Light Focusing

Enable outline: To display the contour of the primitive after it is enabled.

Red light speed: To set the display speed of red light. The slower the speed is, the more obvious the red light path is. The faster speed will result in the clearer and more coherent contour of the red light.

Delay in light emission: The time of delay in enabling of red light.

If the laser system is equipped with a red light positioning laser, the correction parameter setting of the red light positioning laser will not be affected by the correction parameter setting of the field lens.

## 7.2.4 Debug

Testing square: The correction test graphics is a square after it is enabled; otherwise, it is the plotting primitive.

Square size: To set the length of sides of the testing square.

Correction test: To plot a correction graphics according to the set parameters, so as to detect whether the correction effect meets the requirements.

Focusing test: To test whether the focusing red light changes correctly according to the focusing correction parameters.

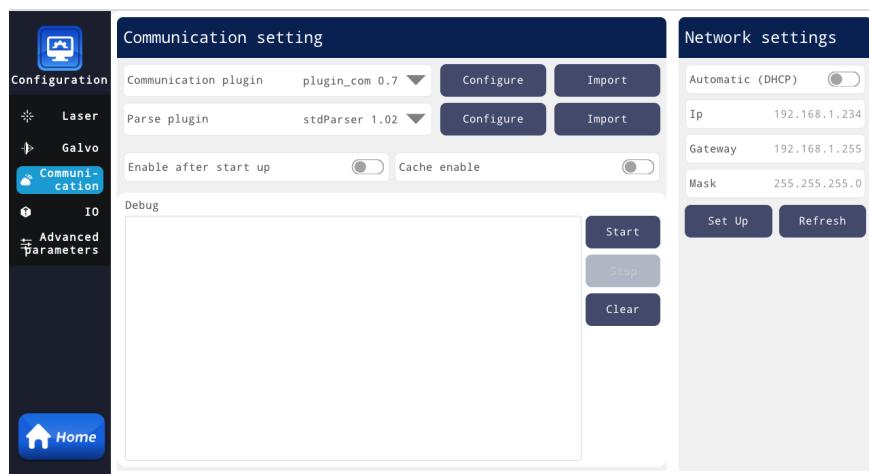
Red light test: To test and preview whether the red light changes correctly according to the red light correction factor.

Export correction file: To generate a file of the current correction values and save it to the specified location.

Import correction file: To read the correction file so saved.

## 7.3 Communication Setting

To achieve the external control board card (No details available currently)



### 7.3.1 Communication Setting Parameters

Communication plug-in: To select different communication plug-ins (Serial port or network port communication).

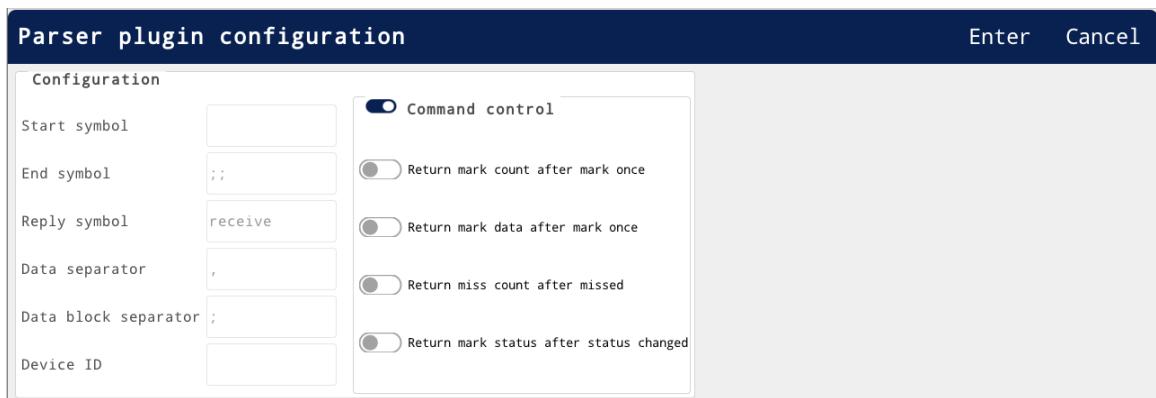
Configure: To configure the selected communication plug-in, such as setting serial port.



Import: To import new communication plug-in.

Parsing plug-in: To select different communication protocols.

Configure: To configure the selected communication protocol.



Import: To import new communication protocol.

Power-on communication: Whether to enable the external communication function.

Cache marking enabled: Whether to enable the cache mode.

Start: To start the external communication.

Stop: To stop the external communication.

Clear: To clear the information window.

### 7.3.2 Network Setting

To set the Network Port IP, gateway, and subnet mask. Click Settings to save the set data to the system.

