高速飞行激光喷码

6.0 High-speed Fly Laser

控制喷码系统

Mark Control System

用户使用手册

User’s Manual

Table of Content

1. 概述 Overview

1.1. 本软件介绍 Software Overview

本版本仍在修订与完善中，请作为临时使用版本本软件具有以下主要功能：This version is still in the process of revision and improvement. As a temporary version, this software provides the following functions:

- 软件支持用户验证，防止非法操作。The software supports user authentication to prevent illegal operations.
- 自由设计所要加工的图形图案。Design the graphics and patterns for marking freely.
- 支持市面上所有光纤激光器、CO2 和端泵激光器，可根据激光器的不同类型，通过软件设置调电流、调脉冲频率、调占空比等参数。Support all the fiber laser devices, CO_2 and end pumping lasers in the market. Adjust the parameters such as current, impulse frequency and duty ratio by software setting according to different types of laser devices.
- 支持单独红光打标指示。Support independent red light indication.
- 软件提供使用权限控制，可防止参数被随意修改。The software provides the authorization management to prevent parameters from being modified randomly.
- 支持高速飞行打标：适用于流水线。Support high-speed fly mark: Applicable to assembly line.
- 支持填充操作：提供直线、环形、弓形等填充方式，可任意角度填充、边距、边框、间距等可调。Support filling operation: Provide straight and annular filling, allow arbitrary angle filling and cross filing, adjust edge distance, edge frame and space.
- 提供变量文本功能：固定文本、序列号、日期、时间、网络通讯、串口通

讯等。Provide variable text function: Fixed text, serial number, date, time, network communication, serial communication, etc.

- 支持 16 层加工参数：可任意定制各层参数，轻松实现多参数打标。Support 16-layer marking parameters: Customize parameters of each layer optionally to realize multi-parameter mark easily.
- 提供文字输入功能，支持单线、双线、点阵和 TTF 字体，并且支持中英文分别设置不同字体。Text input function: Support single line, double lines, dot matrix, True Type font, and different settings of Chinese and English fonts.
- 支持打标动态文件，当文本和图片加工时，文件名固定，但文件内容在加工中会发生变化。Marking of dynamic file: During text and picture processing, file name is unchanged, but file content changes.
- 提供强大的编辑功能：阵列、镜像、复制、对齐、取消/恢复等等。Powerful editing functions: Array, mirror, copy, alignment, cancel/redo, etc.
- 提供仿真功能：可以在打标操作前，预览图形的打标轨迹。Simulation function: Preview mark track of graphs before marking.
- 支持二次开发：提供二次开发 SDK 库，支持用户进行定制开发，扩展现有打标系统的功能、满足客户的特殊应用场合需求。Secondary development: SDK library supports user for custom-made development, expands the functions of the existing mark system and meets special application need, etc.

1.2. 本手册说明 Description of the Manual

- 由于软件升级所造成的实际操作方式、功能设置等，如有与本手册不符之处，以软件为准。When actual operation mode and function setting are inconsistent with this User's Manual because of software upgrading, the software shall prevail.
- 本文所涉及的其他产品和公司名称可能是各自相应所有者的商标。Other

products and company name in this User's Manual may be the trademark of relevant owners respectively.

1.3. 软件安装说明 Software Installation and Use Instructions

- 本软件为绿色软件，解压缩后，即可运行。The software is green software, so it can run after decompression.
- 需要安装板卡的驱动程序。It is required to install the board driver.

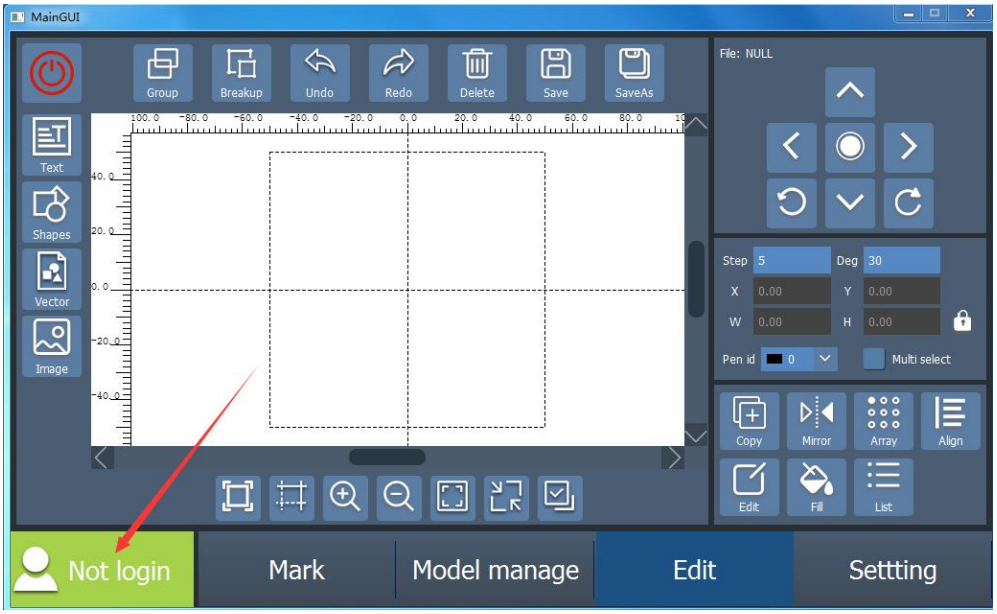
2. 快速入门 Quick Start

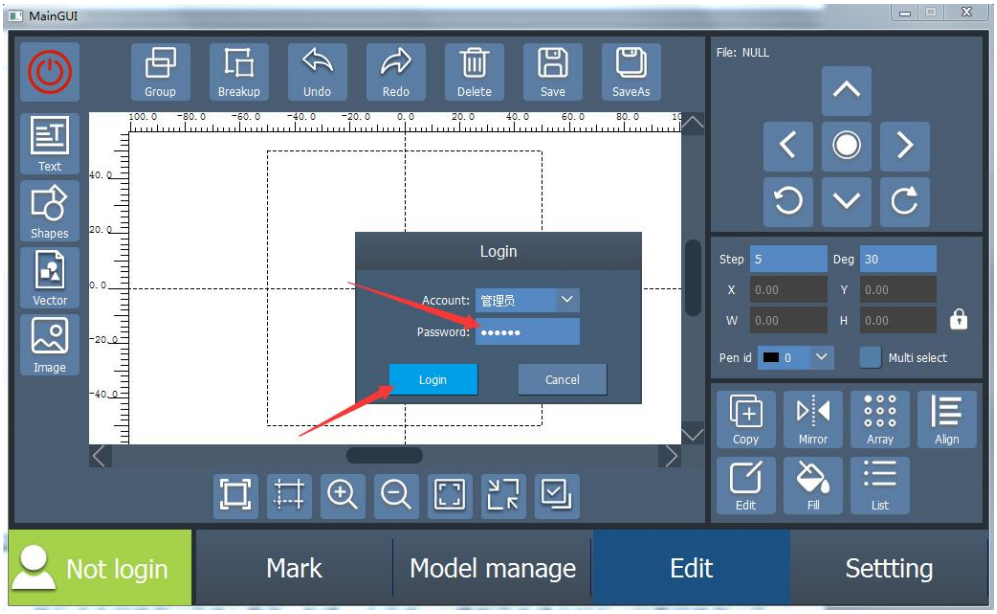
这里我们将以如何生成一个内容为生产日期，批号的固定文字模板文件为例。Here is an example about generating a fixed text template file with the production date and the batch number.

2.1 登录 log in

打开软件后首先确认右上角的连接图标是否为绿色，如果是红色请先检查板卡连接。然后登陆（技术员的默认密码是 111111）。

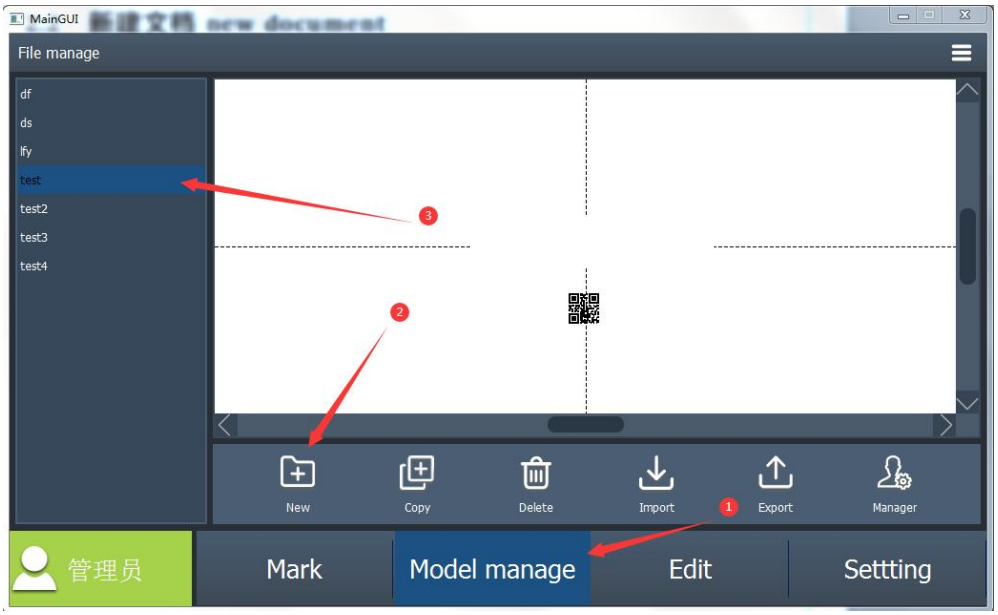
注意：在未登录状态下，将无法进行任何操作。After opening the software, firstly confirm whether the connection icon in the upper right corner is green. If it is red, please check whether the board is connected. Then log in (the default password of the administrator is 111111). Note: You cannot perform any operations if you log out.





2.2 新建文档 new document

然后点击切换到“文件”界面，新建一个文件。（模板文件建立好后，只要切换到“文件”界面就会自动保存在该模板文件中。）Click to switch to the file interface and create a new file. (After the template file is created, it will be automatically saved in the template file, as long as you switch to the file interface.)

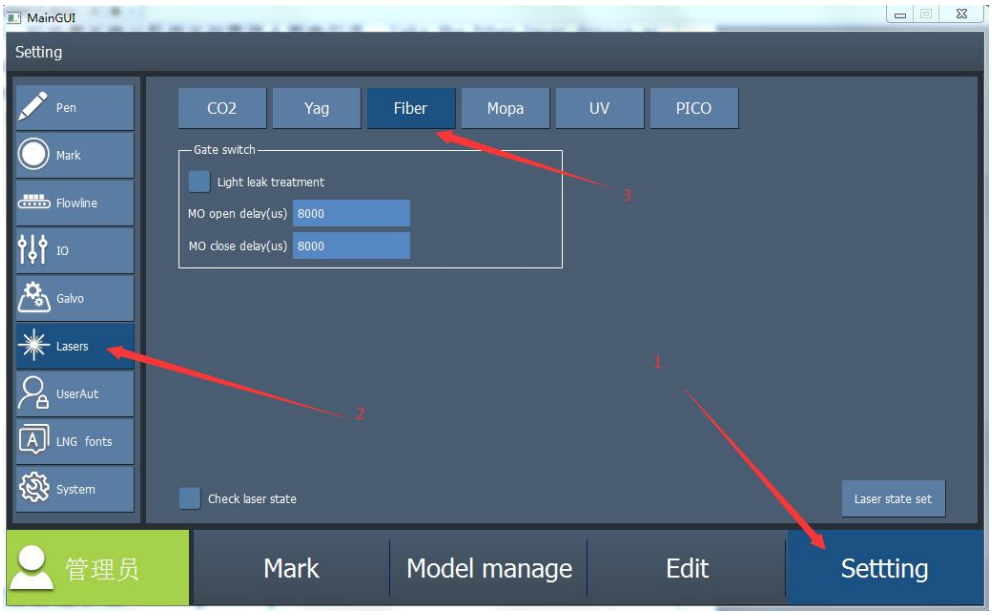


2.3 设置参数 set parameters

切换到参数，分别设置激光参数、区域参数、笔参数、打标参数和流水线。Switch to parameters, set laser parameters, regional parameters, pen list, marking parameters and assembly line, respectively

2.3.1 设置激光参数 Set laser parameters

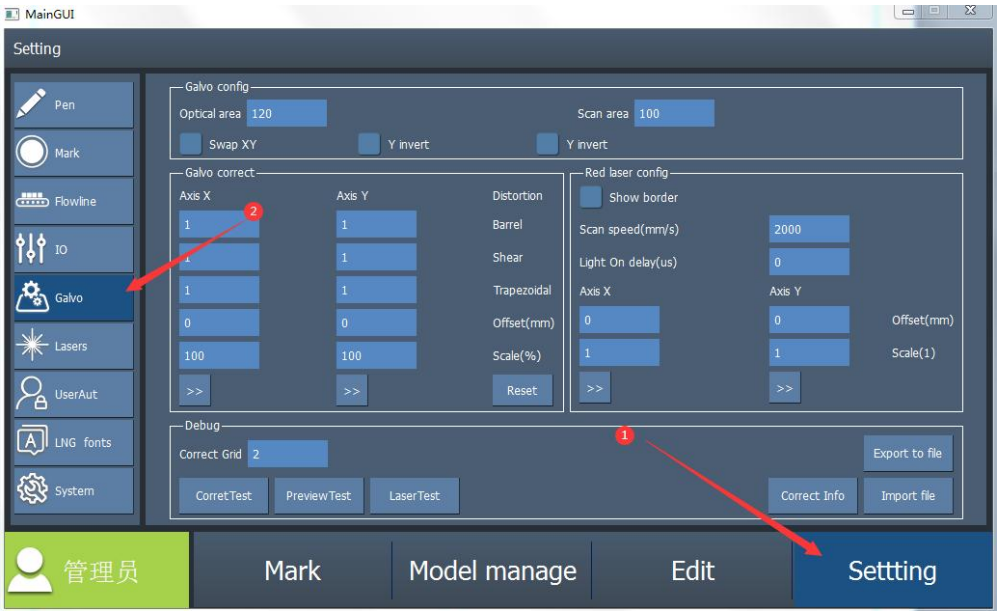
这里以光纤激光器为例，选中光纤后，再使用激光测试检测激光器是否正常出光。漏光处理，如果激光器没有漏光现象就不需要勾选。Take the fiber laser device as an example, after selecting the optical fiber, test to check whether the laser device emits light normally with the laser. If the light does not leak, there is no need to tick the box of light leakage.



2.3.2 设置区域参数 Set regional parameters

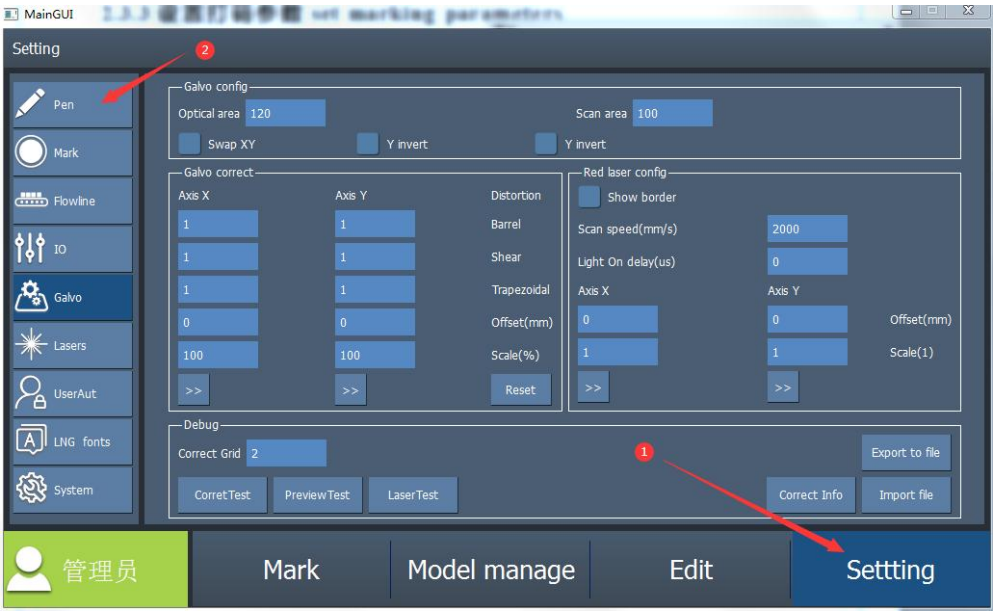
根据场镜的实际情况设置幅面和工作区域（工作区域要小于幅面）；根据实际打标效果调整 XY 交换，X 反向和 Y 反向；根据校正测试打标效果调整振镜校正的参数；根据红光测试的效果调整红光校正的参数。Set the format and work area according to the actual situation of the field lens (the work area should be smaller than the format). Adjust the XY exchange, X reverse and Y reverse according to the actual marking effect. Adjust the parameters of the galvanometer calibration

according to the calibration marking effect. Adjust the parameters of red light calibration according to the effect of the red light indication.



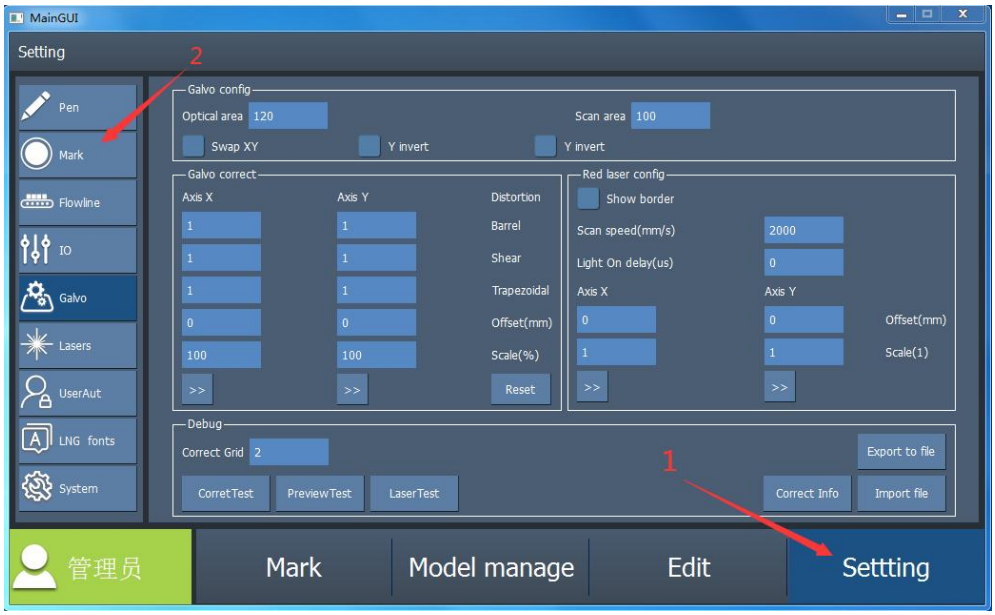
2.3.3 设置打码参数 set marking parameters

根据打标内容适当调整喷码参数。Adjust marking parameters appropriately according to the marking content.



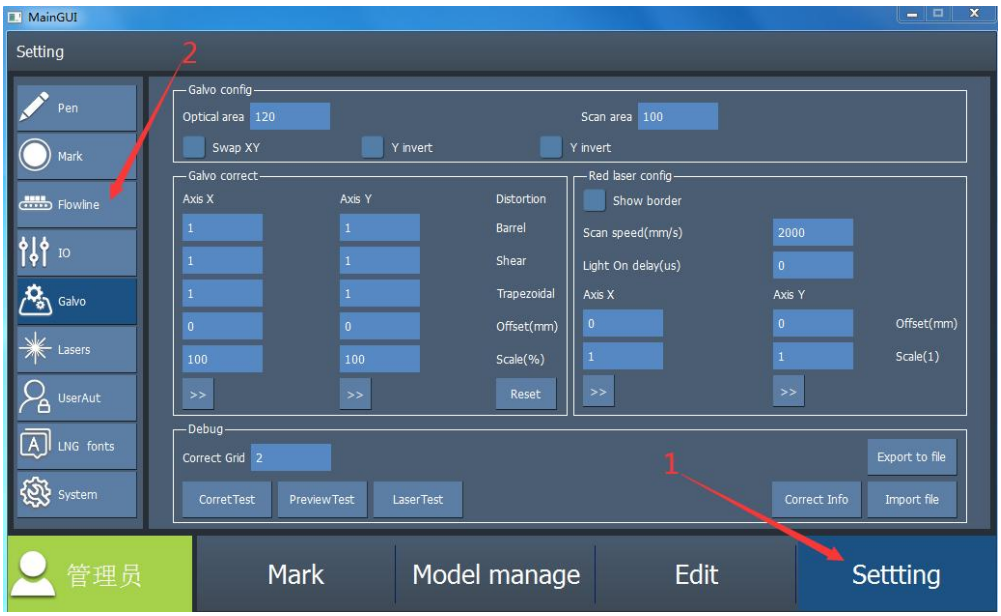
2.3.4 设置打标参数 Set marking parameters

调效果的时候先按下图参数设置。效果调好以后再根据飞打的实际情况调整触发方式，触发延后，最小间隔以及起始位置。When adjusting the effect, set the parameters as shown below. After the effect is adjusted, adjust the trigger mode, trigger delay, minimum interval and starting point according to actual fly marking.



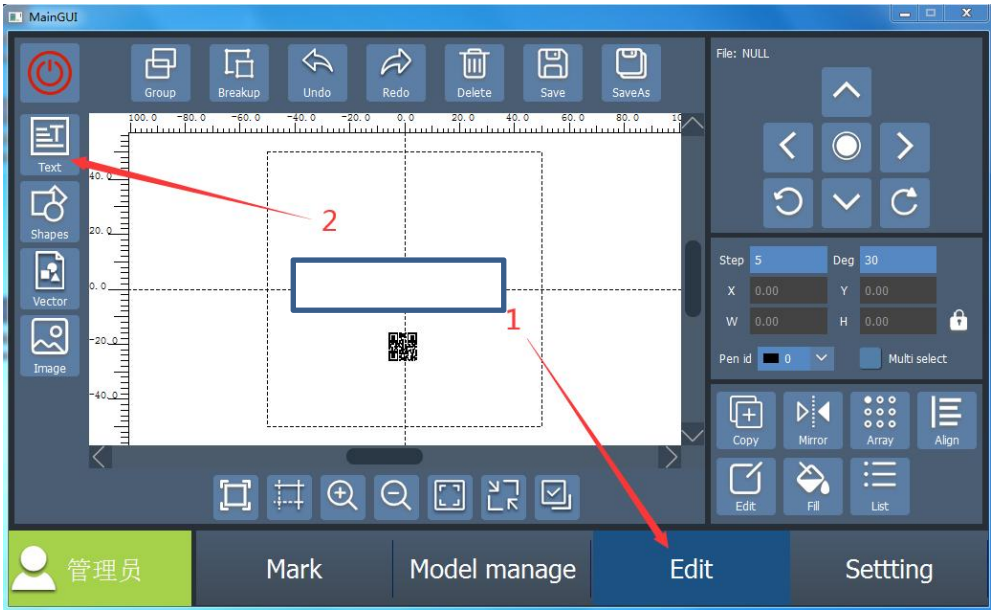
2.3.5 设置流水线 Set the assembly line

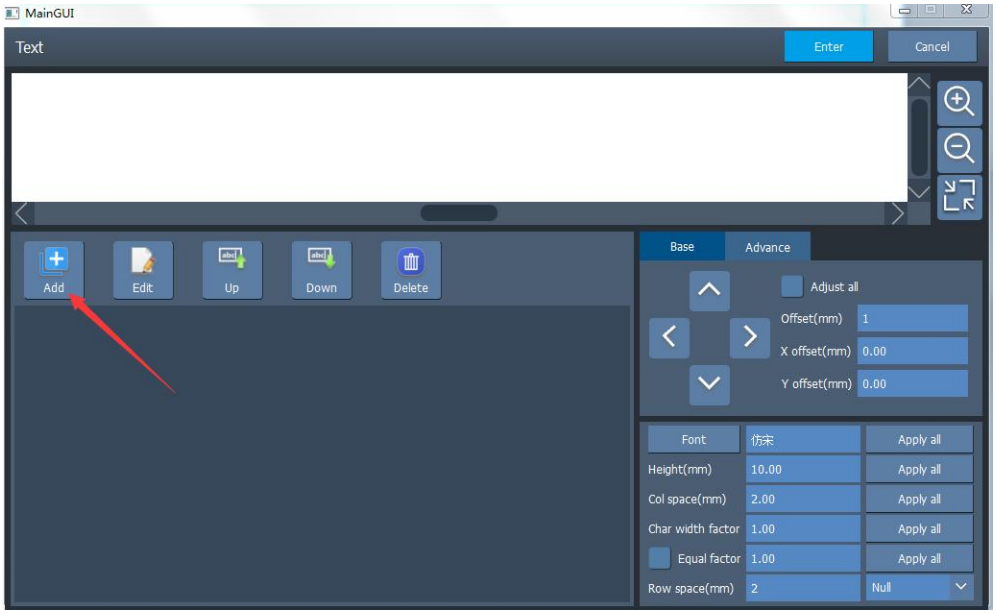
调效果的时候先按下图参数设置。效果调好以后再根据流水线的实际情况调整流水线方向，以及是使用编码器还是固定流水线。When adjusting the effect, set the parameters as shown below. After the effect is adjusted, adjust the direction of the assembly line according to the actual situation of the assembly line, and decide whether to use an encoder or a fixed assembly

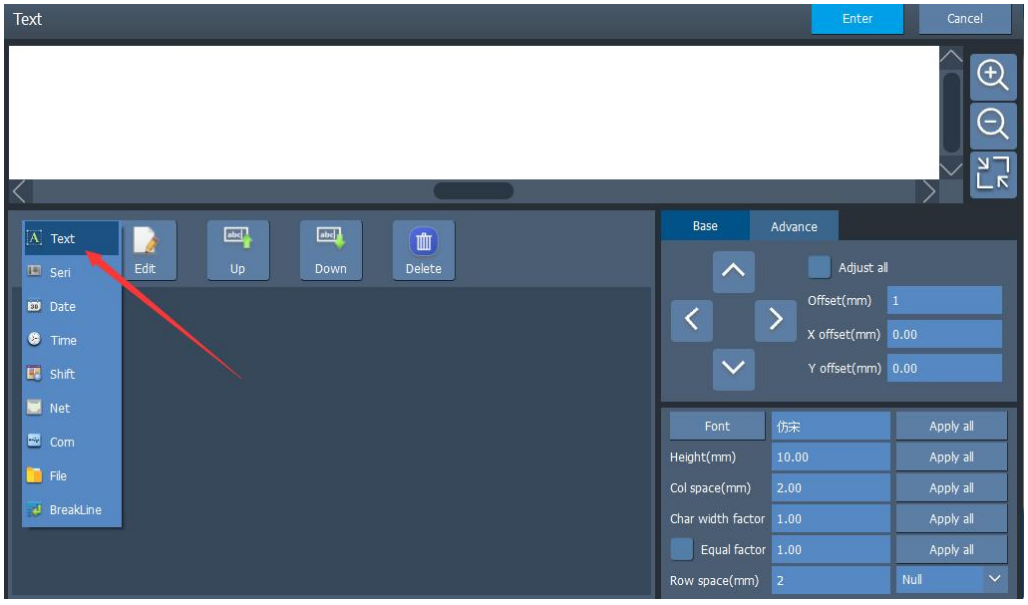


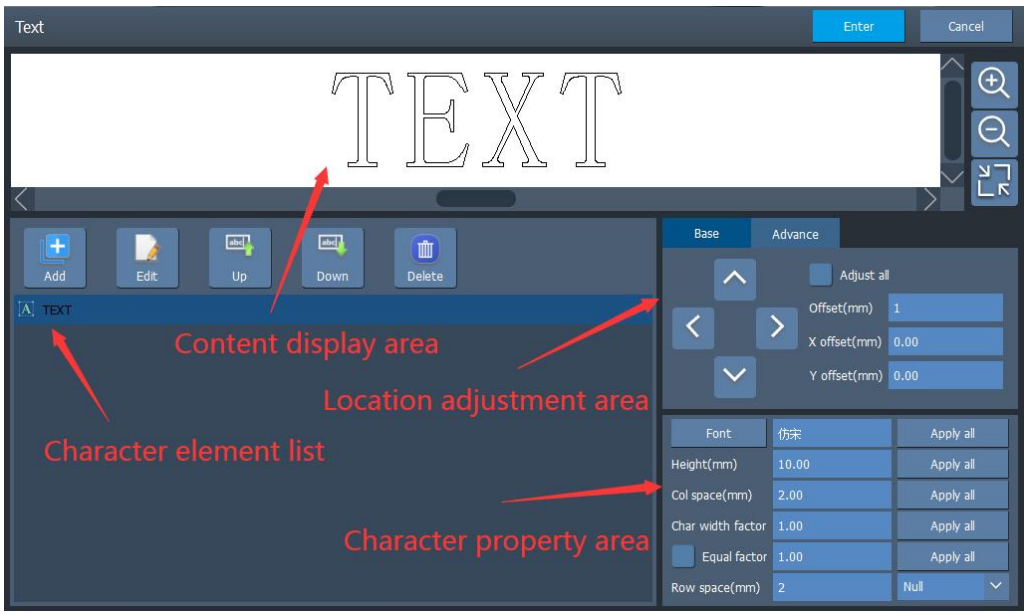
2.4 编辑内容 edit content

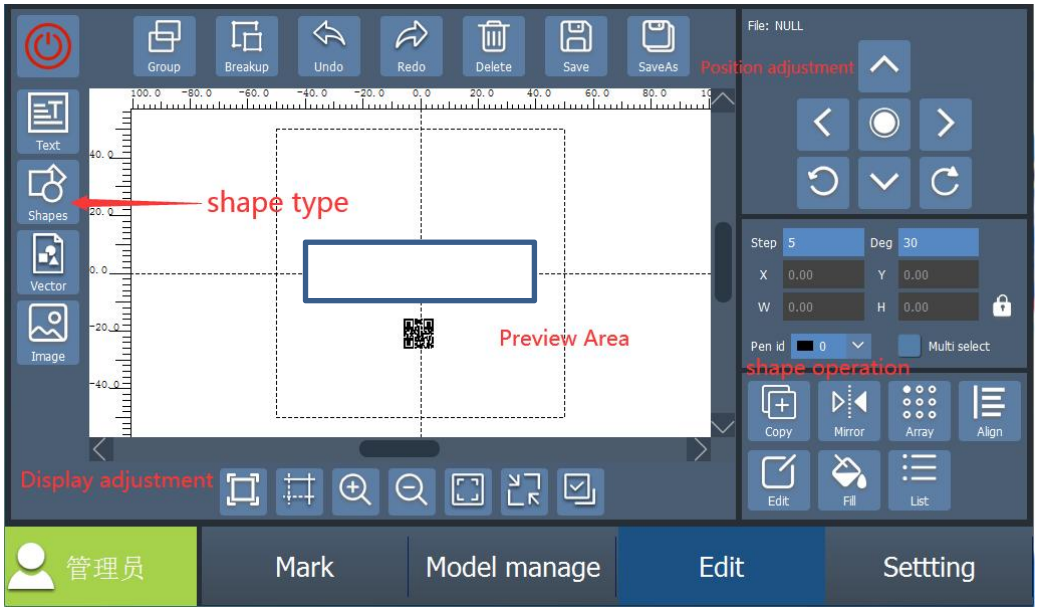
切换到编辑界面绘制固定文本（注意如果是要喷码在深色材料上需要在固定文本属性中勾选反转）。 当绘制好二维码以后切换到模板菜单一次保存当前的内容。Switch to the editing interface to draw the fixed text(Note: If you want to make a mark on dark materials, you need to tick the box of “reverse” in the fixed text features). After the QR code is drawn, switch to the template interface to save the current content all at once.




