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User Manual

1 Introduction

1.1 Statement

Welcome to use HAN'S MOTOR MARKING SOFTWARE V1.0 system, this system is a MARKING control system which is based on vector graphic marking and includes EXTENT TEXT PROCESSING, ACCURATE DRAWING, and EXQUISITE MARKING functions. This version mainly achieved PLI vector diagrams importing and filling, texts inputting, texts, jump number, and so on, the details please see the instruction. This version supports Windows 7 operating system, and compatible with Windows XP system, it is aim to make the software operating at a more reliable environment, and increase the reliability of software operation. HAN'S MOTOR MARKING SOFTWARE V1.0 control system operation needs comparable hardware supports.

The control software of Han's MOTOR MARKING Software V.10 is self-developed by Han's motor R&T Ltd. with an exclusive copyright. This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.

1.2 About Registered trademark and trademark

This manual recorded companies' name and products' name are the registered trademark or trademark of respective companies.

2 Manual structure

The First chapter Overview

Explain the role of MARKING SOFTWARE and the characteristics of Laser marking.

The Second chapter Preparation before operation

Explain the installation and interface of this marking software.

The Third chapter Drawing Explanation

Explain the graphic creation and edition of this marking software.

The Fourth chapter MarkingControl

Explain the marking mode and related parameters of this marking software.

The Fifth chapter Parameter Setting

Explain the Laser and motor control parameters of the software.

The Sixth Chapter Network configureuration

Contents

The First Chapter Overview

1.1 HAN'S MOTOR MARKING SOFTWARE V1.0 functions

Han's Motor Marking Software V1.0 is developed by Han's Motor S&T Ltd which is specifically for the laser marking. Currently, its achieved functions include:

1. Freely design the graphics that need to be processed.
2. Supports TrueType font, SHX font, DMF font, one-dimensional barcode, and two-dimensional barcode.
3. Powerful graphic editing function that is able to draw necessary diagrams based on circumstance.

4. Supports multi-layer edition, it allows set different machine parameters for different objects.
5. Compatible with usual image formats (BMP, JPG, GIF, TGA, PNG, TIF etc.).
6. Compatible with usual vector graphics (PLT, DXF, AI etc.).
7. Supports user authority function, different users could use different software's functions.
8. Powerful filling function, it supports straight line filling, offset filling, screw filling and inside-outside filling etc.
9. Multiple control objects, user could freely control system interact with outside device.
10. Directly support IPG fibre laser, IPG CO2 fibre laser, IPG YAG laser and HAN'S LASER end-pumped laser device etc.
11. Opening multi language support function, it supports Chinese and English currently.

1.1.1 Relationship between Marking system and computer

It is no exaggeration to say that: "There is no laser marker without computer".

Computer responsible for editing and manufacturing marking documents (Including images' collecting after user equipped Image Scanning Device), control galvanometers' movement to scan marking document' content into working surface according laser, control the modulating frequency of acousto-optic Q switch, control marking speed etc.

The computer control system of laser marker includes computer, computer marking specific port, and marking software.

1.1.2 Relationship between marking software and marking machine

The functions of computer marking specific interface board is convert the digital signal sent by computer, into analog signal or directly send out digital signal, drive X-axis galvanometer and Y-axis galvanometer and make the laser beam moving in the space. Produces synchronous Q switch modulating signal, laser pulse laser, and make sure the content of target image burn to machining's surface accurately and completely. The core in computer control system is marking

control system. Nowadays, there are many laser marker manufactures around the world, and they have many kinds of marker. On closer inspection it is easy to find that their hardware structures are pretty much doing the same thing and the key is the different of marking software. Marking software is the technology core of respective marker manufactures and the key of both markers. It determines the function of marker.

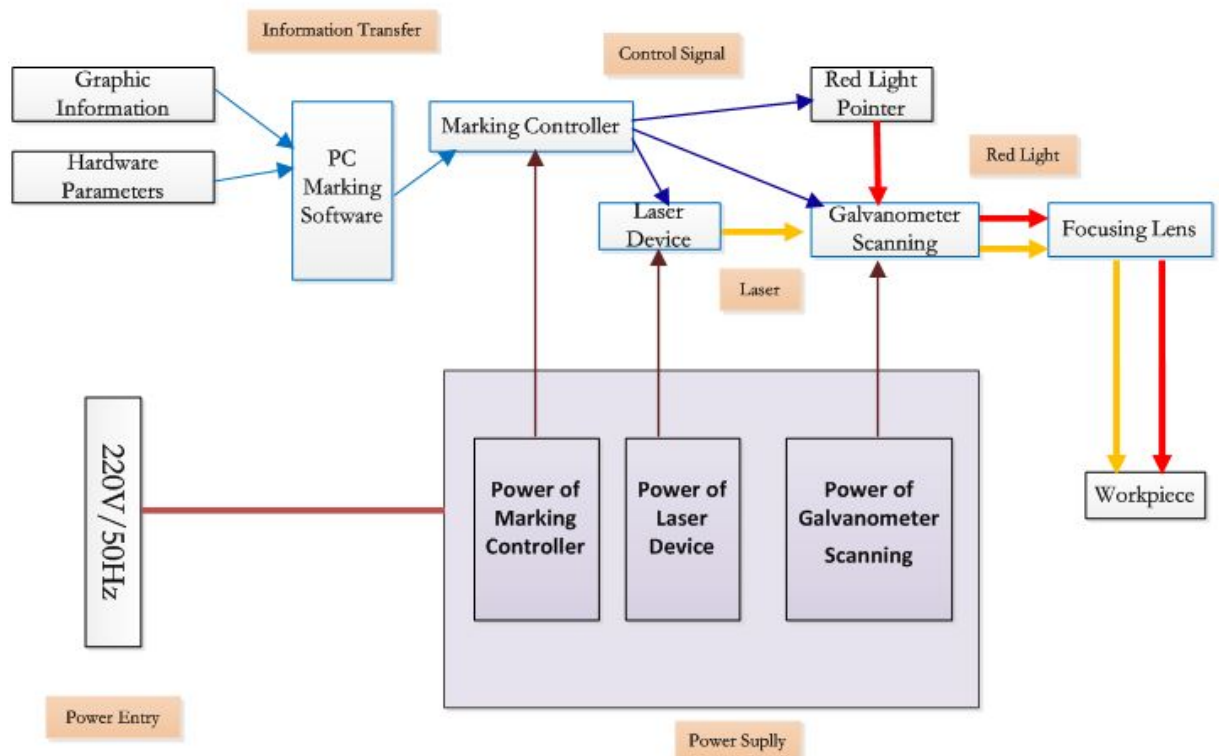


Figure 1. Marker system operation diagram

1.2 Laser marking explanation

This chapter explains the principle, characteristics, and classification of laser marking.

1.2.1 Characteristics

Selecting suitable laser for machining material and its watt level or watt density is able to processing most of metal or nonmetal materials.

Laser is processing with un-mechanical “knives”, it will not impose mechanical pressure or mechanical stress, by this reason, it will not break knives, has non-poisonous and no populations; It is able to processing at air or protect environment; It produces no X-rays, and undisturbed by

electric field and magnetic field; It could go across transparent material and processing elements inside; It has small material consumption; Has no thermal deformation. It could processing internal surface or incline according to prism or speculum.

It is easy to operate; using microcomputer to achieve automatically processing; This software can be used for high speed and efficiency processing on production line; Processing quality is well; Can do precision machining by using precision staging. .

Besides, it also has unique advantages:

1. It can mark barcode, serial number and symbols, graphics, and images etc.
2. The marks will not fade away on account of the environmental factors (e.g., damp, acid or alkaline atmosphere), but will stay permanently. They can also be protected from counterfeit.
3. Top marking quality -- Due to the non-contact machining, the product will not be damaged.
4. High efficiency--It can easily be controlled by computers to achieve automation. It is unnecessary to stop the machine for a rest or increase the temperature to solidify. One or one group of characters and patterns can be marked each time. Or even several parts can be marked at the same time.
5. Low processing cost--the continuous processing in large amounts can eventually make the cost of each part very low so as to bring about benefits, although the lump-sum investment is very high.

All the above advantages make it very difficult to counterfeit. Especially, the colored mark is of different shades of color. When the common metallic materials are marked, a reverse effect can be resulted in because the different shades and thickness of the ablated lines can make the color and luminous reflectivity different from the original color and reflectivity. There exist a reverse color effect and a sub-luminous effect on the glass and plastic materials.

1.2.2 Classification of Laser Marking

The laser marking is classified into three types: mask marking, dot-matrix marking, and scanner linear scanning marking.

Mask marking: The marking processing can be performed with a self-developed marking

device, instead of the complete integrated system, which can reduce the cost. The processing efficiency is very high. A pulse can mark a group of characters, bar codes or patterns. More than 1,000 parts (semi-finished products, products and packages) can be processed at a top speed (up to 30 parts per second) and the lowest processing speed can reach 3 seconds per part. The disadvantage is that masks need to be made (one mask for each part) and the characters or patterns on the mask cannot be altered as soon as the products vary, that is to say, it has a very low flexibility.

Dot-matrix marking: Generally, a 7×5 matrix with 7 dots in the perpendicular stroke and 5 dots in the across stroke can be marked.

Vibration lens linear scanning marking: The marking box can usually vary within the range from 50mm×50mm to 300mm×300mm. Different alphabetic characters, graphs or even images can be marked. Several small parts can be simultaneously marked or a part can be marked with different characters and graphs. The alteration of characters or graphs is very flexible and convenient. Sophisticated graphs and images can also be marked. But the marking speed is slower than that of the mask marking.

The second Chapter

Software installation and interface explanation

2.1 Software installation requirements

This chapter explains the installation requirements of HAN'S MOTOR MARKING SOFTWARE V1.0 and caveats before installing.

2.1.1 Installation environment requirements

The installation of this software requires computer at least has the hardware and software configuration below:

Operating system:

Windows2000/Windows XP/Windows 7 (64 Bit)

Minimum configuration:

CPU: Celeron 2G or above;

RAM: At least 512M, if need to process large image file, we recommend 4G or above.

GPU: If 3D function is necessary, it needs high performance individual GPU to do image processing.

HDD: At least 500M available space, more available space reservation is recommended.

2.1.2 Installation caveats

1. If anti-virus protection software is installed and is running, please make sure this software is trusted by protection software.
2. If previous version of this marking software is installed in your computer, before installing, please uninstall the old marking software.
3. In order to make sure the install processing could complete fast and without errors, please close other Windows program.

2.2 Installation process

This chapter details the install operation process.

2.1.3 Software installing process

Double click or right click to open the package;

Pops up the installation wizard;



Figure 2. 1 Installation interface1

Click "NEXT";

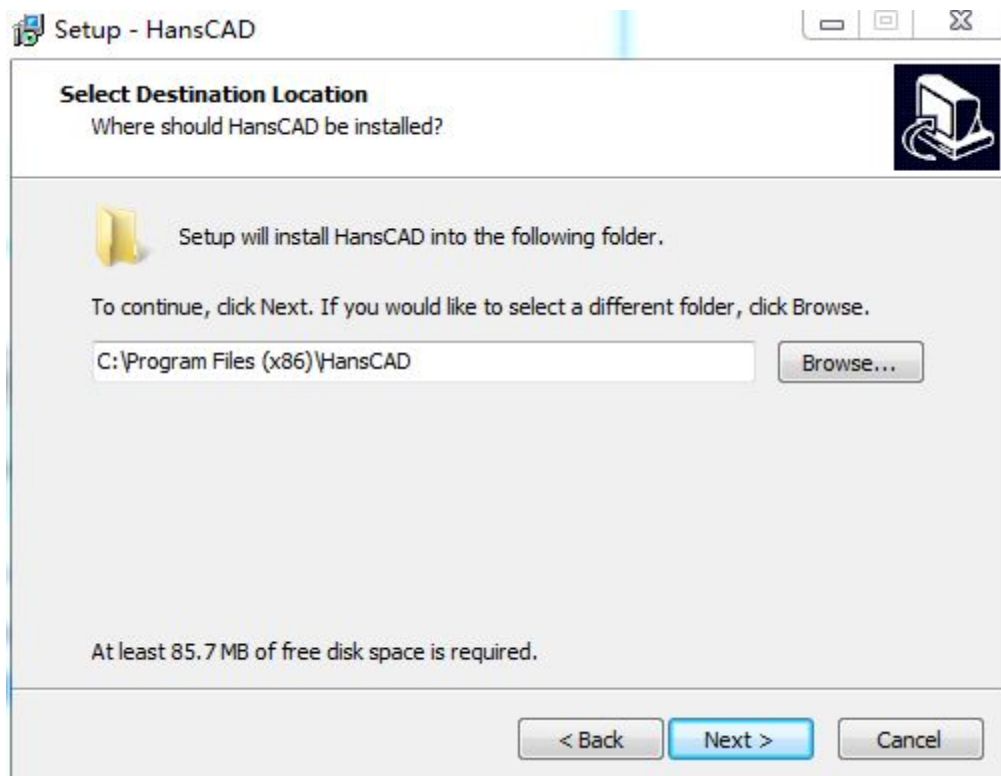


Figure 2. 2 Installation interface 2

Click "NEXT";

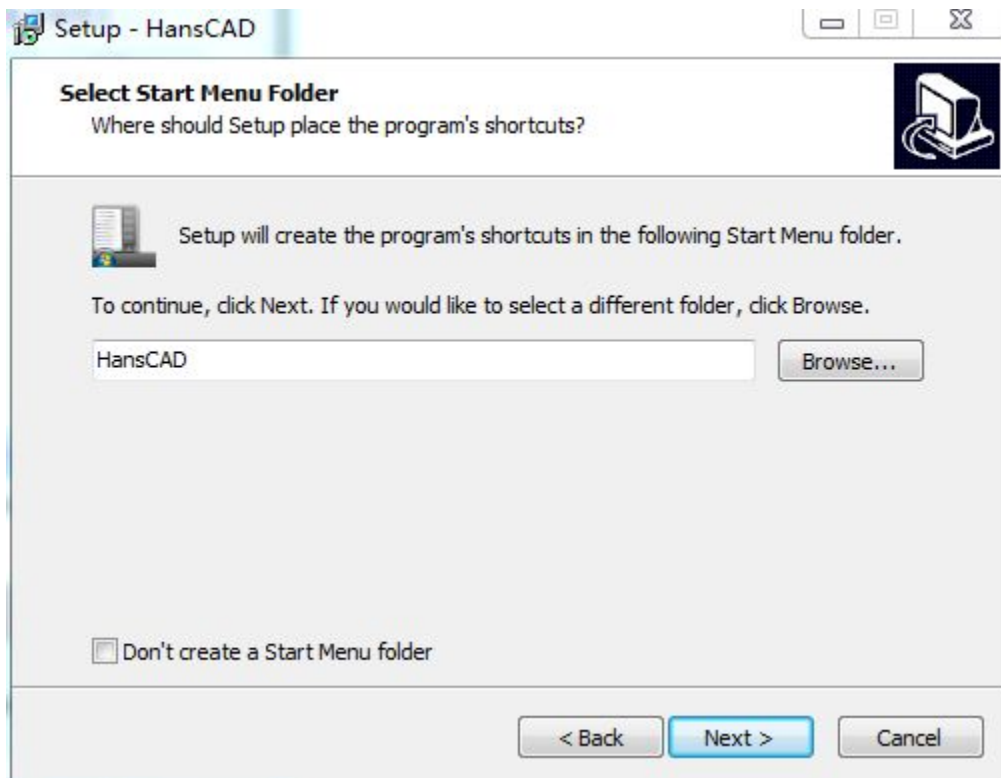


Figure 2. 3 Installation interface 3

Click "NEXT" following the guider till the last step;

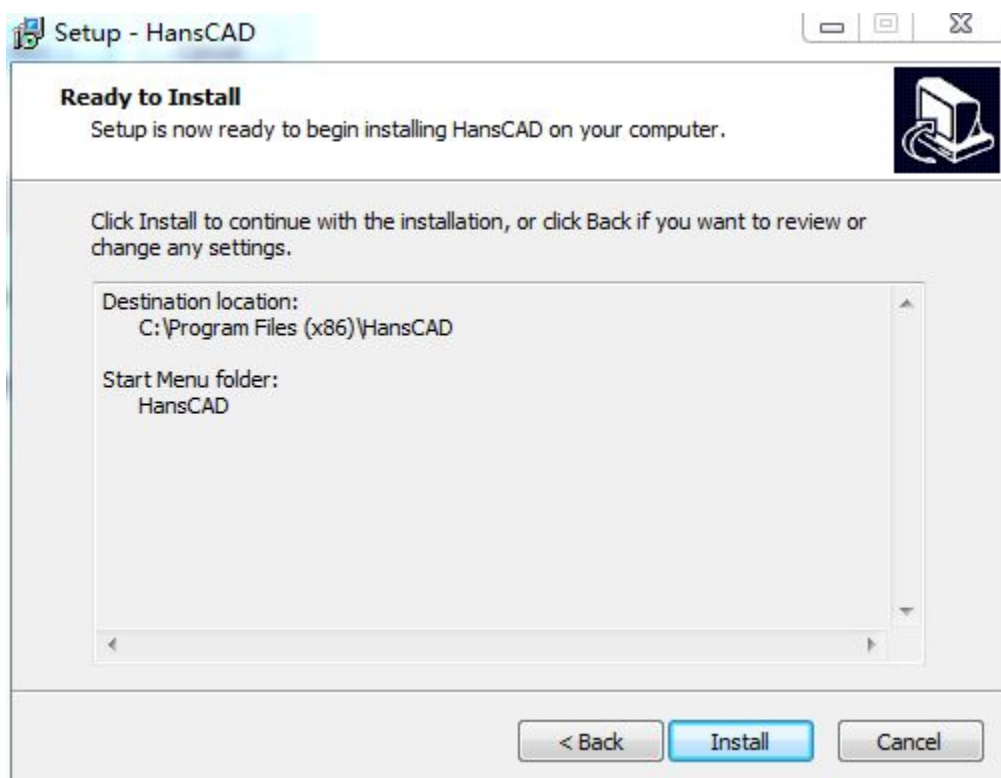


Figure 2. 4 Installation interface 5

Wait for the installation process complete.

2.3 Software interface explanation

This chapter explains the interface of HAN'S MOTOR MARKING SOFTWARE V1.0.