---

### Network settings

Automatic (DHCP)

Ip 192.168.1.234

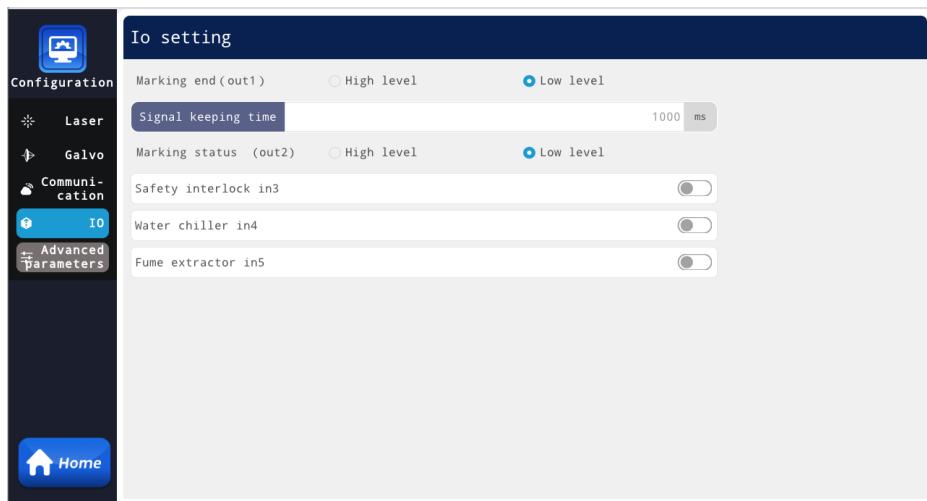
Gateway 192.168.1.255

Mask 255.255.255.0

Set Up
Refresh

## 7.4 IO Setting

To set the status of input/output port.



**Marking ending signal (OUT1):** To set whether the high level or the low level is output from corresponding output port when the marking is completed.

**Marking ending duration:** To set the duration of the output signal from corresponding output port when the marking is completed.

**Marking status signal (OUT2):** To set whether the high level or the low level is output from corresponding output port in the process of marking.

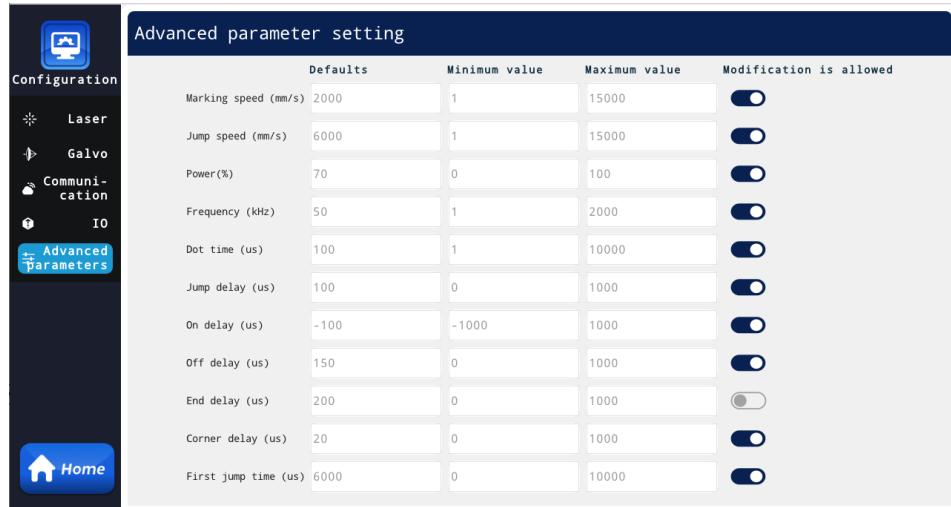
**Safety door interlock IN3:** Whether to enable the safety door interlock function. The default value is “Disabled”.

**Chiller interlock IN4:** Whether to enable the chiller interlock function. The default value is “Disabled”.

**Range hood interlock IN5:** Whether to enable the range hood interlock function. The default value is “Disabled”.

## 7.5 Advanced Parameters

To set the default, minimum, and maximum values of the pen parameters. These parameters have been preset before delivery.



## 8. System Setting

### 8.1 System Information

#### Company information

To display the information about the laser marking system manufacturer, including company name, company address, website, and contact information.

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## System version

To display the version number of firmware, software, and OSs; ID number of device; and service life of the laser marking system.

Generate device code: To generate a file containing the device information for registration with the manufacturer.

Register trial period: To enter the activation code.

Upgrade software: To upgrade the version of software.

Upgrade firmware: To upgrade the version of hardware.

## System configuration:

To display the information about the current system

System service time: To calculate the service time since the system is put into operation.

Total number of system processing: To calculate the number of marking since the system is put into operation.

Factory number: To display the factory number.

Log level: To select the level at which the system stores the content of logs.

Save configuration: To save the current configuration to the default directory of the system.

Clear configuration: To clear the system configuration, restore to the initial value, and restart the system.