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

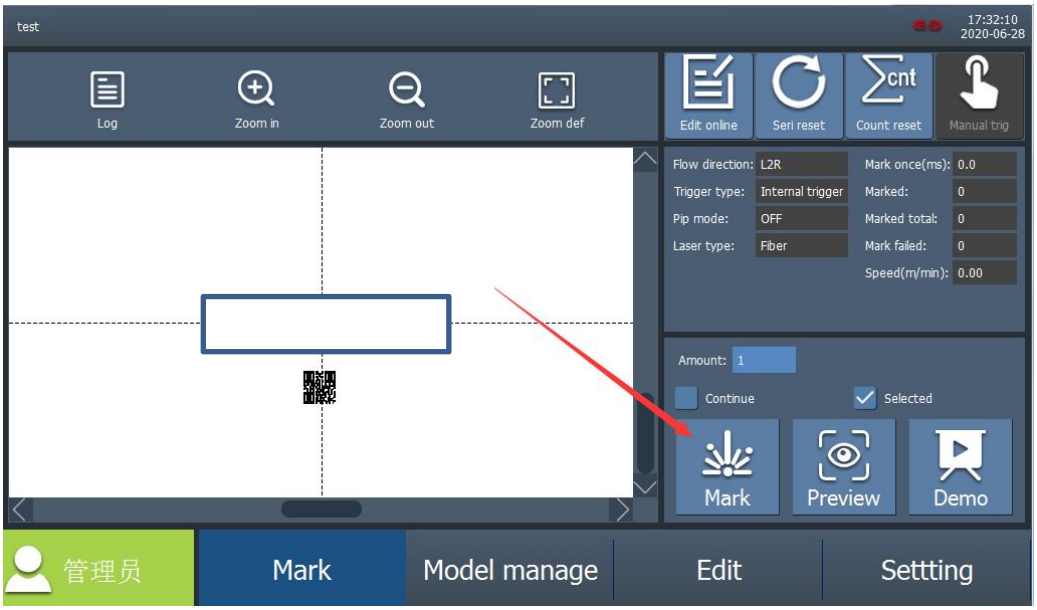

Text
Enter
Cancel
Text
Seri
Date
Time
Shift
Net
Com
File
BreakLine
Edit
Up
Down
Delete
Base
Advance
Adjust all
Offset(mm) 1
X offset(mm) 0.00
Y offset(mm) 0.00
Font 仿宋 Apply all
Height(mm) 10.00 Apply all
Col space(mm) 2.00 Apply all
Char width factor 1.00 Apply all
Equal factor 1.00 Apply all
Row space(mm)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





2.5 打标验证 marking authentication

切换到打标界面，打标后观察效果。Switch to the marking interface to observe the marking effect.



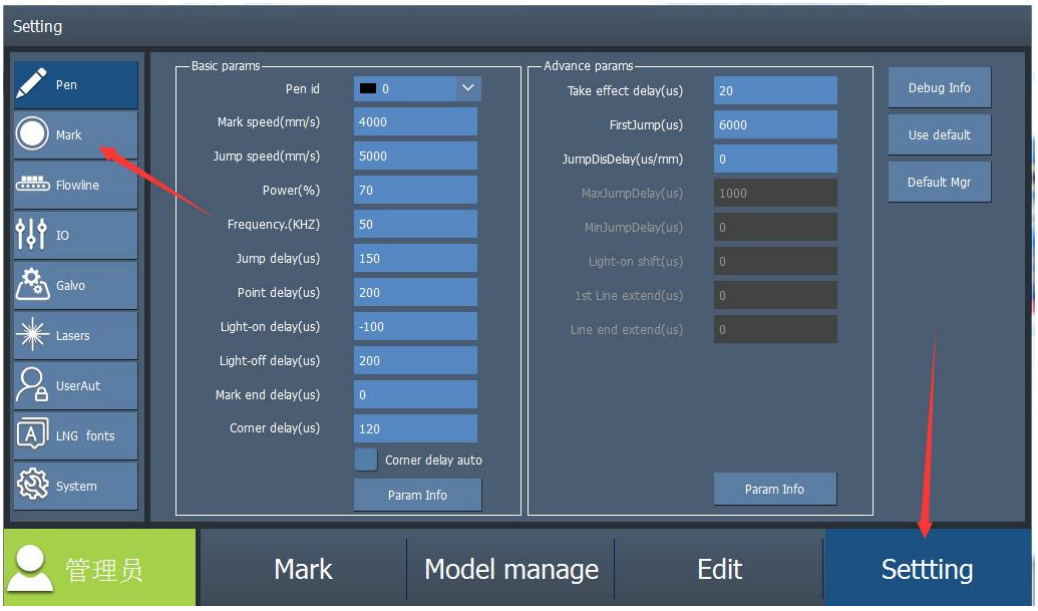
2.6 喷码参数和流水线

marking parameters and assembly line.

在静态喷码效果 OK 后，就切换到设置界面设置喷码参数和流水线。If the static marking effect is good, switch to the settings interface to set the marking parameters and assembly line.

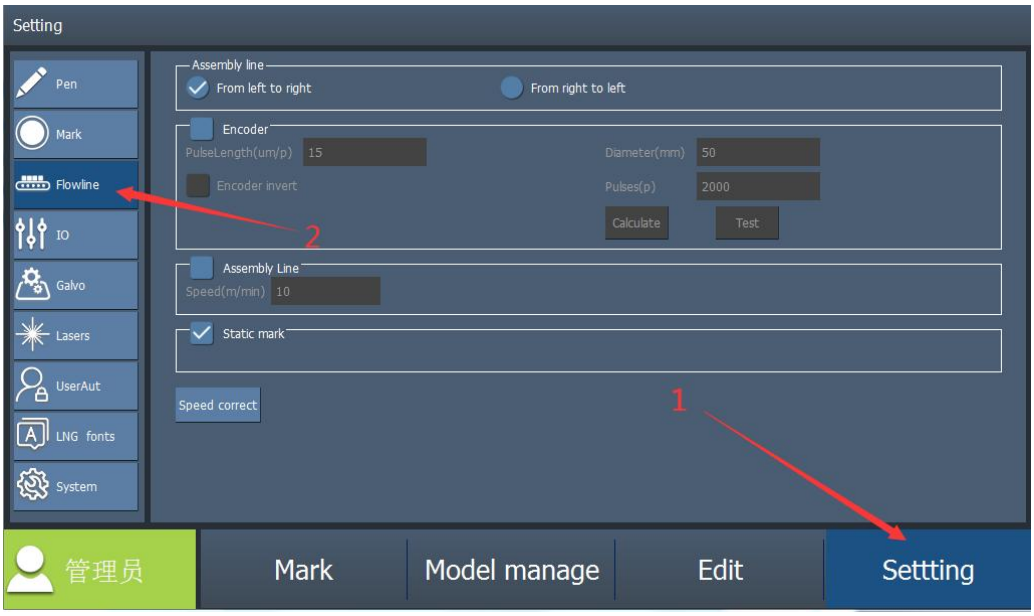
2.6.1 设置打标参数 Set marking parameters

按照实际情况选择触发方式，触发延后，以及最小触发间隔。起始位置使用指定位置和自动都是可以的。如果是指定位置一般是设置 X 坐标，具体值为工作区域的一半减去第一个喷码内容的尺寸，再按照流水线方向决定正负值。 Select the trigger mode, trigger delay, and minimum trigger interval according to the actual situation. It is OK to use a designated point or automatically-selected point as the starting point. For a designated point, generally set the X Coordinate, and the specific value is half of the work area minus the size of the first marking content, and then decide the positive and negative values according to the direction of the assembly line.


Setting
Pen
Mark
Flowline
IO
Galvo
Lasers
UserAut
LNG fonts
System
Basic params
Pen id
0
Mark speed(mm/s)
4000
Jump speed(mm/s)
5000
Power(%)
70
Frequency.(KHZ)
50
Jump delay(us)
150
Point delay(us)
200
Light-on delay(us)
-100
Light-off delay(us)
200
Mark end delay(us)
0
Corner delay(us)
120
Corner delay auto
Param Info
Advance params
Take effect delay(us)
20
FirstJump(us)
6000
JumpDisDelay(us/mm)
0
MaxJumpDelay(us)
1000
MinJumpDelay(us)
0
Light-on shift(us)
0
1st Line extend(us)
0
Line end extend(us)
0
Param Info
Debug Info
Use default
Default Mgr
管理员
Mark
Model manage
Edit
Settting

2.6.2 设置流水线 Set the assembly line

在喷码速度，延时都匹配的情况下，飞打时图元是否整齐可以通过调整脉冲距离这个参数来改变。这个参数本身是通过填入编码器直径和周脉冲来计算出来的。 Under the condition that the marking speed and the delay are matched, the neatness of the shapes during fly marking can be adjusted by adjusting the impulse distance. This parameter is calculated by filling in the diameter of the encoder and cycle impulse.



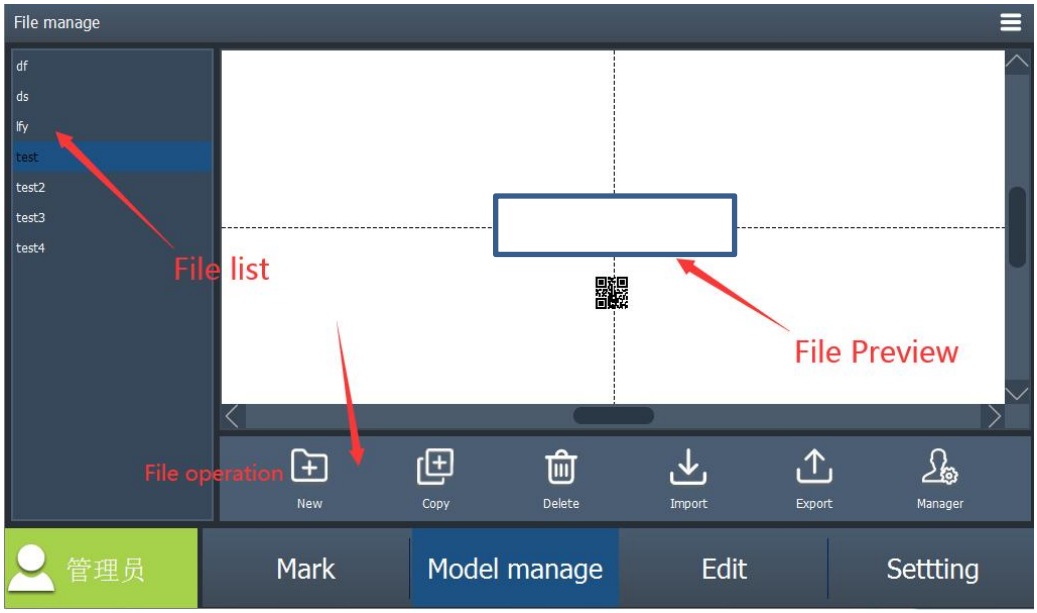
所以参数都调整好后，可以正常飞行打标后再切换到“文件”界面保存。以后每次打开软件后只要加载“文件”模板就可以开始工作了

After all the parameters are adjusted to perform normal fly marking, switch to the file interface to save the content. Each time when you open the software, you can start working by just loading the file template.

3. 软件说明 Description of the Software

3.1. 文件管理 file management

文件管理是管理用户的模板文件的功能组，包括了新建、复制、删除、导入、导出以及管理六个子功能。（软件中操作文件是对 users 文件夹内的文件进行操作，不影响其他文件夹中的文件）File management is a functional group that manages the user's template files, including six sub-functions: new folder, copy, delete, import, export, and manage.



■ 新建：新建一个空白的模板文件，若无模板文件，直接在编辑界面点击保存，有同样效果。

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

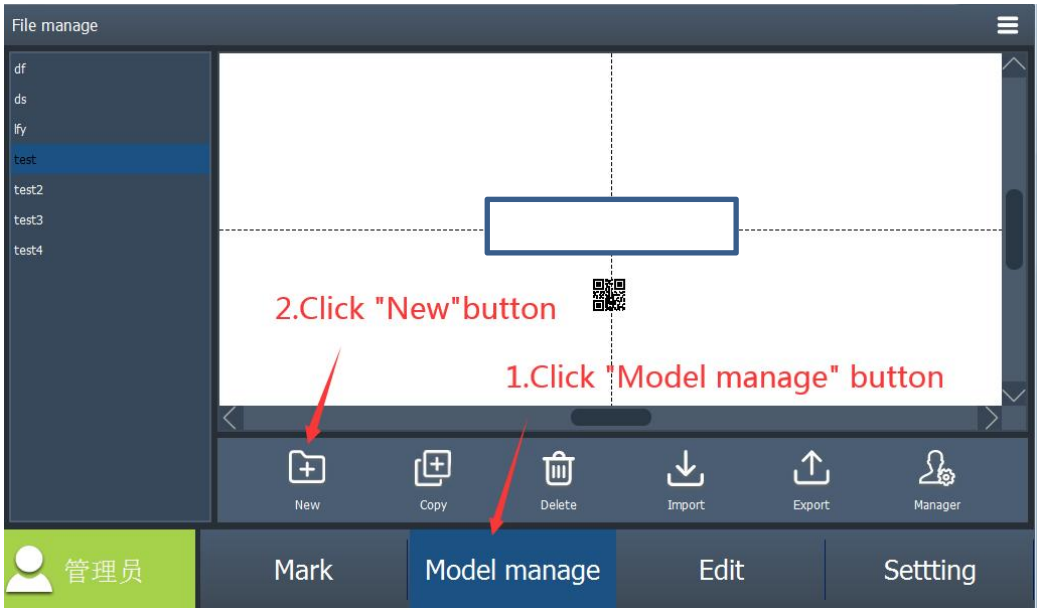
■

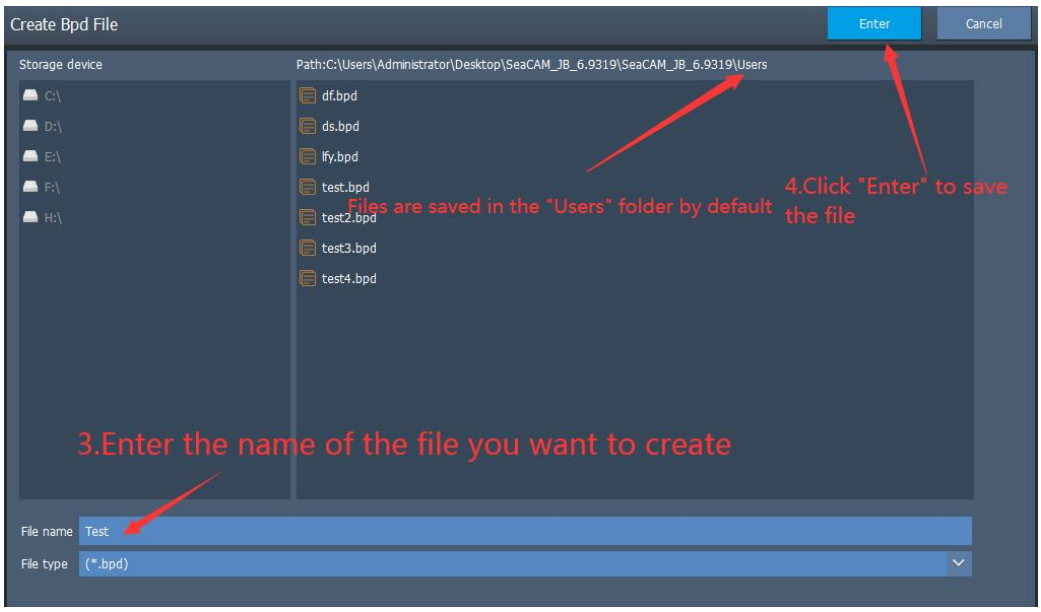
■ 复制：复制当前选中的模板文件。Copy: Copy the selected template file.

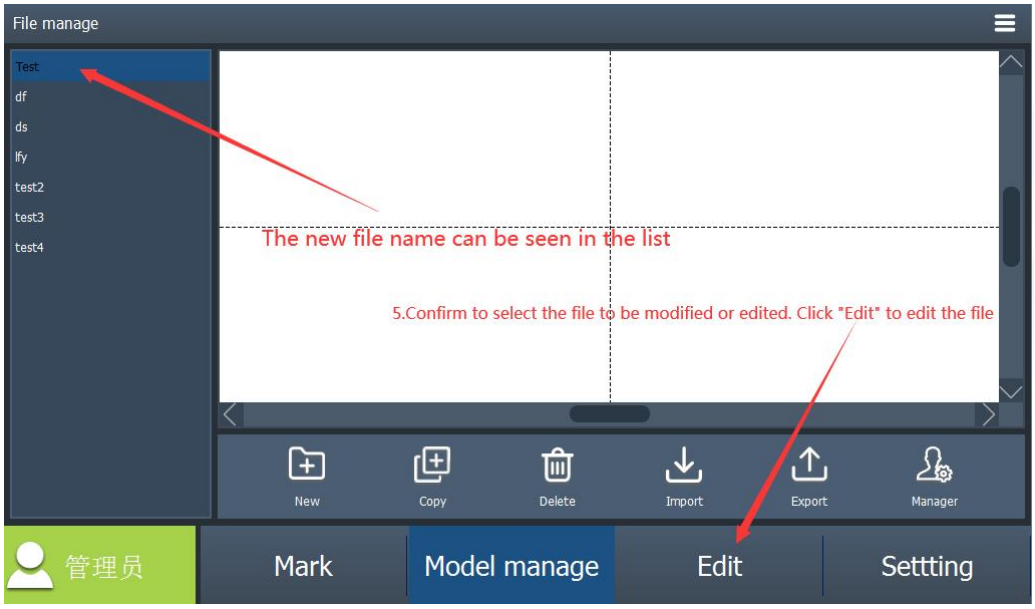
- 删除：删除当前选中的模板文件。Delete: Delete the selected template file.
- 导入：从指定位置导入一个模板文件。Import: Import a template file from a designated location.
- 导出：将当前选中的模板文件导出到一个指定位置。Export: Export a template file to a designated location.
- 管理：就是文件管理器，可以对所有文件进行增删改的操作。Manage: Namely the file manager, which can add, delete and change all files.

3.1.1. 功能说明 Function description

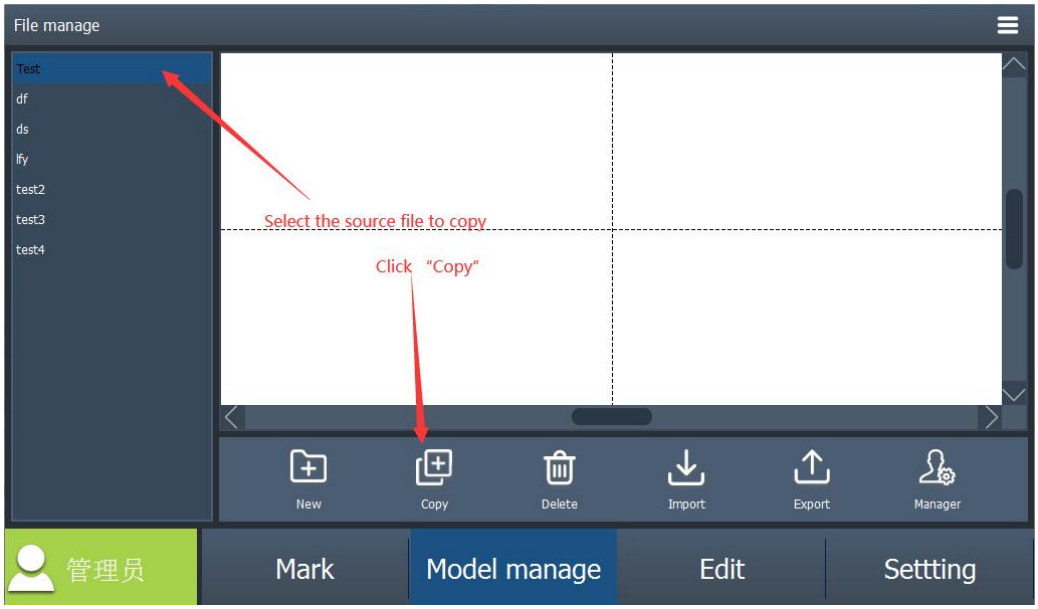
3.1.1.1. 新建 new folder

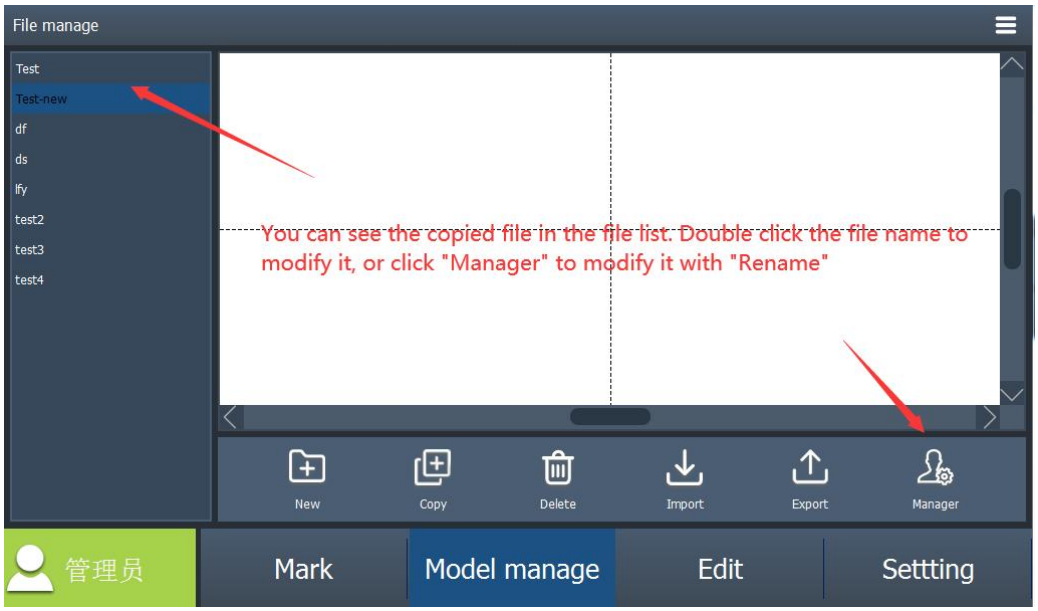



Create Bpd File
Enter
Cancel
Storage device
Path:C:\Users\Administrator\Desktop\SeaCAM_JB_6.9319\SeaCAM_JB_6.9319\Users
C:\
D:\
E:\
F:\
H:\
df.bpd
ds.bpd
lfy.bpd
test.bpd
test2.bpd
test3.bpd
test4.bpd
Files are saved in the "Users" folder by default
4.Click "Enter" to save the file
3.Enter the name of the file you want to create
File name
Test
File type
(*.bpd)

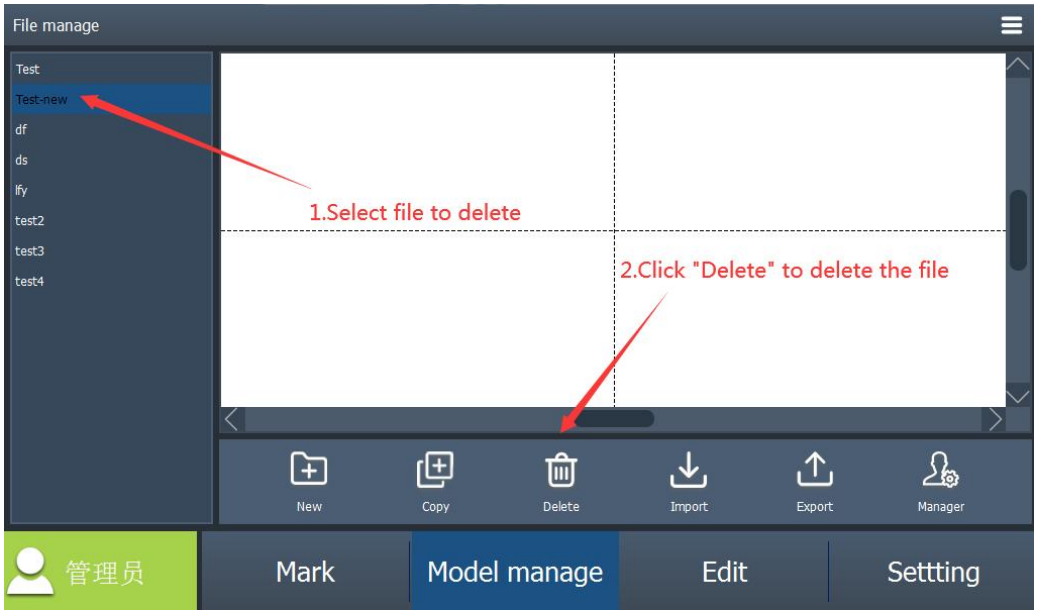

File manage
Test
df
ds
lfy
test2
test3
test4
The new file name can be seen in the list
5.Confirm to select the file to be modified or edited. Click "Edit" to edit the file
New
Copy
Delete
Import
Export
Manager
管理员
Mark
Model manage
Edit
Settting