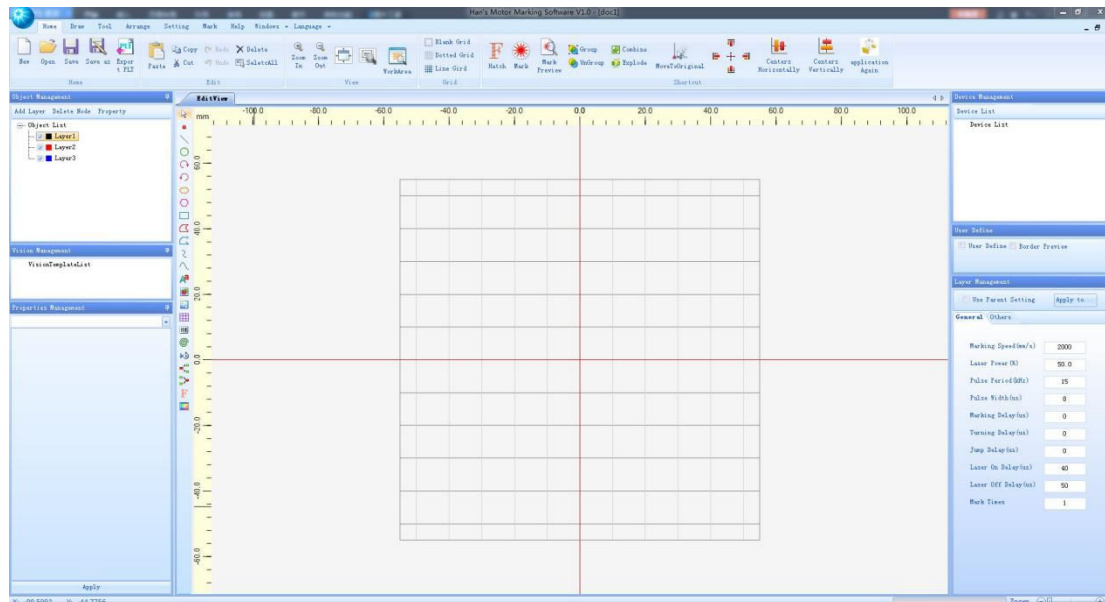


Figure 2. 5 Software main interface

2.4 Menu and toolbar

This chapter explains the title bar, menu bar, and tool bar of this marking software.

2.4.1 Title bar

The title bar locates at the top of software window, displays the name of the currently-used file. Drag the title bar to move the window on the screen. The icons' position at the right side respectively means "Minimize"—minimizes the window and let it appear at taskbar, "Maximize"—maximize the window to the full size of the screen, "Close"—exit this software.

There is also a title bar on the plotting window that is not maximized. It has the same functions as the one on the window of Han's Motor Marking Software. The user can use this title bar to move, maximize, minimize or close one plotting window. When the user maximizes one plotting window, its title bar will appear on the title bar of HAN'S MOTOR MARKING SOFTWARE.

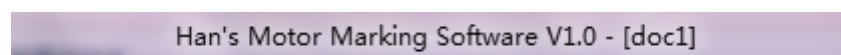


Figure 2. 6 Title bar

2.4.2 Menu bar

The menu bar lies across the top of the **Applications** window and closely below the title bar, displays the menu names. Click the menu name to pop up a list of pull-down menu commands for the user to select.

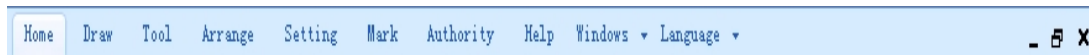


Figure 2.7 Menu bar

This software includes the following menus:

- [Home]** Provide File, Edit, View, Internet command operations
- [Draw]** Provide draw control commands
- [Tool]** Provide graphic mirror, filling, array, combination commands
- [Arrange]** Provide graphic alignment, transformation commands
- [Setting]** Provide marker hardware configuration commands
- [Mark]** Provide Mark and Mark preview commands
- [Authority]** Provide authority change and log-in commands
- [Help]** Provide Han's motor software V1.0 help commands
- [Window]** Provide open file view
- [Language]** Provide language switch commands
- [File close button]** This command is used to close the file

Home menu

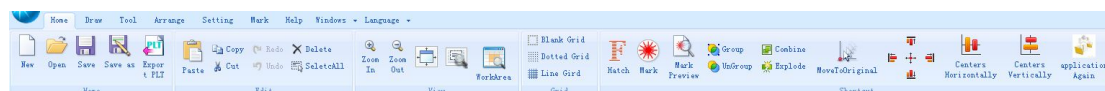


Figure 2.8 Home menu

- [New]** Create a new file
- [Open]** Open existing file
- [Save]** Save editing file use the same file name
- [Save as]** Save current file use a different name
- [Close]** Close editing file
- [Paste]** Paste the data (objects) on the clipboard onto the file
- [Copy]** Copy data (objects) from the file and save them into the clipboard
- [Cut]** Delete data (objects) from the file and save them into the clipboard
- [Redo]** Redo the cancelled edit operation
- [Undo]** Undo the last edit operation
- [Delete]** Delete the selected object

[All] Select all objects in the work area

[Zoom in] Zoom in the view

[Zoom out] Zoom out the view

[Workarea] Make the work area to the original size

[Empty grid] Make no grid at work area

[Dot grid] Work area drawn by dot

[Line grid] Work area drawn by line

[Filling] Graphic filling tools

[Mark] Do marking process

[Mark preview] Preview the mark sequence of marker operation

[Group] Group selected objects

[Ungroup] Ungroup selected objects

[Combine] Combine selected objects

[Explode] Explode selected objects and make it into multi objects

[MoveToOriginal] Move reference point of selected object to the origin

[Mirror mode] Includes horizontal mirror and Vertical mirror

[Centers Horizontally] Make selected objects in a row horizontally based on the center of the first selected image

[Centers Vertically] Make selected objects in a column vertically based on the center of the first selected image

New: This command creates a new file in Han's Motor Marking Software V1.0 system.



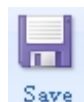
Start: Toolbar button:

Open: This command open an existing file.



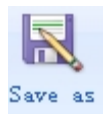
Start: Toolbar button: (Shortcut: CTRL + O)

Save: This file save the editing file to the current path use the same name. If it is the first time this file be saved, Han's motor marking software V1.0 will pops a new dialog box to name the file, suffix name is "hsd". When doing this operation, it is necessary to make sure at least one file is opened.



Start: Toolbar button: (Shortcut: CTRL + S)


Save as: This command will change the name and path of current file; it pops a dialog box and let user select save path and name the file.



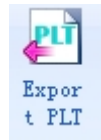
Start: Toolbar button:

Copy: The copy command will copy the currently selected object onto the clipboard. If no object is selected currently, this command will be unavailable. The data which are copied onto the clipboard will replace the previous data on it. If you want to transfer the objects in the current file

to another file and you do not want to delete them from the current file at the same time, you can select this command to copy the objects, and then open the file which the objects are to be put into, and finally paste them. Or, if you want to create two identical objects in the same file, you can also use this command.

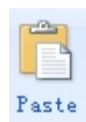
Start: Toolbar button:  (Shortcut: CTRL+C)

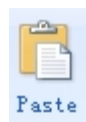
Export PLT: This command will save the contents of canvas as PLT format, it will pop up a dialog box and allows user select save path and name the file.



Start: Toolbar button:

Pasta: The pastecommand will paste the contents on the clipboard to the insertion point. If the clipboard is vacant, this command will be unavailable. You can paste the object where it is necessary by putting it onto the clipboard with the **Paste** and **Copy** commands. When doing paste command, the pasted object will move with mouse till single left click mouse, and the object will be pasted to the current location.



Start: Toolbar button:  (Shortcut: CTRL + V)

Cut: The Cut command will delete the currently selected object from the file and the view and place it on the clipboard. If no object is selected currently, this command will be unavailable. The cut data which are placed onto the clipboard will replace the previous data on it. If you want to transfer the objects in the current file to another file, you can select this command to cut the objects in the current file, and then open the file which the cut objects are to be put into, and finally paste them.



Start: Toolbar button:  (Shortcut: CTRL+X)

Undo: If the file is not want to be changed after some alteration is made, then, this command can undo the alteration operation. The **Undo** command can be used to withdraw the last edit operation within the **Undo Level**. This command may also vary with the last operation. Currently, undo command of this software could process unlimited times (Only for the current file).

For example: Imaging that following operations have been done.

Select "Rectangle" tool, and draw a rectangle on work area.

- 1、 At properties area set both LocationX and LocationY of rectangle are 0;
- 2、 Rotate the rectangle;
- 3、 Select "Circle" tool and draw a Circle on work area;
- 4、 Delete the Circle that has been drawn;

Now add 4 undo commands:

- 5、 Undo delete;
- 6、 Undo "Drawing Circle" (Delete Circle);
- 7、 Undo "Rotating rectangle";
- 8、 Undo "Setting location";

Start: Toolbar button:  (Shortcut: CTRL+Z)

Redo: This command is used for regretting undo some processes. Redo command could redo the “undo processes” at redo process range, and this command may also vary with the last operation.

For example: Imaging that following operations have been done.

- 1、 Select “Rectangle” tool, and draw a rectangle on work area.
- 2、 At properties area set both LocationX and LocationY of rectangle are 0;
- 3、 Snipe the rectangle;
- 4、 Select “Circle” tool and draw a Circle on work area;
- 5、 Delete the Circle that has been drawn;

Now add 4 undo commands:


- 6、 Undo delete;
- 7、 Undo “Drawing Circle” (Delete Circle);
- 8、 Undo “Rotating rectangle”;
- 9、 Undo “Setting location”;

Thus, redo command can process 4 times:

- 10、 Redo “Setting location ”;
- 11、 Redo “Rotating rectangle”;
- 12、 Redo “Drawing Circle”;
- 13、 Redo “Deleting Circle”;

Start: Toolbar button:  (Shortcut: CTRL+Y)

Delete: This command is used to delete the currently selected object. If no object is selected currently, this command is unavailable.

Start: Toolbar button:  (Shortcut: Del)

All: This command is used to select all the objects in the work area.

Start: Toolbar button:  (Shortcut: CTRL+A)

Workarea: This command is used to make the screen display original work area.



Start:

Zoom in: This command is used to magnify the view. Press and hold the left button of mouse at top left corner of the area that need to be magnified, drag the mouse, and release the button at lower right corner of the area that need to be magnified.



Start:

Empty grid: This command can empty the work area.

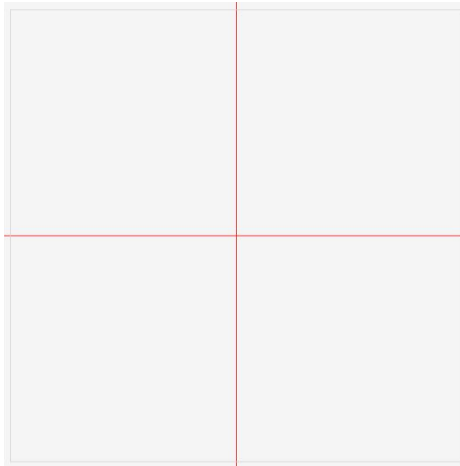


Figure 2.9 Drawing area presented by empty

Start: 

Dot grid: This command can let the work area displays as dot format.

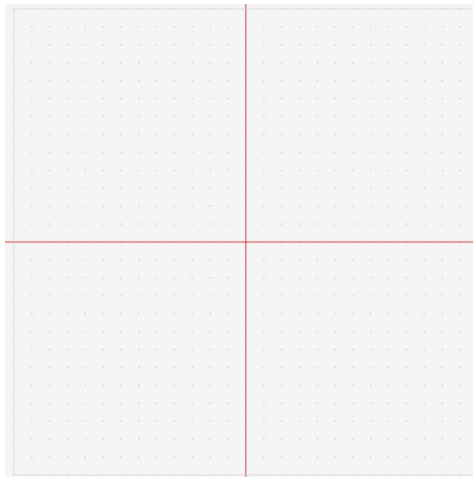


Figure 2.10 Drawing area presented by dot

Start: 

Line grid: This command can let the work are displays as line format.

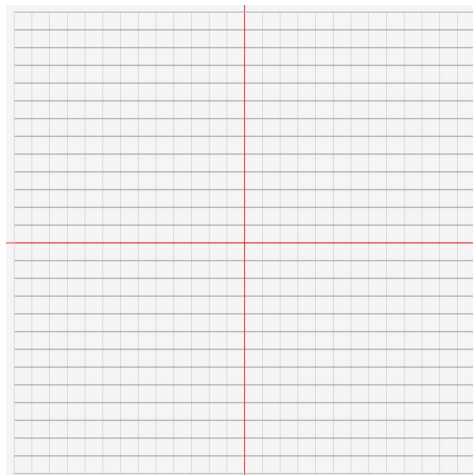


Figure 2.11 Drawing area presented by line

Start: 

Shortcut: Includes some common tools.

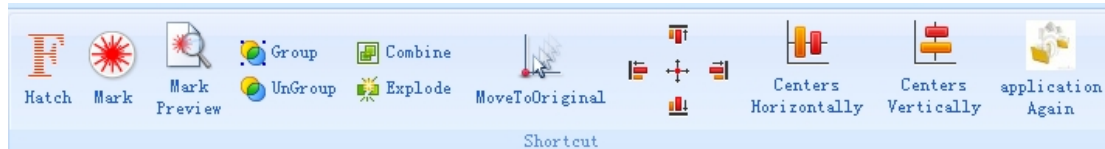


Figure 2.12 General shortcut

Commands “Hatch”, “Mark”, “Mark Preview”, “Group”, “UnGroup”, “Combine”, “Explode”, “MoveToOriginal”, “Mirror mode”, “Centers Horizontally”, “Centers Vertically” will be explained more thoroughly in later sections.

Draw menu

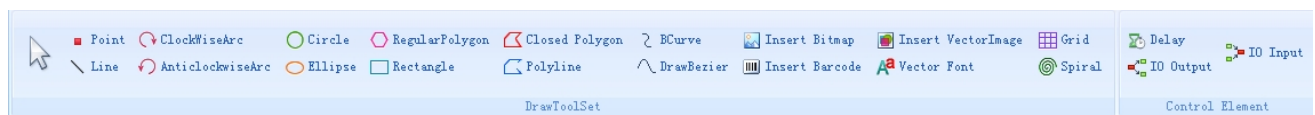


Figure 2.13 General drawing shortcut

[Pick] Select, move, and transform objects

[Point] Draw point

[Line] Draw line

[ClockWiseArc] Draw clockwise arc

[AnticlockwiseArc] Draw anticlockwise arc

[Circle] Draw circle

[Ellipse] Draw ellipse

[RegularPolygon] Draw regular polygon

[Rectangle] Draw rectangle

[Closed Polygon] Draw closed polygon

[Polyline] Draw poly line

[BCurve] Draw B curve

[DrawBezier] Draw Bezier curve

[Insert Bitmap] Insert Bitmap

[Insert Barcode] Draw barcode or QR code

[Insert VectorImage] Insert vector image

[Vector Font] Draw vector text

[Grid] Draw grid

[Spiral] Draw spiral line

[Delay] Insert time delay

[IO Output] Insert a signal output object

[IO Input] Insert a input signal waiting object

The details please see the third chapter-Graphic edit explanation.

Tool menu



Figure 2.14 Graphic transform toolbar

[Mirror] Rollover selected object based on X axis or Y axis.

[Move to Origin] Move object to origin

[Rectangular Array] Arrange selected objects to rectangular array

[Polar Array] Arrange selected objects to polar array

[Group] Group selected objects

[UnGroup] Un group selected objects

[Combine] Combine selected objects

[Explode] Explode selected objects and make it into multi-objects

Mirror Mode: Includes horizontal mirror and vertical mirror.

Mirror on Y Axis: Rollover selected object based on Y axis

Start: Toolbar button:  Mirror on Y Axis

Mirror on X Axis: Rollover selected object based on X axis

Start: Toolbar button:  Mirror on X Axis

Turn on Y Axis: Rollover selected object based on its Y symmetry axis

Start: Toolbar button:  Turn on Y Axis

Turn on X Axis: Rollover selected object based on its X symmetry axis

Start: Toolbar button:  Turn on X Axis

MoveToOrigin: Move the reference point of selected object to the origin

Start:  Move to Origin

The explanation of other commands, please see the third chapter.

Alignment menu

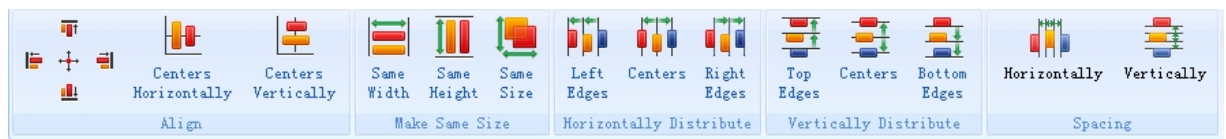


Figure 2.15 Alignment toolbar

- [Leftedge align]** Align all selected object based on left edge of the first selected object
- [Rightedge align]** Align all selected object based on right edge of the first selected object
- [Topedge align]** Align all selected object based on top edge of the first selected object
- [Bottomedge align]** Align all selected object based on bottom edge of the first selected object
- [Centers align]** Align all selected object based on center point of the first selected object
- [Centers Horizontally]** Horizontally set all selected objects in a row based on the center point
- [Centers Vertically]** Vertically set all selected objects in a column based on the center point
- [Same Width]** Set all selected objects have the same width
- [Same Height]** Set all selected objects have the same height
- [Same Size]** Set all selected objects have the same size
- [Left Edges]** Equidistant distribute all selected objects horizontally based on the left edge distant of the far left object and far right object.
- [Right Edges]** Equidistant distribute all selected objects horizontally based on the right edge distant of the far left object and far right object.
- [Centers]** Equidistant distribute all selected objects horizontally based on the centers distant of the far left object and far right object.
- [Top Edges]** Equidistant distribute all selected objects vertically based on the top edge distant of the far top object and far bottom object.
- [Bottom Edges]** Equidistant distribute all selected objects vertically based on the bottom edge distant of the far top object and far bottom object.
- [Centers]** Equidistant distribute all selected objects vertically based on the center distant of the far top object and far bottom object.
- [Horizontally]** Equidistant distribute all selected objects horizontally based on the left spacing of the far left object and far right object
- [Vertically]** Equidistant distribute all selected objects vertically based on the top spacing of the far top object and far bottom object

The details please see the third chapter.

