

Handheld Laser Marking Machine

User Manual



Security Information

A.Safety Sign



Severe personal injury or even life-threatening may result.



May cause general personal injury or damage to the product or equipment.

B.Laser safety class

According to the European standard EN 60825-1, clause 9, the laser inside this device is a class 4 laser. This product emits laser radiation with wavelengths around 1064nm and can cause damage to eyes and skin when directly or indirectly exposed to such light levels. Although this radiation is invisible, the beam can still cause irreversible damage to the retina or cornea. Appropriate and certified laser safety goggles must be worn when the laser is operating.



Be sure to wear laser safety goggles throughout the operation of this product. Laser safety goggles have laser wavelength protection selectivity, so users are requested to choose laser safety goggles that conform to the laser output band of the product. When the hand-held laser marking machine is powered on, it is forbidden to point the laser output head to the direction of people, and prohibit the laser output head to irradiate the mirror surface of strong reflective material.

1.Preamble

1.1Welcome

Thank you for choosing our company's portable handheld laser marking machine product. This user manual provides you with important safety, operation, maintenance and other

precautions. Therefore, before using this product, please read this user manual carefully and keep it properly. To ensure safe operation and optimum product condition, please observe the following cautions and warnings.

This user manual is not a quality guarantee. Corrections of printing errors, modifications to the information described, and product improvements are all explained by our company at any time without prior notice, and the corrections will be incorporated into the reprinted user manual.

2.Product Introduction

The hand-held laser marking equipment is a new generation of laser marking high-tech products, designed to solve the problem of permanent laser marking for large parts/items that are not easy to move, its simple operation, small size, light and portable, wide range of operating environment, with lithium battery, no need to plug in, you can carry out efficient, accurate, consumables free "green" marking. It can carry out permanent marking and engraving in metal and a variety of non-metallic materials, the industry is widely used, covering hardware products, tool accessories, precision instruments, auto parts, plastic pipes, building materials, medical equipment and other industries

2.1 Equipment Characteristics and Implementation Standards

2.1.1 Equipment features

◎Efficient and accurate marking without damaging the part matrix;

- ◎Precise marking, which can realize selective marking of precise position and precise size;
- ◎No need for any consumables, safe and environmentally friendly;
- ◎Easy to operate, portable and handheld marking;
- ◎Ergonomic design, the labor intensity of operation is greatly reduced;
- ◎High marking efficiency and saving time;
- ◎The laser marking system is stable and requires almost no maintenance;
- ◎Optional mobile battery module;

2.1.2 Product implementation standards

Our company has passed the ISO 9001 international quality management system certification, and has formed a quality assurance system for the design, production and service of small and medium power laser processing equipment.

Our company has formulated detailed standards for the working environment and working conditions, basic technical requirements, cooling requirements, laser radiation safety, electrical safety, test methods, inspection and acceptance, packaging and transportation in the production process. The standards are:

GB10320	Electrical Safety of Laser Equipment and Facilities
GB7247	Radiation Safety, Equipment Classification, Requirements and User Guide for Laser Products
GB2421	Basic environmental test procedures for electronic products
GB/TB360	Specification for Laser Power Energy Test Instrument
GB/T13740	Test method for divergence angle of laser radiation
GB/T13741	Test method for beam diameter of laser radiation
GB/T13862-92	Test method for laser radiation power
GB2828-2829-87	Batch-by-batch periodic inspection and counting sampling procedure and sampling table

2.2 Operating Environment and Related Parameters

Operating environment				
Model	LM			
Power supply method	Adapter power supply, Lithium battery power supply AC100-240V、50/60Hz			
Machine power consumption	<200W			
working ambient temperature	5°C~40°C			
Humidity of working environment	≤80%			
Optical Parameters				
Average laser power	20W	30W	50W	100W(MOPA)
power instabilities	< 2%	< 2%	< 2%	< 2%
Laser type	Pulse			
Pulse Width	80-110ns			10-500ns
Maximum single pulse energy	0.7	0.7	1.1	1.2
Beam quality (M ²)	<1.6			<2.0
Power adjustment range (%)	10-100(Gradient adjustable)			
Full power frequency (kHz)	27	30	45	3000
Cable length	1.9m			1.5m
Cooling method	Air cooling			
Handheld head parameters				
Scanning Range (L*W)	60*60mm/100*100mm/150*150mm			
Mechanical parameters				
Machine size (L*W*H)	315mm×215mm×291mm			336mm×129mm×540mm
Machine weight	About 8Kgs (including battery)			13.5kgs
Marking handle weight	<0.9Kg			
Operation method	Handheld			

3. Installation and use of handheld laser marking machine

3.1 Precautions before use:

Check whether the appearance of the device is abnormal, and whether the output cable is bent or damaged;