3.1.1.2. 复制 copy

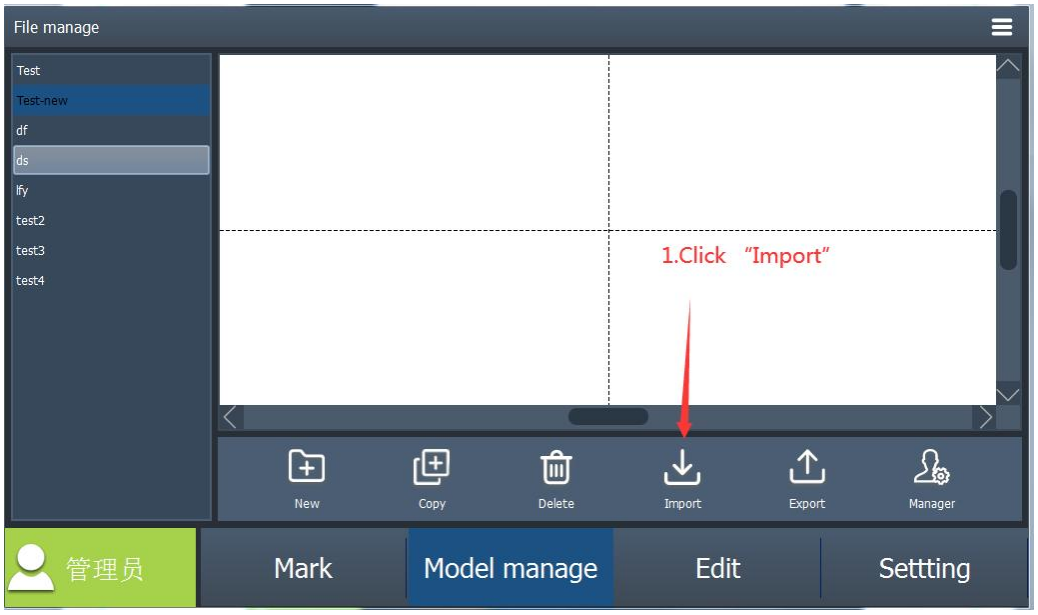

File manage
Test
df
ds
lfy
test2
test3
test4
Select the source file to copy
Click "Copy"
New
Copy
Delete
Import
Export
Manager
管理员
Mark
Model manage
Edit
Settting

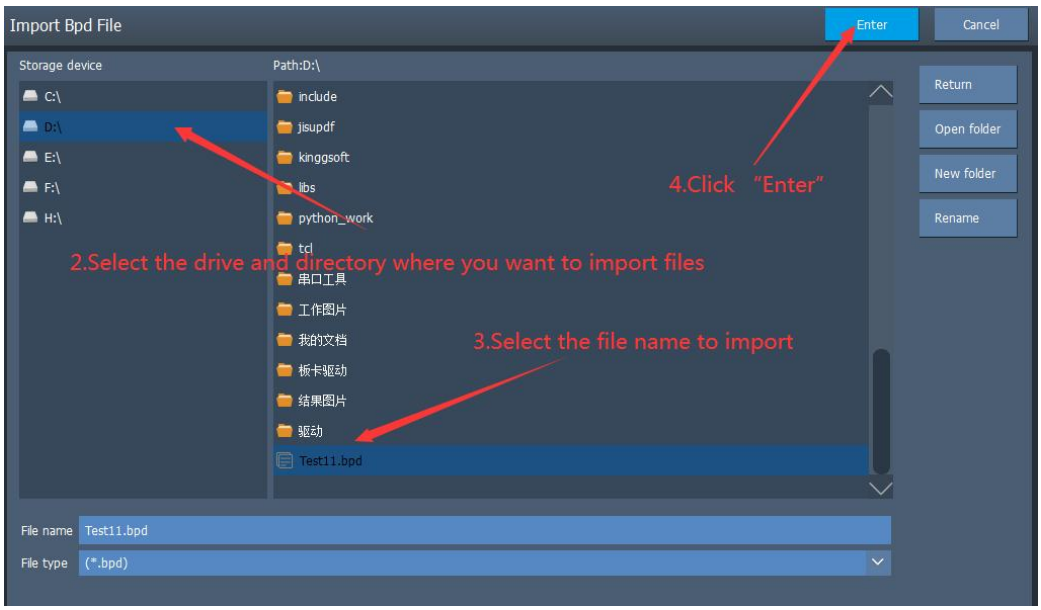

File manage
Test
Test-new
df
ds
lfy
test2
test3
test4
You can see the copied file in the file list. Double click the file name to modify it, or click "Manager" to modify it with "Rename"
New
Copy
Delete
Import
Export
Manager
管理员
Mark
Model manage
Edit
Settting

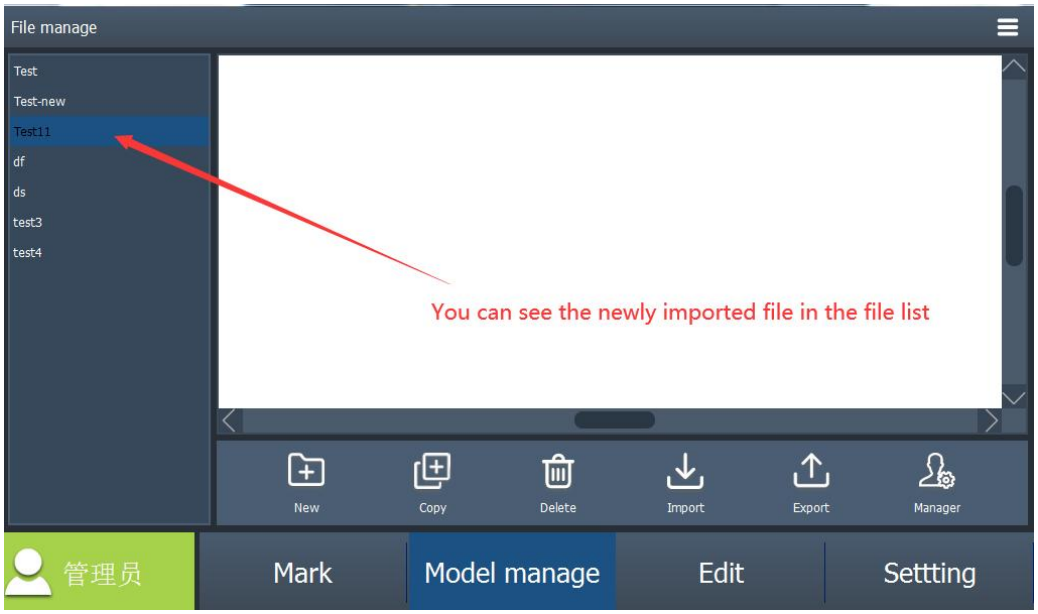
3.1.1.3. 删除 delete



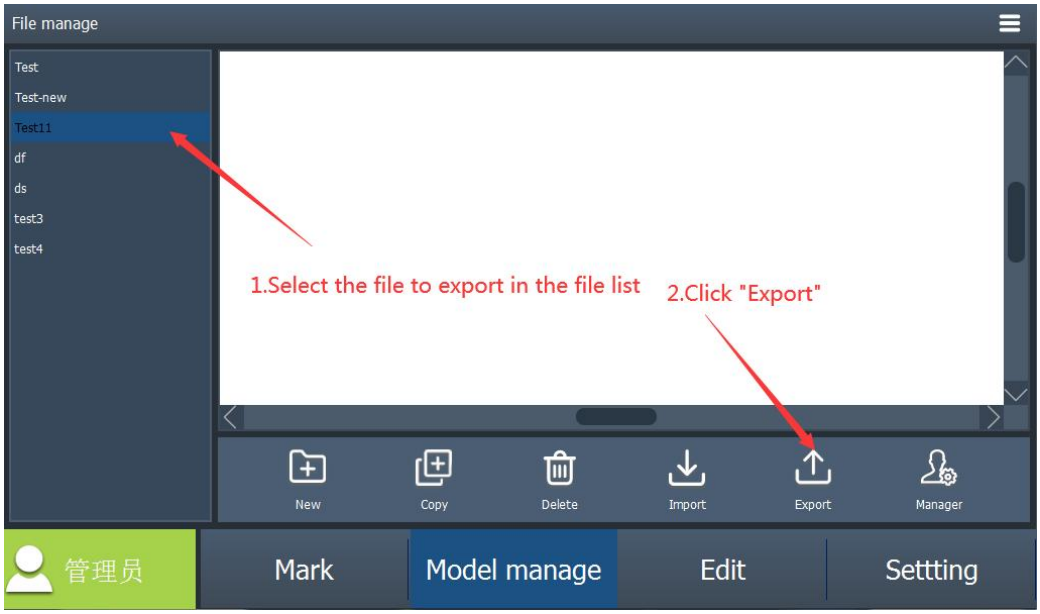
3.1.1.4. 导入文件 Import Files

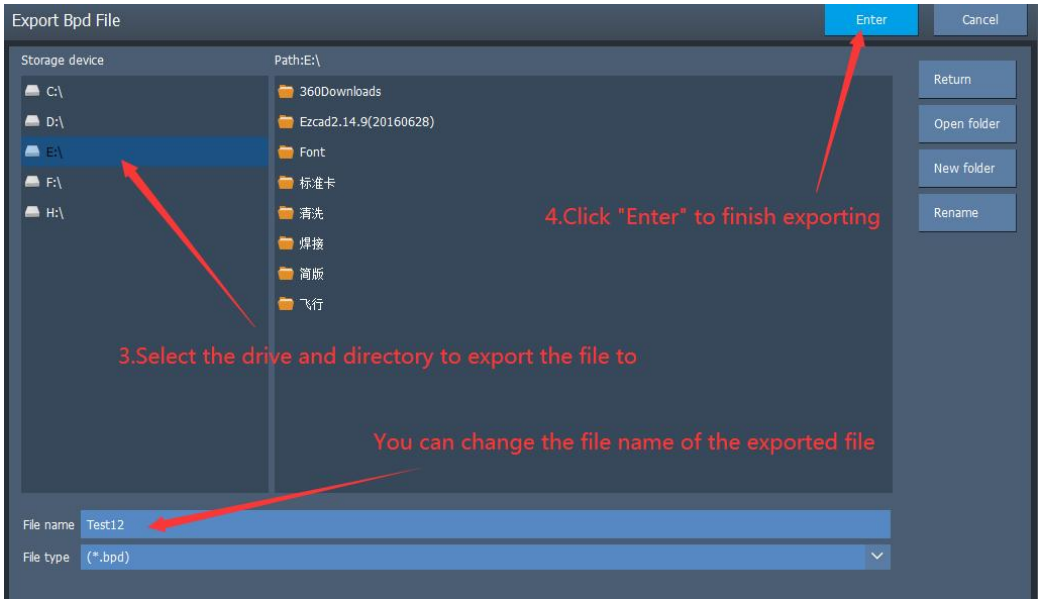



Import Bpd File
Enter
Cancel
Storage device
Path:D:\
C:\
D:\
E:\
F:\
H:\
include
jisupdf
kinggsoft
libs
python_work
tcl
串口工具
工作图片
我的文档
板卡驱动
结果图片
驱动
Test11.bpd
Return
Open folder
New folder
Rename
4.Click "Enter"
2.Select the drive and directory where you want to import files
3.Select the file name to import
File name
Test11.bpd
File type
(*.bpd)

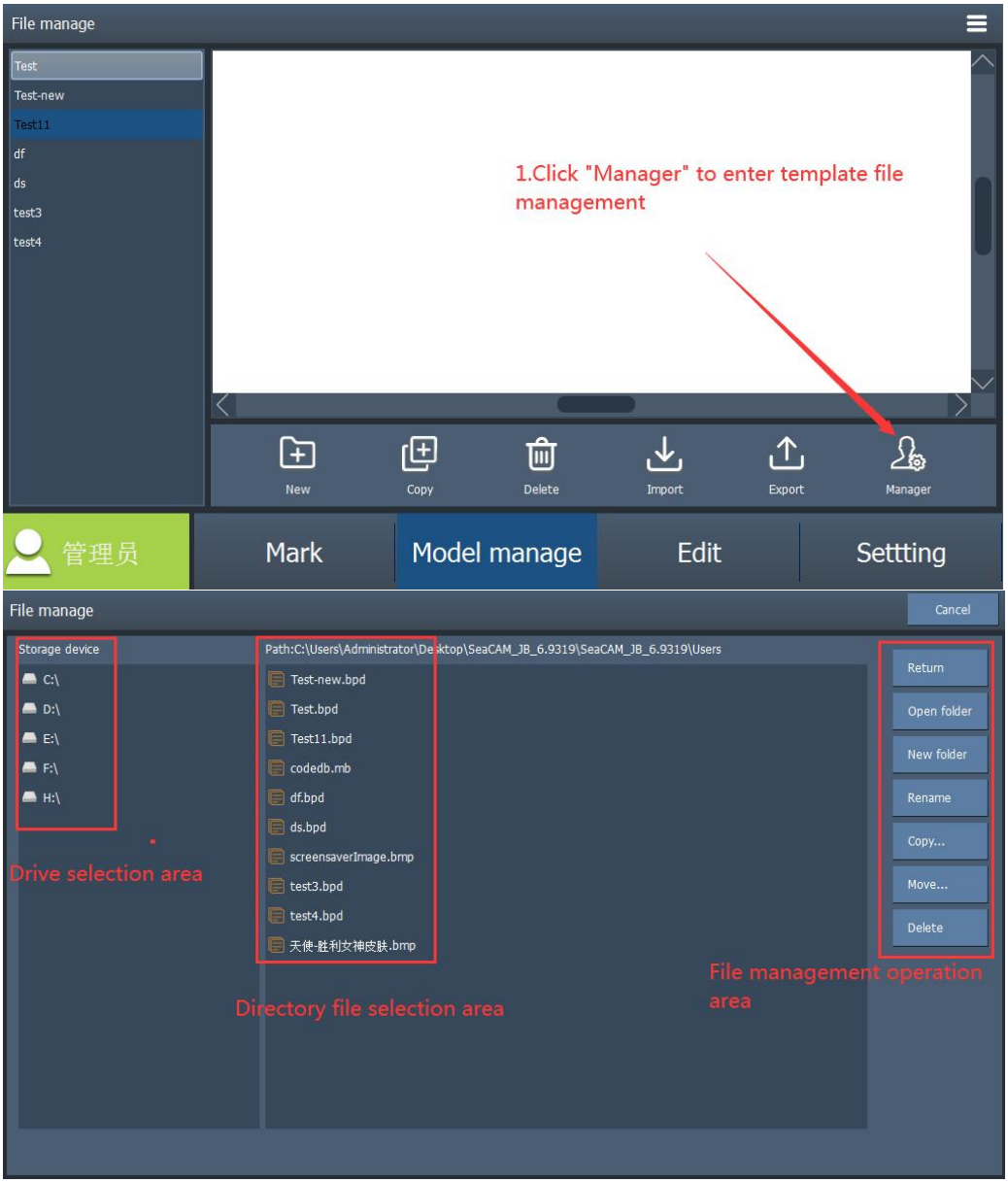

File manage
Test
Test-new
Test11
df
ds
test3
test4
You can see the newly imported file in the file list
New
Copy
Delete
Import
Export
Manager
管理员
Mark
Model manage
Edit
Settting

3.1.1.5. 导出文件 Export Files



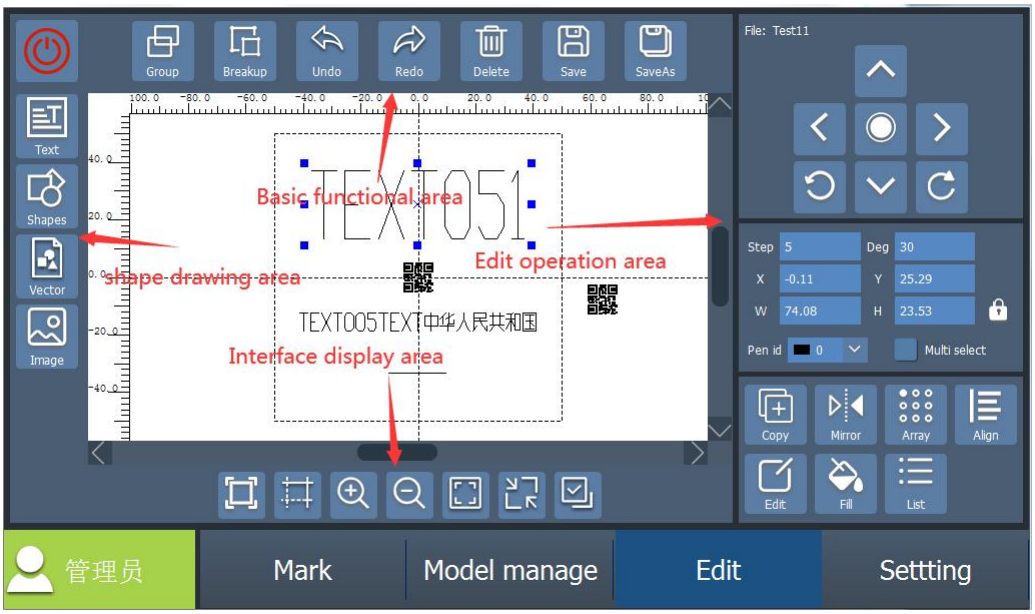


3.1.1.6. 管理 manage



3.2. 编辑 Editing

编辑是绘制、编辑各种图元的功能组。包括绘制（文本、二维码、条形码、几何图元、矢量图以及图片），编辑，填充，镜像，阵列，移动，旋转等子功能。 Editing is a functional group for drawing and editing various shapes, including drawing (text, QR code, bar code, shapes, vector graphics and pictures), editing, filling, mirroring, arraying, moving, rotating, etc.



3.2.1. 基础功能区 Basic Functions

:将选中的复数图元进行群组&将选中的群组解散。Group the selected plural shapes & ungroup the selected group.

：在进行图形编辑操作时，如果对当前的操作不满意，可以使用“撤销”取消当前的操作，回到上一次操作的状态；撤销当前操作之后，可以使用“恢复”功能还原被取消的操作。这是进行编辑工作最常用的功能之一。If you are not satisfied with current operation during graphic editing, you can use “Undo” to cancel current operation and return to the previous status. After undoing the current operation, you can use “Redo” to restore the operation which has been canceled. It is one of the most commonly used function for editing.

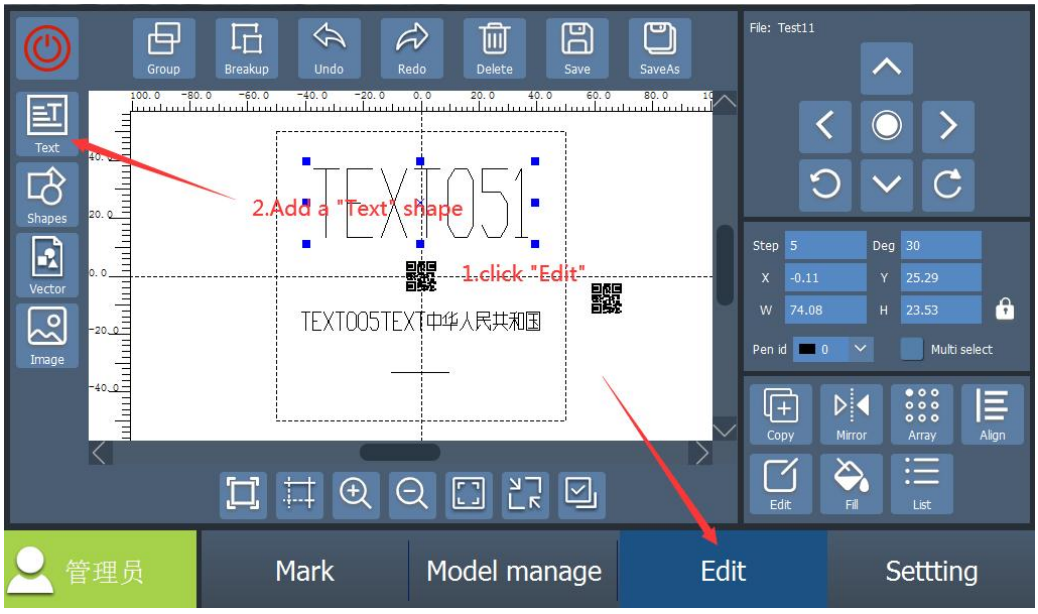
：删掉不需要的图元。Delete the shape you do not need.

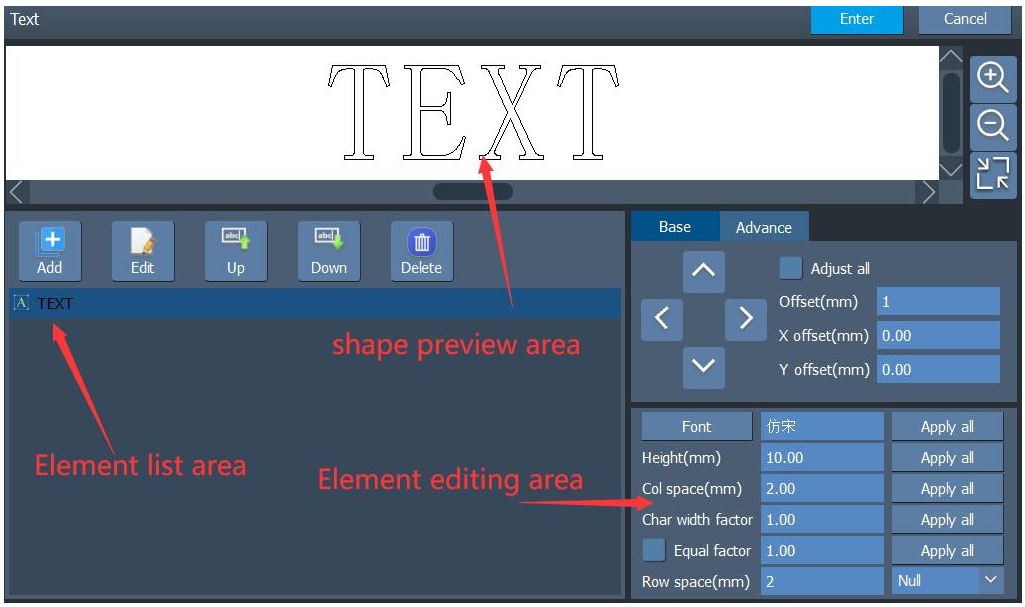
：没有建立模板文件的时候使用此功能可以建立模板文件并保存当前内容。有模板文件的时候使用此功能可以保存当前内容。This function can create a template file and save the current content when no template file is created. It can save the current content when there is a template file.

：将目前文件保存一个不同文件名文件，一般用于保存备份文件 save the current file with a different file name,generally used to save the backup file

3.2.2. 图元绘制区 Drawing area of shape

3.2.2.1. 文本图元 Text shape





3.2.2.1.1. 图元预览窗 The Preview Window

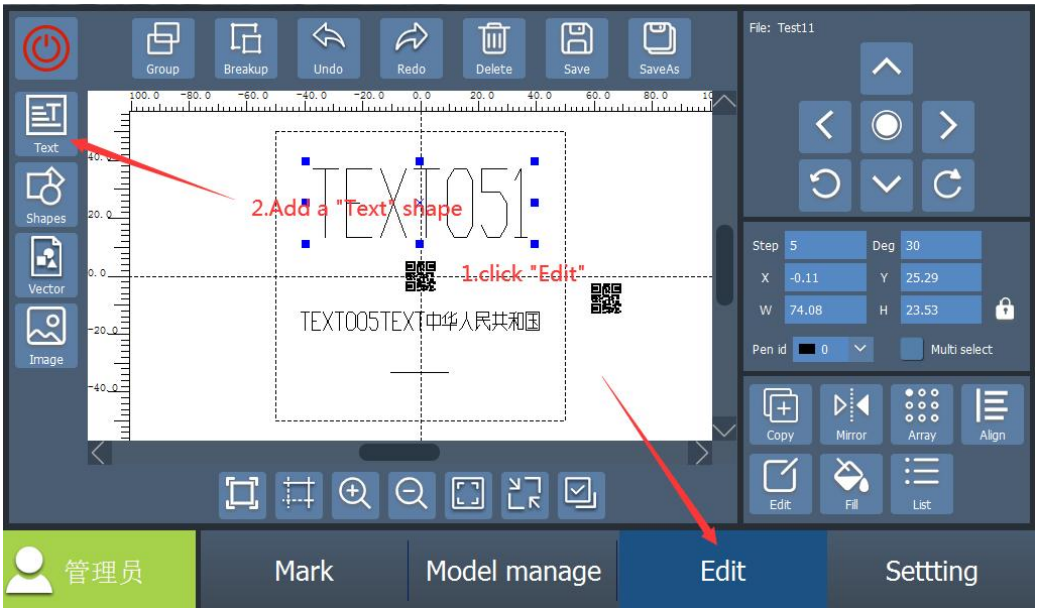
此处会显示当前文本的所有内容。All contents of the current text will be displayed here.

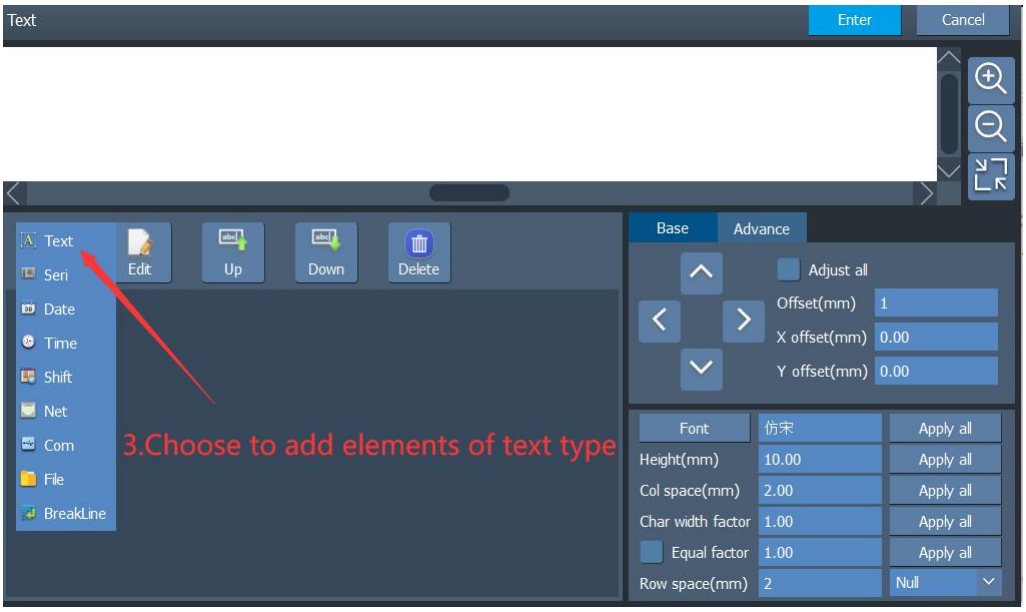
3.2.2.1.2. 元素列表区

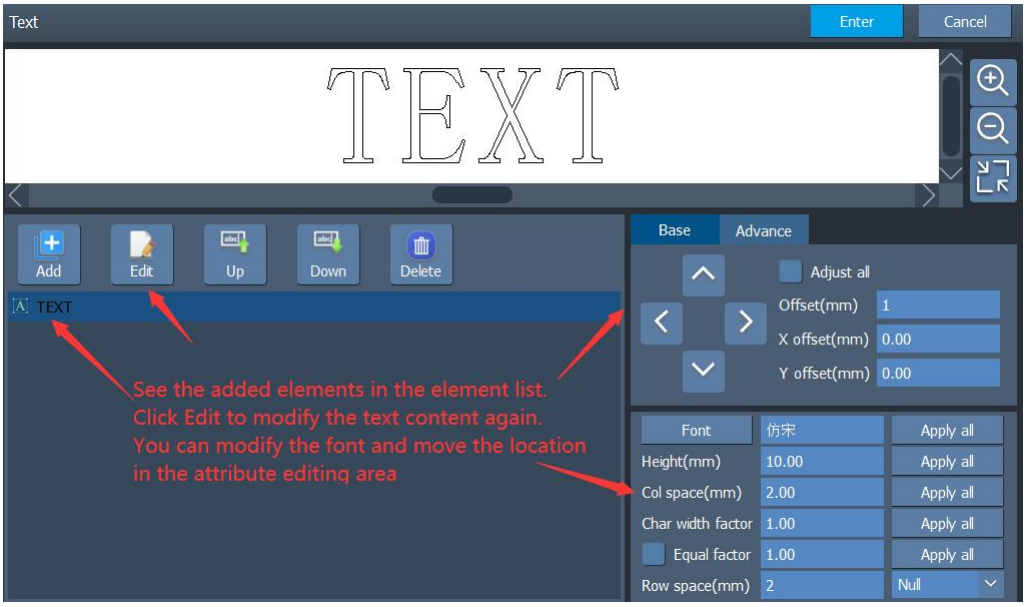
此处会显示文本内容中的每一个元素。选中后可以使用下方的编辑按钮进行相应的操作。 Each element in the text is displayed here. After selecting, use the edit button below to perform the corresponding operations.