Setting menu

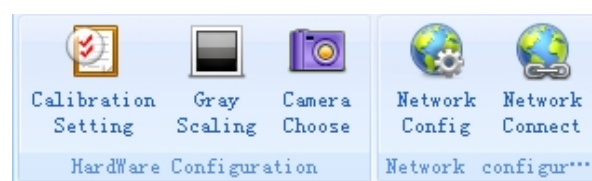


Figure 2.16 Hardware setting toolbar

The details please see the fifth chapter.

Mark menu



Figure 2.17 Marking control toolbar

The details please see the fourth chapter.

Authority menu

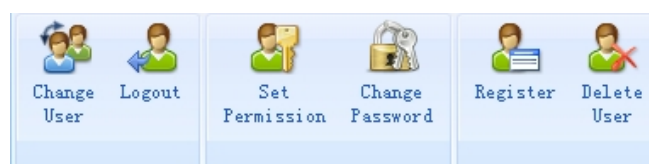


Figure 2.18 Authority toolbar

The details please see the fourth chapter

Help menu

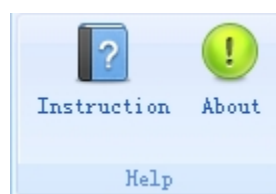


Figure 2.19 Help toolbar

[Instruction] Start topic guides of help menu

[About] Display the version information of this application program

Windows menu

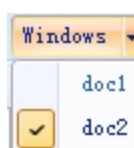


Figure 2.20 File menu

Display the names of all opened files.

Language menu

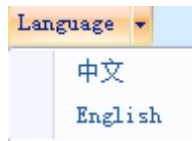


Figure 2.21 Language menu

Provide two options – Chinese and English for user.

File close button



Figure 2.22 Close file

Close: This command is used to close files. Han's Motor Marking software V1.0 recommends user save files before you close them, if close the current file without save, the system will pop up a dialog box and ask whether you want to save this file. All edit process after the last save operation will lost if directly exit the system without save.

Before close a un-name file, Han's Motor Marking Software V1.0 will pops up "Save as" dialog box and recommend user name and save the file.

The third Chapter Graphic Edit

3.1 Graphic creation

Graphic Edit View explanation



Figure 3.1 Drawing shortcut toolbar

Graphic bar provides the following functions:

From the top to bottom respectively are: **Pick**, **Point**, **Line**, **Circle**, **ClockWiseArc**, **AnticlockwiseArc**, **Ellipse**, **RegularPolygon**, **Rectangle**, **Closed Polygon**, **Polyline**, **BCurve**, **DrawBezier**, **Text**, **Insert VectorImage**, **Insert Bitmap**, **Grid**, **Insert Barcode**, **Spiral**, **Delay,IO Output**, **IO Input**, and **Hatch**.

Pick, Select, Move, and stretch object, corresponding icons

The **Pick** tool is used to pick up, move and stretch objects. Before the editing operation, a selection set must be specified. The selection set means the set of objects to be selected. There is one and only one selection set in one view. During the drawing, the system will automatically clear the selection set and add the last drawn object to it. When the selection set contains the object, the view will display the tracker with 10 control points (as shown in the figure below). For the size of the control points and the shape of the tracker, refer to the tracker setting under the view menu.

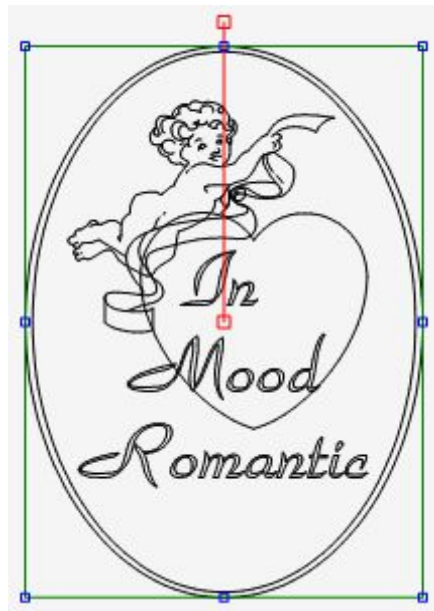


Figure 3.2 PLT vector image

Select object: Click any position of the contour of the object to be added to the selection set, and then the system will automatically clear the selection set empty and add the clicked object to the selection set.

Object selection by framing: Press and hold the left key of the mouse and hold to drag the mouse and a rectangular frame will dynamically be displayed in the view. Make the frame envelop the single or multiple objects to be added to the selection set and then release the left key. The system will automatically clear the selection set empty and add the framed objects to it.

Empty selection set: Click at any blank area.

Graphic Drawing section

Point

Draw point, click left side tool menu button, and left click at suitable place.

Shortcut button:



Line

1. Left click at the start point of the straight line,
2. Drag the mouse, and the track of straight line will be changed dynamically
3. Left click at the end point of the straight line,

Shortcut button:



Circle

1. Left click mouse at the circle center,
2. Drag the mouse until the desired circle is shown dynamically
3. Click left button at a desired point to end drawing.

Shortcut button:



ClockWiseArc

1. Click spiral shortcut and pop dialog box, select "ClockWiseArc" option.
2. Drag mouse to target position and release it, then move mouse and the track of arc will be changed dynamically.
3. Click mouse at suitable point to end drawing.

Shortcut button:



AnticlockwiseArc

4. Click spiral shortcut and pop dialog box, select "AntiClockWiseArc" option.


5. Drag mouse to target position and release it, then move mouse and the track of arc will be changed dynamically.
6. Click mouse at suitable point to end drawing.

Shortcut

button: 

Ellipse

1. Drag mouse to target place, click mouse to confirm ellipse's center, and then release it.
2. Click mouse at the second point, release it to confirm the first axis.
3. Click mouse at the third point, release it to confirm the second axis, and end drawing.

Shortcut button: 

RegularPloygon

Click tool button of the left side and pops a dialog box to set properties of corresponding polygon.

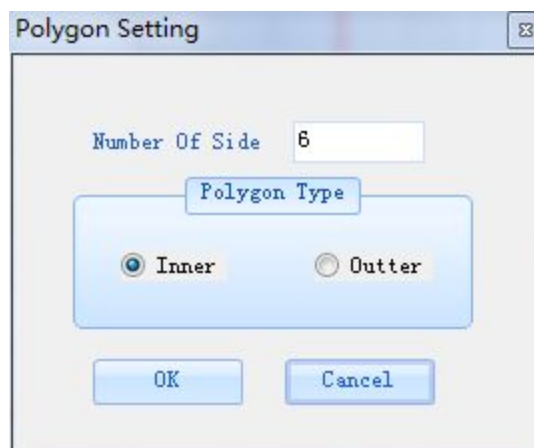




Figure 3.3 Insert regular ploygon

1. Press and hold the left button of mouse.
2. Drag mouse and the track of regular polygon will be changed dynamically.
3. Release the button at suitable point to end drawing.

Shortcut button: 


Rectangle

1. Left click the mouse
2. Drag mouse and the track of rectangle will be changed dynamically.
3. End drawing at suitable point.

Shortcut button: 

Closedpolygon

Repeat left click mouse, release, move actions till arrive suitable position, end drawing closed polygon.

Shortcut button: 


Polyline

Repeat left click mouse, release, move actions till arrive suitable position, end drawing polyline.

Shortcut button: 


BCure

Repeat left click mouse, release, move actions till arrive suitable position, end drawing B cure.

Shortcut button: 

DrawBezier

Repeat left click mouse, release, move actions till arrive suitable position, end drawing Bezier.

Shortcut button: 

Text

1. Click text button of the left toolbar and pops the following dialog box

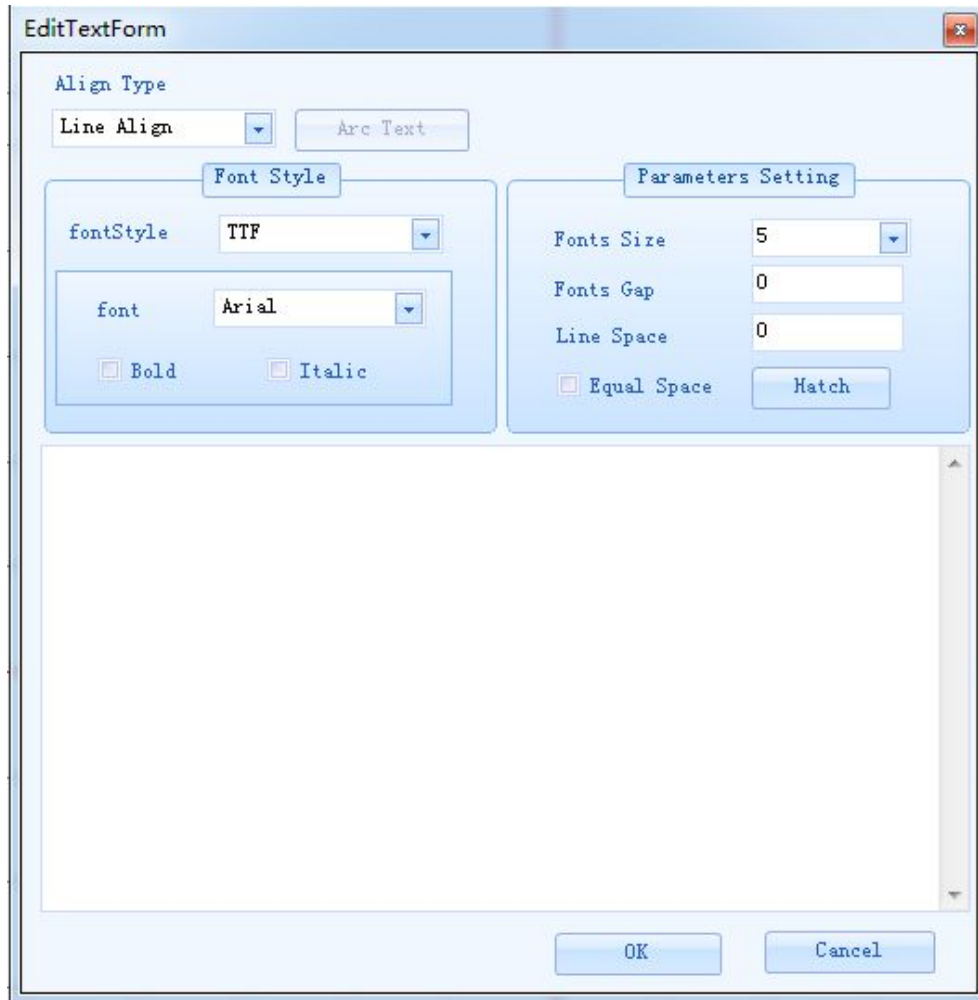



Figure 3.4 Text edit dialog box

4. Press and hold the left button of mouse.
2. Select reliable parameters, input text and click "OK".
3. The texts will appear after left click at suitable place on canvas.

Shortcut button: 

About text

WINDOWS (TTF) font: TTF font is one of standard fonts used generally in WINDOWS OS, which the marking software can use. User can select standard font and style, and fill it (The details please see Hatch part)

Single line font (SHX): SHX font is used for SHX files of AutoCAD, this font cannot be filled. It includes English/Digit, Chinese. When choose English/Digit it can only inputs English, Digit, and special symbol. When choose Chinese it cannot inputs English, Digit, and special symbol.

Dot font: Dot font is combined by dot, the text that laser marked is structure by some dots.

Font height: Means the height of text, the unit is millimeter (mm), 24 means 2.4 millimeters.

Word spacing: Default as 0, or it based on user's input.

Align Type

Texts align type includes line align and arc align, the following figure shows the align type:

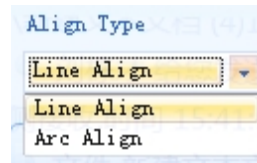


Figure 3.5 Text align type

Select arc align to act "Arc Align" button:



Figure 3.6 Arc align type

Click "Arc Align" button and pops out the following interface:

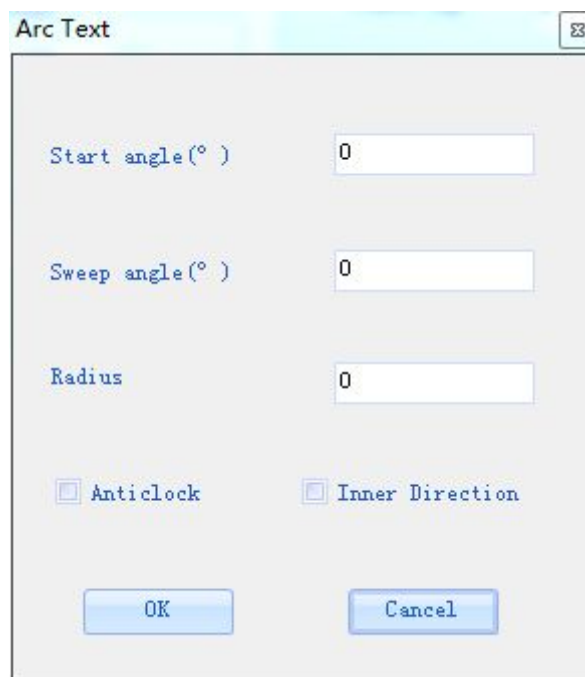


Figure 3.7 Arc text setting dialog box

Start angle: The angle of the first word;

Sweep angle: The angle of arc;

Radius: Radius of arc;

Clockwise: The direction of text is clockwise.

Anticlockwise: The direction of text is anticlockwise.

Inner Direction: The top of the text is toward to inside or outside.

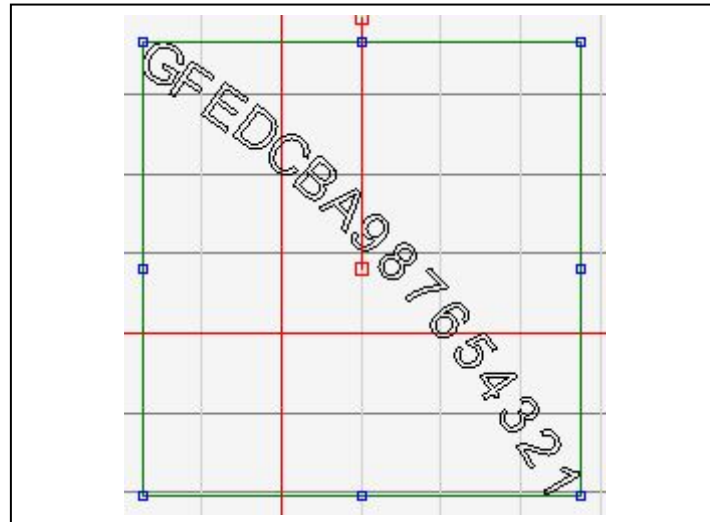


Figure 3.8 Arc text impression

changeText

1. Operate following the previous process, select the arc text and “changeText” will appear at “properties management” dialog box which is located at lower left corner of main interface.

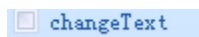


Figure 3.9 changeText

2. The following interface will appear after tick “changeText”:



Figure 3.10 Jump number setting window

Jump number: Set jump number, the application of jump number will be detail later.

Date: Set date of text, the application of date will be detail later.

Delete: It can delete object which in “changeText” dialog box.

Edit: It can edit object which in “changeText” dialog box, its function is almost the same with Add.

up: Revise upward object which in “changeText”.

down: Revise downward object which in “changeText”.

Jump number

Single click “Add” in changeText and pops up the following dialog box;

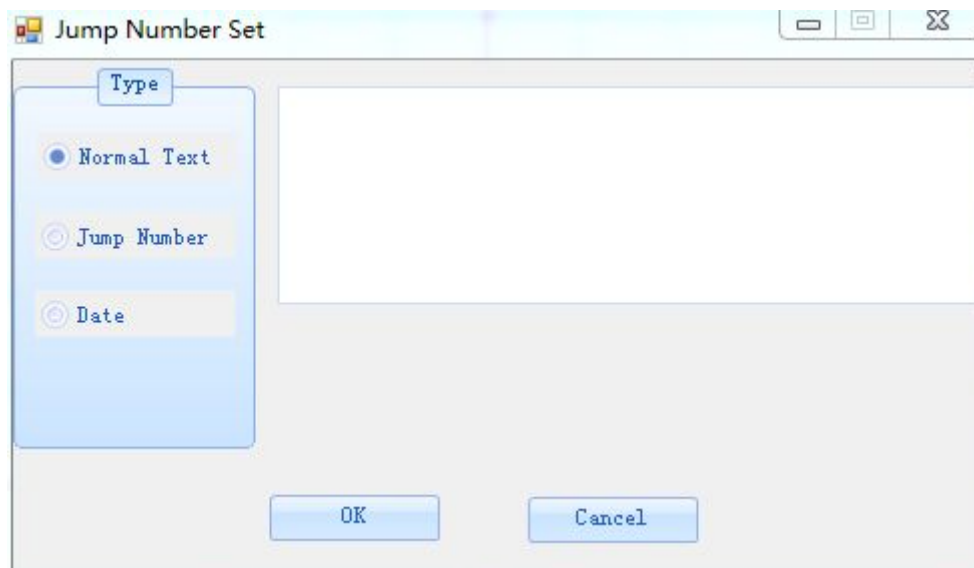


Figure 3.11 Normal text setting

Jump number: A dialog box will pops up when choose jump number:

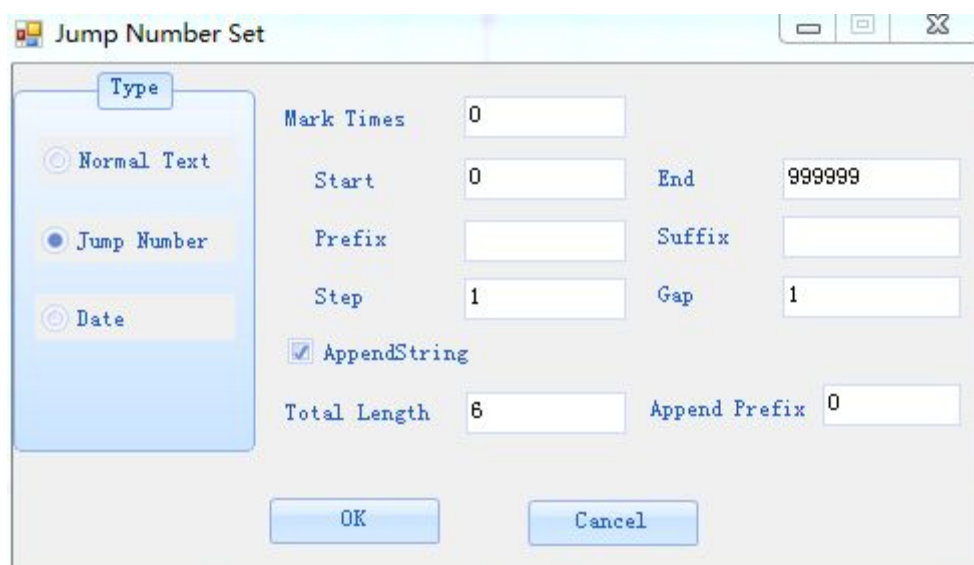


Figure 3.12 Jump number setting window

Mark times: Count the current mark time.