Please make sure the power socket is in good contact;

Check and ensure that there is no dust inside and outside the field lens at the hand-held marking handle;

Check and ensure that the buttons and switches on the whole machine are in normal state;

3.2 Operating Steps

STEP 1: Take the handheld marking handle and remove the lens dust cover of the field lens of the laser marking handle;

STEP 2: Insert one end of the special power adapter into the power port of the handheld laser marking machine, connect the power cord plug at the other end, and press the power button;

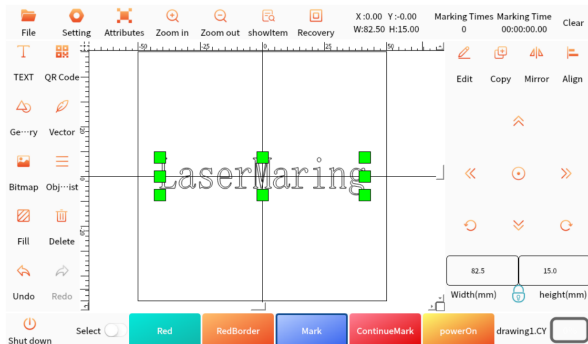
STEP 3: After the system is started, complete the parameter setting of the laser marking file through the touch screen interface;

STEP 4: After setting the parameters of the laser marking file, put on the laser protective glasses, align the handle with the workpiece to be processed, press the laser marking key on the handle with your finger to display the red light preview of the processing file, and press the laser marking key on the handle again After marking, you can also use the touch screen interface of the control software to click to power on, preview with red light, and output marking;

STEP 5: After use, turn off the power button of the laser marking screen, cover the dust cover of the field lens, turn off the power button, and cut off the power supply of the special power adapter.

3.3 Software control interface

Marking content is displayed in the middle part of the main interface. The left and right sides of the main interface are commonly used input and setting menus, and the lower part is the device light output control menu. Specific functions are as follows:



File	System file operations, including creating a new file, opening a file, saving a file, and saving as a file.(3.3.1)
Settings	Configure system parameters, including laser type, calibration, marking format settings, etc.(3.3.2)
Attribute	Configure marking parameters, including marking speed, laser power, etc.(3.3.3)
Zoom in	Zoom in on the view area.
Zoom out	Zoom out the view area.
ShowItem	Zoom the drawing area so that the selected object fills the visible area.
Recovery	Zoom the drawing area to fill the visible area with the marking area.
Text	Add text.(3.3.4)
QR Code	Add a QR code object.(3.3.5)
Bitmap	Add pictures, including (png, jpg, bmp formats).(3.3.6)
Vector	Add vector files (dxf, plt, svg).(3.3.7)
Geometry	Add rectangles, circles, lines.
Object list	Displays the total drawn objects.
Fill	Fill the current object with scan lines.(3.3.8)
Delete	Delete the current object.
Revocation	Cancel the previous operation.

Redo	Redo the action just now.
Edit	Modify the parameters of the drawn object.
Copy	Copy the current object and paste it.
Mirror	Flip the current object (horizontal, vertical).
Alignment	Set the text alignment.
Move Up	Move the object up.
Move Down	Move the object down.
Move Left	Move the object to the left.
Move Right	Move the object to the right.
Center	Center the object to display.
Power Off	Shutdown system.
Selective Marking	Select what you want to mark.
Red light	Preview the drawn object with red light without laser light.
Red light profile Marking	Red light shows the marking outline.
Continuous marking	Laser mark the drawn object.
Power On	Repeat marking content.
	Laser Source power on.

3.3.1 File



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

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

Save: Overwrite the original file and "save" saves the graph being drawn with the current file name.

Save as: Set the file name, "save as" is used to save the current drawing of the graph as another file name, both to achieve the function of saving files, when you click "save as", the following dialog box will appear, select the location to save.

3.3.2 System setting

Including galvanometer Settings, laser Settings, red light Settings, calibration Settings, startup Settings, system Settings, and other content.

3.3.2.1 Galvanometer Settings

Work Size: the effective range of galvanometer marking, the default is 50mm, the range is 50mm ~ 150mm.

Coordinate Axis Settings:

①**XY Change:** after selected, swap XY axis when outputting.

②**X-axis negative:** after selected, the X-axis will be negative when outputting.

③**Y-axis negative:** after selected, the Y-axis will be negative when outputting.

Mission End Coordinates:

the position where the red light stays, after the marking task is over, there are three options.