- **添加**：添加新的元素，按此按钮进行编辑操作。Add:add a new element and press this button to edit it
  - **编辑**：选中已有的元素，按此按钮进行编辑、修改属性等操作。**Editing:** Select the existing element, and press the editing button to edit.
-
  - **上移/下移**：修改选择元素的位置。**Move Up/Move Down:** Modify the location of the selected elements.
-
  - **删除**：删除当前选择的元素。**Delete:** Delete the selected elements.
-

3.2.2.1.3. 固定文本 Fixed Text

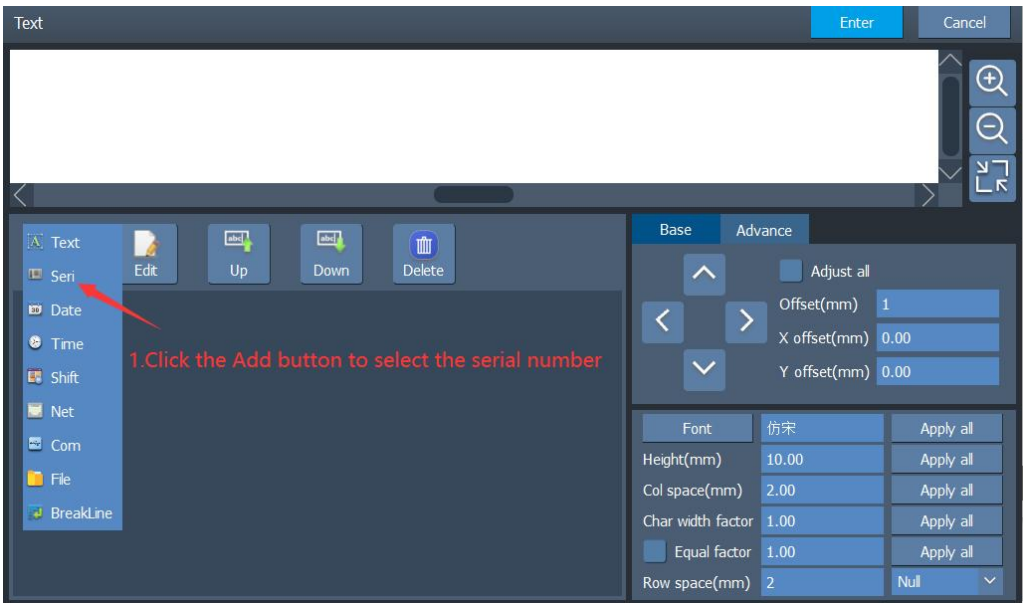


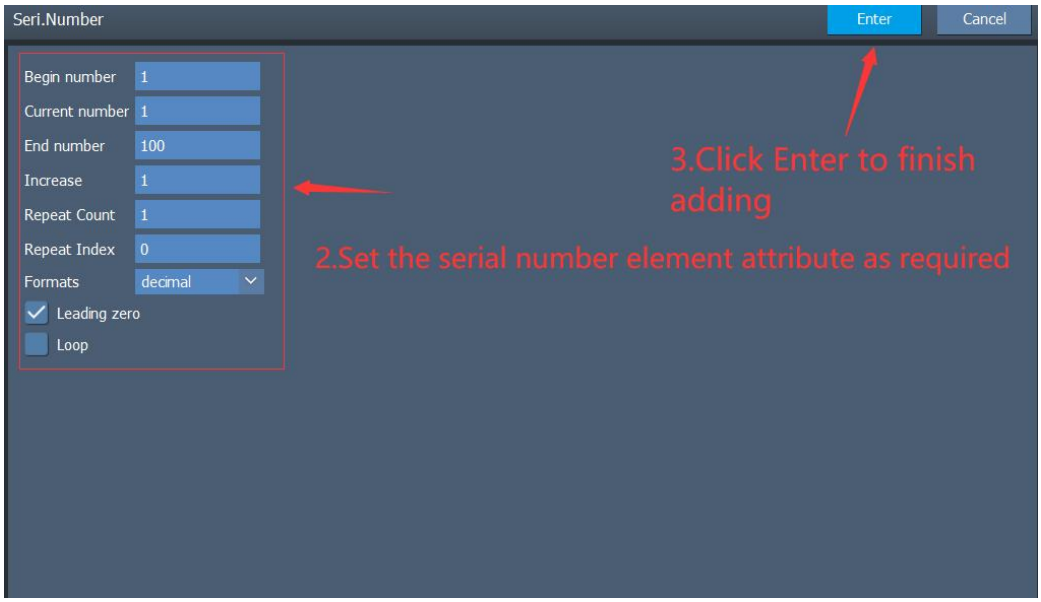




3.2.2.1.4. 序列号 Serial Number

加工过程中按固定增量改变的文本元素（序列号）。如图所示（前面步骤可参考固定文本添加步骤）：Text elements that change in fixed increments during processing, as shown below:(For the previous steps,please refer to the fixed text adding step)





◆ **开始序号**：序列号开始时候的数字。**Starting serial number:** The digit when the serial number begins.

◆

◆ **当前序号**：目前序列号的数字。

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

◆

◆ **结束序号**：该组序列号的位数以及当加工的序列号等于该序号值时，该组序列号

就结束加工了。**Ending serial number:** The digit of the serial number in the group. When the processed serial number is equal to the ending serial number, the serial number in the group ends the processing.

◆

◆ **增量**：指该组序列号的增加量。**Increment:** The increment of the serial number of the group.

◆

◆ **重复次数**：指该组序列号每个数值加工到指定的数目后，才会变成下一个序列号。**Number of repetitions:** Each value of the serial number of the group will become the next serial number after processed to the designated number.

◆

◆ **进制**：指该组序列号的进制模式。默认选择有十进制，十六进制大写，十六进制小写。**Positional notation:** The positional notation of the serial number of the group. The default selections are decimal system, hexadecimal uppercase, and hexadecimal lowercase.

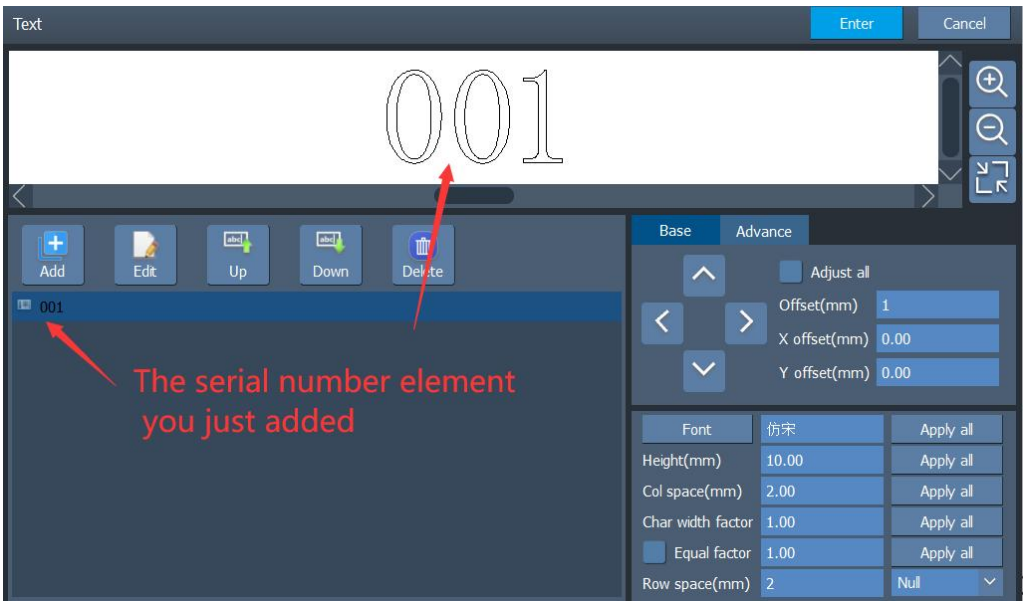
◆

◆ **前导零**：是否显示序列号前面的补位 0。**Leading zero:** Whether to display the complement digit 0 in front of the serial number.

◆

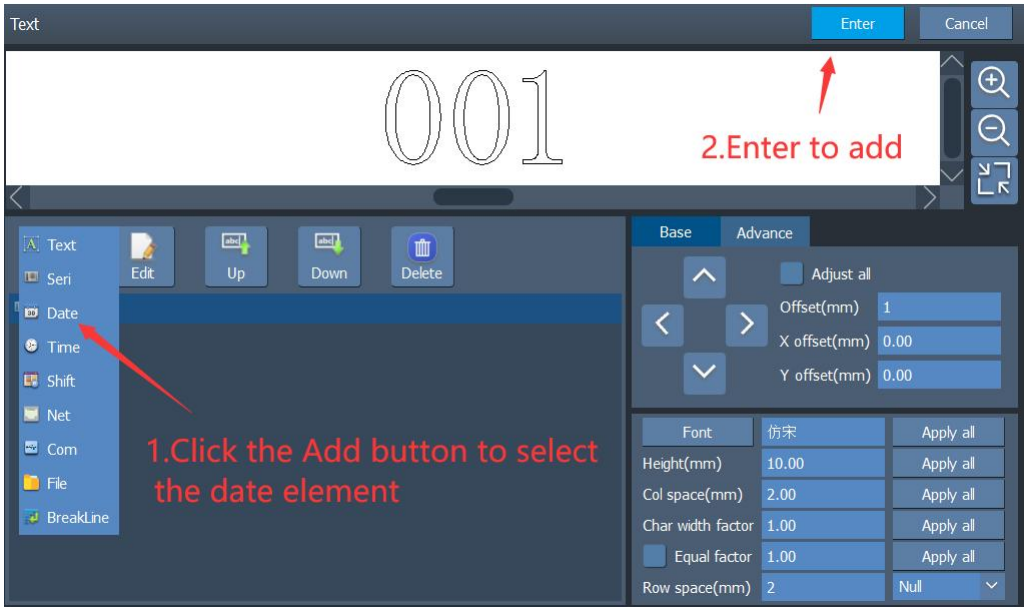
◆ **数据循环**：当打码完结束序号后，是否自动从开始序号开始打码。**Data cycle:** After marking the ending serial number, whether to automatically mark from the starting serial number.

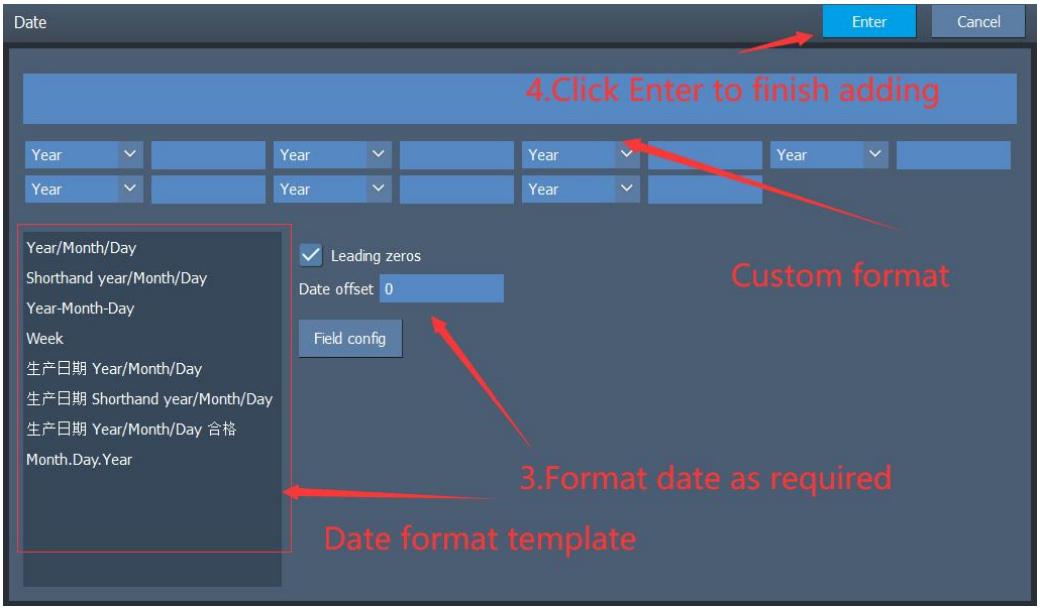
◆



3.2.2.1.5. 日期 Date

加工过程中系统自动从计算机中取日期信息的文本元素。默认提供了多种日期格式以供选择，还可以对默认格式进行修改。如图所示（前面步骤可参考固定文本添加步骤）：During processing, the system automatically selects the text element of date from the computer. A variety of date formats are provided by default for selection, and the default format can be modified as shown below:





内容预览窗：预览当前日期效果。**Preview window**: Preview the current date.

默认格式选择：内置了多种日期格式，选择好后可以在自定义格式窗口再进行个性化修改。**Default format selection**: There are multiple built-in date formats. After selection, make personalized modifications in the custom format window.

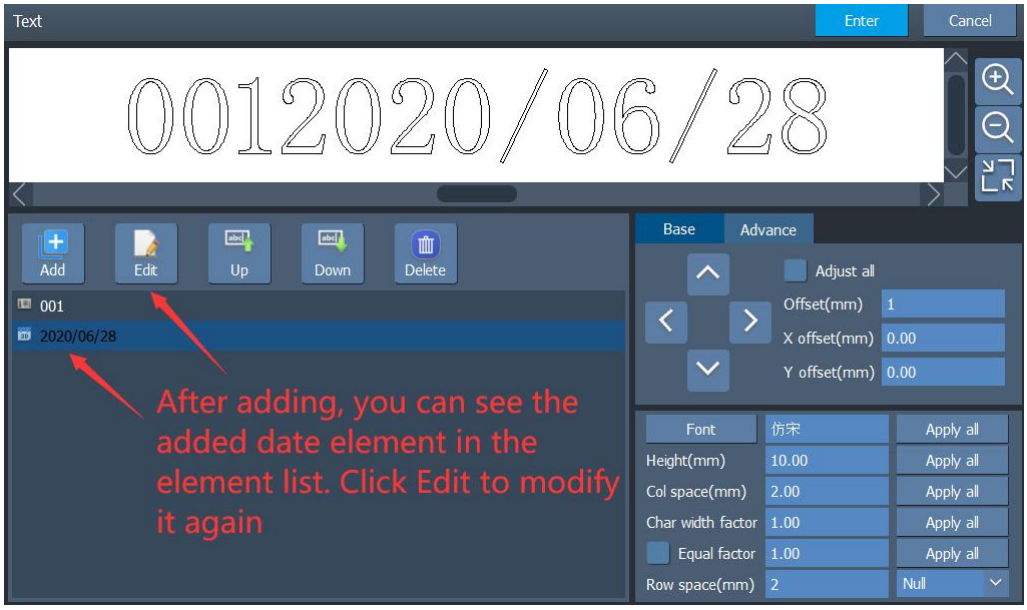
字段自定义：下拉框选择需要定义的元素，输入框输入元素 的内容。**Numeric field setting:** Select the element to be defined in the drop-down list, and enter the content of the element in the input box.

字段设置：可以对周以及英文月份的显示进行自定义。比如英文周，英文简写月等。

Numeric field customization: Customize the display of week and English month. For example, English week and English abbreviations of months.

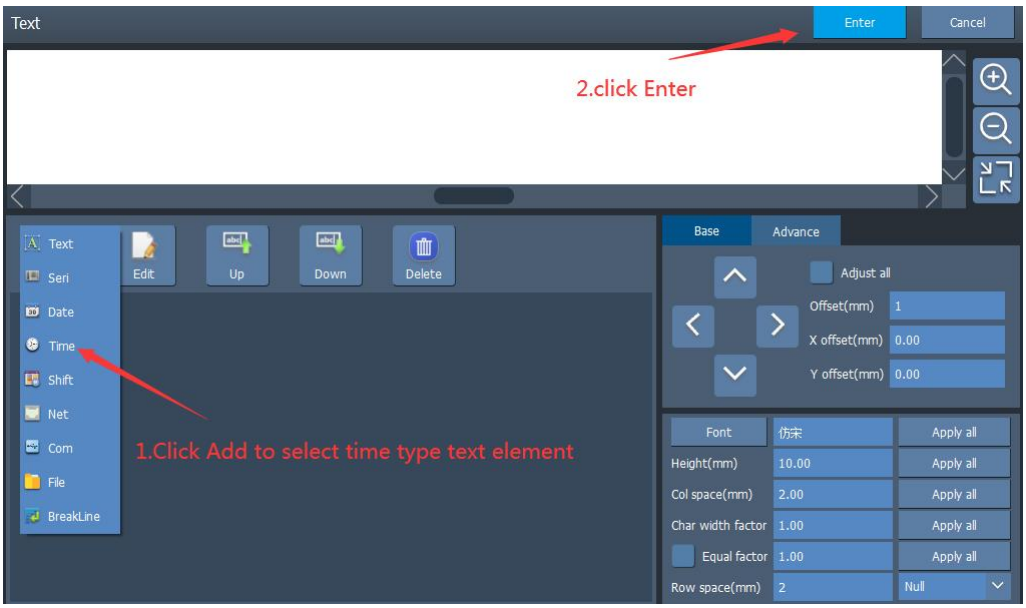
日期偏移：将日期加上或者减去此数值显示并喷 0 码出来。

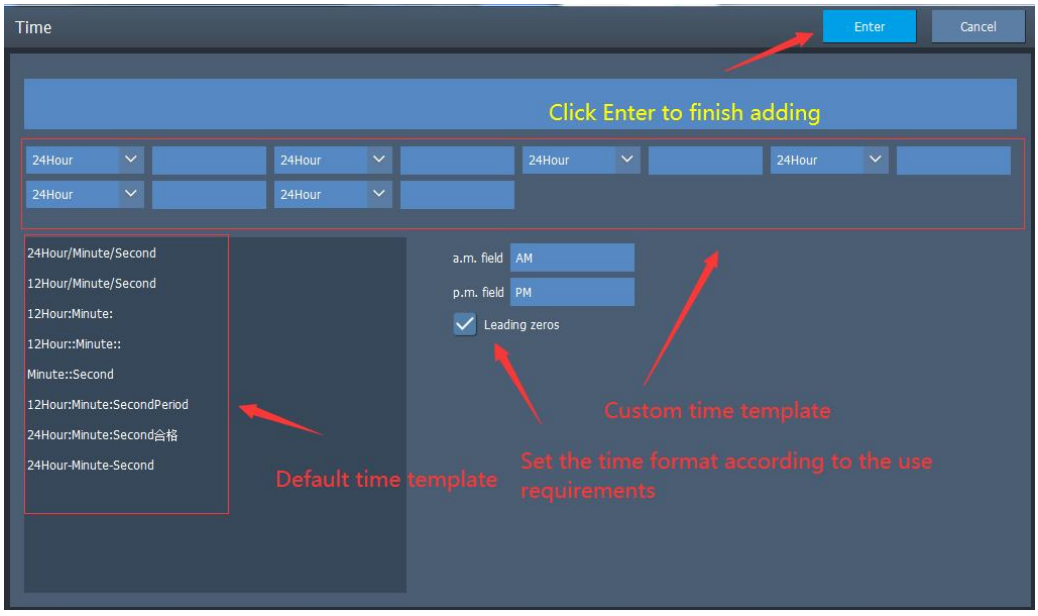
Date **offsets:** Add or subtract the value from the date to display and mark it.



3.2.2.1.6. 时间 Time

加工过程中系统自动从计算机中取时间信息的文本元素。默认提供了多种时间格式以供选择，还可以对默认格式进行修改。如图所示（前面步骤可参考固定文本添加步骤）：During processing, the system automatically selects text elements of time from the computer. A variety of time formats are provided by default for selection, and the default format can be modified as shown below:(For the previous steps,please refer to the fixed text adding step)





- **前导零：**是否显示时间的补位 0**Leading zero:** whether to display the complement digit 0 of time.

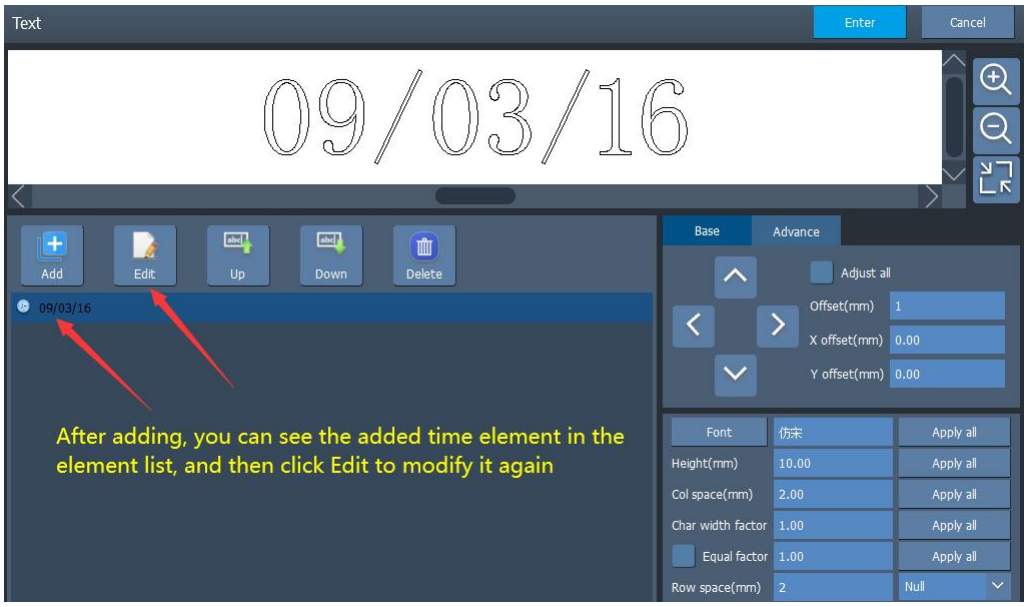
- **默认格式选择：**内置了多种时间格式，选择好后可以在自定义格式窗口再进行个性化修改 Default format selection:a variety of time formats are built-in.After selection,you can customize them in the custom format window

- **字段自定义：**下拉框选择需要定义的元素，输入框输入元素 的内容

- Field Customization:drop down box select the element to be defined input box input element content

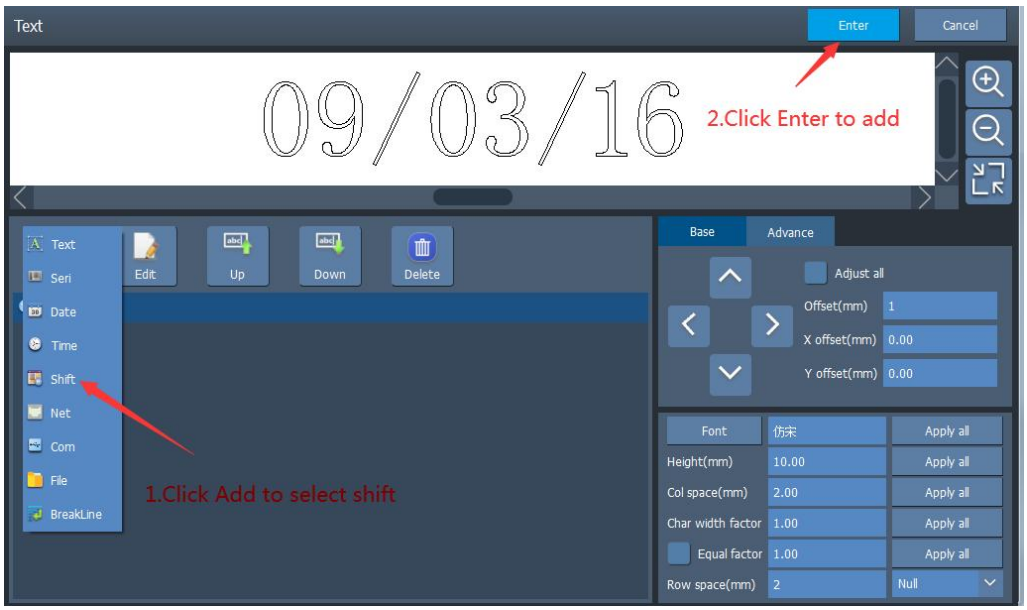
- **上午字段/下午字段：**自定义分时间段显示的字符内容 **AM/PM numeric field:** Customize the character content displayed by time period

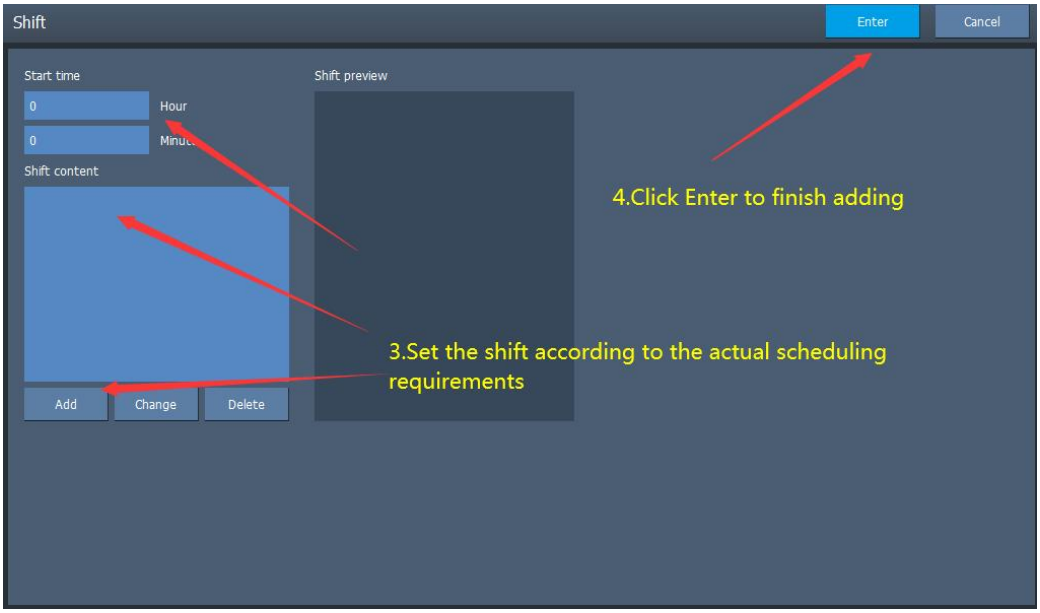
-



3.2.2.1.7. 班次 Shifts

用来设定工作班次（相当于定时跳码的功能）。如图所示（前面步骤可参考固定文本添加步骤）。It is used to set the shifts (equivalent to the time hopping function) as shown below:(For the previous steps,please refer to the fixed text adding step)



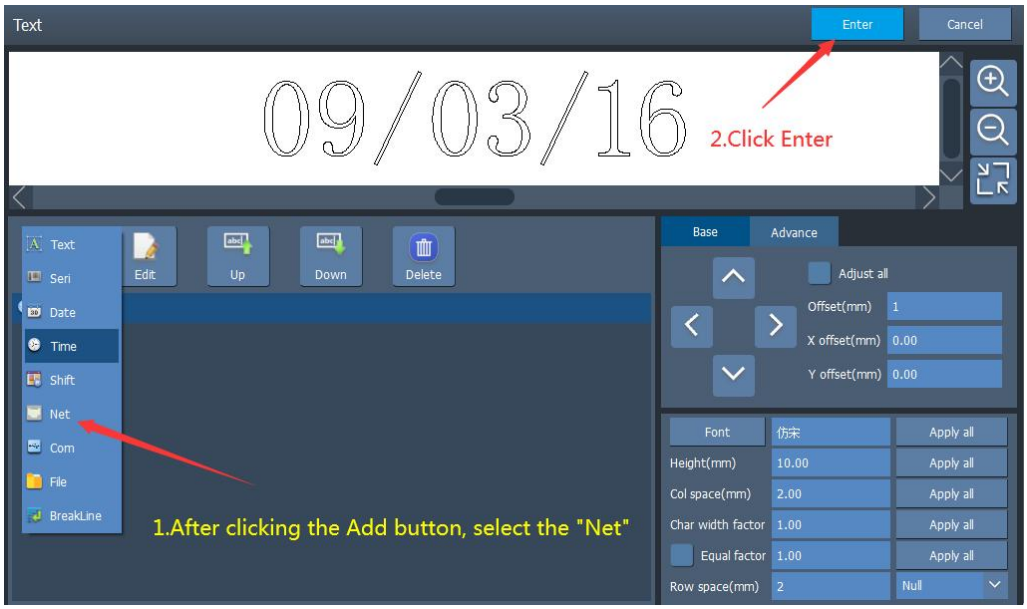


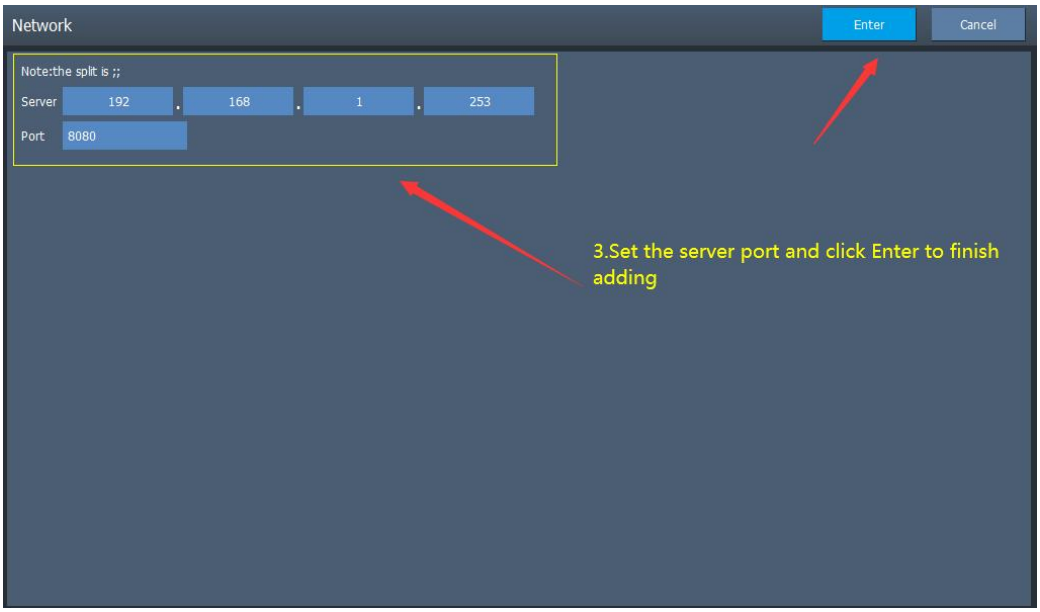
- **开始时间**：每班次开始的时间，可以设置到分钟。到了设定时间就会变成这个时间对应的班次。**Starting time:** The starting time for each shift can be set to minute. When it is the set time, it will display the shift corresponding to the time.