Start: The beginning size of jump number, digit input only.

End: The finish size of jump number, digit input only.

Prefix: The content defined by user added at front of jump number, such as: "Hans000000", "Hans" is the prefix, "000000" is the number that need jumped.

Suffix: The content defined by user added at behind of jump number, such as: "000000Hans", "Hans" is the suffix, "000000" is the number that need jumped.

Step: The increase value or decrease value of each mark, its value should equal to the number of rows multiplied by the number of columns.

Gap: The difference between the previous value and the following value. For instance, the start number is 100, the gap is 10, the number in the first text is 100, in the second one is 110, in the third one is 120, the following accumulations are like these.

AppendString: Set total length and prefix of jump number.

Total length: The total length of whole jump number.

Append Prefix: If total length of jump number is longer than total length of end point, use append prefix to fill vacancies. For instance: The start is 0 and the end is 100, gap is 10, total length of jump number is 6, Append prefix is H, thus, the first number of jump number is "HHH000", the second one is "HHH010", the last one is "HHH100".

After parameters setting complete, click "OK", and the textbox will appear a number "000000", click "OK" at last. Right click mouse on canvas and the following content will appear:



Figure 3.13 Text content

Select this text, right click mouse and select jump number button as following figure shows.

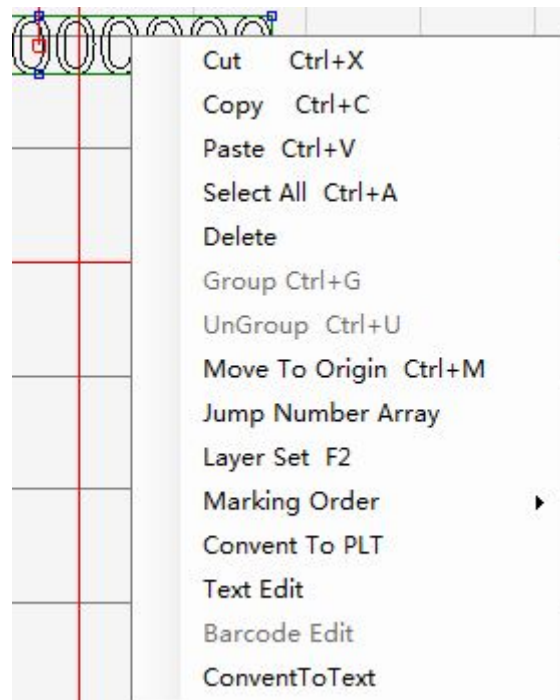


Figure 3.14 Set jump array

The following dialog box will pop up after click jump number button.

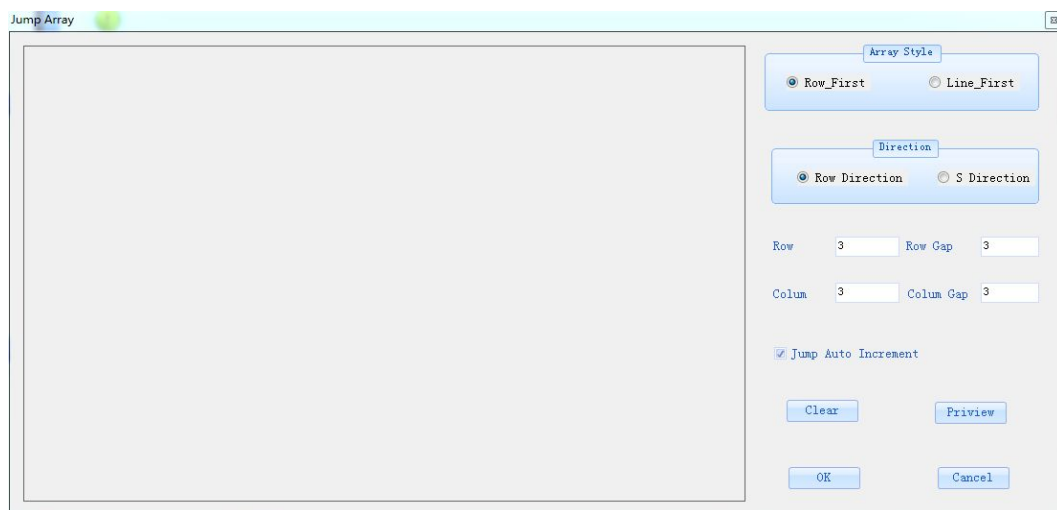


Figure 3.15 Jump number preview dialog box

The left side is preview window of jump number, the right side is preferences, and it can set priority mode and direction. The product of row's number and column's number has to equal to the step or it will make error.

After corresponding parameters are selected. Set row's gap is 20, column's gap is 25, and other parameters are default values. Click "OK" and the following graphic will appear on canvas.

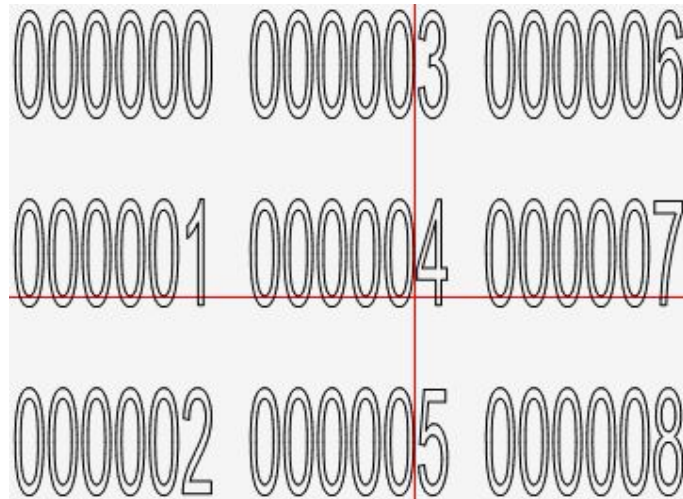


Figure 3.16 Text jump impression

Besides, we can also checking setting through preview window. At this moment, all the settings of jump number is complete.

Date and time

Single click “Add” in changeText and pops up the following dialog box;

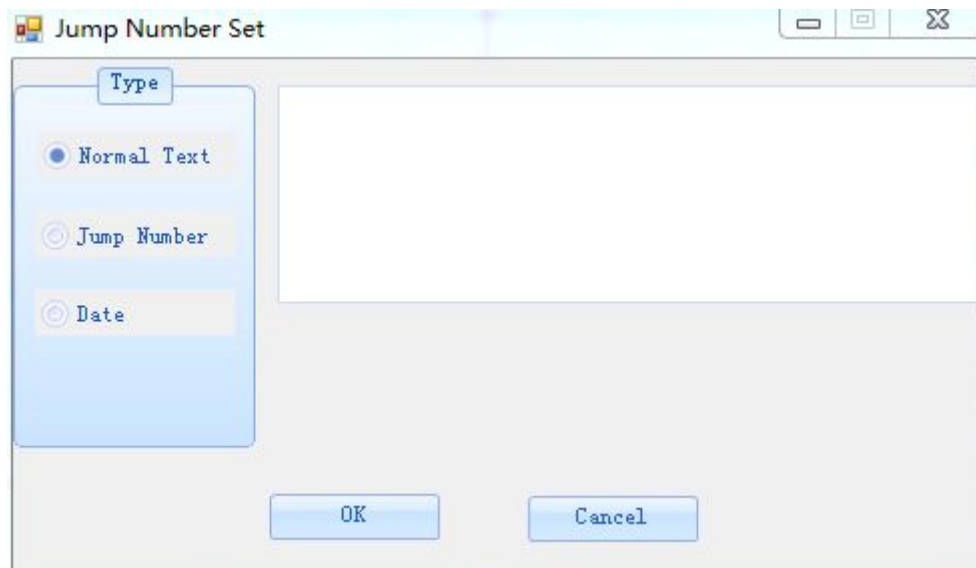


Figure 3.17 Normal text setting window

1. Date: A dialog box will pop up when choose date, user can select date time by their requirement. (日期英文名称拼写错误)

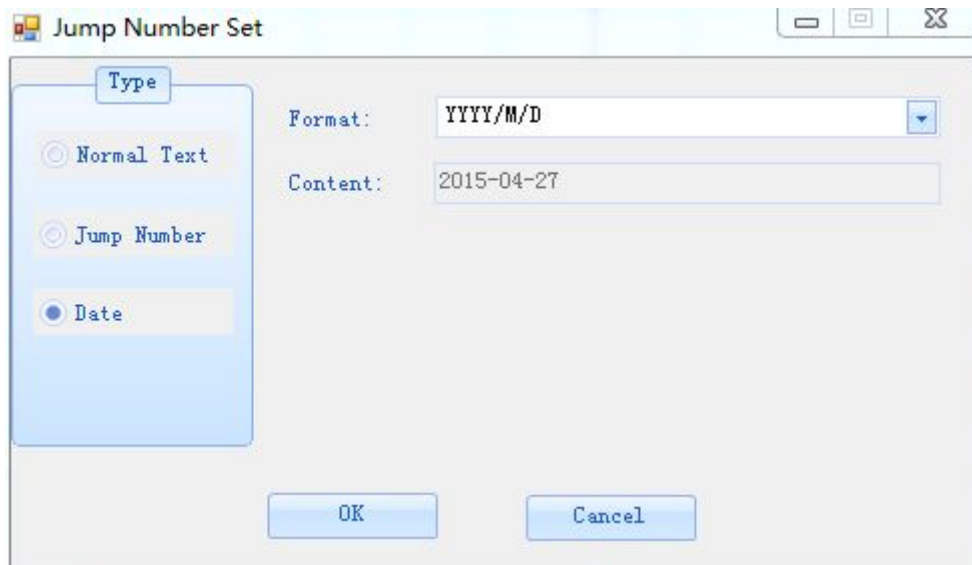


Figure 3.18 Jump number setting window

Vector image

- Click vector image button of left toolbar and pops the following dialog box, it can select files that need to be imported (PLT, DXF).

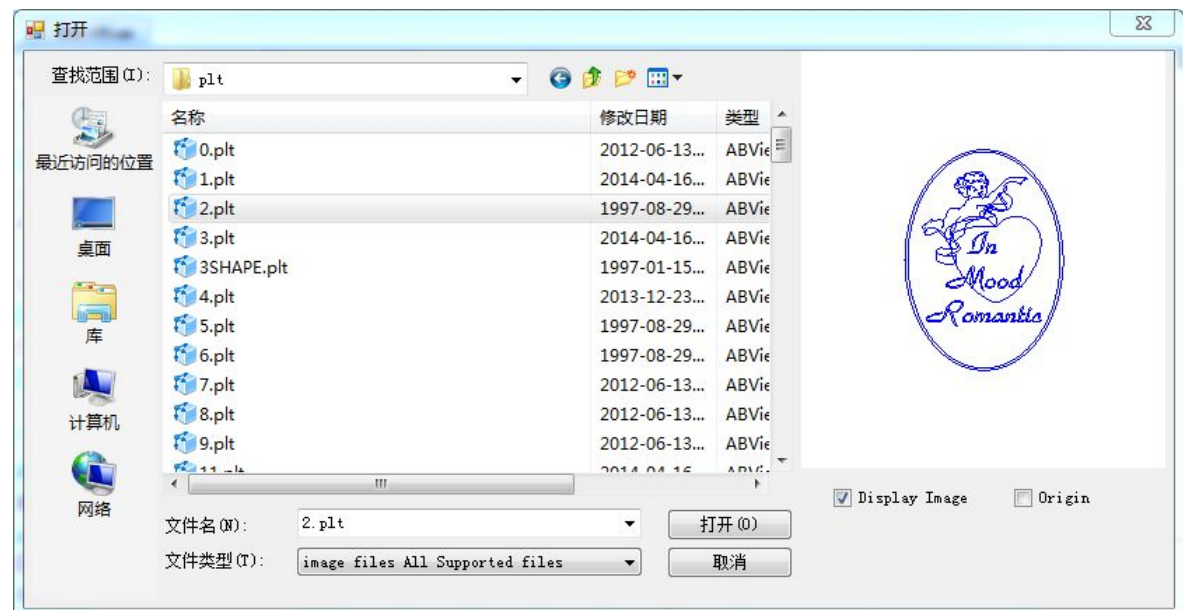



Figure 3.19 Vector image insert dialog box

- Select file in the dialog box, and it could be previewed at the right side of the dialog box.
- Left click mouse at suitable place of canvas, the vector image will appear on canvas with the ration of 1:1 after release mouse button.

Shortcut button: 

Bitmap

1. Click vector image button of left toolbar and pops the following dialog box, it can select images that need to be imported.

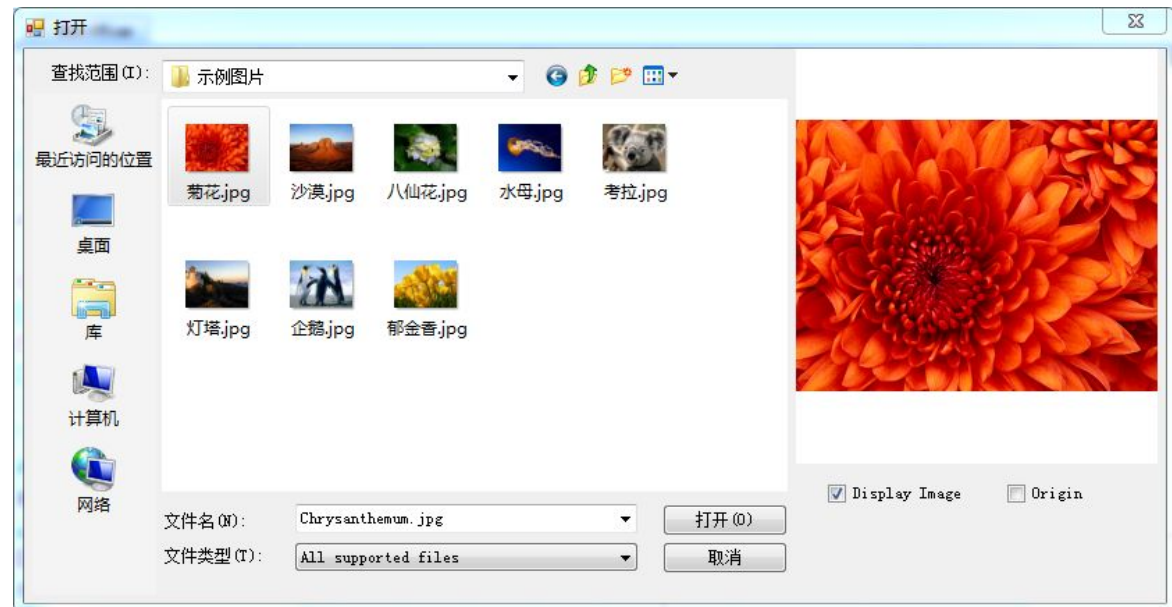



Figure 3.20 Image insert dialog box

2. Select file in the dialog box, and it could be previewed at the right side of the dialog box.
3. Left click mouse at suitable place of canvas, the vector image will appear on canvas with the ration of 1:1 after release mouse button.

Shortcut button: 

NOTE: Besides draw graphic by user, this system could also receive other standard format files of image or graphic. The types of file that can be supported could be checked by click “File type” drop-down menu of dialog box. Such as PLT file of HP-GL format, DXF file of graphics exchange format (Only a part of the files could be supported), BMP file of bitmap. These files could be created by general processing software, such as PLT and DXF files that created by AutoCAD, PLT, DXF, and BMP files that created by CorelDRAW, BMP, JPG, PNG, and ICO files that created by Photoshop.

Files created by the above software could be called by this system through “Import function”, and keep the correct size ratio without any adjustments.

Grid

1. Click grid button of left toolbar and set grid properties, and click “OK” as following figure shows.

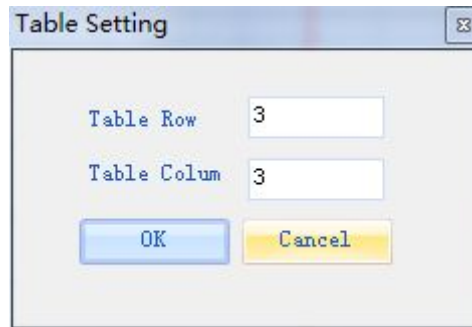



Figure 3.21 Grid insert dialog box

2. Left click on drawing space and drag the mouse, and the track of rectangle will be changed dynamically.
3. End drawing at suitable point.