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

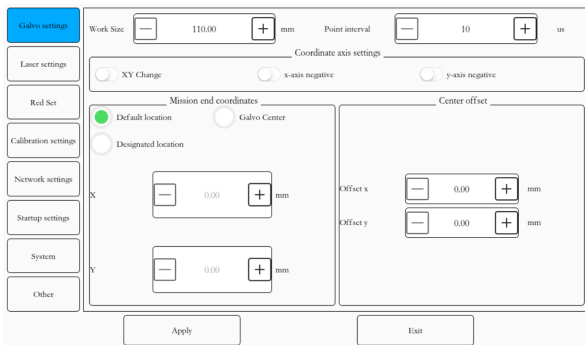
②**Designated location:** you can directly input the value of X and Y to determine the position where the red light will stay after marking, the range is -450mm ~ 450mm.

③**Galvo Center:** after marking, the red light stays at the center of the galvanometer.

Center Offset:

Offset X: adjust the horizontal center (laser output) position of the galvo mirror.

Offset Y: adjust the vertical center (laser output) position of the galvo mirror.



3.3.2.2 Laser Settings

Laser type choosing should be the same as the actual laser type. This software provides four types of laser, **including CO₂, YAG, FIBER, SPI.**

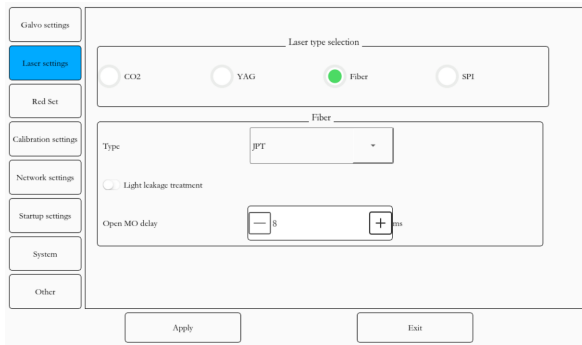
CO₂: The current laser type is CO₂ laser.

YAG: The current laser type is YAG laser.

Fiber: The current type of laser is a fiber laser.

SPI: The current laser is SPI fiber laser.

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



3.3.2.3 Red Light Setting

Red light settings:

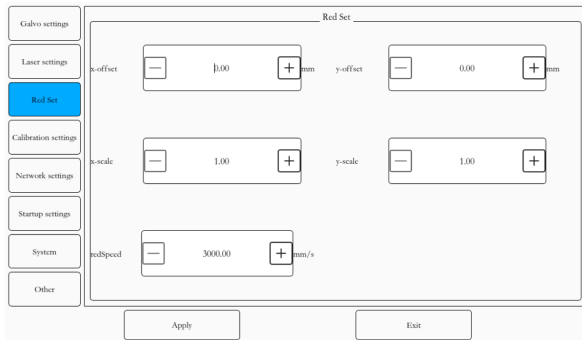
Horizontal offset: Adjust X center position when red light preview.

Vertical offset: Adjust Y center position when red light preview.

Horizontal ratio: The proportion of horizontal dimensions and theoretical dimensions of red light output.

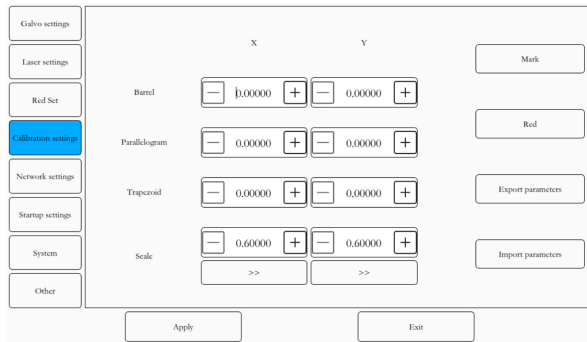
Vertical ratio: The proportion of vertical dimensions to theoretical dimensions of red light output.

Red light speed: red light scanning speed.



3.3.2.4 Correction Settings

Click the label button to label a rectangle, the size is set. Observe whether the rectangle of the knocked is deformation. (Deformation generally has three types of barrel pillow, trapezoidal, Parallelogram), and deformation is X-axis and Y-axis deformation, respectively. By adjusting the parameters of the X-axis and Y-axis directions, the deformation can be corrected. The setting of the parameter can be positive or negative, and the



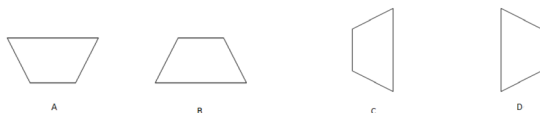
positive and negative of the value represents the correction trend. The absolute value of the value represents the strength of the correction. Increasing the setting data absolute value can enhance the intensity of correction. If you find that the adjustment is too much, you can reduce it appropriately.



As shown in the figure above, there are barrel pillow-shaped distortion. Among them, A and B are Y-axis deformation, A is too small in the deformation coefficient, and B is too large in the deformation coefficient; C and D are X-axis deformation, C is too large deformation coefficient, D is too small in the deformation coefficient. The correction parameter setting range of the barrel pillow is -0.5 - $+0.5$.