- **班次内容**：每个班次的名称，代号。**Shift content:** The name and code of each shift.

3.2.2.1.8. 网口 Internet Access

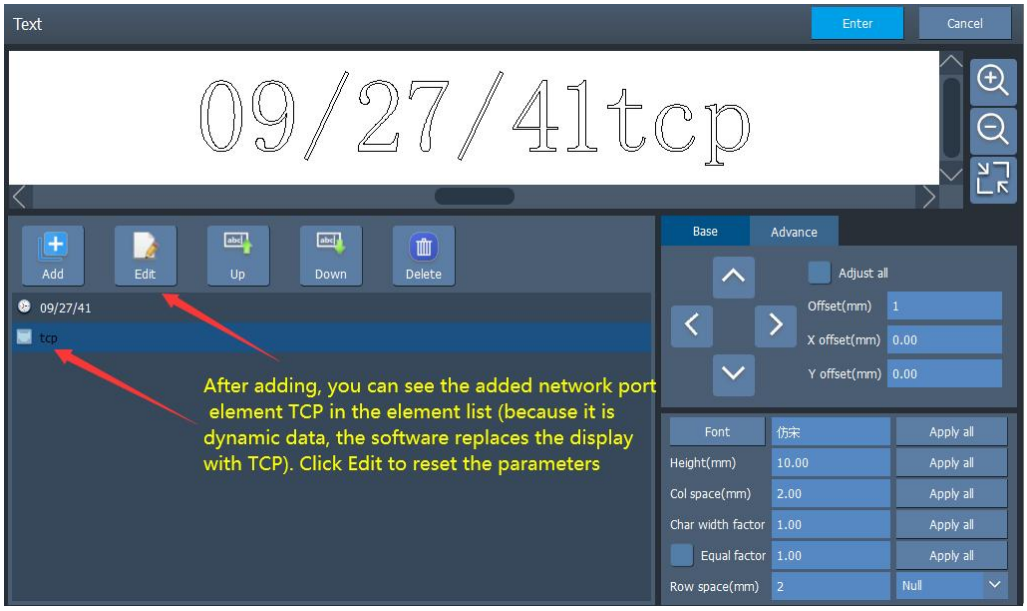
网络通讯元素是加工过程中系统自动通过计算机网口从网络上读取文本的元素。如图所示（前面步骤可参考固定文本添加步骤）。 The network communication element is an element that the system automatically reads text from the network through the computer internet access during processing as shown below(For the previous steps,please refer to the fixed text adding step)





◆ **服务器：**服务器的 IP 地址。**Server:** The IP address of the server.

◆ **端口号：** 选择网络通讯使用的端口号。**Interface number:** Select the interface number used for network communication.



下面结合具体实例来说明一下如何使用此功能： This function is exemplified as follows:

现在有个客户需要加工 10000 个工件，工件上的打标内容是一个序列号 ，他和另一个工件的序列号是一一对应的（对方序号是随机的）。所以每次加工前都要实时通过网络从局域网上一台计算机服务器（IP:192.168.0.1 端口为 1000）上读取要加工的内容。这样同时一起加工，就不会出错。Suppose there is a customer who needs to process 10,000 workpieces. The marking content on the workpiece is a serial number,He and another The serial number of the workpiece is one-to-one correspondence(the opposite serial number is random). so every time before processing, the customer must read real-time the content to be processed on a server (IP: 192.168.0.1, Interface number: 1000) from the local area network.such Processing together at the same time,there will be no mistakes.

1. 打开软件后选择绘制“文本”，再选择网口。系统会弹出上图的对话框。IP 地址参数填入服务器计算机的 IP，这里为 192.168.0.1；端口参数设置为用于通讯的端口号，这里为 1000，注意网口参数必须和服务器计算机上设置的网口参数一样，否则会导致无法通讯。 Open the software, choose to draw the QR code, and then select the internet access. The system will pop up the dialog box as shown above. Fill the server’s IP in the IP address parameter box, which is 192.168.0.1. The interface parameter is set to the interface number used for communication, which is 1000. Note: the internet access parameter must be the same as the interface parameter set on the server, otherwise it will be unable to communicate.

2. 点击右上角“确定”按钮。Click Yes in the upper right corner.

按“喷码”按钮开始加工，高速飞行喷码系统会立即通过网口发送命令“CMD”到服务器，并等待服务器返回。 Press the “Marking” button to start processing, the high-speed fly mark system will immediately send “CMD” to the server through the internet access, and wait for the server to reply.

3.

4. 服务器发现网口接收到命令，发现是 “CMD”后立即读取数据库得到当前要加工的文本，然后通过网口回答给高速飞行喷码系统。 When the server finds that the internet access receives the order of “CMD”, it will immediately read the database to obtain the text to be processed, and then answers the high-speed fly mark system through the internet access.

高速飞行喷码系统得到要加工的文本后立即更新加工数据到工作区域和板卡。5. After the high-speed fly mark system obtains the text to be processed, it will immediately update the processed data to the work area and board.

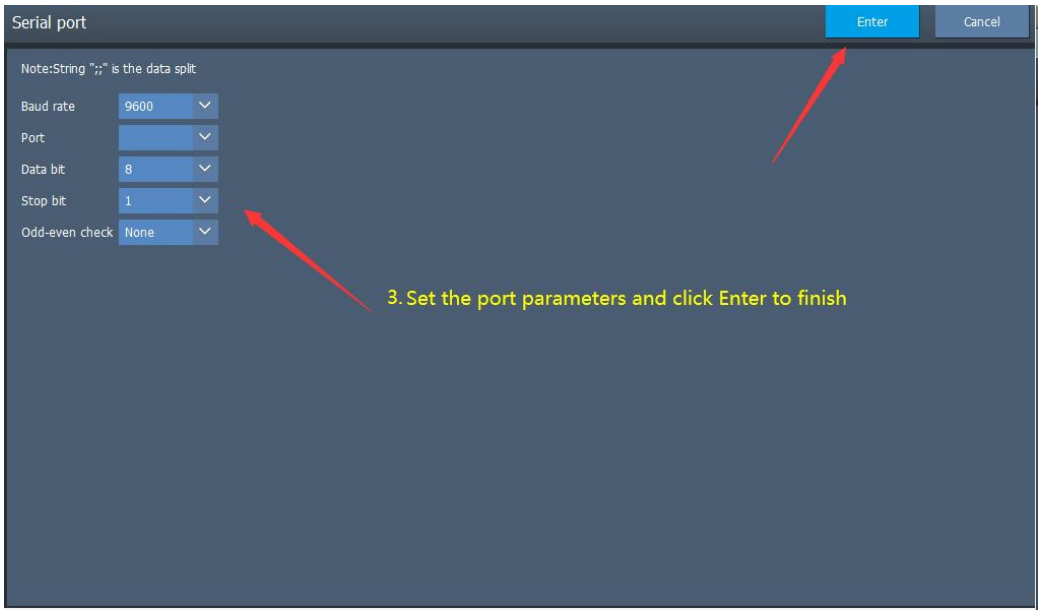
5.

6. 板卡接收到加工数据后立即控制打标机加工工件。 After the board receives the processed data, it will immediately control the mark device to process the workpiece.

3.2.2.1.9. 串口 Serial Ports

串口通讯元素是加工过程中系统自动通过计算机串口从外围设备上读取文本的元素。如

图所示： The communication element of a serial port is an element that the system automatically reads text from the peripheral through the serial port of the computer during processing as shown below:



◆ **波特率：** 选择串口通讯使用的波特率 **Baud:** Select the baud used for serial communication

◆

◆ **端口：** 选择计算机与外部设备连接使用的串口号 **Interface:** Select the serial port number used by the computer to connect with external devices

◆

◆ **数据位：**选择串口通讯使用的数据的位数 **Data bit:** Select the data bit used for serial communication

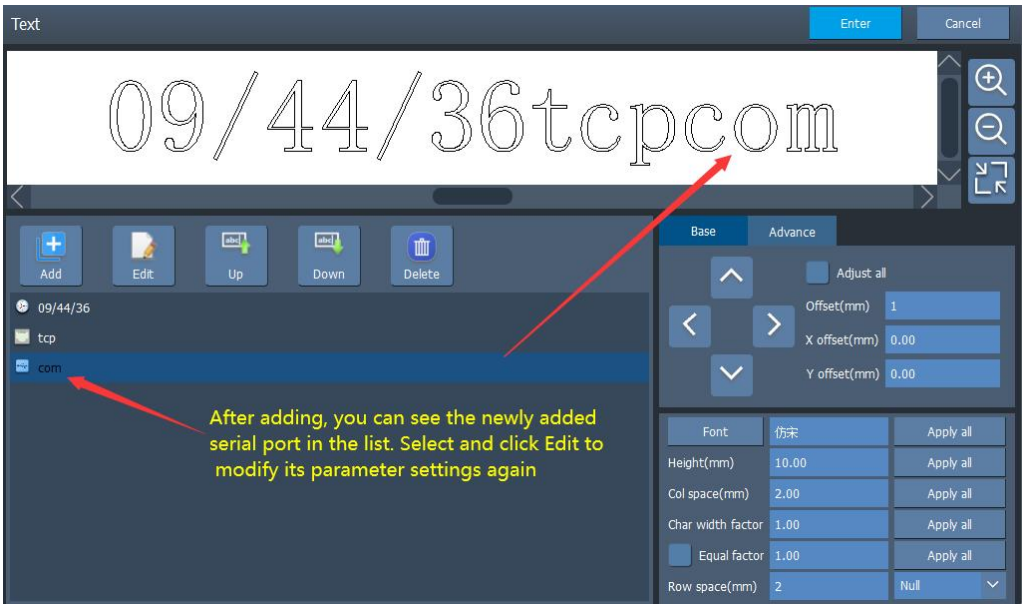
◆

◆ **停止位：**选择串口通讯使用的停止位的位数 **Stop bit:** Select the stop bit used for serial communication

◆

◆ **校验：**选择串口通讯使用的奇偶校验的位数 **Parity:** Select the parity bit used for serial communication

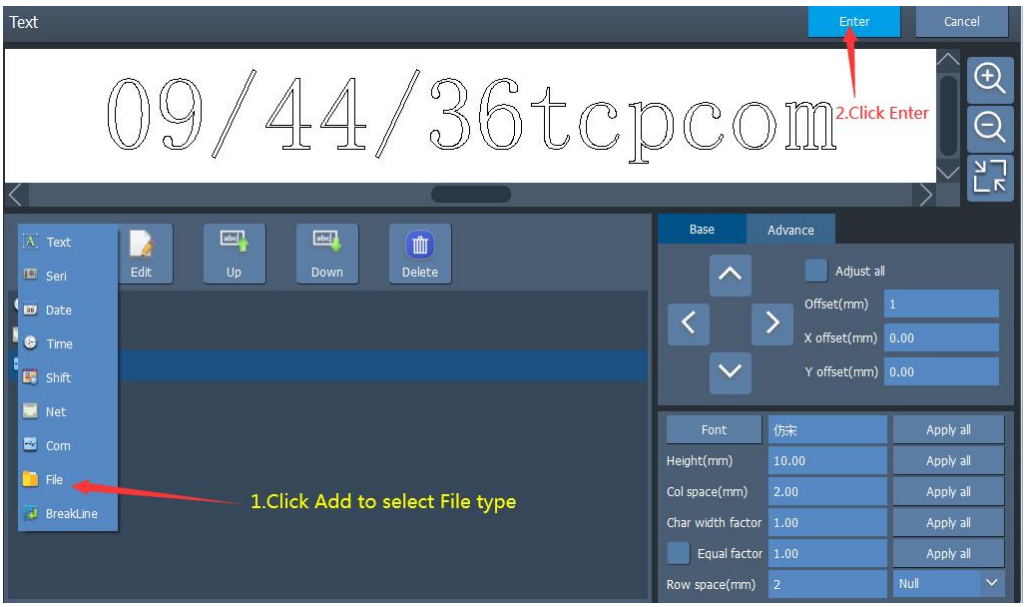
◆

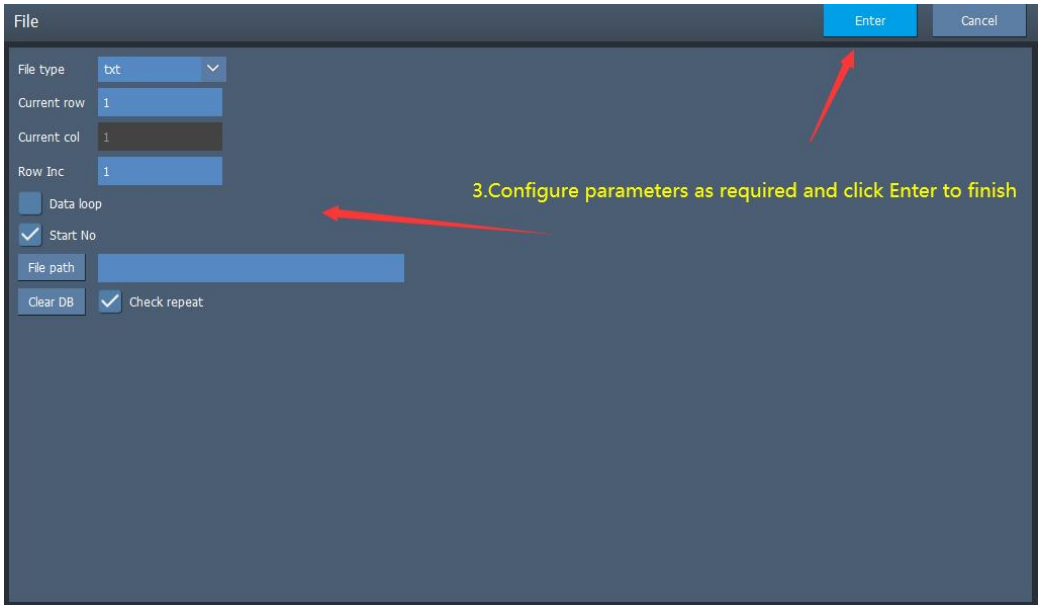


3.2.2.1.10. 文件 Files

文件元素是加工过程中从 txt 或者 Excel 文件中一行一行读取要加工的文本元素。如图所示：The file element is a text element to be processed line by line from a txt or Excel file during processing as shown in Figure:

注意：文件内容，必须每行的字符个数一致，且不能有空行。Note: The content of the file must have the same number of characters in each line, and there must be no blank lines.





文件类型：选择关联文件的类型，支持 TXT 和 CSV**File type:** Select the type of associated file, support TXT and CSV

当前行号：从哪一行开始读取加工数据。**Current line number**: The line from which to start reading the processed data.

当前列号：从哪一列读取加工数据。**Current column number**: The column from which to read the processed data.

行增量：每次跳几行读取内容进行喷码 **Line increment:** jump a few lines at a time to read the content for marking

数据循环：当文件内容读取到最后一行时，是否循环读取。**Data cycle:** Whether to read the file again and again when reading the last line of the file.

是否标刻当前行：当前行号的内容是否喷码，否就从当前行号的下一行开始喷码。**Whether to mark the current line**: Whether the content of the current line is marked. If no, mark from the next line of the current line.

文件路径：指定关联文件的路径。**File path:** Specify the path of the associated file.

清空缓存：清空为了防止重码而保存的文件。**Clear cache:** Clear files saved to prevent weight codes.

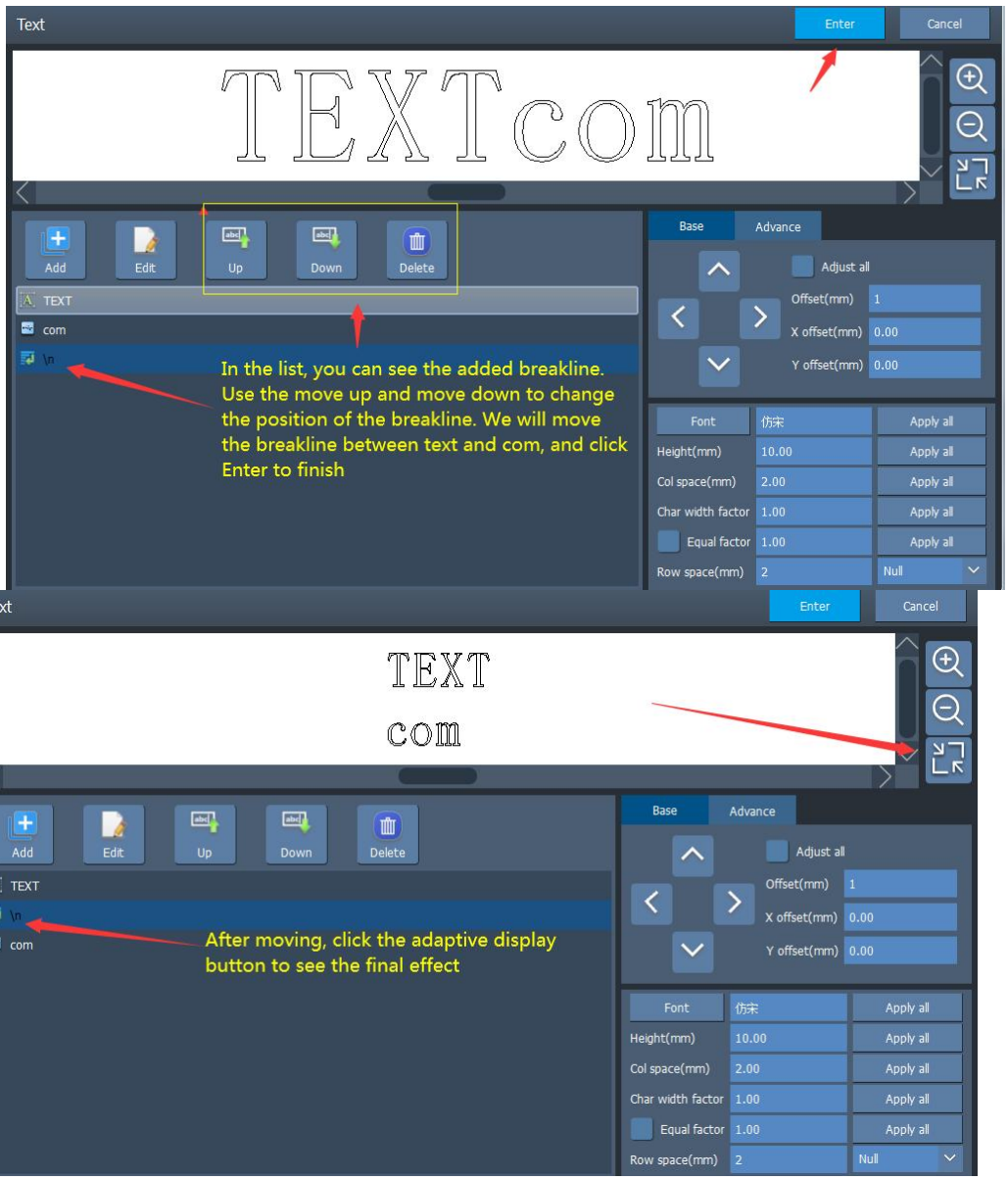
检查重码：勾选后如果发现是喷码过的内容会停止喷码 **Check the weight code:** After checking, stop marking if it is found the content is already marked

3.2.2.1.11. 换行符 Line Break

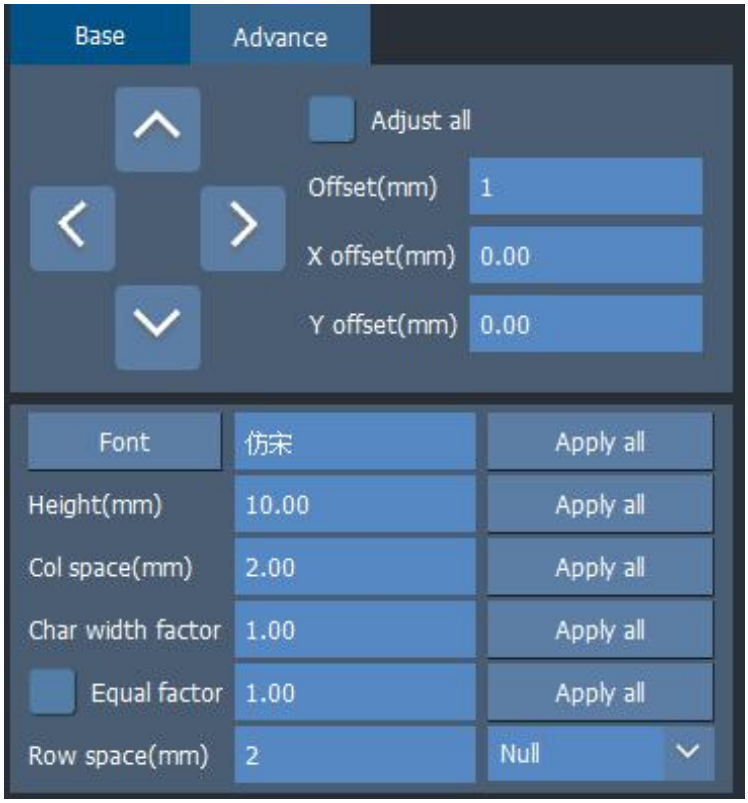
在文本列表中两个文本元素之间插入一个换行符合，可以让两个文本元素分行显示。在没有换行符的情况，默认文本列表的文本元素都在一行。Insert a line break between two text elements in the text list to allow the two text elements to be displayed on separate lines. In the absence of line breaks, the text elements of the default text list will be all on one line.


Text
Enter
Cancel
TEXTcom
Add
Edit
Up
Down
Delete
TEXT
com
As shown in the figure, there are two elements.
Com needs to move to the next line
Base
Advance
Adjust all
Offset(mm) 1
X offset(mm) 0.00
Y offset(mm) 0.00
Font 仿宋 Apply all
Height(mm) 10.00 Apply all
Col space(mm) 2.00 Apply all
Char width factor 1.00 Apply all
Equal factor 1.00 Apply all
Row space(mm) 2 Null


Text
Enter
Cancel
TEXTcom
Text
Seri
Date
Time
Shift
Net
Com
File
BreakLine
Edit
Up
Down
Delete
1. Click add, select BreakLine
Base
Advance
Adjust all
Offset(mm) 1
X offset(mm) 0.00
Y offset(mm) 0.00
Font 仿宋 Apply all
Height(mm) 10.00 Apply all
Col space(mm) 2.00 Apply all
Char width factor 1.00 Apply all
Equal factor 1.00 Apply all
Row space(mm) 2 Null


Text
Enter
Cancel
TEXTcom
Add
Edit
Up
Down
Delete
TEXT
com
\n
In the list, you can see the added breakline. Use the move up and move down to change the position of the breakline. We will move the breakline between text and com, and click Enter to finish
Base
Advance
Adjust all
Offset(mm) 1
X offset(mm) 0.00
Y offset(mm) 0.00
Font 仿宋
Apply all
Height(mm) 10.00
Col space(mm) 2.00
Char width factor 1.00
Equal factor 1.00
Row space(mm) 2
Null
Text
Enter
Cancel
TEXT
com
Add
Edit
Up
Down
Delete
TEXT
\n
com
After moving, click the adaptive display button to see the final effect
Base
Advance
Adjust all
Offset(mm) 1
X offset(mm) 0.00
Y offset(mm) 0.00
Font 仿宋
Apply all
Height(mm) 10.00
Col space(mm) 2.00
Char width factor 1.00
Equal factor 1.00
Row space(mm) 2
Null

3.2.2.1.12. 基础参数 Basic Parameters



字体：选择文本的字体。支持单线，双线，点阵以及 TTF 四类字体。 **Font:** Select the font of the text. Support single line, double lines, dot matrix, True Type font.

高度（mm）：字体的高度。 **Height (mm)**: The height of font sizes.

字间距（mm）：字符之间的距离。**Letter-spacing (mm)**: The space between letters.

字宽系数：将字符按照设定的字符宽度排列。

Word width factor:arranges characters according to the set character width

等宽系数：将字符按照设定的占位宽度排列。

Equal width factor:arranges characters according to the set occupation width

行间距（mm）：每一行字符之间的距离。**Leading (mm)**: The space between adjacent lines of type.

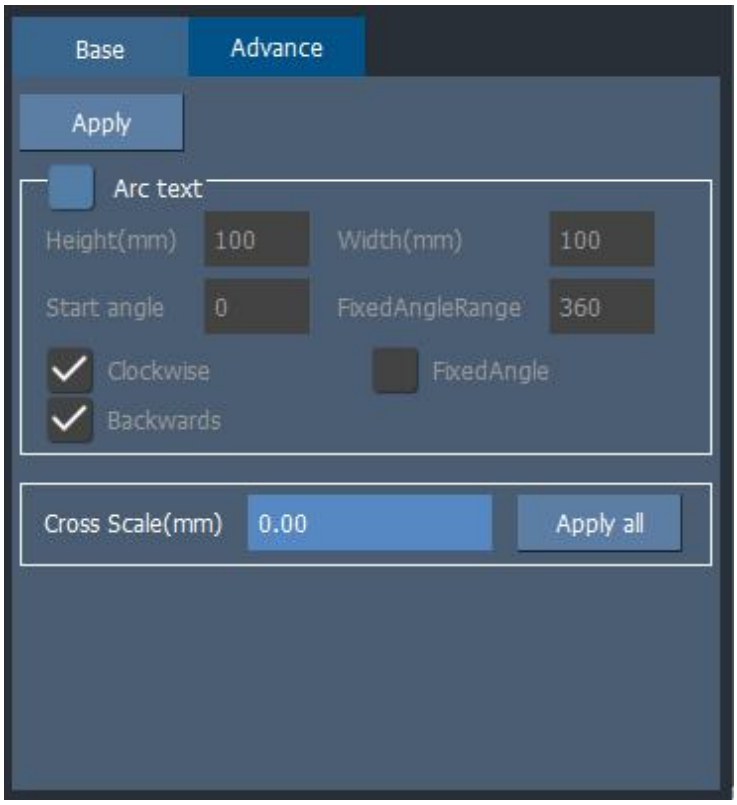
对齐：修改文本图元的对齐方式

Alignment:changing the alignment of text elements

应用所有：点击应用所有后，该参数会对图元中所有元素的文本生效。

Apply all:after clicking apply all,this parameter will take-effect on the text of all elements in the element

3.2.2.1.13. 高级参数 Advanced Parameters

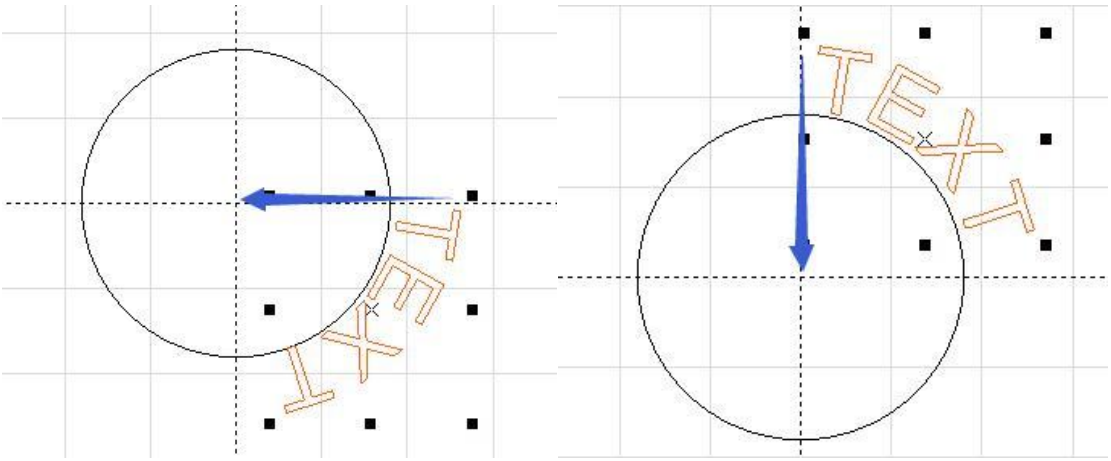


- **应用：**让高级参数立即生效 Application: let the advanced parameters take effect immediately.
-
- **圆弧字体：**是否允许当前圆弧化功能生效。**Arc fonts:** Whether to allow the current arc function to take effect.
-
- **宽度/高度：**宽度、高度如果一致就相当于圆弧化的直径，不一致就变成椭圆弧化。**Width/Height:** If the width and height are the same, it is equivalent to the diameter of the arc, and if they are not the same, it will become an elliptical arc.