Shortcut button: 

Barcode

1. Click vector image button of left toolbar and pops the following dialog box.

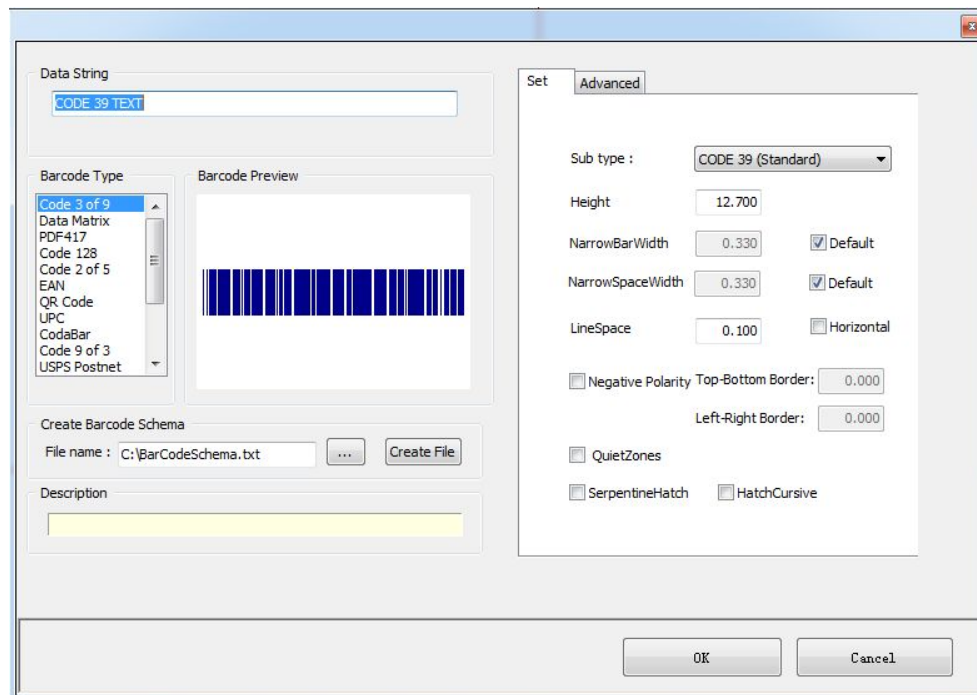



Figure 3.22 2-dimension code insert dialog box

2. Click "OK" after parameters setting complete.
3. Left click on drawing space and drag the mouse, and the track of barcode will be changed dynamically.
4. End drawing at suitable point.

Shortcut button: 

Barcode examples

1. PDF417

A PDF417 code is a continuous 2D barcode, which has several rows, variable length, high capacity and high error correction capability.

Rows of barcodes: Each PDF417 barcode is a stacked barcode symbol, consisting of 3 to 90 rows. However, the area of barcode is fixed, and the barcode will become dense and unclear if this value is increased.

2. CODE39(standard)

CODE39 often used for asset management, membership card, store code management, products label and so on because data content supports 0~9, A~Z etc. Because the density of barcode could be adjusted, by this reason, it has less limitations and high resilient when using.

The content length of CODE39 (standard) could be 1~N code, and it has no limitation when using. "*" should be added at the start and end of data as "start code" and "end code" to let code reader identify and use, thus, "*" cannot be used as data content. For example: *123ABC* is correct but *123*ABC* is wrong.

3. CODE39 (full ASCII)

CODE39 (full ASCII) is the enhanced version of CODE39 (standard), the data content add to support a~z, !@#\$%^&etc, the using of CODE39 (full ASCII) is the same as CODE39 (standard).

4. Codabar

When using Codabar, start & end code "A, B, C, D" should be added at the start and end of data content. The length of data has no limitation, but data content can only support 0~9, and "+", "-", "*", "/", "\$", ".", ",", ":", those 7 special symbols. For example: b567890c.

5. EAN8

EAN supports digit 0~9 and its length is 8 codes, the last code is check code.

6. UPC

UPC is generally used in United States and Canada, and only support digit 0~9. It has a check code and often used for smaller products. UPC is the predecessor of EAN. The characteristics of UPC: Only supports digit coding and can only has bits, needs check code.

7. Code128

Code128 has A, B, C three types of start code. The support data range of type A and Type B are almost the same (0x00~0x7F), type C can only supports digit parts and its data length should be even number. The length of data has no limitation, but it has less resilient when using.

8. Data Matrix

Data Matrix is a kind of matrix 2-dimension barcode, its conception of development is save more information on smaller barcode. The minimum size of datamatrixx is also the minimum size of all kinds of barcode. It especially suit for signs of tiny part, and printed on physical directly.

9. MaxiCode

MaxiCode is a kind of 2-dimension code with medium capacity and fixed size. It is combined by connected hexagon module and the finder pattern which is located at the center of symbols. Maxicode is specially designed for high speed scanning, and is mainly used for searching and tracking of package.

Spiral

1. Click vector image button of left toolbar and pops the following dialog box.

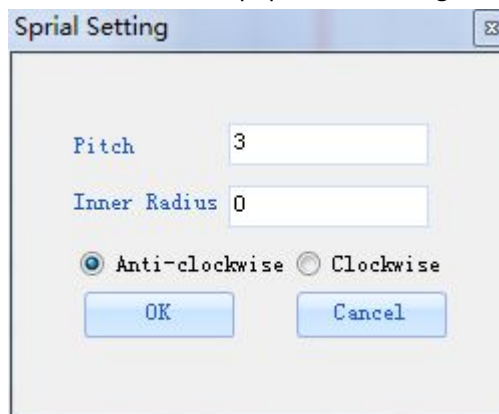



Figure 3.23 Spiral insert dialog box

2. Click "OK" after parameters setting complete.
3. Left click on drawing space and drag the mouse, and the track of barcode will be changed dynamically.

Shortcut button: 

Delay

Click delay icon and it will add a delay object, as following figure shows.

Function: Delay between multi objects. Unit: ms
Properties' setting is shown in following figure.



Figure 3.24 Delay setting dialog box

IO output

Click IO output icon and it will add a delay object, as following figure shows.



Figure 3.25 IO output

Function: Output IO signal during marking process.

Properties' setting: First, set the valid signal bit, then select high level and low level of voltage (If selected the voltage is high, otherwise the voltage is low) and set time duration. The effect is shown in following figure.

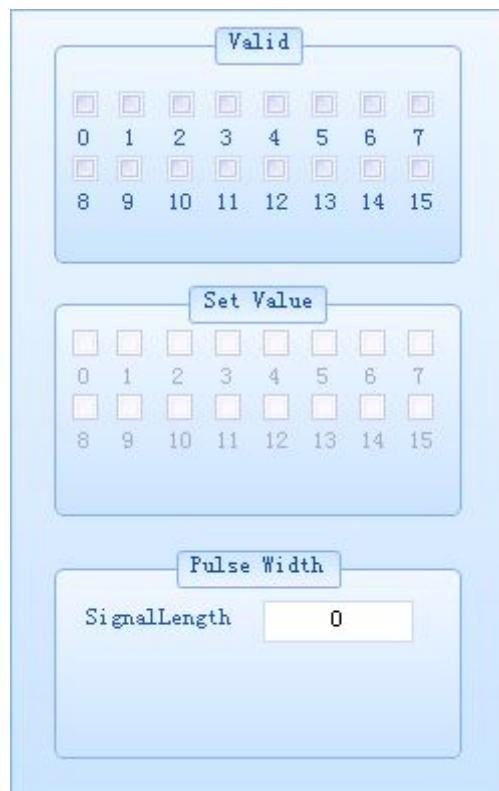


Figure 3.26 IO output setting dialog box

IO input

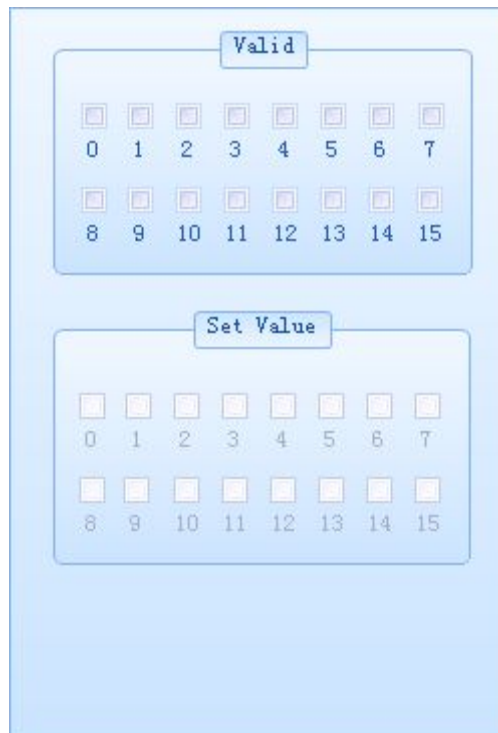
Click IO output icon and it will add a delay object, as following figure shows.



Figure 3.27 IO input

Function: Continue after input during marking process.

Properties' setting: First, set the valid signal bit, then select high level and low level of voltage (If selected the voltage is high or the voltage is low). The effect is shown in following figure.



The dialog box is titled "Valid" and "Set Value". It contains two sections, each with a grid of 16 checkboxes arranged in two rows of eight. The top section is labeled "Valid" and the bottom section is labeled "Set Value". The checkboxes are numbered 0 through 15.

Valid															
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
0	1	2	3	4	5	6	7								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
8	9	10	11	12	13	14	15								

Set Value															
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
0	1	2	3	4	5	6	7								
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								
8	9	10	11	12	13	14	15								

Figure 3.28 IO input setting dialog box

Hatch

1. Click vector image button of left toolbar and pops the following dialog box.

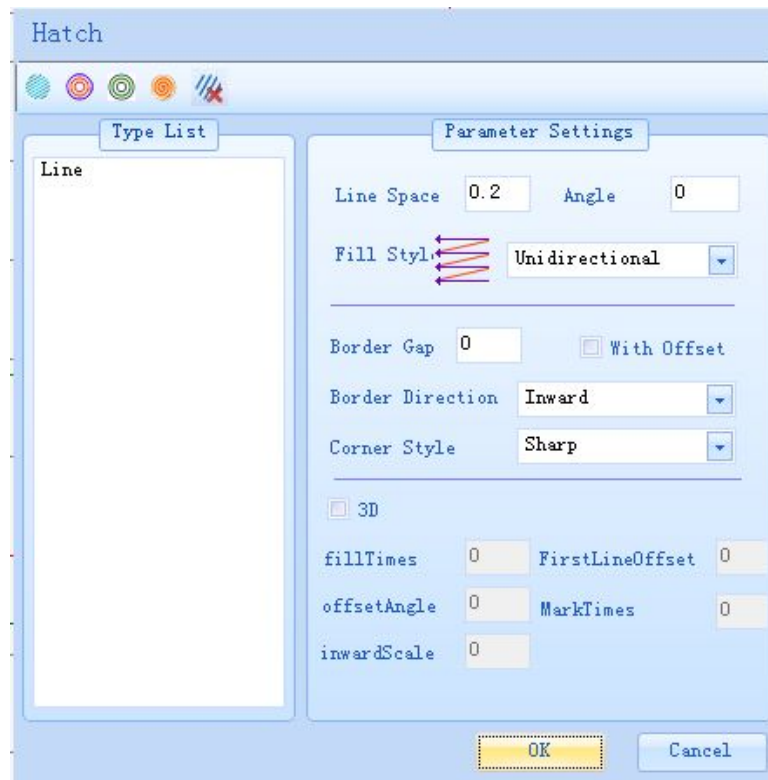


Figure 3.29 Fill setting dialog box

About how to use fill tool will explained more in the second section “Vector image filling setting” of this chapter.

Graphic operate part

Move object

1. Move mouse to the inside of graphic till the cursor become “finger”.
2. Press and hold left button of mouse.
3. Drag mouse and the track of graphic position will be changed dynamically.
4. Release mouse at suitable point. Or fine-turn the position by CTRL + direction key.

Transverse tensile

1. Move mouse to transverse tensile control point of tracker till the mouse become cursor.
2. Press and hold left button of mouse.
3. Drag mouse and the track of tensile status will be changed dynamically.
4. Release mouse till graphic stretched to suitable size.

Longitudinal tensile

1. Move mouse to Longitudinal tensile control point of tracker till the mouse become cursor.
2. Press and hold left button of mouse.
3. Drag mouse and the track of tensile status will be changed dynamically.
4. Release mouse till graphic stretched to suitable size.

Zoom

1. Move mouse to corner control point of tracker till the mouse become cursor.
2. Press and hold left button of mouse.
3. Drag mouse and the track of tensile status will be changed dynamically.
4. Release mouse till graphic zoomed to suitable size.

3.2 Vector image filling setting

Initial setting of object

Select vector image of drawing space and click “Home” button of menu bar, and select “Hatch” tool at “Shortcut” option, or select “Graphic Edit View”-“Drawing bar”-“Hatch” and pops the following dialog box.

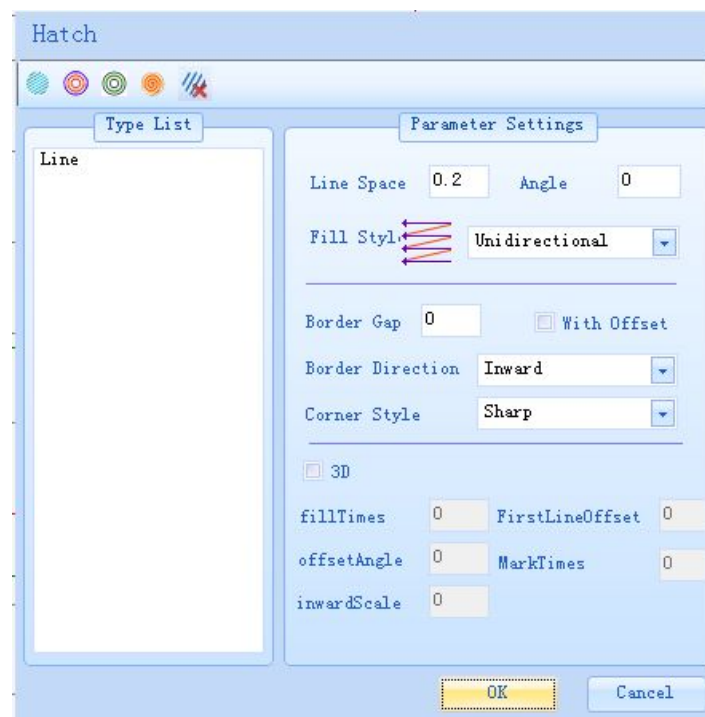


Figure 3.30 Fill setting dialog box

Hatch dialog box provides 5 operations. They respectively are Line Hatch, Offset Hatch, In/Out Hatch, Spiral Hatch, and Delete Hatch, their icons from left to right are shown in the following figure.

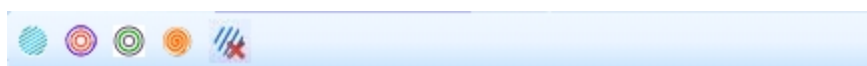


Figure 3.31 Filling button shortcut toolbar

If a PLT file is imported on drawing board like the following figure shows.

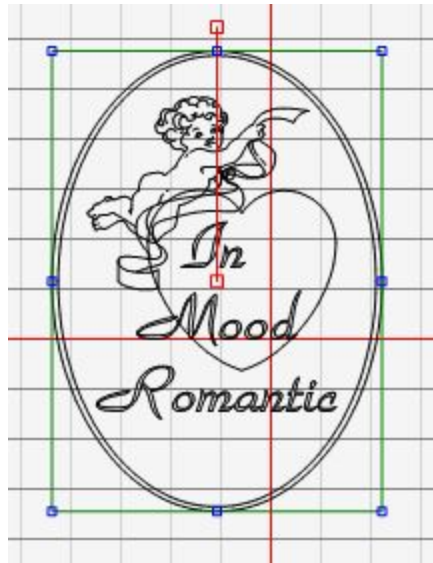


Figure 3.32 PLT vector image

A dialog box will pop up after select PLT graphic and click line hatch button. Fill style can be selected by in dialog box, default that the opened interface is determined by user click offset type, and user could revise corresponding filling parameters to achieve ideal effect.

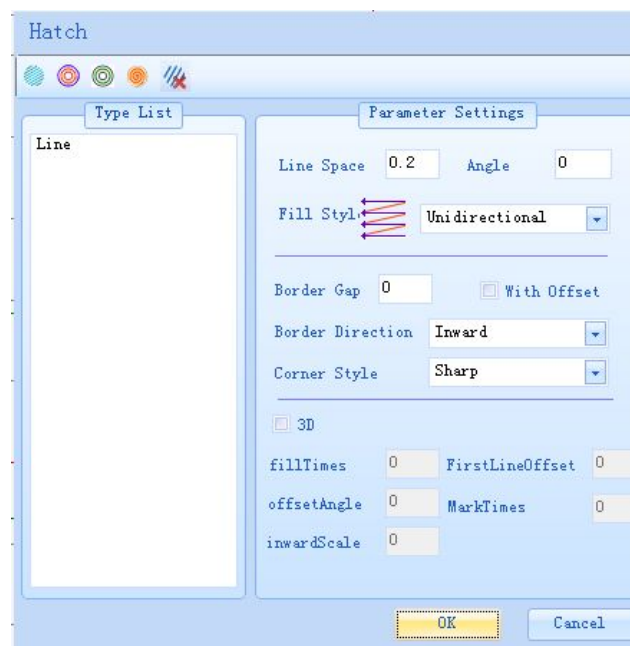


Figure 3.33 Straight line filling dialog box

Filling effect is shown in figure 3-4:



Figure 3.34 Filling impression

Definition of filling parameters

Line filling parameters definition

Dialog box of line filling is shown in following figure.

[Line space]: Set space between filling line. Unit: mm.

[Angle]: Angle of filling line. The default is 0 and range is (-360,360).

[Fill style]: Path of filling line. It includes multi styles such as single direction, double directions, S-shaped and so on. User can select style according to their requirement.

[Board gap]: Space between filling content and outline board. Unit: mm

[With offset]: Whether draw the outline board of filling line after offset.

[Board Direction]: Offset direction of filling line, it includes inward and outward.

[Corner Style] When board direction is outward this function is available, includes smooth transition and sharp transition.

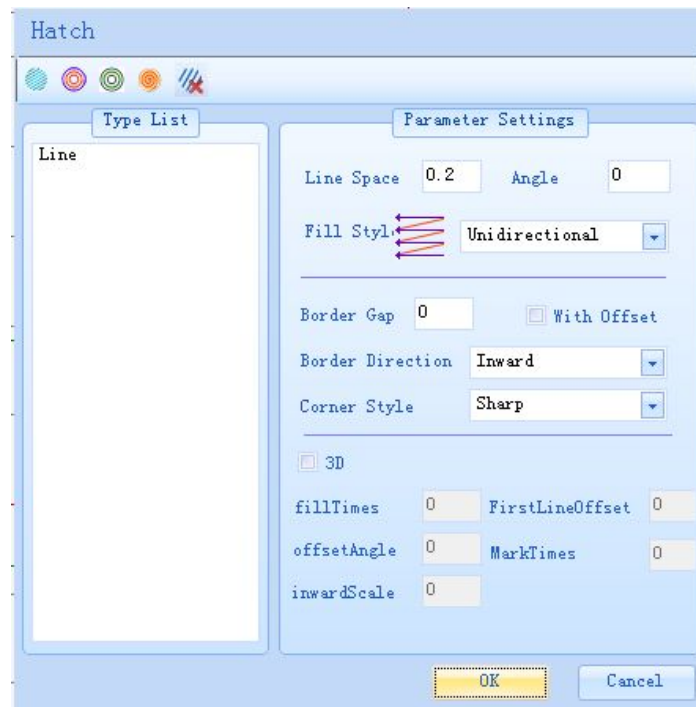


Figure 3.35 Straight line filling dialog box

Offset filling parameters definition

The dialog box of offset filling is shown in the following figure.