As shown in the figure above, it is a parallel secondary deformation. Among them, A is a deformation of X, and B is a deformation of Y direction.



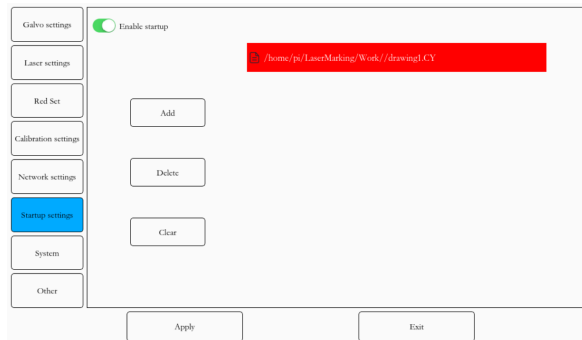
As shown in the figure above, A and B are trapezoidal deformation in the X-axis. Among them, A is too small in trapezoidal deformation coefficient, and B is too large in trapezoidal deformation coefficient; D is the trapezoidal deformation coefficient, and the setting range is -1 to +1.

After the correction is completed, the size correction is performed, and the actual size of the X-axis and Y axis direction of the bench marking graphics manually, and then click the >> button after the x ratio and Y ratio. Value, (can also be cleared up and redesigned) Correct work is completed, click the application and exit.

3.3.2.5 Startup Settings

Enable starting up:

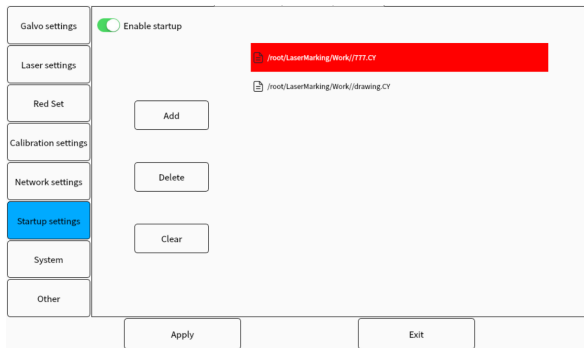
Choose Startup. When the system starts, it will automatically open the preserved file in the boot list. If there is only one file in the boot list, then it will be opened by default. If there are many, you need to choose one of them to open it. , Or click to cancel, do not open all.



Add: Add startup file to the list.

Delete: Delete the startup file from the list.

Remove: remove the startup list.

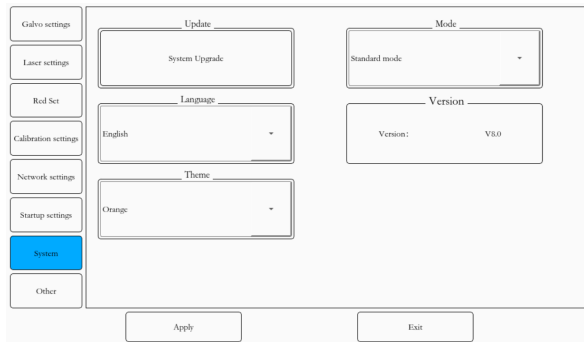


3.3.2.6 system

System upgrade: Click the system upgrade, select the upgrade file (must be .bin file). After the upgrade, you need to restart.

Language: Support Chinese and English.

Subject: Support multiple sets, dark, light, blue, green, orange.

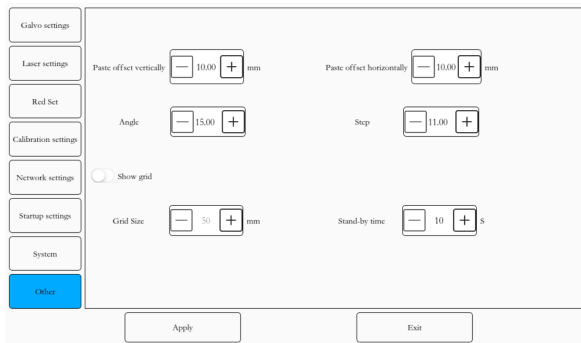


3.3.2.7 Other

Horizontal paste offset: When copying the paste, the new object position is shifted to the horizontal direction of the original object.

Vertical paste offset: When copying the paste, the new object position is shifted to the vertical direction of the original object.