-

- **起始角：**指文字对齐的角度基准，以文本最左侧为角度的起始基准。如下图所示：**Start angle:** The benchmark of text alignment, with the leftmost side of the text as the start angle as shown below:

-

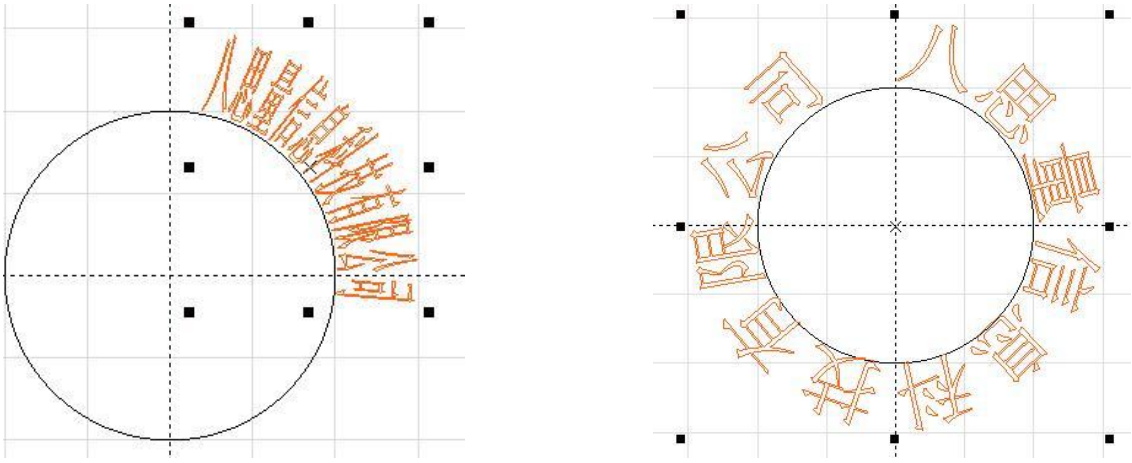


左侧是基准角度=0，右侧是基准角度=90.

On the left the benchmark angle = 0, on the right the benchmark angle = 90.

- **固定角度范围：**如果选择此参数，则无论输入多少文字，系统都会把文字要缩在限制的角度之内。**Fixed angle:** If this parameter is selected, no matter how many characters are entered, the system will limit the text in a certain angle.

-



左侧是勾选了角度范围限制，右侧是没有勾选角度范围限制。

On the left, the angle range is limited,

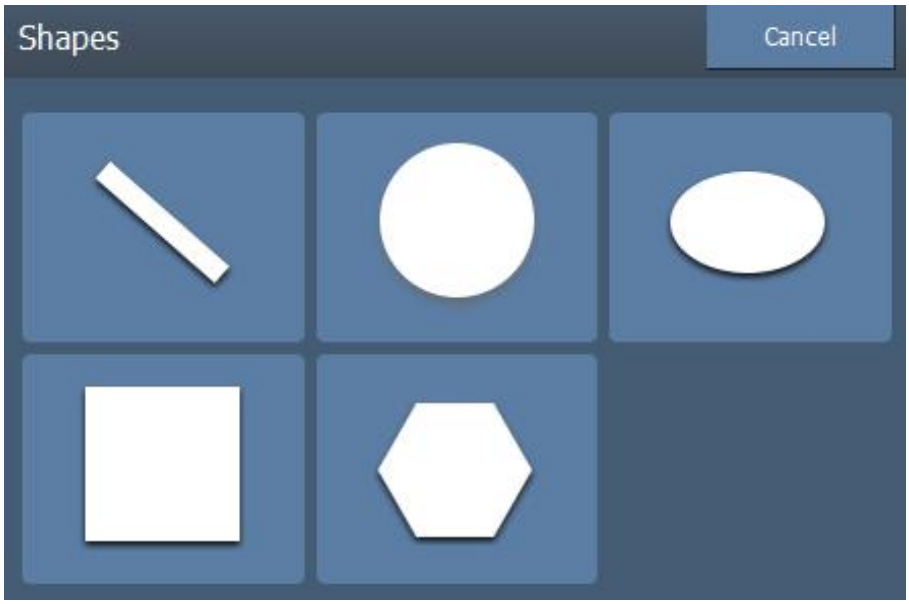
and on the right, the angle range is not limit.

顺时针：把字符串圆弧化后按顺时针排列。**Clockwise:** Arrange the string in a clockwise direction after arcing.

文字外向：把字符串按字符串的 Y 方向镜像。**Text outward:** Mirror the string in the Y direction of the string.

3.2.2.2. 几何图元 Shapes

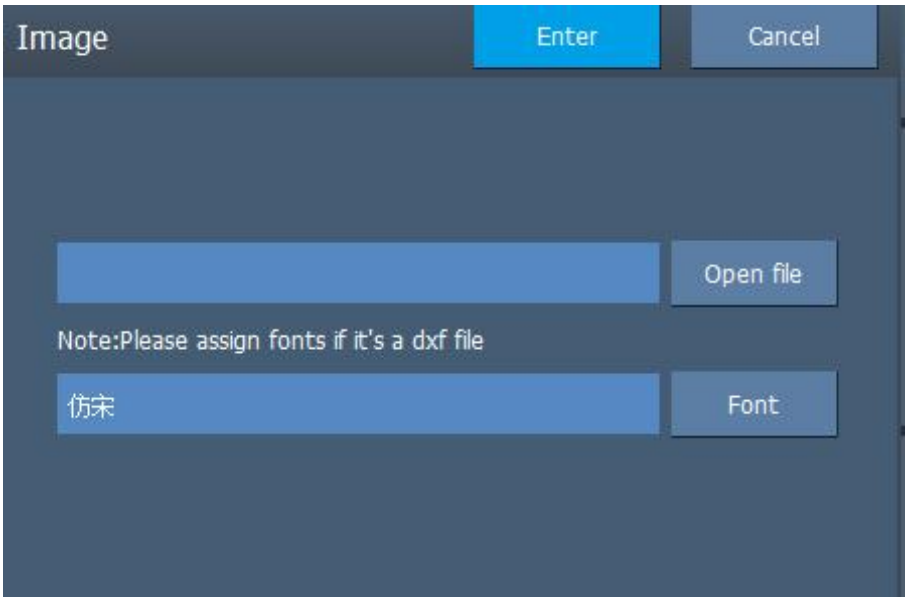
用来绘制直线、圆形、椭圆、点、多边形、矩形和三角形。如图所示。Used to draw straight lines, circles, ellipses, dots, polygons, rectangles and triangles as shown below:



- **多边形：**绘制一个自定义边数的多边形。**Polygon**: Draw a polygon with customized edge number.\
-

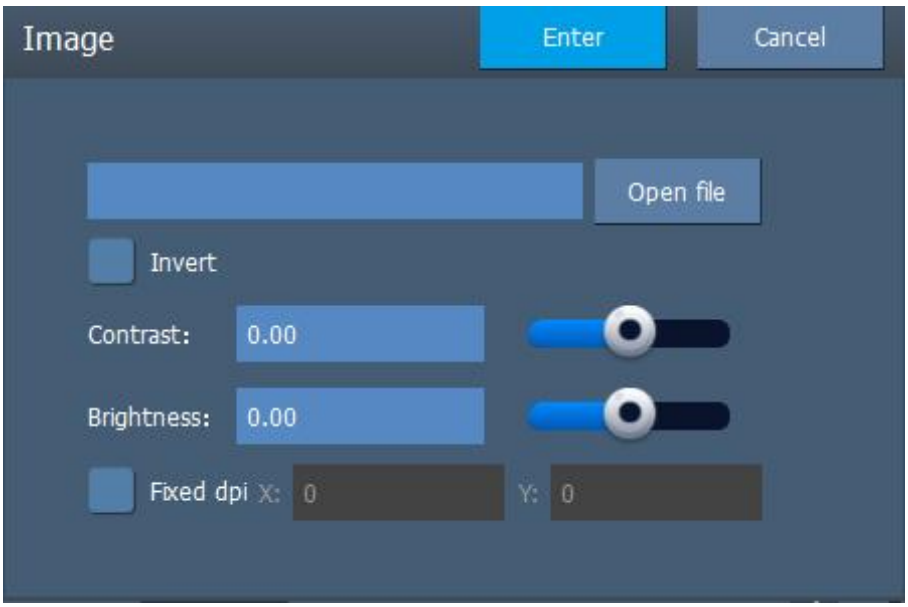
3.2.2.3. 矢量图 Vector Graphics

当前软件支持 DXF、PLT 以及 AI 三种格式的矢量图。The current software supports vector graphics in DXF, PLT and AI formats.



3.2.2.4. 位图 Bitmap

导入位图后软件会自动修改为 256 级 灰阶位图，并且进行网格化处理。 After importing the bitmap, the software will automatically modify it to 256 grayscale bitmap and perform grid processing.



反转: 在深色材料或者浅色材料上喷码可以用勾选此选项进行转换。**Reversal**: Marking on dark or light materials can be converted by ticking this option.

3.2.3. 界面功能区 Interface Functions

 : 将工作区域显示最大化。 Maximize the display of the work area.

 : 使隐藏工作区域的范围框，中心十字线。Hide the range box in the work area, the center cross.

 : 放大或者缩小工作区域的显示。：Zoom in or zoom out the display of the work area.

 : 恢复默认工作区域显示大小。： Restore the default display size of the work area.

 : 最大化显示当前选中的图元。： Maximize the currently selected shape.

 : 选中工作区域的所有图元。Select all shapes in the work area.

3.2.4. 编辑功能区 Editing Functions

- 、、、**与步长**：对所选择图元进行上下左右的移动，移动距离就是步长参数。**and Step (mm):** Move up, down, left, and right to carry out movement of shape and the movement distance is the step length.
- ：居中可以使任何位置的图元直接放置在工作区域中心位置。
- Click Center can directly put shape at any position in the center of work area.
- **角度、左旋与右旋**：点击左旋或者右旋图标可以对图元进行旋转的操作。旋转角度就是角度参数。**Angle, left rotation and right rotation:** Click Left Rotation or Right Rotation to rotate shape. The angle of each rotation is the angle (°) parameter.

- **笔号：**每个对象打标时都需 要一支笔。默认情况下是第一支笔。为了区分不同的笔，我们给不同的笔定义不同的颜色 。笔的参数编辑位置在设置笔参数中进行。**Pen number:** Each object needs a pen when marking. The first pen is chosen by default. In order to distinguish different pens, we define different colors for different pens. Pen list is edited in the setting of pen list.

-

- **复制：**复制选中的图元（在工作区域左上角会有一个 图示），点击工作区域任意空白处粘贴。**Copy:** Copy the selected shape (there will be an icon in the upper left corner of the work area), click any blank space in the work area to paste it.

-

- **镜像 Mirror**

  - **比例：**设置镜像对象与原对象的 X 轴与 Y 轴的百分比。**Proportion:** Set the percentage of the X-axis and Y-axis of mirroring object and original object.
  -
  - **镜像模式：**点击后可以切换水平镜像、垂直镜像、对角镜像不同的镜像方式。**Mirror mode**: Click it to switch between different mirror modes of horizontal mirror, vertical mirror and diagonal mirror.

- ◆ **基准点位置**：设置镜像对象与原对象的镜像基准点位置。**Position of datum point:** Set the position of mirroring datum point of mirroring object and original object.
- ◆

- **阵列 Array**

  - ◆ **横向/纵向阵列数目**：阵列时横向或者纵向的阵列数目。**Number of horizontal/vertical arrays**: The number of horizontal or vertical arrays when arraying.
  - ◆
  - ◆ **横向/纵向增量**：阵列后横向或者纵向图形之间的距离。**Horizontal/vertical increment:** The space between horizontal or vertical shapes after arraying.
  - ◆
  - ◆ **方向**：切换阵列的图元喷码顺序是水平还是垂直。**Direction**: Switch the marking order of the array to horizontal or vertical.
  - ◆
  - ◆ **模式**：切换阵列图元喷码方式是单方向还是来回双方向 **Mode:** Switch the shape marking arraying method to unidirectional or bidirectional
  - ◆

- **对齐**：将选中的复数图元按选择的对齐方式进行排列。**Alignment:** Arrange the selected plural shapes according to the selected alignment mode.
-

- **编辑**：对选中的图元进行内容的修改（文本，二维码，条形码）**Edit:** Modify the content of selected shape (text, QR code, bar code)
-

- **填充**

  - 填充可以对指定的图形进行填充操作。被填充的图形必须是闭合的曲线。如图所示。**Fill:** Fill can carry out filling of the designated graph. The graph to be filled

must be closed curve, as shown below:

- **使能填充**：是否允许当前填充参数有效。**Enable filling:** Allow current filling parameter to be valid or not.
-
- **使能轮廓**：表示是否显示并喷码原有图形的轮廓。即填充图形是否保留原有轮廓。**Enable outline:** Whether to display and mark the outline of original graph or not. That is, filling graph maintains original outline or not.
-
- **整体计算**：是一个优化的选项，如果选择了该选项，那么在进行填充计算时将把所有不互相包含的对象作为一个整体进行计算，在某些情况下会提高加工的速度。（如果选择了该选项，可能会造成电脑运算速度的降低），否则每个独立的区域会分开来计算。为了便于描述，现在我们举个特殊实例来说明此功能。**Whole computing**: It is an optimal option. If you select the option, take all the objects which do not contain each other as a whole for calculation during filling calculation. It will increase the marking speed under some circumstances. (If you select the option, the

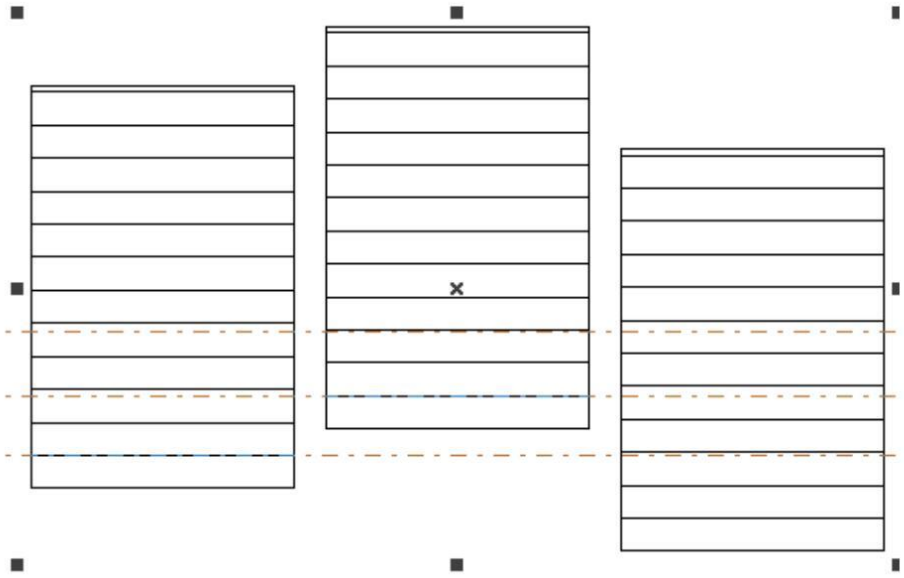
computer computing speed will be reduced), otherwise, calculate each independent area respectively. For the convenience of description, we take a special example to describe the function.

◆

例：在工作空间中绘制三个独立矩形，填充线间距 1mm，为 0 度填充。

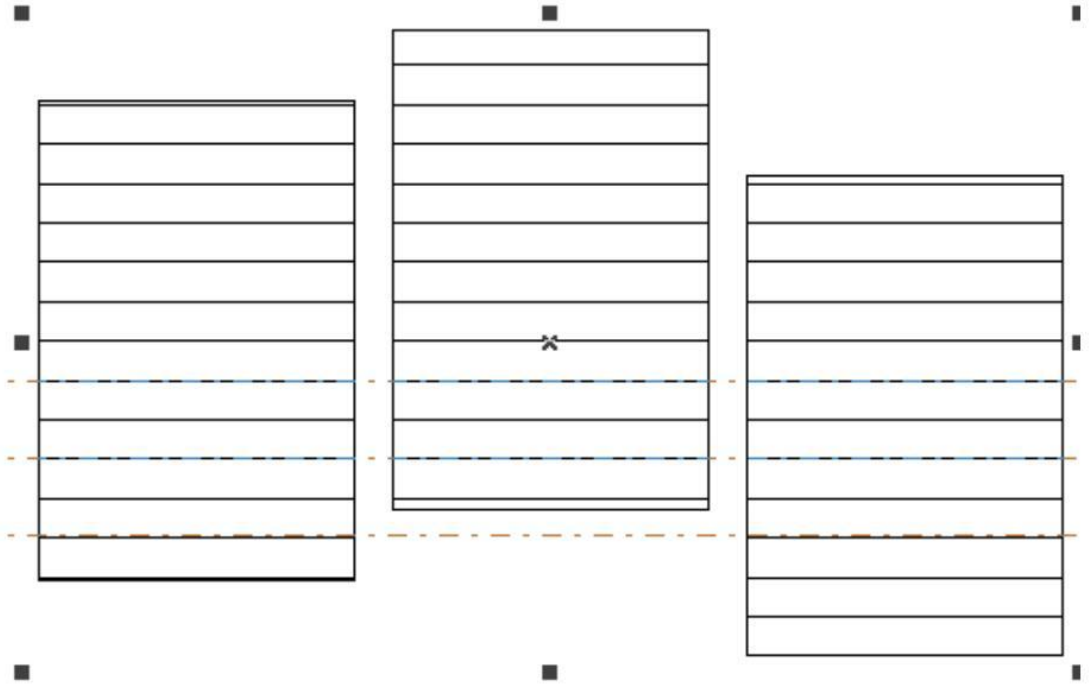
不勾选“整体计算”：在加工时会按照对象列表里的加工顺序依次喷码其填充线，即先喷码完一个对象的填充图在喷码下一个的。如图所示：Example: Draw three independent rectangles in work space, with fill line space of **1mm** and filling degree of 0°. **Do not tick “Whole Computing”:** mark the fill lines according to the marking sequence in the list of objects during processing. That is, mark the filling graph of an object, and then mark the next one, as shown below:

◆



不勾选整体计算 **Do not tick “Whole Computing”**

◆ **勾选“整体计算”：**在加工时一次喷码出全部的填充线，即将几个对象中同一行的填充线一起喷码出。如图所示：**Tick “Whole Computing”**: Mark all the fill lines during processing. That is, mark the fill lines of several objects at the same line together, as shown below:



勾选整体计算 Tick Whole Computing

◆ **平均填充线**：解决在填充对象的起始和结尾处填充线分布不均匀的问题。由于填充对象的尺寸和填充线间距设置等原因，填充后，在填充对象的起始和结尾处可能会出现填充线分布不均匀的现象。为了简化操作，在不需要用户自己重新设置线间距的情况下，也能达到所有填充线均匀分布的目的，增加此功能。选择该项后，软件会在用户设置的填充线间距的基础上自动微调填充线间距，以让填充线均匀分布。**Average Fill line:** Solve uneven distribution of fill line at the beginning and end of filling object. Due to the settings of size and fill line space of filling object, there may be the phenomenon of uneven distribution of fill line at the beginning and end of filling object after filling. For simplifying operation, and reaching the purpose of even distribution of all the fill lines under the circumstance that the user will not reset line space, add the function. After selecting the option, the software will implement automatic fine

adjustment of fill line space on the basis of fill line space set by the user, so that the fill line is distributed evenly.

◆

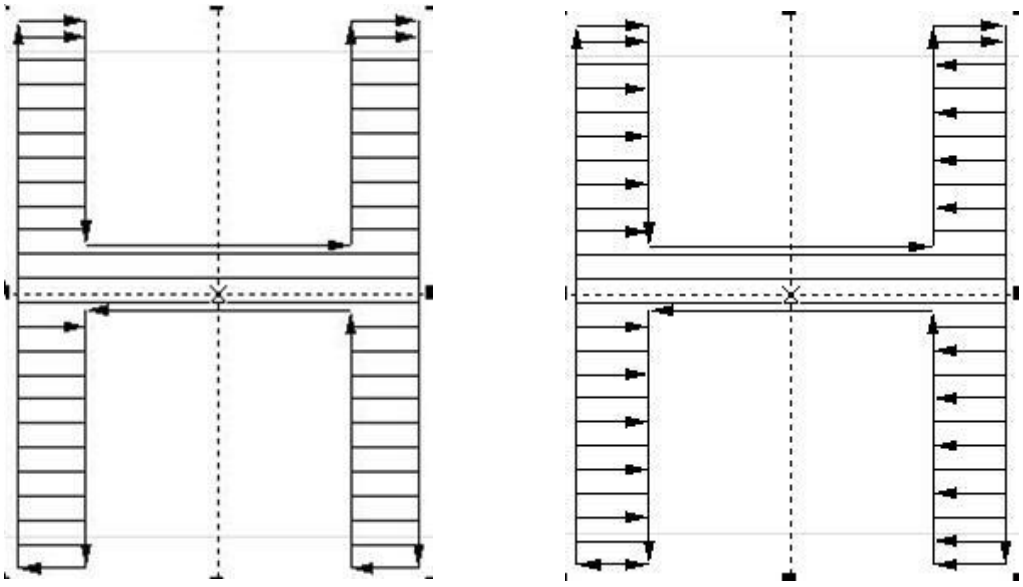
◆ **绕边走一圈**：指在填充计算完后,绕填充线外围增加一个轮廓图形。**Roll round:** Increase an outline graph around fill line after completion of filling calculation.

◆

填充类型 Filling Types

◆  **优化双向填充**：类似于双向填充，但填充线末端之间会产生连接线。**Optimizing bi-directional filling:** Similar to bi-directional filling, but there is connecting line between ends of fill line.

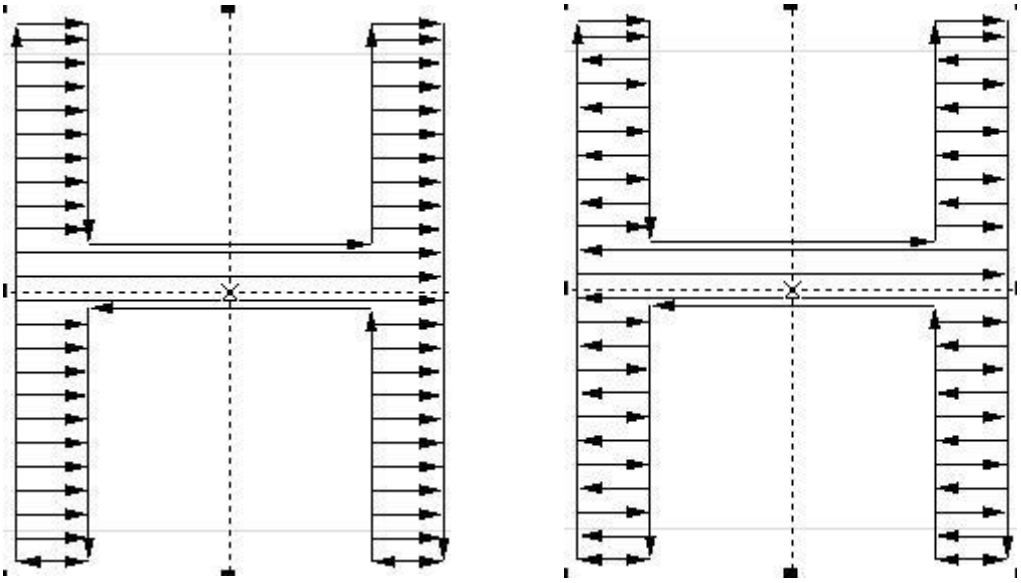
◆  **优化弓形填充**：类似弓形填充，在对象空白的地方仍会跳过去填充。**Optimizing arch filling:** Similar to arch filling, jump the area with blank object.



左为优化双向填充，右为优化弓形填充 Optimizing Bi-directional Filling on the left, Optimizing Arch Filling on the right

◆  **单向填充**：填充线总是从左向右进行填充。 **One-way Filling:** Fill line from left to right.

◆  **双向填充**：填充线先是从左向右进行填充，然后从右向左进行填充，其余循环填充。**Bi-directional Filling:** Fill line from left to right firstly, and then fill line from right to left. The remaining line implements circular filling.



左为单向填充，右为双向填充 One-way Filling on the left, Bi-directional Filling on the right

◆ **线间距（mm）**：指填充线相邻的线与线之间的距离。**Line space (mm):** refer to the distance between neighboring lines of fill line.

◆

◆ **开始偏移（mm）**：指第一条填充线与边界的距离。**Start offset (mm):** refer to the distance between the first fill line and boundary.

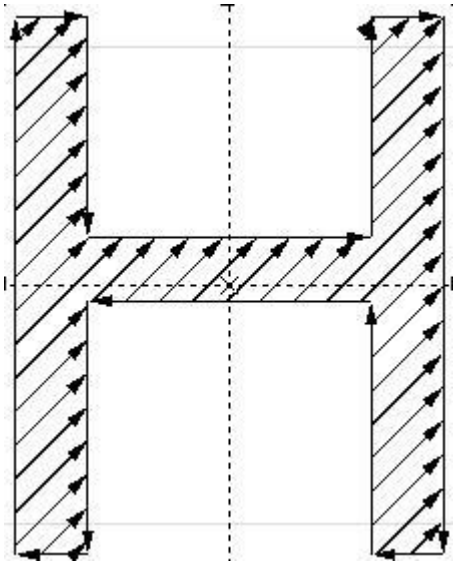
◆

◆ **结束偏移 (mm)**：指最后一条填充线与边界的距离。**End offset (mm):** refer to the distance between the last fill line and boundary.

◆

◆ **填充角度（°）**：指填充线与 X 轴的夹角。如图所示为填充角度为 45 度时的填充图形。**Filling Angle (°):** refer to the included angle between fill line and X axis. The filling graph with filling angle of 45°is shown below:

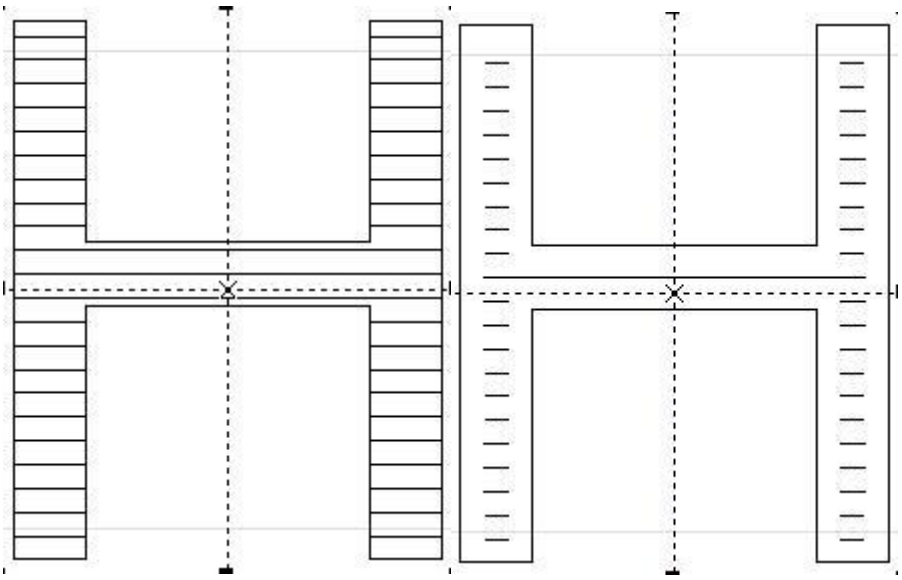
◆



填充角度为 45 度　filling angle of 45°

◆ **边距**：指所有填充计算时,填充线与轮廓对象的距离。如图所示填充线与对象所有边的距离都为边距。**Edge Distance:** refer to the distance between fill line and outline object during overall filling calculation. As shown below, the distance between fill line and all the edges of object is edge distance.