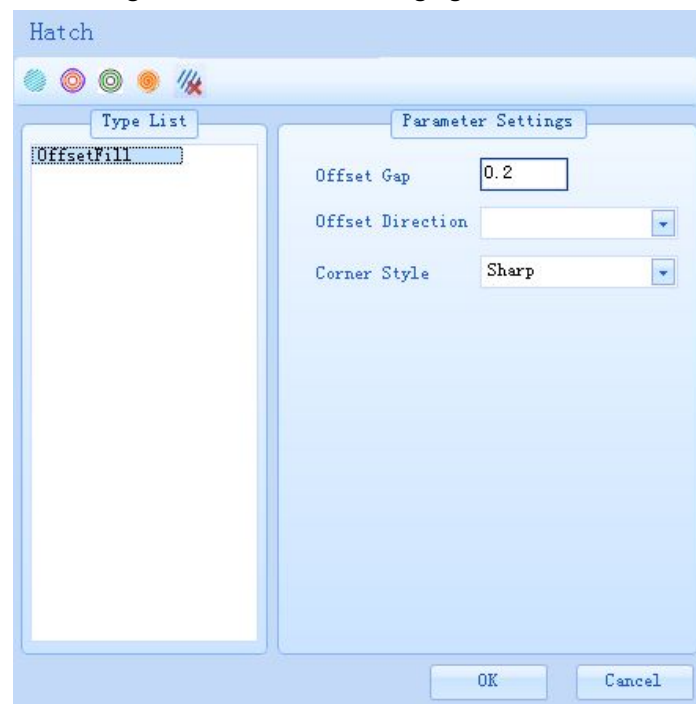


Figure 3.36 Offset filling dialog box

[Offset Gap]: Set Gap between filling line. Unit: mm.

[Offset direction]: Offset start position, includes inward and outward two types.
[Corner Style] Transition of filling graphic, includes smooth and sharp two types.

In/Out filling parameters definition

The dialog box of In/Out filling is shown in the following figure.

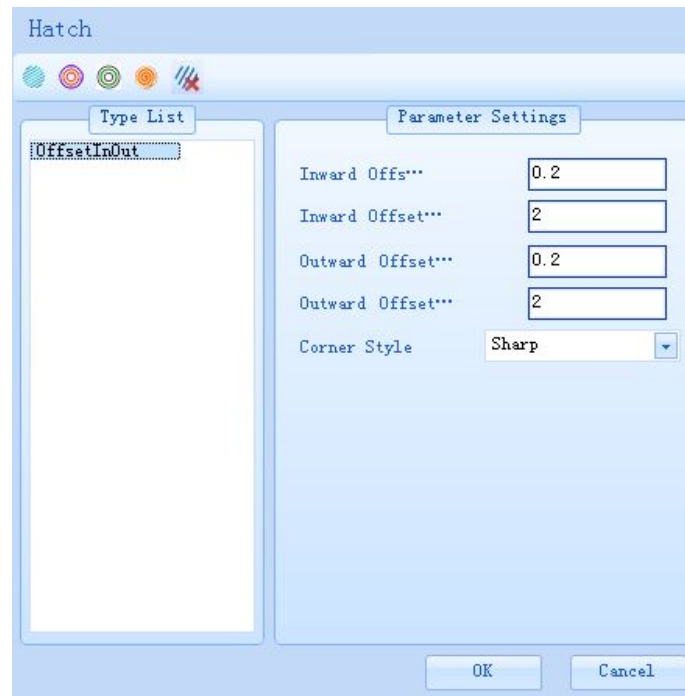


Figure 3.37 In/Out filling dialog box

[Inward Offset Gap]: The distant of graphic inward offset. Unit: mm.
[Inward Offset Number]: The number of graphic inward offset.
[Outward Offset Gap]: The distant of graphic outward offset. Unit: mm.
[Outward Offset Number]: The number of graphic outward offset.
[Corner Style] Transition of filling graphic, includes smooth and sharp two types.

Spiral filling parameters definition

The dialog box of In/Out filling is shown in the following figure.

[Helix Gap]: Set Gap between filling line. Unit: mm.
[Helix direction]: Offset start position, includes inward and outward two types.
[Corner Style] Transition of filling graphic, includes smooth and sharp two types.

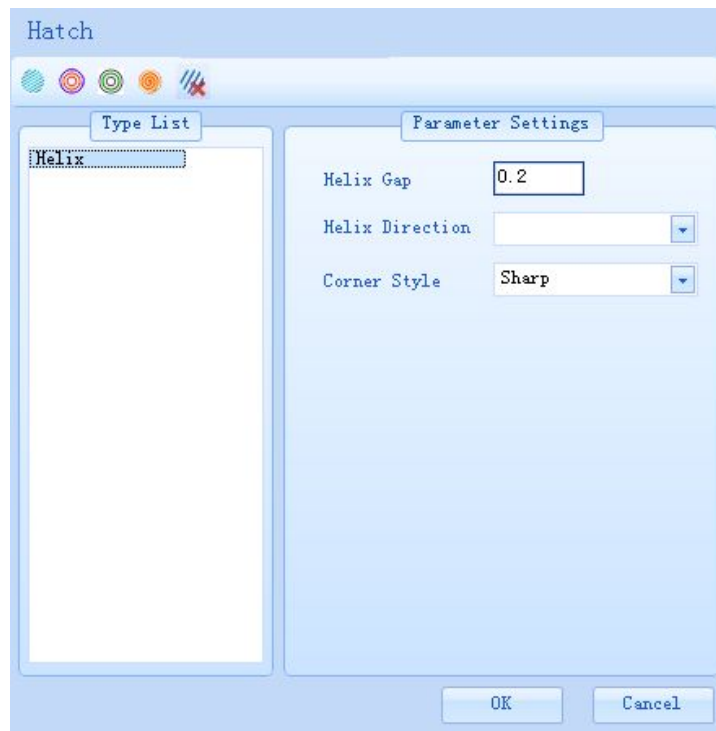


Figure 3.38 Spiralfilling dialog box

Assembly Objects filling

1. Draw multi overlapping objects (Like circle and rectangle).
2. Pick multi overlapping objects (Like circle and rectangle).
3. Filling objects and the effect is shown in following figure.

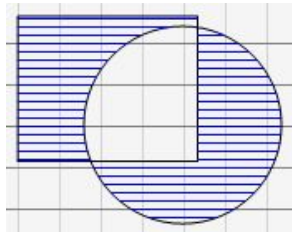


Figure 3.39 Assembly objects filling impression

Multiple overlapping objects filling

1. Draw multi overlapping objects (Like circle and rectangle).
2. Pick multi overlapping objects (Like circle and rectangle).
3. Filling objects and the effect is shown in following figure.

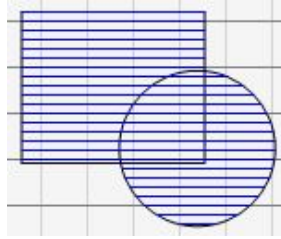


Figure 3.40 Multiple objects filling impression

Revise Filling line setting

1. Pick the object that need to be revised
2. Select “filling” command or double click the filling object.
3. Revise filling properties.
4. Click “OK”.

Remove filling line

1. Pick the object that need to be revised
2. Select “Delete” command.

Graphic Transformation setting

Graphic Mirror

Click “Tool” button at toolbar after select vector image in drawing area. As the following figure shows, the graphic transformation includes mirror mode and Move to origin mode.



Figure 3.41 Graphic transform toolbar

Mirror mode includes horizontally and vertically two types, as the following figure shows:

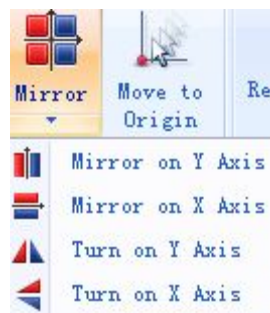


Figure 3.42 Graphic mirror toolbar

[Mirror on Y Axis]: Rollover selected object based on Y axis.

[Mirror on X Axis]: Rollover selected object based on X axis.

[Turn on Y Axis]: Rollover selected object based on its Y symmetry axis.

[Turn on X Axis]: Rollover selected object based on its X symmetry axis.

[Move to Origin]: Move the selected object to the center of canvas.

Graphic Array Setting

Rectangular array

Select one or multiple graphics, click menu options “tool” as the following figure shows

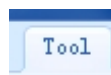


Figure 3.43 Array toolbar

Then, click “Rectangular Array”, as the following figure shows.



Figure 3.44 Rectangular array button

The following figure shows the dialog box of rectangular array.

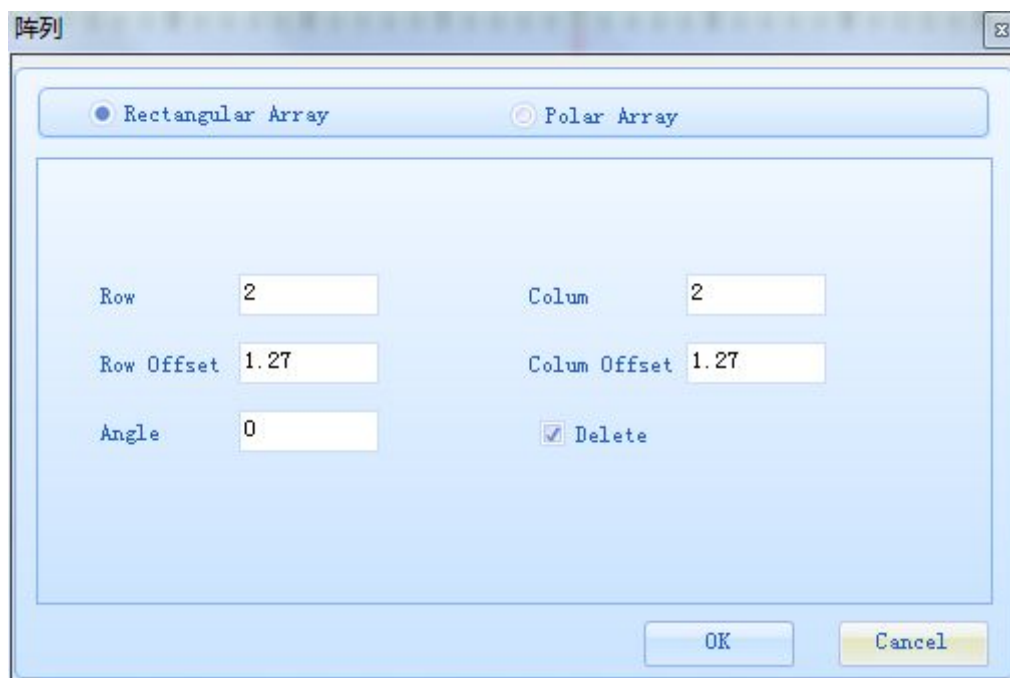


Figure 3.45 Rectangular array setting dialog box

Parameters Declaration

[Row] The number of rectangular array's row.

[Column] The number of rectangular array's column.

[Row Offset]: The edge distance between neighboring graphics of each row.

[Column Offset]: The edge distance between neighboring graphics of each column.

[Angle]: The rotational angle of all graphics after array is complete.

[Delete]: Whether delete the original graphic.

Polar array

Select one or multiple graphics, click menu options "tool" as the following figure shows

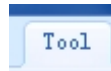


Figure 3.46 Array toolbar

Then, click "Rectangular Array", as the following figure shows.



Figure 3.47 Polar array button

The following figure shows the dialog box of polar array.

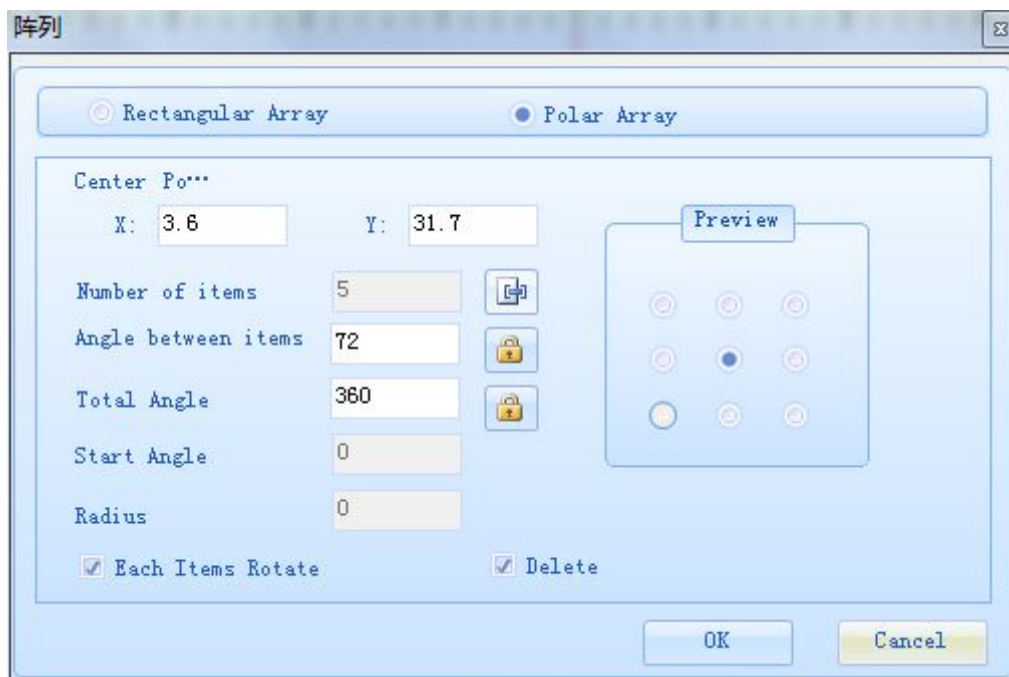


Figure 3.48 Polar array setting dialog box

Parameters Declaration

[Center point] X and Y coordinate values of rotational center

[Number of items] Number of graphics

[Angle between items] Angle difference between rotational graphics

[Total Angle] Set the maximum rotational angle

[Each Items Rotate] Whether rotate the graphic when it is in polar array.

[Delete]: Whether delete the original graphic.

Graphic Arrange

Arrange menu

Click “Arrange” button at toolbar, as the following figure shows this system provides multiple arrange styles for user such as align style, adjust size, and horizontally distribute.

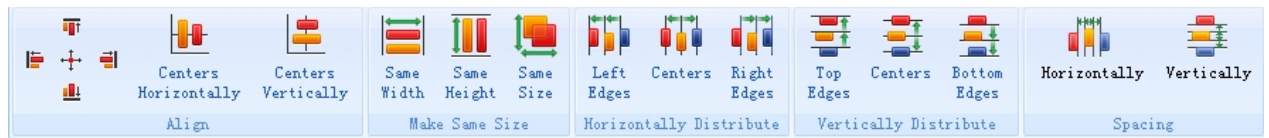


Figure 3.49 Graphic alignment toolbar

Align

[Left align] Set the finally draw graphic be the benchmark and align left edges of other graphics with the left edge of this graphic

[Right align] Set the finally draw graphic be the benchmark and align right edges of other graphics with the right edge of this graphic

[Top align] Set the finally draw graphic be the benchmark and align top edges of other graphics with the top edge of this graphic

[Bottom align] Set the finally draw graphic be the benchmark and align bottom edges of other graphics with the bottom edge of this graphic

[Centers Horizontally] Set the finally draw graphic be the benchmark and horizontally align center points of other graphics with the center point of this graphic

[Centers Vertically] Set the finally draw graphic be the benchmark and vertically align center points of other graphics with the center point of this graphic

Make same size

[Same Width] Set the finally draw graphic be the benchmark and make two graphics have same width

[Same Height] Set the finally draw graphic be the benchmark and make two graphics have same height

[Same Size] Set the finally draw graphic be the benchmark and make two graphics have same size

NOTE: If a circle included in selected graphics, then the benchmark is based on circle's size

Horizontally distribute

[Left Edges] Select at least three graphics on canvas, the position of both ends graphics do not change but adjust the middle graphics to make the left edge spacing of graphics be same

[Right Edges] Select at least three graphics on canvas, the position of both ends graphics do not change but adjust the middle graphics to make the right edge spacing of graphics be same

[Centers] Select at least three graphics on canvas, the position of both ends graphics do not change but adjust the middle graphics to make the horizontal distance between graphics' center be same

Vertically distribute

[Top edges] Select at least three graphics on canvas, the position of both ends graphics do not change but adjust the middle graphics to make the top edge spacing of graphics be same

[Bottom edges] Select at least three graphics on canvas, the position of both ends graphics do not change but adjust the middle graphics to make the bottom edge spacing of graphics be same

[Centers] Select at least three graphics on canvas, the position of both ends graphics do not change but adjust the middle graphics to make the vertical distance between graphics' center be same

Spacing

[Horizontally] Select at least three graphics on canvas and make the horizontal distance between each two graphics be same

[Vertically] Select at least three graphics on canvas and make the vertical distance between each two graphics be same

Authority Management

User authority management is a mode of laser marker. Its basic function is give different authority based on user's type.

Administrator has all function authorities, include add/delete other user, change password, change authorities and other authorities. Besides, administrator can operate all functions of software.

Engineer has fewer authorities than administrator, but more than NormalUse, all authorities of Engineer is distributed by administrator.

NormalUse has least authorities, all authorities of NormalUse is distributed by administrator.



Figure 3.50 Authority management toolbar

The following interface will pops up when change user.

Figure 3.51 User log-in interface

Different user name will appears when select different user type, and manual input is also allows, this system can verify the user type automatically. The start password of Hans is 8888, User can entry system after input password correctly.

The following window will pops up after click "User authority setting". In this window, administrator can distribute authority to non-administrator. Left click at the user name that wants to change authority, tick authority content at right side, the click OK and revising is complete.