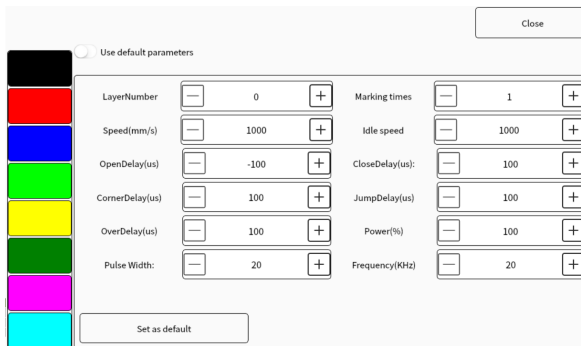
Grid size: When the main interface displays the table, the size of each grid.



3.3.3 Attributes

On the left side are 8 groups of layer buttons, which means that the system can store 8 groups of different marking parameters, and each group of parameters can be set individually.

Use Default Parameters: if the default parameters are checked, the default parameters will be used. If the default parameters are not checked, the parameters of the current layer can be customized and saved.



Layer Number: the layer where the object is located.

Marking Times: after clicking mark, the number of times of laser marking.

Marking Speed: the operating speed of the galvanometer when the laser is out of light.

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

Open Delay: Delay time to turn on the laser when marking starts. Setting the appropriate "Turn-on Delay" parameter can remove the "match head" phenomenon at the beginning of marking, but if the light-on delay parameter is set too large, it will lead to the missing phenomenon of the initial segment, which can be negative.



Parameter is too large



Parameter is too small



Parameters are normal

Close Delay: Delay time to turn off the laser when marking is end. Setting the appropriate close delay parameter can eliminate the non-closing phenomenon when marking is completed. But if the close delay is set too large, it will cause a "match head" phenomenon in the end segment, which cannot be a negative value.



Parameter is too small



Parameter is too large



Parameters are normal

Corner Delay: one stroke sends an end command, the next one sends a start command, and there is no empty stroke in the middle. At this time, due to the lag of the galvanometer, it will take a period of time for the galvanometer to reach the designated position. If the parameter is too large, the galvanometer has been fully rotated, and the laser does not

stop emitting light at this time, and then there will be repeated points in the corners; If the parameter is too small, the galvanometer has not been fully rotated, and the next segment will be marked, and an arc will appear at the corner.



Parameter is too small



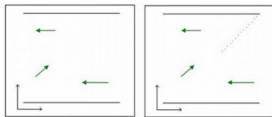
Parameter is too large



Parameters are normal

Jump Delay: the time to wait for the galvanometer to reach the specified position. When the last command of the empty stroke is given, due to the lag of the galvanometer, it will take a period of time to reach the specified position, so this parameter should be set to wait for the

galvanometer to reach the specified position. If the parameter is too large, the galvanometer has been fully rotated, and the next stroke is processed after staying for a period of time, which increases the marking time; If the parameter setting is too small, the galvanometer has not been fully turned to the laser and the light has been emitted, and scattered points will appear at the beginning of the stroke.



Jump delay
is normal

Parameter
is too small

Over Delay: time to wait for the laser to turn off completely. The laser needs a period of response time from the time the light-off command is issued until the laser is completely turned off. Setting an appropriate over delay parameter is to give the laser sufficient light-off response time, so as to achieve the purpose of turning off the laser completely and then marking the next time. Appropriate over delay parameters

can eliminate the "smearing" phenomenon that occurs when marking. But if the end delay is too large, it will affect the processing speed. Cannot be a negative value.

Laser Power: the output power of the laser in the state of light output.

Pulse Width: refers to the time that the laser power is maintained at a certain value.

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

3.3.4Text editing

Enter the marking content and click the edit command to enter the editing details page. You can edit the marking content in detail. The editing menu is divided into four parts: position setting, content setting, variable text and arc text.

3.3.4.1 Location Settings

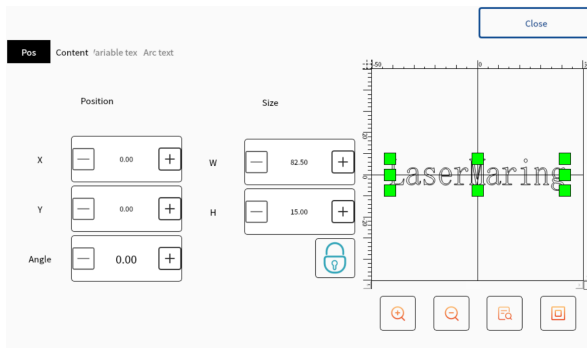
X: The x-coordinate of the object's center point.

Y: The y coordinate of the object's center point.

W: The width of the object.

H: The height of the object.

Angle: The rotation angle of the object.



3.3.4.2 Content Settings

Text: Modify the text content.

Font type: TrueType font, monoline font.

Font name: such as Hei, Song, etc.