◆



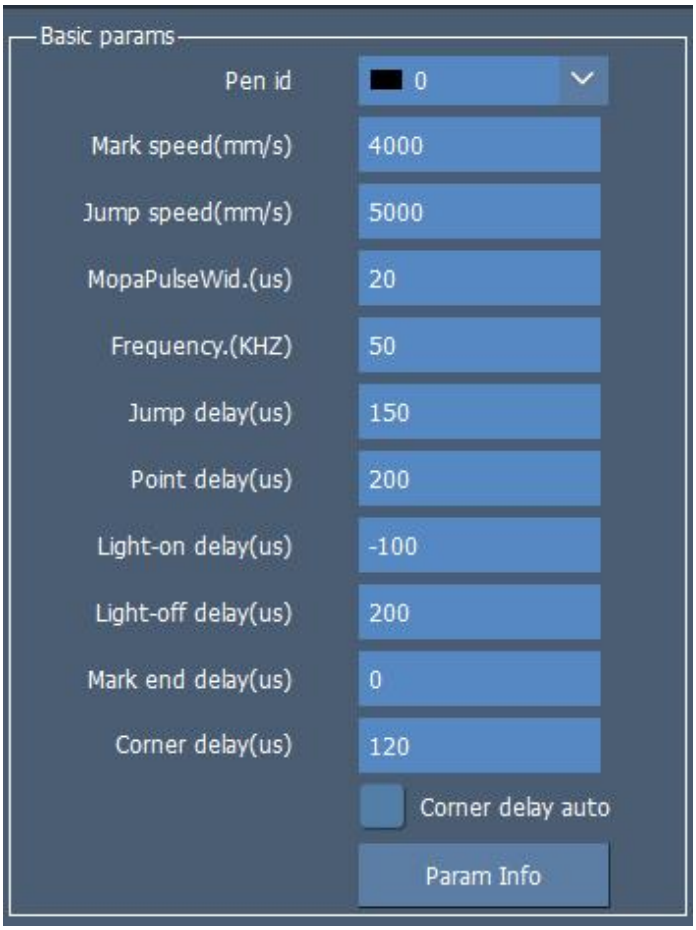
边距示例 Edge Distance Example

- **列表：**可以对列表中的图元进行排序管理（打码顺序按列表由上至下），或者删除。
  List: Sort and manage the graphs in the list (the marking order is from top to bottom in the list), or delete it.
-

3.3. 设置 Settings

3.3.1. 打码参数

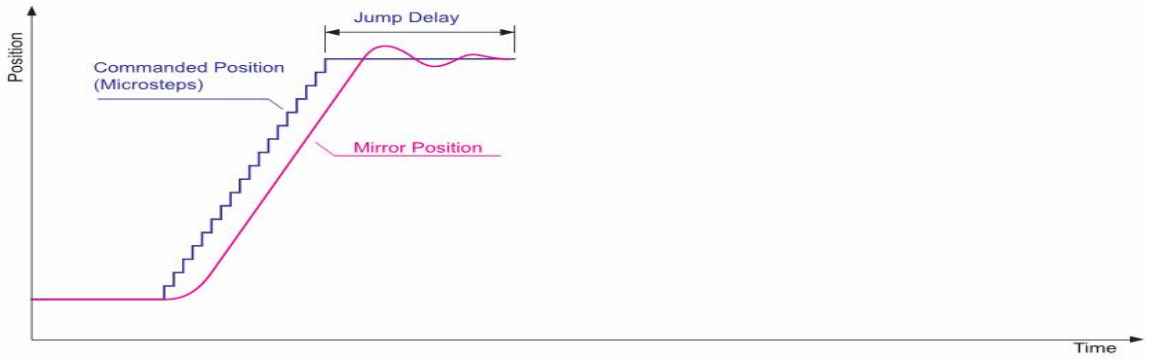
- **基础参数 Basic Parameters**



- **笔号**：选择 0-15 不同的笔号进行配置。每一个笔号对应一种颜色。**Pen number**: Select the pen with 0 to 15 numbered for configuration. Each pen number corresponds to one color.
-
- **功率（%）**：激光器的输出功率，其范围值为 0% ~ 100%**Power (%)**: Range value of output power of laser device is 0% ~ 100%.
-

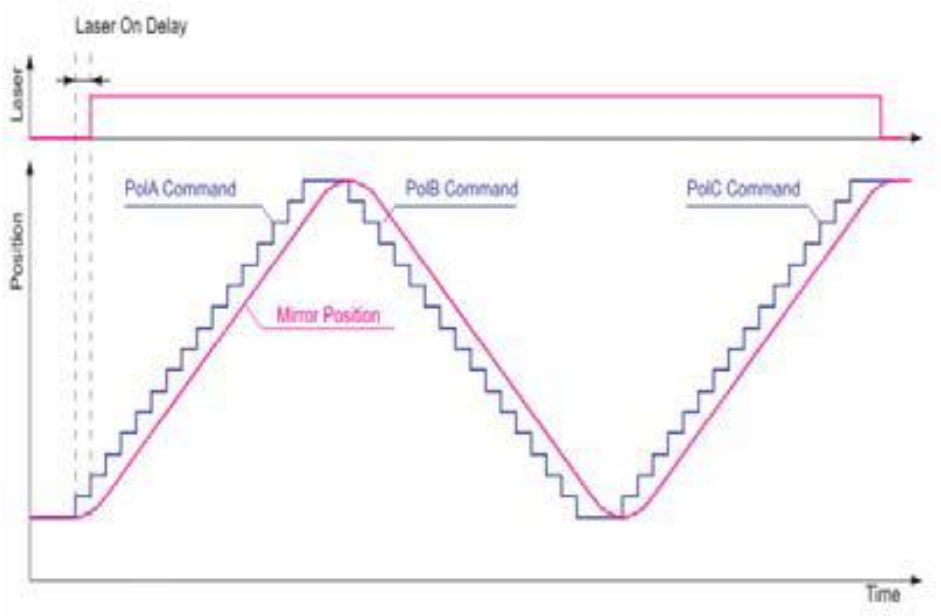
- **频率（kHz）：**激光器的脉冲频率，范围参考激光器类型。**Frequency (kHz):** It refers to laser's pulse frequency whose adjustment range is based on the type of laser device.
-
  - **标刻速度（mm/s）：**打标时振镜运行的速度。**Speed (mm/s)**: Running speed of galvanometer when marking.
-
- **跳转速度（mm/s）：**空跳时振镜运行的速度，空跳速度一般与跳转延时配合调试，空跳速度越大，一般跳转延时需要越大。**Jump speed (mm/s):** Refer to the running speed of galvo during empty jump. Empty jump speed is usually debugged with jump delay. The higher the empty jump speed, the more jump delay time.
-
- **跳转延时（us）：**跳转位置延时值；**Jump position delay (us):** The delay value of jump position
-

作用：等振镜跳转至目标点后再继续执行下一条矢量命令；Function: Continue to execute the next vector command after galvo jumps to the target point.



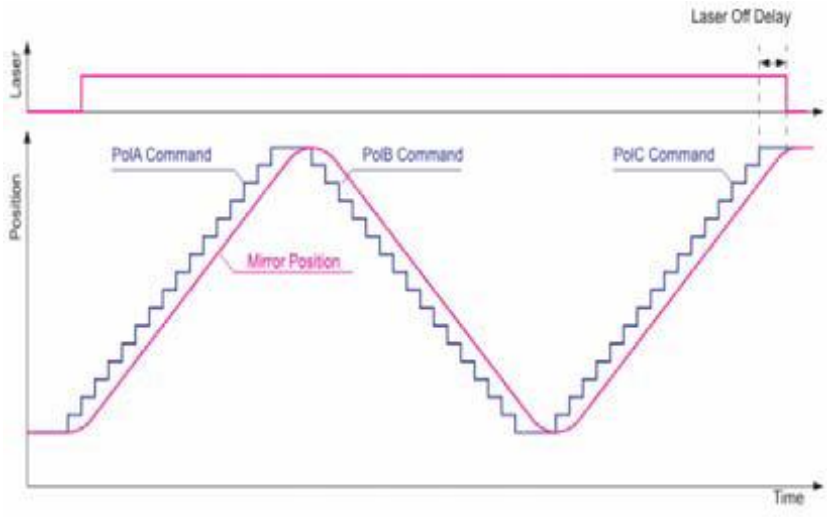
跳转延时示意图 Jump delay example

- **脉宽（us）：**输出信号频率的占宽比。**Pulse width (us):** Ratio of output signal frequency to width
-
- MOPA **脉宽:**设置 mopa 激光器的脉宽值。**Mopa pulse width:** Set the pulse width of Mopa laser device
-
- **打点时间 (us) :**绘制每个点所用时间。**Point time (us):** This parameter is used to set the marking time if there are dot objects.
-
- **开光延时（us）：**喷码开始时激光开启的延时时间。设置适当的开光延时参数可以去除在喷码开始时出现的“火柴头”，但如果开光延时设置太大则会导致起始段缺笔的现象。可以为负值，负值表示激光器提前出光。LaserOn: The laser starting delay time at the beginning of marking. Appropriate setting of LaserOn delay parameter can eliminate “Burn-in”, but long-term delay will cause blank stroke. Negative value is allowed, and it means advance marking of laser.
-



开光延时示意图

- **关光延时（us）**：喷码结束时激光关闭的延时时间。设置适当的关光延时参数可以去除在喷码完毕时出现的不闭合现象，但如果关光延时设置太大则会导致结束段出现“火柴头”。不能为负值。**LaserOff delay (us):** The laser closing delay time at the end of marking. Appropriate setting of LaserOff delay parameter will eliminate non-closed phenomenon at end of marking. But too long LaserOff delay will cause “Burn-in” at the end. Negative value is not allowed.



关光延时示意图

- **生效延时（us）：** 每次切换笔号都会无条件执行一段时间来保证参数更改生效。

  Effect delay (us): Execute a period for each switching of pen number unconditionally to guarantee effect of the change.

-

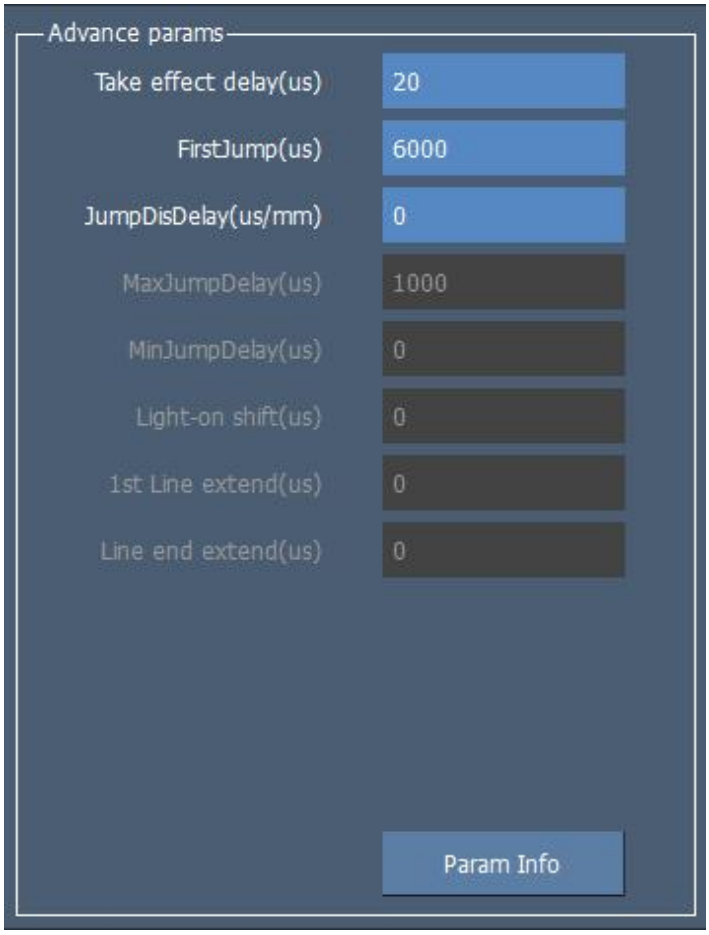
- **图元结束延时（us）：**激光关光后振镜延时（0，+ ∞ ）；**Shape end delay (us):**

  Galvanometer delay (0, + ∞) after laser off

-

  作用：保证未点位置振镜轨迹的准确性及精确性，在一定程度上能够减轻 IPG 激光器拖尾现象； Role: Guarantee the accuracy and veracity of galvanometer track at end position. **Alleviate trailing phenomenon of IPG laser device to certain extent.**

- **高级参数　Advanced Parameters**



- **开光滞后（us）：**振镜和激光器执行命令时会有时间差，通常情况都是振镜慢于激光器 100us 左右，用此参数进行补偿。**LaserOff lag (us):** There is time difference between execution of command by galvanometer and laser device. Normally, the galvanometer is about 100us slower than laser device. Use the parameter for compensation.
-
- **首次跳转延时（us）：**打标时的首次跳转，在原有跳转延时的基础上额外增加一定延时。**First jump delay (us):** First jump during marking, increase certain delay on the basis of original jump delay.
-

- **首笔延长（us）： First pen delay (us):**
-
- **线段两端延长（us）： Extension of the two ends of line (us):**
-
- **拐角延时（us）**：喷码时每段之间的延时时间。**Corner delay (us):** Delay time between marking sections
-
- **拐角可变**：使能拐弯角度越小，延时越小。此功能开启时可以同时保证直角和圆弧的喷码质量。**Corner delay changeable:** The smaller the corner angle is, the smaller the delay is. After enabling the function, ensure the mark quality of both right angle and arc.
-

保存默认参数：把当前普通参数下的各个参数当成默认参数保存起来。**Save default parameter:** Take each parameter under ordinary parameters as the default parameter, and save it.

使用默认参数：用默认参数的配置替换当前的参数配置。**Use default parameter:** Replace current parameter configuration by the default parameter configuration.

	太大 Too Big	太小 Too Small	是否可为负值 Negative or Not
速度 Speed	打标出的笔画不够精细，稀疏，无深度，打标速度快 Bad stroke, rapid marking speed	打标出的笔画精细，致密，有深度，打标速度慢 Fine stroke, slow marking speed	否 No
开光延时 LaserOn delay	会导致起始段缺笔的现象 Burn-in effects at the start point	喷码开始时出现的“火柴头”重点现象“Match end” focus point in the beginning	是（负值表示激光器提前出光）Yes (Negative value refers to advance laserOn)
关光延时 LaserOff delay	会导致结束段出现“火柴头”重点现象“Match end” focus point in the end	喷码完毕出现不闭合现象 Non closure at the end	否 No
跳转速度 Jump speed	空笔画处理时间短，打标总时间减少，但会出现笔画相连的情况，振镜运动不稳 Short disposal time of empty stroke, decrease total marking time, but strokes will be connected together, and galvo movement is not stable	空笔画处理时间长，打标总时间增加 Long disposal time of empty stroke, increase the marking time	否 No
跳转位置延时 Jump position delay	振镜已充分转到，并停留一段时间后才处理下一个笔画，增加打标时间 Dispose next stroke	振镜还未充分转到，PC 就开始处理下一个笔画，笔画开始的地方会出现散点，起笔出现抖动 PC	否 No

	after galvo speeds up and stops for a period, increase the marking time	starts to dispose next stroke after galvo slows down. Scattered point occurs at the start of stroke, and oscillations will occur at the start of a vector.	
拐角延时 Corner delay	会导致喷码时间增加，且拐角处会有重点现象 Increase the marking time, focus point at corner	喷码直角时出现的圆角现象 Round appears during marking of right angle	否 No
图元结束延时 Shape end delay	拐弯处有重点，且增加打标时间 Focus point at corner, increase the marking time.	在高速情况，有效矢量轨迹末段不完整，容易发生变形 Under high speed, incomplete at the end of valid vector, easy deformation	否 No

笔参数设置大小对比表 Comparison of Settings of Pen List

3.3.2. 打标方式 Marking modes:

触发方式： Trigger modes:

- **光电触发/脚踏触发：**选择不同的触发方式，光电触发对应板卡上 GD 接口,脚踏触发对应板卡上 JT 接口。**Photoelectric trigger/pedal trigger:** Select different trigger modes. The photoelectric trigger corresponds to the GD interface on the board, and the pedal trigger corresponds to the JT interface on the board.
-
- **内部触发：**软件内部自动触发打标。**Internal trigger:** Trigger marking automatically in the software
-

触发优化：Trigger optimization:

- **触发延后：Trigger delay:**

-
  - **延后距离（mm）：**触发喷码信号后流水线再走多长距离执行喷码。**Delay distance (mm):** Execute marking after how far the assembly line moves.
  -
  - **延后时间(ms)：**触发喷码信号后间隔多长时间执行喷码。**Delay time (ms):** Execute marking after how long the assembly line moves.
  -
- **最小间隔：**客户产品有孔洞的时候可能会引起多次触发，为避免这种情况，设置一个最小触发间隔，来回避孔洞的问题。**Minimum distance:** Holes on customer’s product may cause multiple triggers. To avoid this situation, set a minimum trigger interval.
-
  - **距离：**相邻触发必须大于此距离，否则过滤掉。**Distance:** The adjacent trigger must be greater than this distance, otherwise it should be filtered out.
  -
  - **时间：**相邻触发必须大于此时间，否则过滤掉。**Time:** The adjacent trigger must be greater than this time, otherwise it should be filtered out.
  -
- **管线模式：**是否启用管线模式 **Pipeline mode:** Whether to enable pipeline mode
-

- **触发间隔**(㎜)：间隔多长距离喷码一次。**Trigger distance (mm):** The distance between marks.
- **打标次数**：距离触发的次数。**Marking times:** The times before the trigger.

- **路径优化**：**Path optimization:**

- **起始位置**：设置开始喷码图元的坐标位置。**Starting position:** Set the coordinate position of the shape.
  - **指定**：指定第一个被喷码图元的起始坐标。**Designation:** Designate the starting coordinate of the first marked shape.
  - **自动**：自动根据流水线方向设置图元的起始坐标。**Automation:** Automatically set the starting coordinates of shapes according to the direction of assembly line.
  - **原始**：不改变图元的坐标，图元在工作区域什么坐标就是什么坐标。**Original:** The coordinates of the shape are not changed. The coordinate should be the same with that of the shape in the work area.

- **其他：Others:**
-
  - **缓存个数：**设置缓存中保存的个数，不能设置为 0. **Number of caches:** Set the number of cache saved, and it cannot be 0.
  -

3.3.3. 流水线 Assembly Line

- **流水线方向：Direction of assembly line:**
-
  - 从右到左/从左到右：设置流水线的运行方向。From right to left/left to right: Set the running direction of the assembly line.
  -
- **编码器：Encoder:**
-
  - **编码器反向：**交换编码器 AB 两相的输入信号。**Encoder reverse:** Exchange the input signal of encoder AB phases.
  - **直径（mm）：**编码器的直径。**Diameter (mm):** The diameter of the

encoder.

- ◆
- ◆ **周脉冲**：编码器一圈的脉冲。**Pulse per revolution:** Pulse per one full revolution of the encoder.
- ◆
- ◆ **脉冲距离（um/pulse）**:编码器每个脉冲的运动距离。**Pulse distance (um/pulse):** Movement distance of each pulse of encoder
- ◆
- ◆ **计算**:根据直径和周脉冲的参数值,算出流水线的脉冲距离。**Calculation:** Calculate the pulse distance of assembly line based on the diameter and the pulse per revolution.
- ◆
- ◆ **测速**：显示当前流水线的速度。**Speed measurement:** Display the current speed of assembly line.
- ◆

- **固定线速**：选择使用固定流水线的模式进行飞行喷码。**Fixed-speed assembly line:** Select the mode of fixed assembly line for fly mark.
-

  - ◆ **流水线速度（m/min）**：设置固定速度的值，该值与当前流水线速度相对应。**The speed of assembly line** (**m/min**): Set a fixed speed, and the value shall conform to current speed of assembly line.
  - ◆

- **静态喷码**：流水线静止状态下喷码。**Static mark:** Static mark of assembly

line

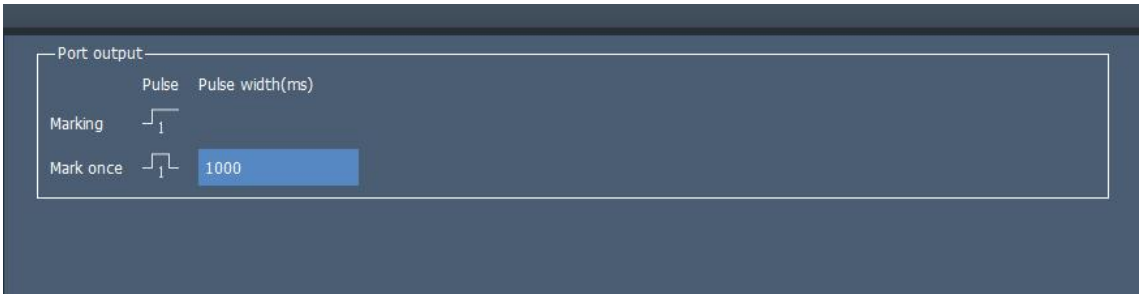
-

- **线速校准**：固定流水线时候可以使用此功能观察流水线速度和喷码是否匹配。

  Calibration of the speed of assembly line: When the assembly line is fixed, use this function to observe whether the speed of the assembly line matches the mark.

-

3.3.4. IO 参数 IO Parameters



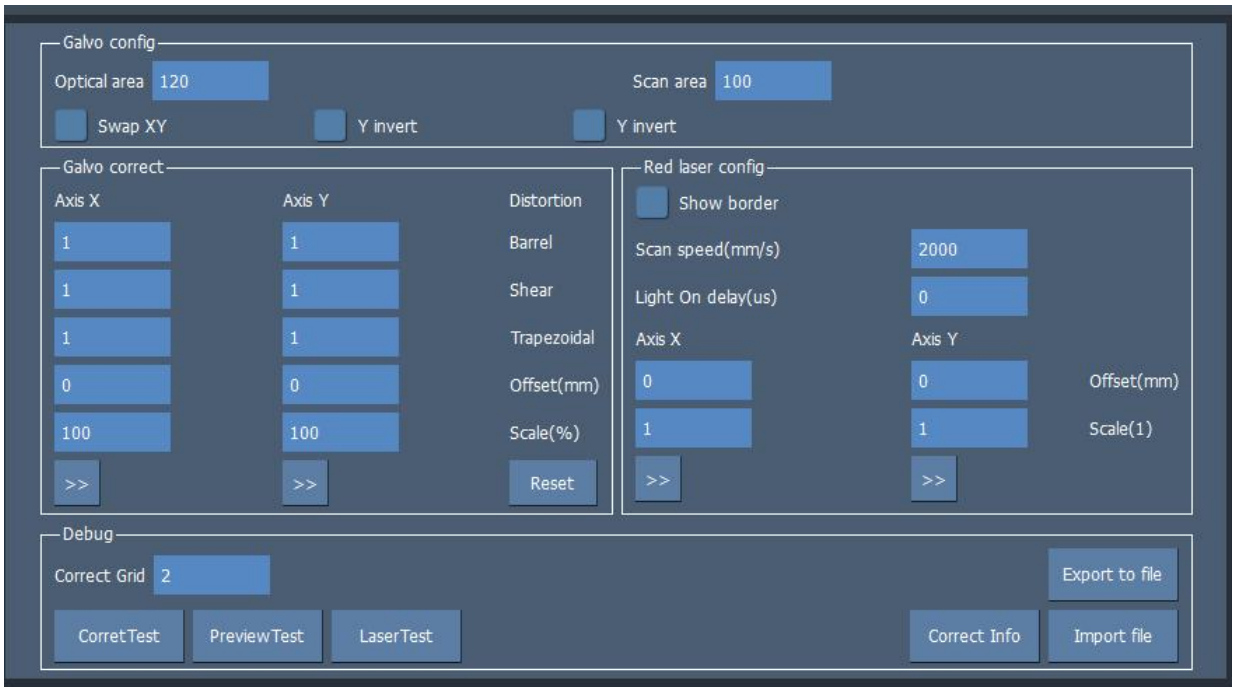
- **正在打标**：设置打标时候对应的输出口是输出高电平还是低电平。**Marking:** Set whether the corresponding output interface outputs high or low electrical level when marking.

-

- **单次打标**：设置每次打标完成后对应的输出口输出的电平类型以及时间。**Single marking**: Set the type and time of electrical level output by the corresponding output interface after completing each marking.

-

3.3.5. 区域参数 Regional Parameters



区域参数 Regional Parameters

振镜设置：用来设置振镜 X/Y 轴的基准以及振镜范围。**Setting of galvanometer:** Set the datum of X/Y axis and range of galvanometer.

3.3.5.1.

- **幅面（mm）：**设置振镜的范围。**Static area (mm):** Set the range of galvanometer.
-
- **工作区域 (mm)**：设置工作区间的大小。**Work area (mm):** Set the size of work area.
-
- XY **交换**：振镜 X/Y 轴的基准。**XY exchange:** Datum of galvo X/Y.
-
- X/Y **反向**：用于设定振镜输出反向。**X/Y reverse:** Set the output inversion of

galvo.

■

3.3.5.2. 振镜校正 Correction of Galvanometer

对振镜进行校正，两竖排校正分别对应振镜 X 和振镜 Y.Correct galvanometer, two vertical corrections are corresponding to galvanometer X and Y respectively.

■ **桶形校正**：表示桶形或者枕形校正系数，默认系数为 1.0（参数范围 0.5-1.5）。

BarrelAdj: Refer to barrel or pillow-like correction coefficient. Default coefficient is 1.0 (reference range: 0.5-1.5).

■

■ **倾斜校正**：表示平行四边形校正系数，默认系数为 1.0（参数范围 0.5-1.5）。

LeanAdj: Refer to the correction coefficient of parallelogram, and the default coefficient is 1.0 (reference range: 0.5-1.5).

■

■ **梯形校正**：表示梯形校正系数，默认系数为 1.0（参数范围 0.5-1.5）。

TrapezoidAdj: refer to the correction coefficient of trapezoid, and the default coefficient is 1.0 (reference range 0.5-1.5).

■

■ **偏移校正（mm）**：调整实际喷码出来的图元与预计图元位置的偏差。**OffsetAdj (mm):** Adjust the offset between the actually marked shape and the predicated shape position.

■

■ **比例校正（%）**：伸缩比例，默认值为 100%。当喷码出的实际尺寸和软件图示尺寸不同时，需要修改此参数。当喷码出的实际尺寸比设计尺寸小时，增大此参数

值；当喷码出的实际尺寸比设计尺寸大时，减小此参数值。**ScaleAdj (%):** It refers to the flex percentage, and the default is 100%. This parameter will be adjusted when the trim size marked is different from the setting size. If the trim size is smaller than the designed one, users can raise this parameter; if the trim size is bigger than the designed one, users can lower this parameter.

■

■ **比例：**设置比例时，可以直接按下  ，此时，将弹出图所示的对话框，我们可以将软件里设置的尺寸和测量出来的实际打标尺寸输入，软件将自动计算伸缩比例。**Scale:** When setting scale, press  directly. At this time, Fig. 2-10 will pop up. We can enter the dimension set in software and the measured actual mark size, and the software will calculate the scale automatically.

■

设置比例 Setting of Scale

3.3.5.3. 调试 Modulation

◆ **激光测试：**检测激光器是否出光正常。**Laser test:** Check whether the laser emits light normally.

◆

◆ **校正测试**：按照设置好的参数绘制一个矩形框，检测校正效果是否符合要求。

Correction test: Draw a rectangular box according to the set parameters to check whether the correction meets the requirements.

◆

◆ **红光测试**：测试红光是否按红光参数正确变化。**Red light test:** Test whether the red light changes correctly according to the red light parameters.