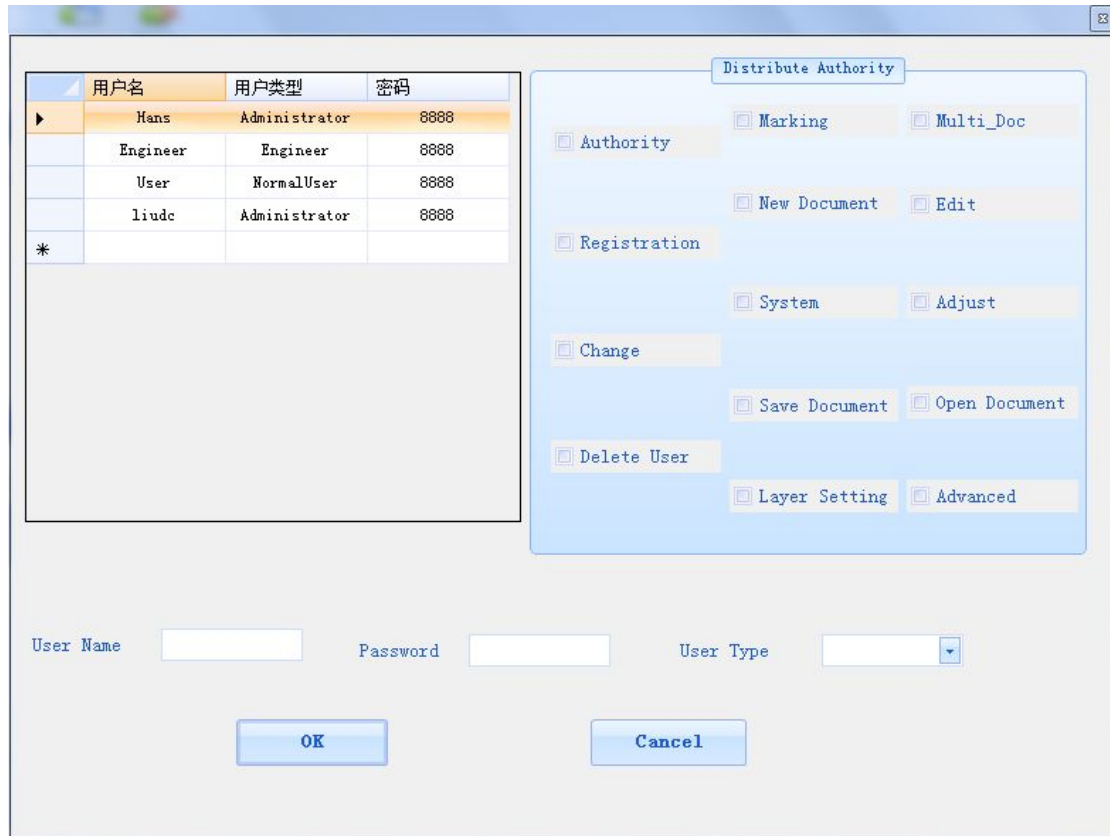


Figure 3.52 User authority setting dialog box

Other functions are also available here, such as change password, user register, and delete user.

Graphic Property management

After draw a graphic, the graphic property management interface will appears at lower left corner. In this interface, user can set graphic properties.

Rectangle Property	
X	-24.089
Y	-24.729
Z	0.000
Rotate Angle 0.000	
Height	36.027
Width	44.981
<input checked="" type="checkbox"/> Outline	<input checked="" type="checkbox"/> Hatch
<div>Hatch</div> <div>DeleHatch</div>	

Figure 3.53 Graphic property dialog box

Reference point X, Y, Z means the coordinate of graphic on canvas (Unit: mm), Rotate Angle means the angle of graphic, hatch setting and delete hatch is also available here.

Object management

Profile: Object management mainly used for operate layer and objects that added by user, see the following figure.

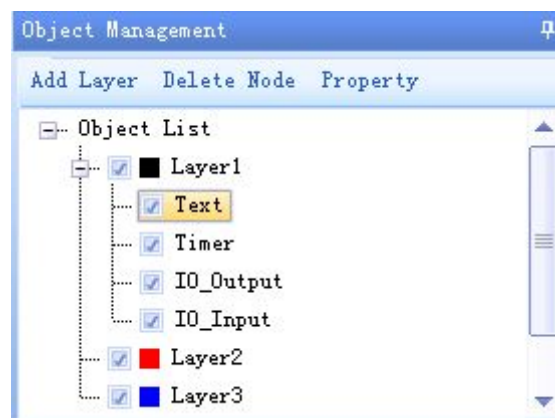


Figure 3.54 Node management window

[Add Layer] Add layer object

[Delete Node] Delete layer of user added object.

[Property] Manage own property of each layer. Instructions: Click "Layer Property" button and pops the following management window.

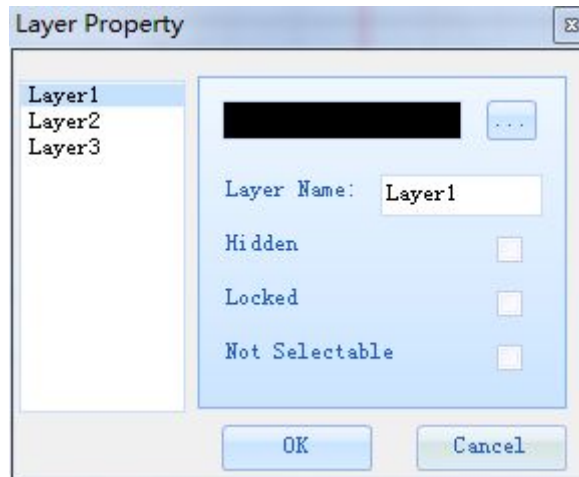


Figure 3.55 Layer management window

[Layer Name] Change layer name

[Color] Change layer color

Parameter Management

Profile: Parameter management mainly used for manages object list and layer, relationship between layer and graphics, and custom user parameters. Its operate interface is shown in following figure:

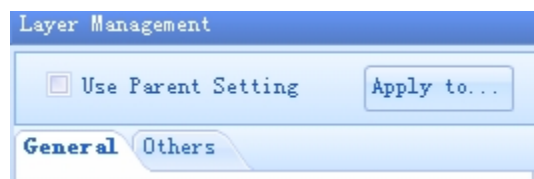


Figure 3.56 Parameter management window

This function manages object list, layer and graphic with three layers, the level from high to low is: object list, layer, graphic respectively. Layer should changing with the change of marking parameter when tick “Use Parent Setting”. Graphic is similarly.

The Fourth Chapter Document Mark

Mark Menu

Mark menu provides the following commands to achieve marking.



Figure 4.1 Marking toolbar

[Marking] Initialize marker to make it into normal marking state.

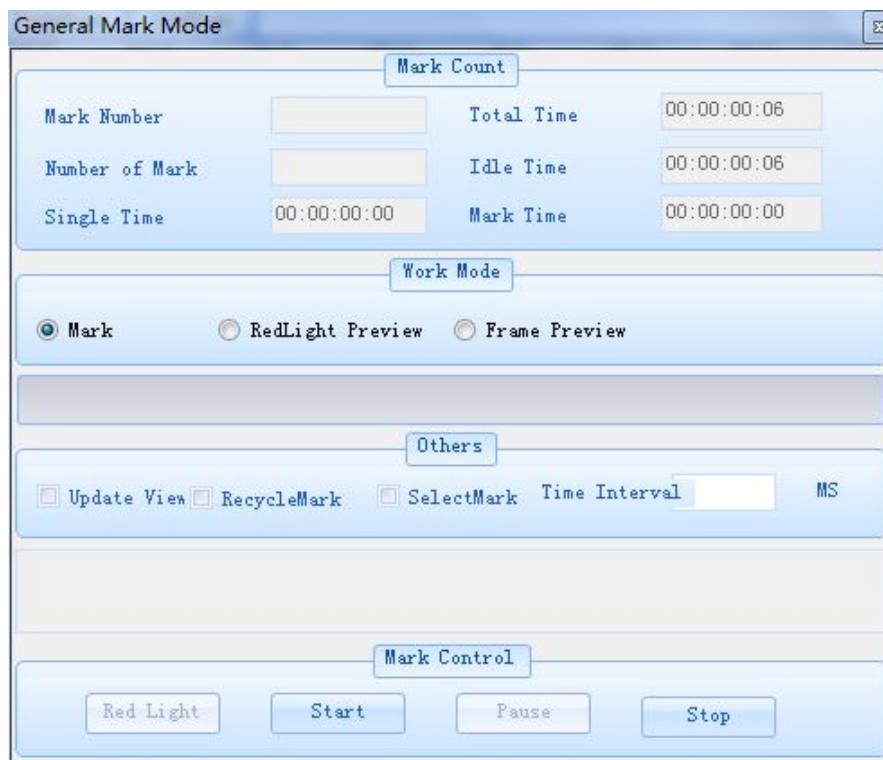
[Preview the Marking] Preview the marking operate process

[Multi Documents Marking] Marking multi opened documents based on set sequence.

4.1 Marking

4.1.1 Software Operate

Mark Window



The image shows a software dialog box titled "General Mark Mode". It contains several sections: "Mark Count" with input fields for "Mark Number", "Number of Mark", "Single Time", "Total Time", "Idle Time", and "Mark Time"; "Work Mode" with radio buttons for "Mark", "RedLight Preview", and "Frame Preview"; "Others" with checkboxes for "Update View", "RecycleMark", and "SelectMark", along with a "Time Interval" input field and a "MS" unit label; and "Mark Control" with buttons for "Red Light", "Start", "Pause", and "Stop".

Figure 4.2 Marking control dialog box

Select "Marking" of "Marking Option" at menu and pops "General Mark Mode" dialog box, as the previous figure shows.

Operate Explanation

Marking

Select "Marking" and click "Start", the marking process will begin, and progress bar will displays current marking state dynamically.

NOTE: At marking process, because laser is a kind of invisible ray, all person around the machine please stay safe.

RecycleMark

Tick “RecycleMark” and click “Start” button, continuously mark the objects in mark mission. Click “Stop” or “Pause” to stop operating if it is necessary.

Time Interval

The time delay from the marking process complete to the next marking process begins in recycle marking.

Update View

When mark jump number, if this option is ticked the object on screen will dynamically change with actual mark circumstance but mark efficiency will go lower.

Redlight Preview

For the markers that have red light tip, it allows to preview the whole marking process according to this function before laser marking. Tick “Redlight Preview” and click “Start” button, the user can watch whole marking process. Progress bar will dynamically displays current marking state in preview state.

Frame Preview

For the markers that have red light tip, it allows to preview the marking space according to this function before laser marking

Redlight

Switch red light tip

Mark Count

System could automatically count the data of marking, includes mark time, number of mark, single time, total time, idle time, mark time.

4.2 Mark Preview

Mark Preview is mainly used for preview the marking time sequence of marker operating (see figure); reconstruct the original graphic and text based on graphic drawn by user; and check path direction of laser marking. Mark preview module can control marking speed. The interface is simple and elegant, and more human.

Click “Refresh” button and select “Mark”–“Preview the Marking”, as the following figure shows.



Figure 4.3 Marking preview button

Click “Preview the Marking” will pops up the following interface.

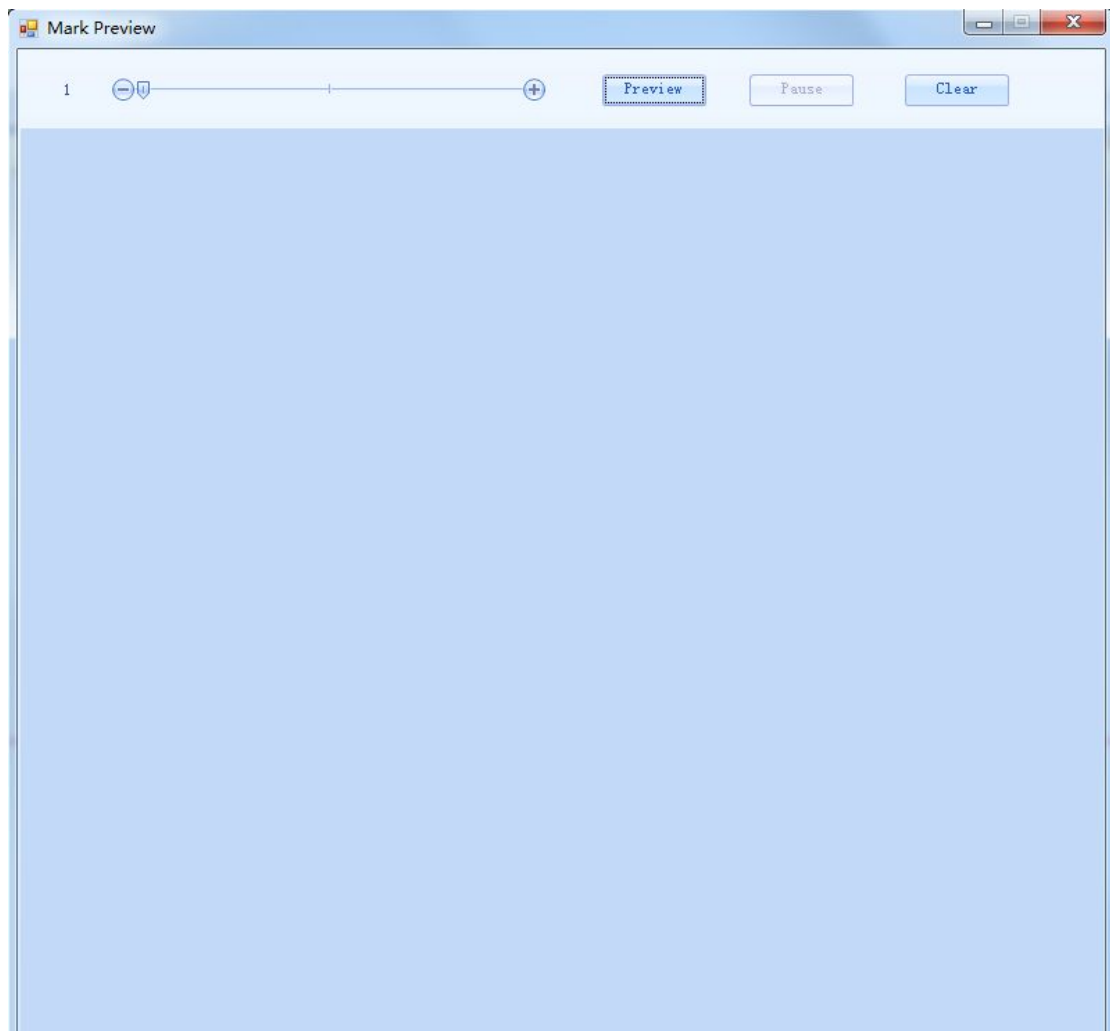


Figure 4.4 Marking preview window

Set marking speed first, click “Start” button, then effect after marking is able to be seen. The preview speed will achieve the fastest when preview progress bar dragged to the most right side, or achieve the slowest when preview progress bar dragged to the most left side.

4.3 Multi Documents Marking

Operational Approach

1. Place the graphics that need to be marked in correct sequence according to create new file or open existing file.
2. Click menu “Mark” as the following figure shows



Figure 4.5 Mark menu

Then select “Multi Doc-Marking” (see following figure)



Figure 4.6 Multi-targets marking

Click “Multi Doc-Marking” will pops multi documents dialog box as the following figure shows.

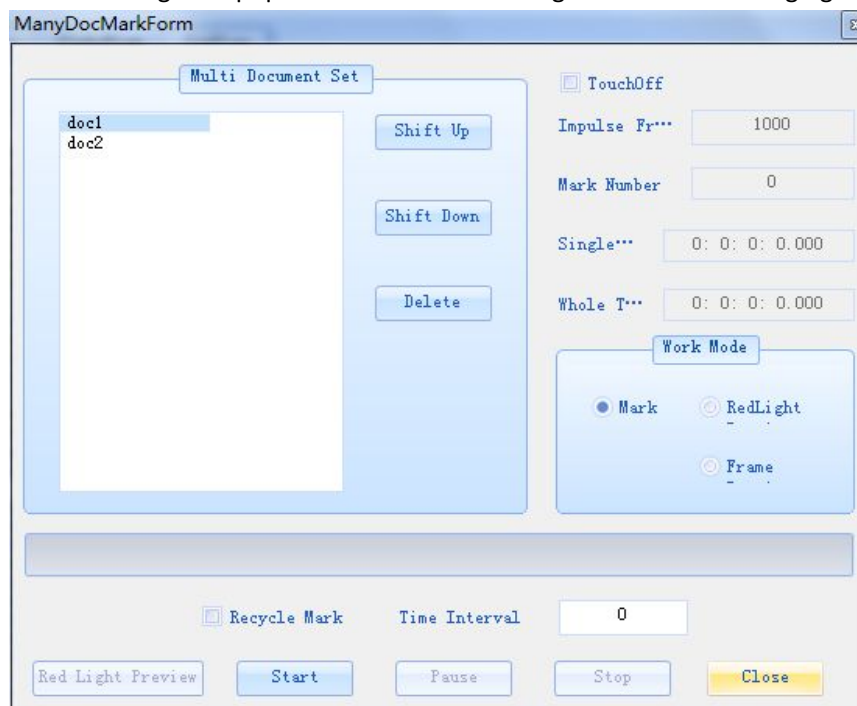


Figure 4.7 Multi-documents marking setting dialog box

The list box at top left corner listed all opened files. This sequence is the marking sequence. The marking sequence could be change by click “Shift Up”, “Shift Down”. Click “Delete” can delete the selected file (Do not delete the substance of file).

Operate Explanation

Mark Number

It means the number of completed marking process.

Single time

It means the time cost for one marking process.

Total time

It means the total time cost for the whole process of automatically or manually marking multi documents.

Work Mode

Select different work mode.

NOTE: Other functions are the same with general mark function and will not explain more here.

The Fifth Chapter System Setting

Open menu button at top left corner as the following figure shows:

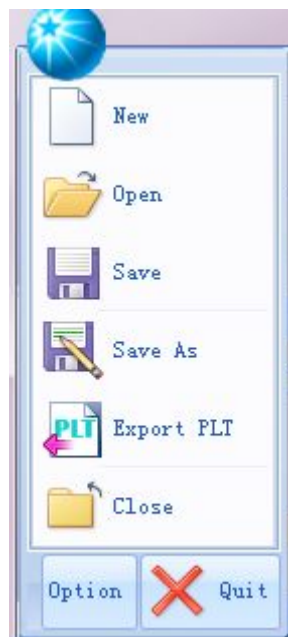


Figure 5.1 Setting button dialog box

The click “Option” button and pops preferences dialog box as the following figure shows.