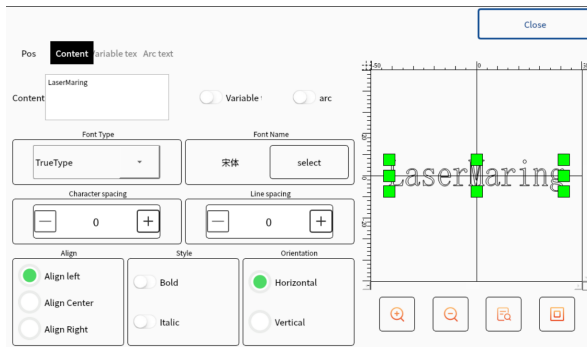
Character Spacing: The distance between characters.

Line Spacing: The distance between two lines of text.

Alignment: When the text has multiple lines, you can choose the alignment, left, center, and right.

Style: bold, italic.

Arrangement direction: horizontal or vertical.



3.3.4.3 Variable Text

Click the Variable text button in content Settings to enter the variable text interface, you can quickly enter several built-in variable text.

Variable text includes fixed text, serial number, date, time, external file, VINCODE, etc

Number	Name	Content
1	Fixed Text	A fixed part of the input content
2	Serial Number	It is used for quick input of the serial number and automatically increases according to the set jump number increment
3	Date	Add the system date to the marking content, you can set a variety of date formats
4	Time	Add the system time to the marking content. You can set multiple time formats
5	External Text	Read files added to the marking content, support TXT files, xlsx files
6	VIN CODE	The system supports the frame number generation function. After entering the vehicle identification number in the VIN CODE position, click "Generate VIN" below to automatically generate the VIN code, which is convenient for marking the frame number
7	Network Command	Use network commands to add marking content
8	Serial Command	Use the serial port command to add marking content

3.3.4.4 ARC

The marking content is distributed in an arc to facilitate the marking of flange products

Starting Angle: starting angle of the first character.

Included Angle: the angle range of the arc circle (for example, 360 degrees means arc text is circular arc text, and 180 degrees means arc text is semi-circular arc text).

Arc Radius: the size of the arc.

Clockwise: characters are arranged clockwise.

Flip: characters inward or outward.



3.3.5 QR code editing

Select the QR code and click the edit command, the QR code editing details page will appear, you can edit the contents of the QR code, as follows.

Content: the content to be displayed in the QR code.

Barcode Mode: QR code, Bar code.

Barcode Type: **BarCode:** CODE25、CODE39、CODE93、CODE128。

QRCode: QRCode、DataMatrix

Variable Text: such as serial number, date, time, etc.

Display Mode: positive or reverse.

Positive:



Reverse: added a border around the QR code.



QRCode Style: standard mode, dot mode, circle mode, rectangle mode.

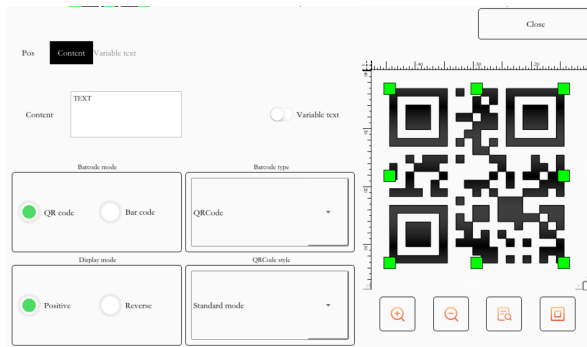
Dot Mode:



Circle Mode:



Rectangle Mode:



3.3.6 Bitmap editing

Positive or Reverse: reverse the color value of each point in the current image.

Positive:



Reverse:



Brightness: adjust the brightness of the picture, the larger the value, the brighter the picture, the smaller the value, the darker the picture.

Contrast ratio: make the bright parts of the picture brighter and the dark parts darker.

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

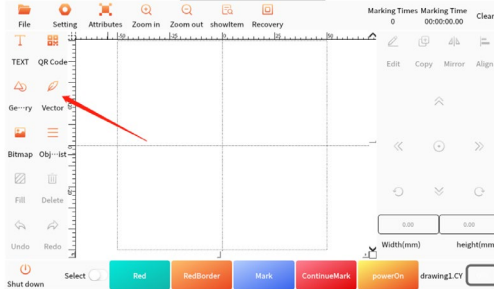
Fixed DPI: similar to the resolution of the picture. Since the DPI value of the original bitmap file is not fixed or uncertain, you can set a fixed DPI value through "Fixed DPI", which can be set separately in the X and Y directions. The larger the DPI value, the denser the dots, the higher the image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

Marking Resolution: displays the resolution of the image, which will vary according to the size of the image.