◆

3.3.5.4. 红光校正 Red Light Correction

- **使能显示轮廓**：勾选后可以显现图元的轮廓。**Enable display outline:** Display the outline of shape.
-
- **开光延时(us)**：红光开启的延时时间。**LaserOn delay:** The delay time of laser on.
-
- **红光速度（mm/s）**：红光的显现速度；速度越慢，红光路径越明显;速度越快，红光的轮廓越清晰。**The speed of red light (mm/s)**: Display speed of red light. The slower the speed, the more obvious the red light path. The faster the speed, the clearer the red light outline.
-
- **偏移位置 X（mm）**：使红光的外框或者轮廓向 X 方向偏移设定的距离。**Offset position X (mm):** Refer to the set distance after deviating the frame or outline of red light to X direction.
-
- **偏移位置 Y（mm）**：使红光的外框或者轮廓向 Y 方向偏移设定的距离。**Offset position Y (mm):** Refer to the set distance after deviating the frame or outline of red light to Y direction.
-

- **尺寸比例** X/Y：指红光与激光的尺寸偏差。调节此参数可以使激光与红光完全重合。**Scale X/Y:** Refer to the size deviation of red light and laser. Adjust the parameter to fully coincide laser and red light.
-

3.3.5.5. 导出文件/导入文件 Export/Import Files

将当前的校正值保存成一个文件/是读取保存好的校正文件。Save the current correction value as a file/read the saved corrected file.

3.3.6. 激光参数 Laser Parameters

用于设置当前所使用的激光器类型，并进行相关的基本参数设置。如图所示。Set the types of the used laser device, and set relevant basic parameters, as shown below:

激光参数 Laser Parameters

CO2

- **使能预电离：**使能预电离信号。有些厂家 CO2 激光器需要此信号才能正常工作，比如美国 SYNRAD 公司的激光器。**Enable preionization:** Enable preionization signal. CO_2 laser devices of some manufacturers require such signal for normal work, such as laser device of SYNRAD.
-
  - **脉冲宽度：**预电离信号的脉冲宽度。**Pulse width:** Pulse width of preionization signal.
  -
  - **脉冲频率：**预电离信号的脉冲频率。**Pulse frequency:** Pulse frequency of preionization signal.
  -
- **首脉冲抑制：**此功能是为了解决在 CO2 机器上打标，激光功率太强或者间隔时间较长，激光能量积蓄较多，在开始喷码时引起“首点重 ”的现象。**First pulse depress:** This function aims to solve mark on CO_2 machine. Too strong laser power, longer interval, or more laser energy saving will cause the phenomenon of “First Point Heavy” at the beginning of mark.
-
  - **起始功率：**首脉冲的起始功率大小。**Start power:** Power of first pulse.
  -
  - **功率增量：**每脉冲的功率增量值，直到所设置功率值。**Power increment:** Power increment of each pulse, till the set power value.

CO2/YAG/UV

-

CO2/YAG/UV

漏光处理：门信号延时时间的处理方式。当激光不稳定时，勾选漏光处理，打标过程中，每次开/关激光都会先执行相应的门信号开/关延时时间。未勾选漏光处理，打标过程中，只有起始位置执行一次门信号开/关延时时间。**Leakage:** Treatment of door signal delay time. When laser is unsteady, tick the Leakage. During marking, each LaserOn/LaserOff will execute related door signal on/off delay time. If you fail to tick the Leakage during marking, execute a door signal on/off delay time only at

the start position.

- **门信号开启时间（us）**：激光开光之前，门信号开启延时时间。**Door signal on time (us):** Door signal on delay time before laserOn.
-
- **门信号关闭时间（us）**：激光关光之前，门信号关闭延时时间。**Door signal off time (us):** Door signal off delay time before laserOff.
-

YAG

- **使能 PWM 信号**：在 PWM 引脚产生一定频率的调制信号。**Enable PWM signal:** Produce the modulating signal of certain frequency at PWM pin.
-

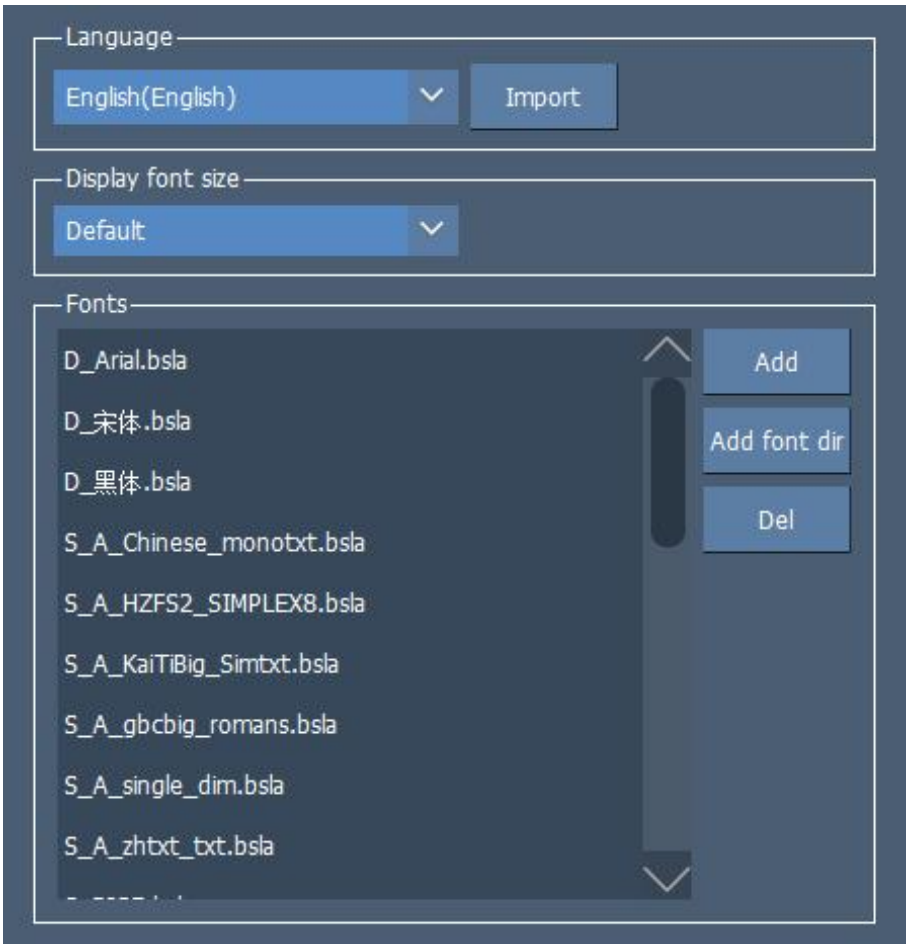
YAG/**紫外 ultraviolet**

- **脉宽反转**：将 PWM 脉冲高电平变为低电平，相应的低电平变为高电平并将其偏移相应的相位角，以满足 PWM 低电平有效 Q 驱动器要求。**Pulse width reversal:** Change PWM pulse is changed from high level to low level and vice versa. Deviate it to a corresponding phase angle to meet the requirements of PWM low-level and effective Q driver.
-

光纤/MOPA**Fiber/ MOPA**

- MO **开/关时间（ms）**：激光器发射引脚打开之前需要提前打开 MO；设置 MO 开/关启的时间。**MO on/off time (ms):** Open MO before opening laser device transmission pin, set the MO on/off time.
-

3.3.7. 语言字体 Languages and Fonts

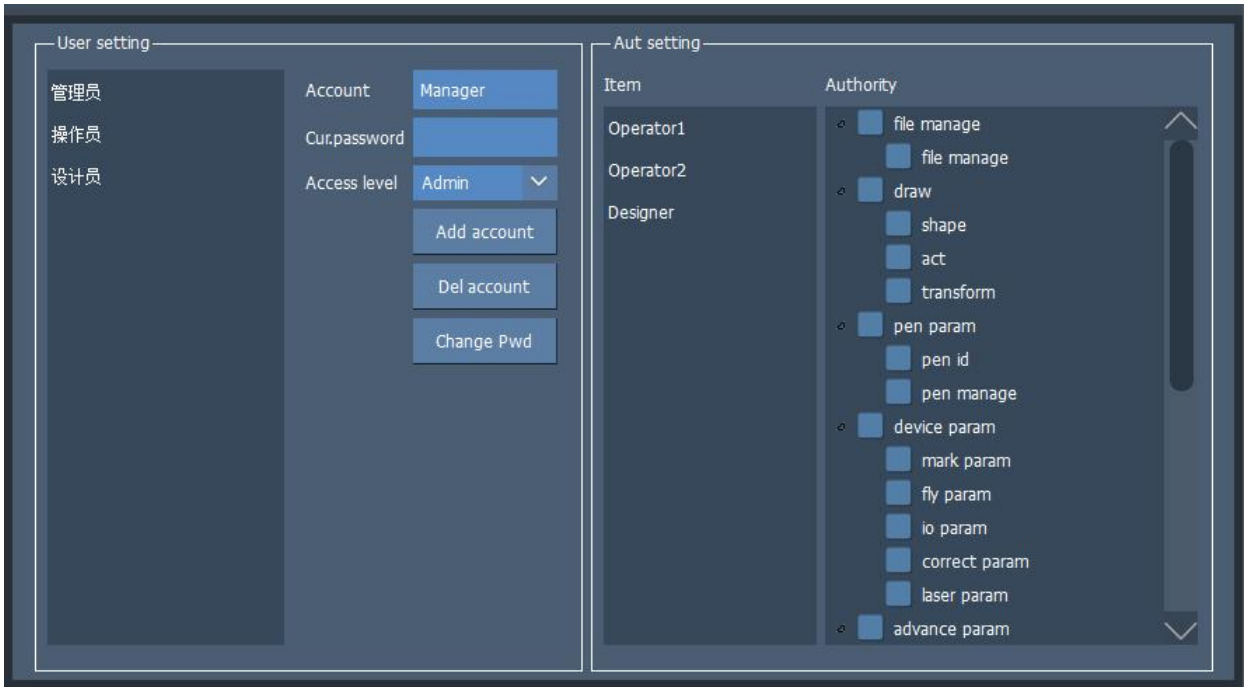


语言：选择软件的使用语言，目前提供简体中文以及英语。**Language:** Choose the language of the software. Currently, Simplified Chinese and English are available.

字体：对软件现有的字体进行管理。可以导入指定位置的字体或者删除现有的字体，目前只支持.bsla 格式的字体，需要用字体转换工具转换。**Fonts:** Manage existing fonts in the software. You can import the fonts in the specified location or delete the existing fonts. Currently, only fonts in .bsla format are supported. You need to use a font conversion tool to convert them.

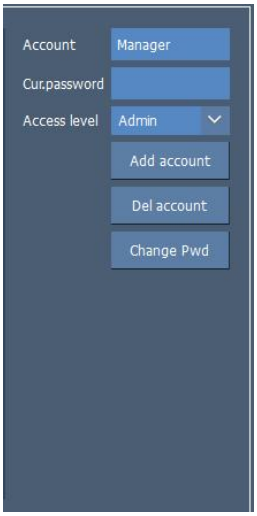
3.3.8. 权限参数 Permission Parameters

可以给不同的用户设置不同的权限。默认提供了 3 种用户级别。Different permissions can be set for different users. Three user levels are provided by default.



权限参数 Permission Parameters

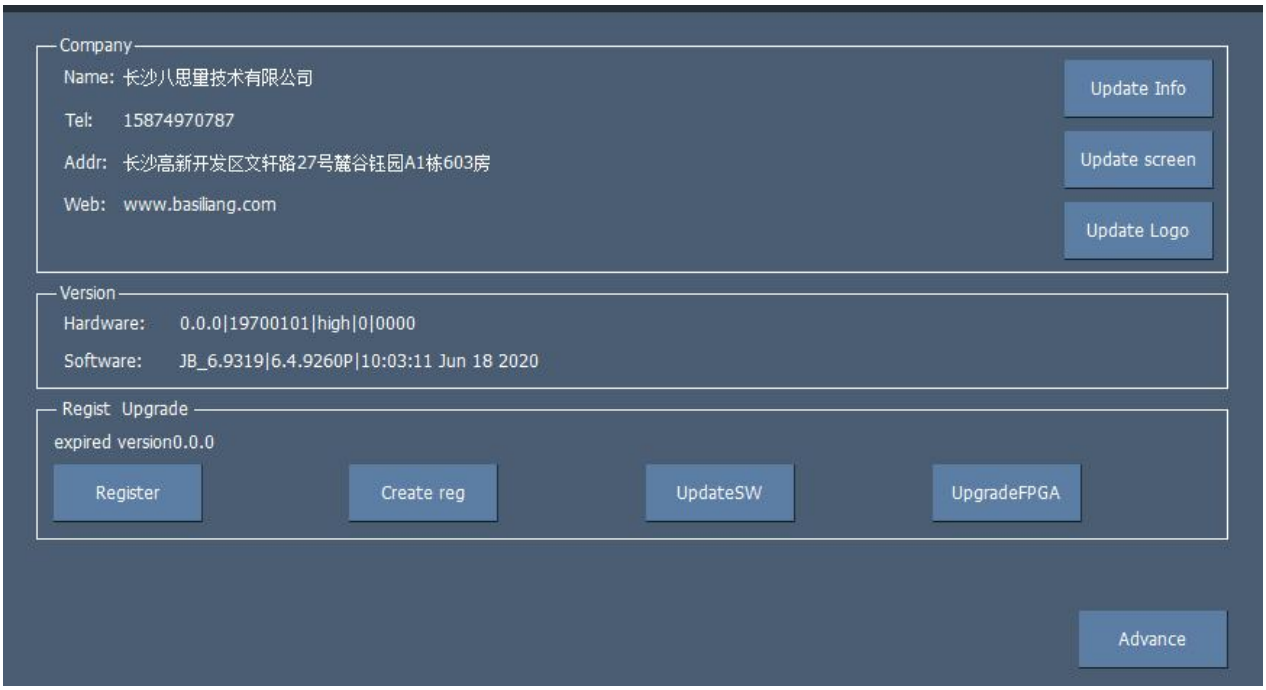
3.3.9. 用户管理 User Management



用户管理 User Management

可以对用户进行管理，比如增加，删除，修改密码，权限级别。Users can be managed, such as adding, deleting, changing passwords and permission levels.

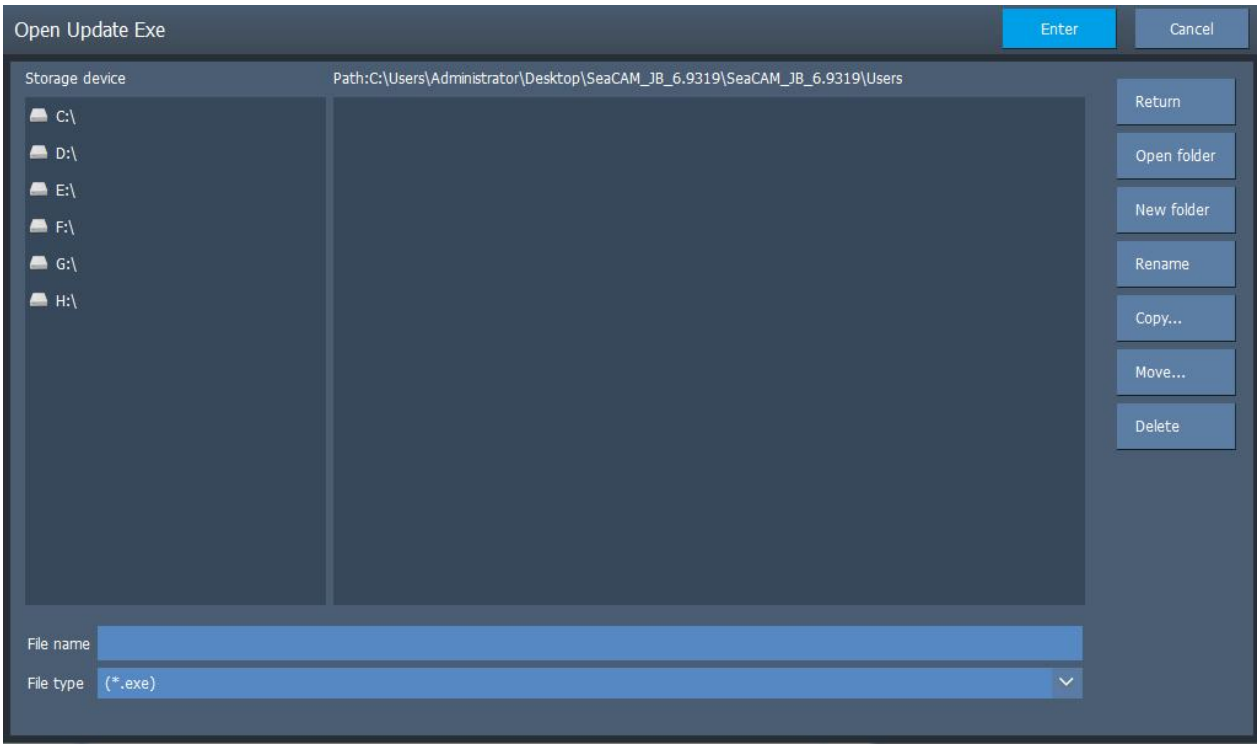
3.3.10. 系统 System



- **公司信息**：显示公司相关的信息。**Company information:** Display information related to the company.
-
  - **更新**：导入指定的 XML 文件就可以更改公司信息。**Update:** The company information can be changed by importing the specified XML file.
  -
  - **更新开机画面**：指定符合要求的位图文件就可以更改开机画面。**Update the start screen:** Specify the bitmap file that meets the requirements to change the start screen.
  -
- **版本信息**：显示软件和硬件的版本号 **Version information:** Display the version numbers of software and hardware
-
- **注册升级**：显示当前软件激活状态，并提供注册，升级等功能。**Registration and upgrade:** Display the activation status of the current software, and provide functions such as registration and upgrade.

◆

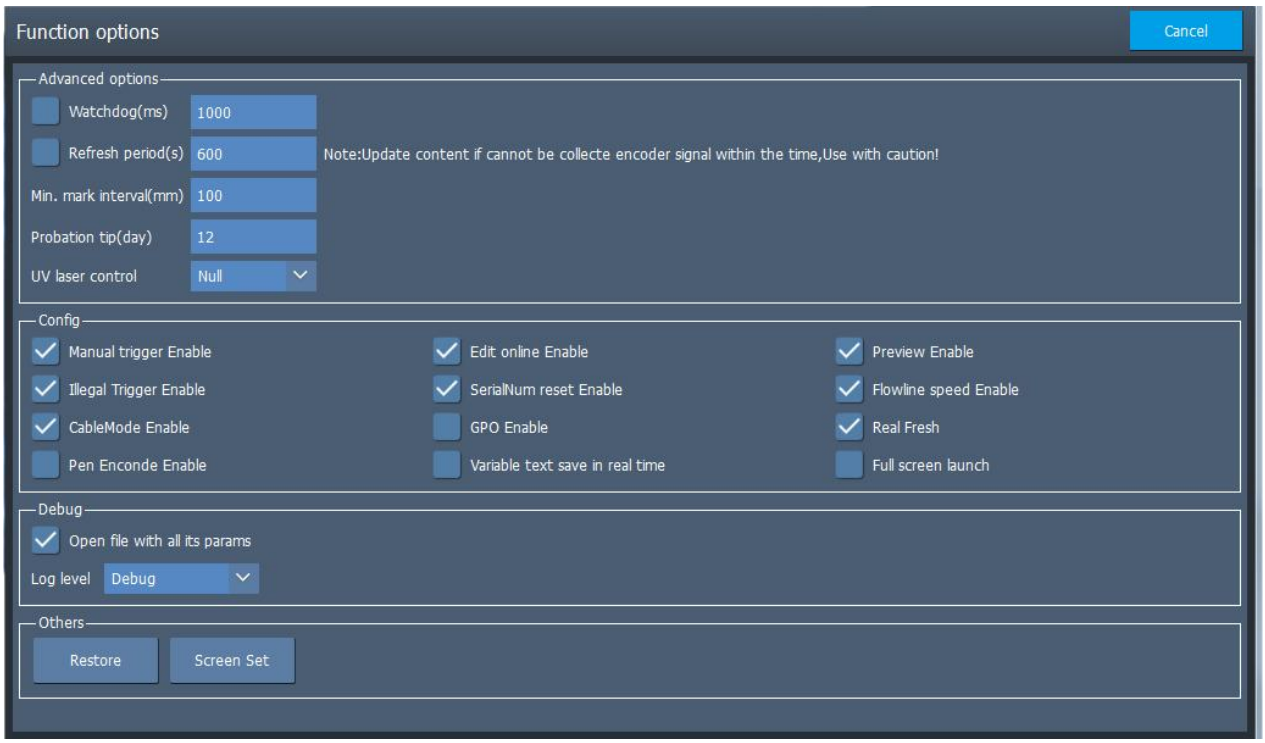
- **注册信息：**指定厂家生成的注册文件即可完成注册。**Registration information:** Complete the registration with the registration file generated by the designated manufacturer.
-
- **生成文件：**生成一个包含本机信息的文件提供给厂家注册。**Generate a file:** Generate a file containing the information of this computer for manufacturer to register.
-
- **升级 FPGA：**升级硬件的版本。**Upgrade FPGA**: Upgrade the hardware version.
- **升级软件：**升级当前的软件版本。**Upgrade software**: Upgrade the current software version.
-



点击“升级软件”按钮，选中由八思量提供的升级工具。Click the “Upgrade Software” button and select the upgrade tool provided by Basiliang.

进入升级程序，红色框是选择要升级的新安装包，绿色框是指定原程序下不允许修改的文件或文件夹（这个一般不用处理），点击开始安装，等待安装完毕。Enter the upgrade program, the red box is to select the new installation package to be upgraded, the green box is the files or folders that are not allowed to be modified under the original designated program (generally no need to be processed), click to start the installation, and wait for the installation to complete.

◆ 高级功能 Advanced Functions



1. 高级功能 Advanced Functions

- **看门狗使能（ms）：** 在设置时间中没有收到上位机信号，会复位。并且让对应输出口输出信号。**Enable watchdog (ms):** If there is no signal from the host computer within the set time, it will be reset, and the corresponding output interface will output the signal.

- **定时更新（s）：** 即使不触发也会按照设定时间自动更新打标内容中的时间元素。**Timed update (s)**: Even if not triggered, the time element in the marking content will be automatically updated according to the set time.

- **最小物流间隔（mm）：** 这个参数只会影响软件的适合流水线速度的计算，不会对实际打标有影响。可以不用设置。**Minimum logistics distance** (mm): This parameter will only affect the calculation of the suitable assembly line speed of the software, and will not affect the actual marking. It is not necessary to set it.

◆ **试用期提示：**如果是试用版，那么距离试用期结束还有多长时间就会报警。**Trial period reminder**: If it is a trial version, how long will it be before the trial period ends.

◆

2. **功能配置：**一些高级功能的的开关。其中管线模式需要注意只能配合板卡 FPGA12.12.X 以上的版本才可以使用。**Function configuration:** Some advanced function switches. Among them, note that the assembly line mode can only be used with the board FPGA12.12.X and above.

3. **调试：Debugging:**

a) SDK **代码测试日志：**打开以后可以在  里看到相关的日志。**SDK code test log**: Open it to read related logs in

b) **界面代码测试日志：**打开以后可以在  里看到相关的日志。**Interface code test log:** Open it to read the related log in

c) **模板全属性打开：**勾选以后，所有的参数都会保存在模板里。**Open all attributes of the template:** Tick it to save all parameters in the template.

d)

4. **其他 Others**

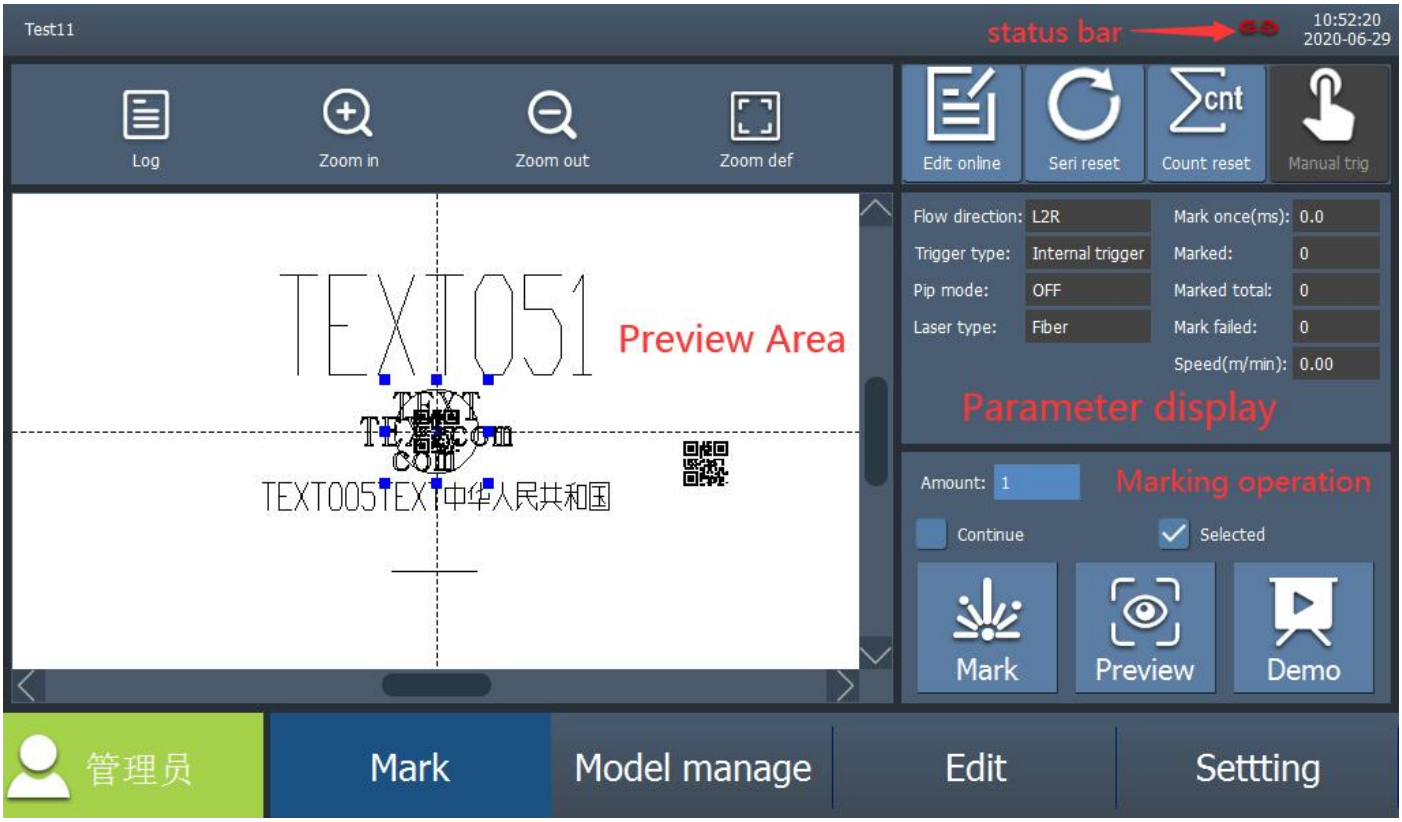
恢复出厂：可以把所有的设置都恢复成出厂状态。**Factory reset:** All settings can be reset to the factory state.

3.4. 打标 Marking

“打标”窗口是对设计完成的文件执行激光操作界面。在正式打标之前，请反复对打标的参数进行调试，对设计文件仔细核对，以免造成不必要的损失！The "marking" window is a laser operation interface for the designed files. Before the official marking, please repeatedly debug the marking parameters and carefully check the design documents to avoid unnecessary losses!

注意： 由于激光可以对您的身体可以造成不可逆的损伤，操作时应谨慎，无关人员应该远离操作区域。Note: since the laser can cause irreversible damage to your body, you should be careful during operation, and irrelevant personnel should be far away from the operation area.

“打标”窗口主要分为“状态栏”、预览区域、可选功能、参数显示、打标操作五个部分。The marking window is mainly divided into five parts: status bar, preview area, optional function, parameter display and marking operation.



- **日志**  ：点击进去可以查看软件运行期间的一些信息。为查找故障原因提供帮助。
- Log:Click in to view some information during the software operation. Help to find the cause of the fault.
- **误触发数**：在喷码过程中如果又被触发，那么此次触发就被计为误触发。 **Number of false triggers:** If it is triggered again during marking, the trigger will be counted as a false one.

序列号重置：选中一个序列号使用此功能，可以把序列号重置到需要的号码。在不选中任何图元的情况下，会把所有序列号重置为起始序列号。**Serial number reset:**

Select a serial number to use this function, you can reset the serial number to the wanted number. Without selecting any shape, all serial numbers will be reset to the starting serial number.

-

- **计数清零：**在喷码过程中可以使用计数清零功能将已喷码次数等数值清零。

- count clearing: in the process of code spraying, count clearing function can be used to clear the number of times of code spraying and other values.

手动触发：在设置了非内部触发的方式后，可以直接使用此功能进行喷码。

Manual trigger: After setting the non-internal trigger mode, you can use this function to mark directly.

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