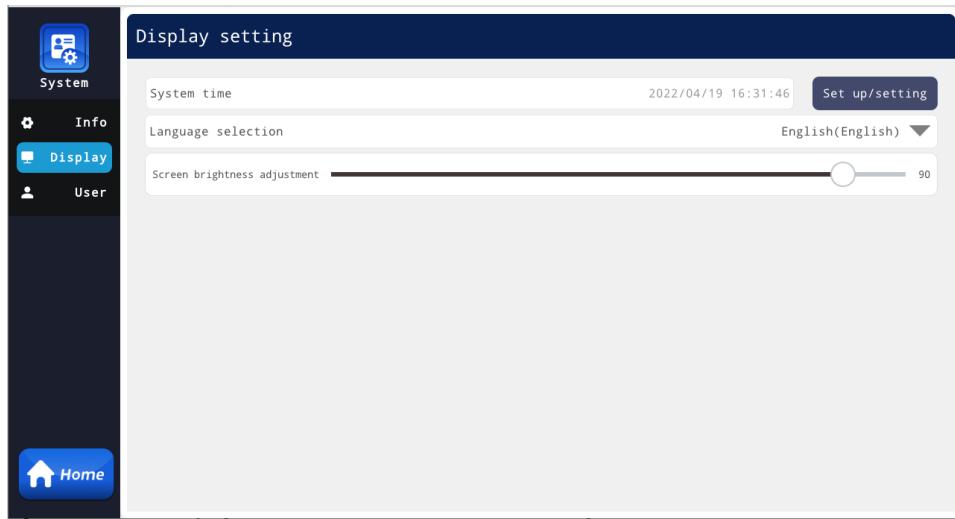
**Important:** When clearing the configuration, the relevant settings of the laser marking system will be zeroed, which may cause marking distortion or impossible marking.

Restore configuration: To restore the factory settings (The values of the factory settings shall be saved to a specific directory of system by clicking “Save Settings”) and restart the system.

Import configuration: To import the saved configuration file.

Export configuration: To export the current configuration file.

## 8.2 Display Setting



System time: To display the master clock time of the current system.

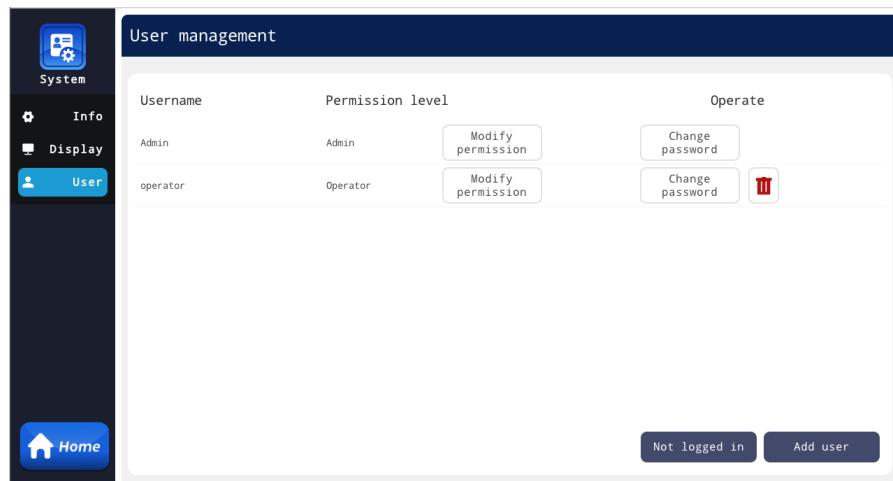
Setting: To set the master clock of the system.

Select language: To display the language package already installed on the current laser marking system. You can modify the interface language used by the system here. The selection made here will not take effect until the next start-up of the system.

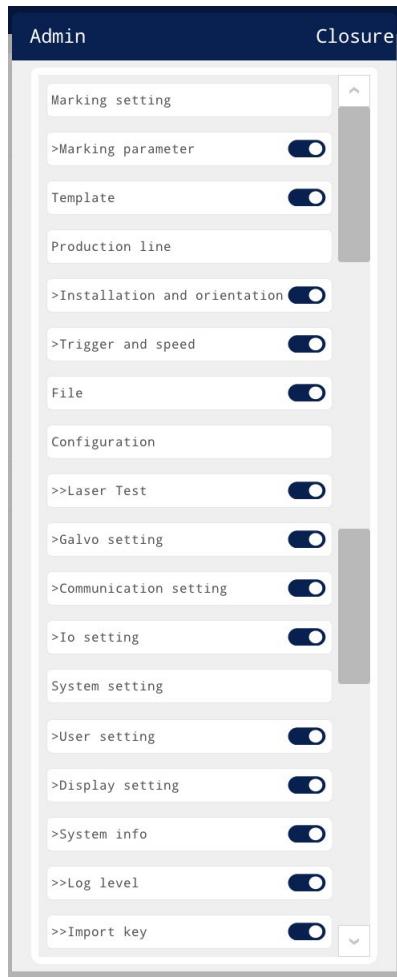
Adjust screen brightness: To adjust the screen brightness.

## 8.3 User Management

The user password must be entered to use the current laser marking system; the user can create administrator, operator and other users, and password and authority independently.



Modify authority item: To enable or disable the specified authority for users.



Change password: To set a password for a user.

Click the button to delete the corresponding user.

Not log-in authority: To set the authority items of the user not logging-in.

Add user: To add a new user and specify the authority level for such new user.

The dialog box is titled "Add user". It has three input fields: "Username" (placeholder: "Please enter"), "Password" (placeholder: "Please enter"), and "Permission level" (set to "Admin"). At the bottom are two buttons: "Cancel" and "Confirm".