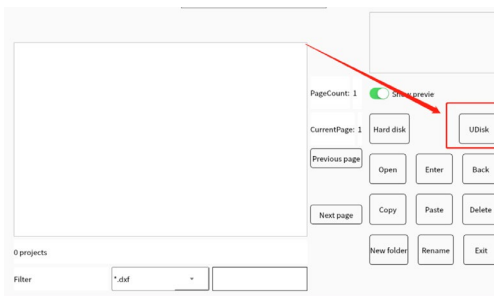


3.3.7 Vector Diagram

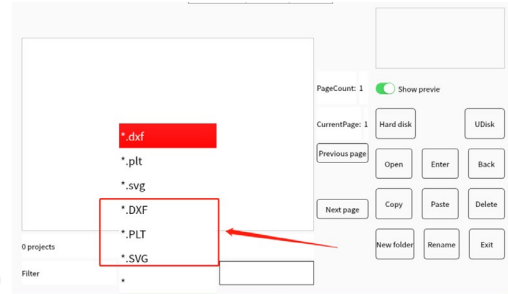
Software main interface click vector map



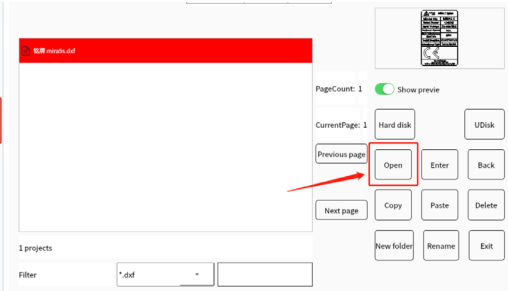
Click the USB flash drive at this interface



Enter the vector map open interface, vector map support format: DXF/PLT/SVG




Find the corresponding file in the USB flash drive and click to open it




3.3.8 Fill


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


Enable Profile: indicates whether to display and mark the outline of the original graphics. That is, whether the filled graphic retains the original outline.


 indicates that in the case of "Enable profile", fill lines are marked first and then outlines are marked.

 indicates that in the case of "enable outline", the outline is marked first and then the fill line is marked.


Fill 1, Fill 2 and Fill 3: it means that three sets of unrelated filling parameters can be set at the same time for filling. Cross-filling at any angle can be done, and each filling can support four different filling types. (The four filling types include: Unidirectional Filling, Bidirectional Filling, Ring Filling, and Optimized Bidirectional Filling, see below for details).

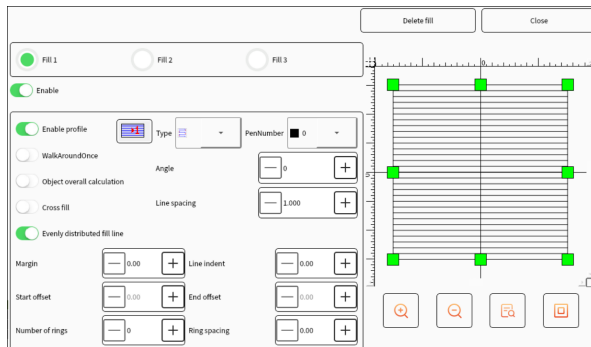
 **Unidirectional Fill:** fill lines always fill from left to right.

 **Bidirectional Fill:** the fill line is filled from left to right first, then from right to left, and the rest is filled in a loop.

 **Bow Fill:** optimized bidirectional fill: Similar to bidirectional fill, but creates connecting lines between the ends of the fill lines.

 **Optimized Bow Fill:** similar to bow fill.

 **Ring Fill:** the fill line is the outline of the object to be filled cyclically from the outside to the inside.



Angle: refers to the angle between the fill line and the X axis.

Line Spacing: refers to the distance between adjacent fill lines.

Fill Line Margins: refers to the distance between the filling line and the outline object in all filling calculations.

Walk Around Once: refers to adding a contour figure around the periphery of the filling line after the filling calculation is completed.

Evenly Distributed Fill Line: resolved an issue with uneven distribution of fill lines at the start and end of fill objects. Due to the size of the filling object and the setting of the spacing between the filling lines, after filling, uneven distribution of the filling lines may occur at the beginning and end of the filling object. In order to simplify the operation, the purpose of uniform distribution of all filling lines can be achieved without the need for the user to reset the line spacing, and this function is added. After selecting this item, the software will automatically fine-tune the filling line spacing based on the filling line spacing set by the user, so that the filling lines are evenly distributed.

Start Offset: refers to the distance between the first fill line and the boundary.

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

Line Indent: refers to the indentation at both ends of the filling line. If it is positive, it is the indentation. If it is negative, it is the extension.

Number of Rings: Refers to the number of ring fills before horizontal fills. Since the last ring may not be filled evenly when using "Ring Fill" completely, this function is used to solve such problems.

3.4 Precautions in the use of hand-held marking machine

If you don't use this handheld laser marker according to this use manual, it may reduce reliability and life of the product. So please read the following requirements and precautions carefully, and follow the relevant specifications during use.

a) This handheld laser marker use 220V /50Hz AC power;

b) A ventilated distance of about 10cm around the equipment must be left. Insufficient

ventilation distance may cause internal laser failure and unable to work!

- c) Normal use temperature range is 0 ~ 40 ° C, internal laser system to report to the alarm without light if exceeds the temperature range.
- d) Please keep laser head clean. Use a protective cover to cover the laser output port under the non -working state. The dust on end of the head output may cause the lens too heat and damage, causing the equipment output power attenuation or cannot output light.
- e) Before cleaning maintenance equipment and handheld marking handles should ensure that the device is in power -off state.
- f) During the operation, please wear labor protection supplies in accordance with regulations, and protective glasses near the laser beam.
- g) When the handheld laser marking machine is powered on, please do not watch the laser output head directly. The laser output head is prohibited from facing the position of someone, and the laser output head is prohibited from irradiation of the high -retained mirror.
- h) Do not place flammable and explosive items near the handheld laser marking machine! Such items should avoid direct or reflected laser!
- i) Forbidden excessive bending tip of the ripple, the ripple tube bending radius is $\geq 150\text{mm}$ to prevent the optical fiber in the ripple tube.

3.5 Common Problems and Solutions

The equipment does not emit light during use:

1. The device power supply and laser power supply are not turned on.
2. When marking, the distance between the laser focal cover and the workpiece is too large or too small;
3. Set the laser power too small, causing no light to emerge.

4. The lens protective cover of the laser marking handle field mirror is not removed.

In the process of use, the light is weak, and the marking content depth is not consistent:

1. The field mirror at the marking handle is dirty;
2. Marking workpiece is not smooth;

The device cannot read the USB flash drive:

1. The USB flash drive is not properly connected to the USB port on the device.
2. The USB flash drive is faulty.

During the operation of the equipment, the blurred screen, black screen, and touch failure occurred:

1. Strong electromagnetic interference exists in the equipment environment;
2. The touch screen is dirty;

Equipment marking workpiece depth and marking effect is not obvious:

1. The parameters do not match.
2. The field lens at the marking handle is dirty.
3. Marking workpiece is out of flatness.

4. Pre -sale and after -sales service

4.1 service commitment

Our company focus on customer, fully know well customer' s marking require, and provides comprehensive and personalized debugging, training, maintenance, etc. before -sales and after -sales service to customers .

(1) Pre -sale service

Before signing the contract, my company provides various production process plans, technical consulting, sample samples, and equipment selection services of laser marking equipment.

(2) Machine debugging

Based on the contract, our company will transport the equipment safely to the location designated by the user within the prescribed time, contact our customer service staff, and online equipment technology guidance services.

(3) After-sales training

My company provides free online technology training, until the operator reaches the basic use of the device, the main training content is as follows:

Laser marking technology basic principles;

Laser marking equipment main structure;

Laser marking equipment operation;

Laser marking process parameter adjustment;

Laser marking equipment maintenance ;

(4) After-sales commitment

Free warranty for equipment for one year (excluding human damage, fiber break);

Free technical consulting, process and software upgrade services;

Provide maintenance services for life, only for accessories of accessories;

Provide extensive software and hardware support for life

4.2 Limitation of warranty

Products and spare parts (including fiber) caused by tampering, opening, disassembly, misunderstanding and improvement caused by non -our company's personnel are damaged; or damage caused by misuse, negligence, or accidents; Or beyond the use of specifications, abuse or maintenance, abuse or no damage caused by information and warnings on the user manual, and the damage caused by the use of the warning is not within the warranty range. Customers have the responsibility to understand and operate in accordance with the user manual and operation scope, and the damage caused by the wrong operation is not warranty. Parts and other parts such as attachments are not within the warranty range.

Within the warranty, if the buyer finds any problem, it must be written in writing within 30 days from the date of discovery. This warranty does not involve third parties (including specified buyers, end users or customers). It does not include parts, equipment or other products produced by non -company.

4.3 Technical support and product repair

This product does not need users to repair parts, components and components, and all maintenance operations should be carried out by our company's technicians.

If any failure in the process of use, please notify our company's technical personnel in time and deal with them.

All maintenance and replacement products must be placed in the original packaging box provided by our company, otherwise our company has right to refuse repairing if product damage caused by that.

When you receive products, please check whether the product is complete and non-destructive in time and whether the accessories are complete. If there are any abnormalities, please contact the carrier in time and contact our company.

Our company will continue to develop new products. The product information listed in the manual may change without notice. All technical parameters are subject to contract terms.

The above-mentioned our company's warranty and service terms are for users' reference only. The formal service and warranty content shall prevail in the contract.