Figure 5.2 Marking parameter setting dialog box

5.1 Laser

Because considering user can custom laser, click “Edit” button in “Laser” page, then user can custom laser name and necessary parameters. See the following figure:

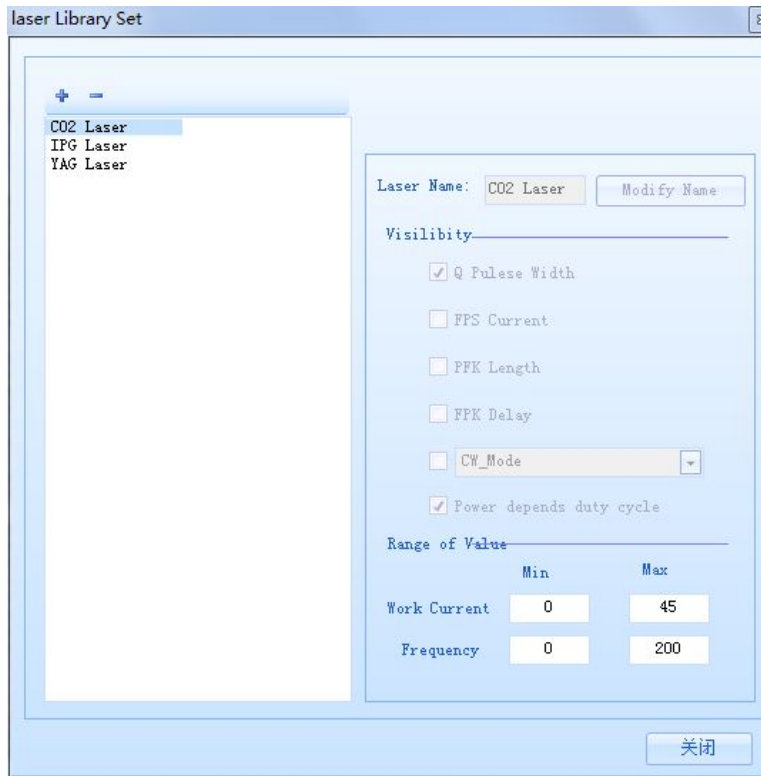


Figure 5.3 Laser library setting dialog box

It is able to see the created laser types and optional parameters.

5.2 Mark Preference

Mark preference is mainly displayed in “Laser Preference” page, as the following figures shows.

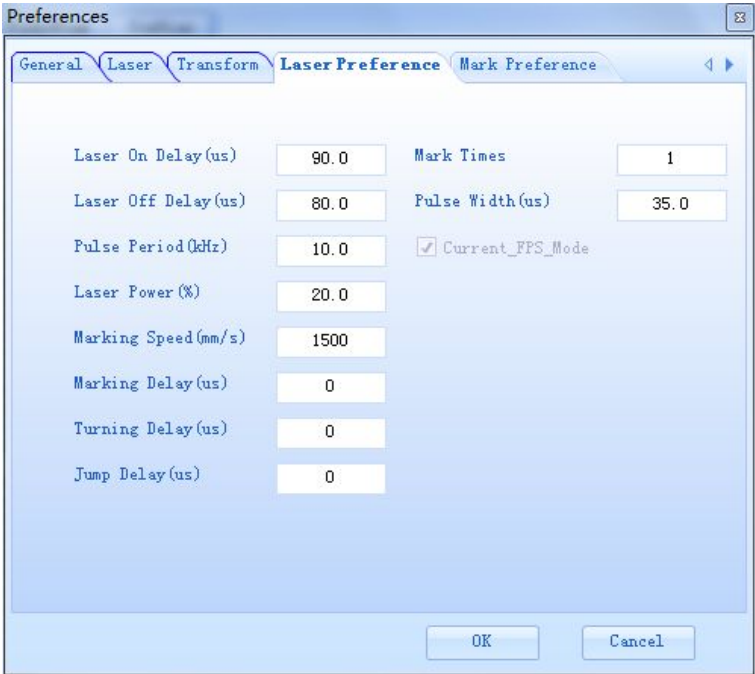


Figure 5.4 Laser parameter setting dialog box

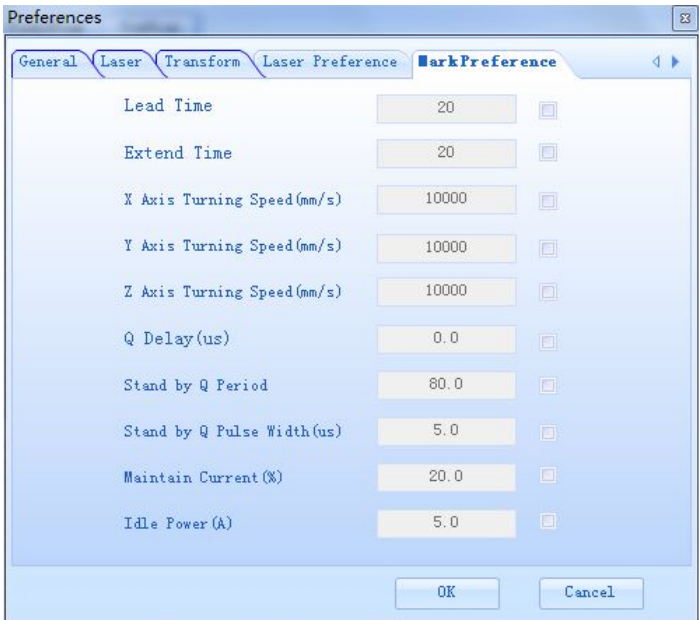


Figure 5.5 Marking parameter setting dialog box

Each laser has different control approach, and their mark preferences are different. This section explains the preferences that used by this software, please using theses preferences according to real circumstance.

Laser On Delay

Definition: Adjustment time that combined by laser start point and the start point of galvanometers movement. The delay time or ahead time before laser is on $(-\infty, 0, +\infty)$;

Function: The time delay between valid vectorsexecuting begin and switch on laser outputting. This value could be either positive or negative. It will not affect marking time if it is positive.

Too large: The laser switch on after the galvanometer moves a long distance and the stroke's beginning will not long enough.

Too small: The laser switch on too early and galvanometers does not move. Overlapping point will appear at the beginning of stroke.

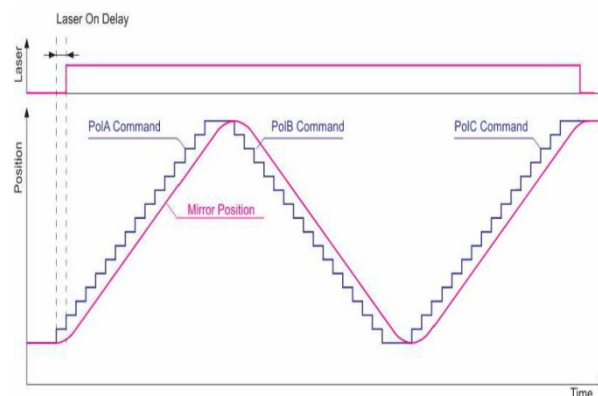


Figure 5.6 Laser on delay

Laser Off Delay

Definition: Adjustment time that combined by laser end point and the end point of galvanometers movement. The delay time or ahead time before laser is on $(0, +\infty)$;

Function: The time delay between valid vectors executing complete and switch off laser outputting. This value cannot be negative and do not affect marking time; after the last command of stroke gives out, with a lag of galvanometer it has to wait a short time until it arrive designated spot.

Too large: Laser switched off after galvanometer is arrived and stayed a short time. The end of stroke will form overlapping point and marking time will be increased.

Too small: The laser switch on too early and galvanometers does not arrive. The Stroke's end will not long enough.

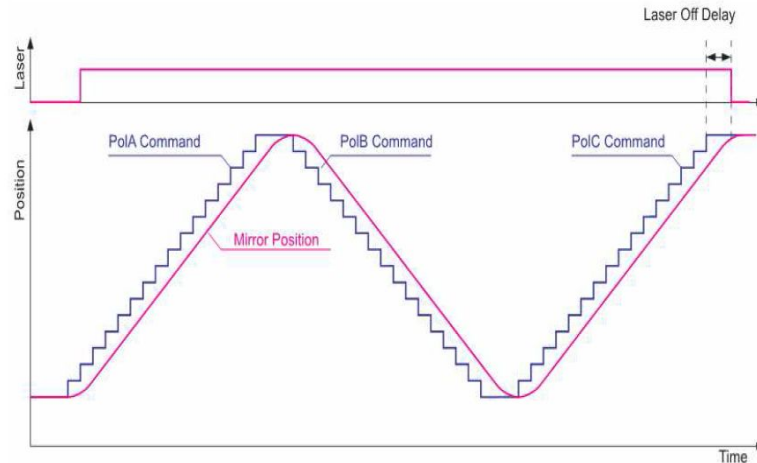


Figure 5.7 Laser off delay

Pulse Bit Width (us)/Pulse Period (KHz)

Definition: The number of pulses outputted by laser in one second (Pulse Bit Width and Pulse Period depict an inverse relation). For example, 20KHz means output 20000 pulses in one second.

Function: Changing Pulse Bit Width/Pulse Period can increase laser output frequency, decrease point energy and peak power, increase marking speed partly.

Too large: Have less energy collecting time, energy is not strong enough, and the output dot is intensive.

Too small: Have long energy collecting time, energy is too strong, and the output dot is sparse.

Laser Power(%)

Definition: Output power of laser, setting value is the percentage of full power.

Function: Used for set laser percentage or current of laser when marking current layer.

Marking Speed(mm/s)

Definition: Move speed of galvanometer during marking process.

Too large: Strokes that marked out is sparse and not intensive, has no depth, marking speed is fast.

Too small: Strokes that marked out is too intensive and has depth, marking speed is slow.

NOTE: Marking speed usually coordinate with pulse period and laser power, recommend value is 1000mm/s.

Marking Delay(us)

Definition: The galvanometer delay after laser switched off (150, + ∞).

Function: Guarantee the accuracy and precision of galvanometer path at end point and partly decrease tailing phenomenon of laser.

Too small: At high speed state, the end part of valid vector path will incomplete and easy to transform.

Too large: Has no effect on marking. Has overlapping point at curves and increase marking time.

Turning Delay

Definition: The adjustment time that makes the galvanometer move curves arrive at turning corner. Range $(0, +\infty)$.

Function: After the last command given out, with a lag of galvanometer, it has to wait a short time until it arrive designated spot.

Too large: Process the next section of strokes after galvanometer is arrived and stayed a short time. The turning corner will form overlapping point and marking time will be increased.

Too small: Process the next section of strokes too early and galvanometers does not arrive. The turning corner will form arc.

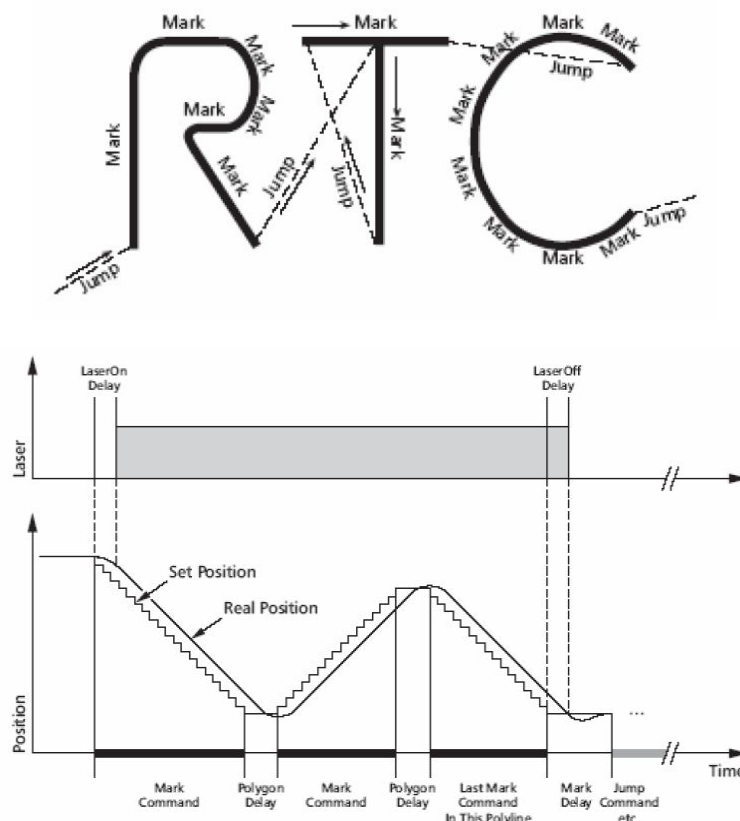


Figure 5.8 Turning delay

Jump Delay (us)

Definition: After jump, the time cost for making galvanometer stop. Range $(0, +\infty)$.

Function: Execute the next vector command after galvanometer jump to the target point.

Too large: Process the next section of strokes after galvanometer is arrived and stayed a short time. The marking time will be increased.

Too small: Process the next section of strokes too early and galvanometers does not arrive, scatter point will appear at the beginning of strokes and strokes will have jerky at start point.



Figure 5.9 Jump delay

Mark Times

Definition: Marking times of single object after trigger.

Maintain Current

Definition: Control parameters of end pumped laser switching on.

Function: If maintain current is too small, the start point will lack of light, if it is too large, light exposure will appear during jump process.

PulseWidth(us)

Definition: Laser output time in one cycle with particular pulse period.

Function: Used for adjust output energy and peak power of laser, and has less effect on fibre laser.

Q delay

Definition: Delay of Q signal over laser switch on signal.

Function: Control laser's output.

Stand by Q Period

Definition: Period of Q signal during no laser output time.

Function: Maintain

Stand by Q pulse width

Definition: Width of Q signal during no laser output time.

Function: Maintain

Lead time

Definition: Before marking, the time cost that galvanometer goes into marking direction and achieves marking speed.

Function: Guarantee the speed of galvanometer keep constant and marking effect keep even.

Extent time

Definition: After marking complete, the time that galvanometer keep marking direction and marking speed.

Function: Keep the speed of galvanometer constant after marking is complete to avoid end point offset which is because the delay of galvanometer; And keep end point keep even when mark delay is 0.

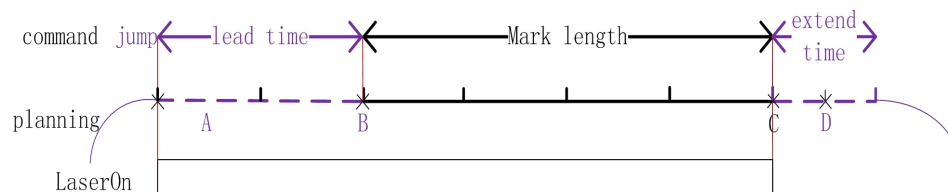


Figure 5.10 Extent time

NOTE: When jump delay is larger than 0, lead time is invalid. When mark delay is larger than 0, extent time is invalid.

Increasing lead time will cause the laser on delay become lager; Increasing lead time and extent time will increase the whole marking time.

X/Y/Z Axis Turning Speed

Definition: When marking folded line, the variations of X/Y galvanometers at corner.

Function: When marking folded line, jump command will be added automatically at corner when the variations of X/Y galvanometer is larger than given X/Y Axis turning speed, and makes

the marking effect become obviously sharp.

The Sixth Chapter Network Configuration

Function: Configure IP address, subnet mask, gate way of facilities. Revise and test facilities' network parameter.

Network Connect

Select "Fit" at menu as the following figure shows:



Figure 6.1 Network configuration toolbar

Then select "Network Connect", see the following figure:



Figure 6.2 Network connect button

The following dialog box will pop up.

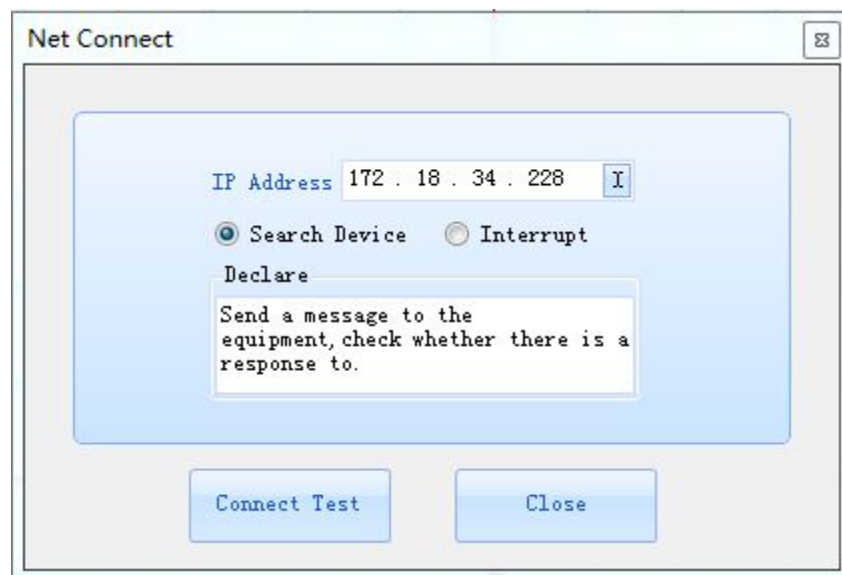


Figure 6.3 Network connect dialog box

Search Device: Select "Search Device" option and click "Connect Test", if connection is correct, the un-added IP will be added to the list and pops up a dialog box which shows device responding correctly. If cannot connect to device, a dialog box will pop up and shows no respond from device and notice user cannot find device.

Interrupt: Select "Interrupt" option, switch device off, fill factory setting for IP address (172.18.34.227) in "IP Address", then click "Connect Test" and switch device on. Receiving device interrupt respond dialog box will pop up.

Then revise parameter in "Net Configure" or the parameter is not changed.

NOTE: This function is mainly used when user forget IP address or cannot connect device. PC net configureure such as: IP Address: 172.18.34.22; Subnet mask: 255.255.255.0; Gate way: 172.18.34.1. Because switchboards or routers of different locations have different subnet mask and gate way, and it is recommend reset IP address by using cross wire, IP address of PC cannot be the same with device's IP address.

Net Configure

Select "Net Configure" button as the following shows:



Figure 6.4 Network configure button

And "Net Configure" dialog box will pop up as the following figure:

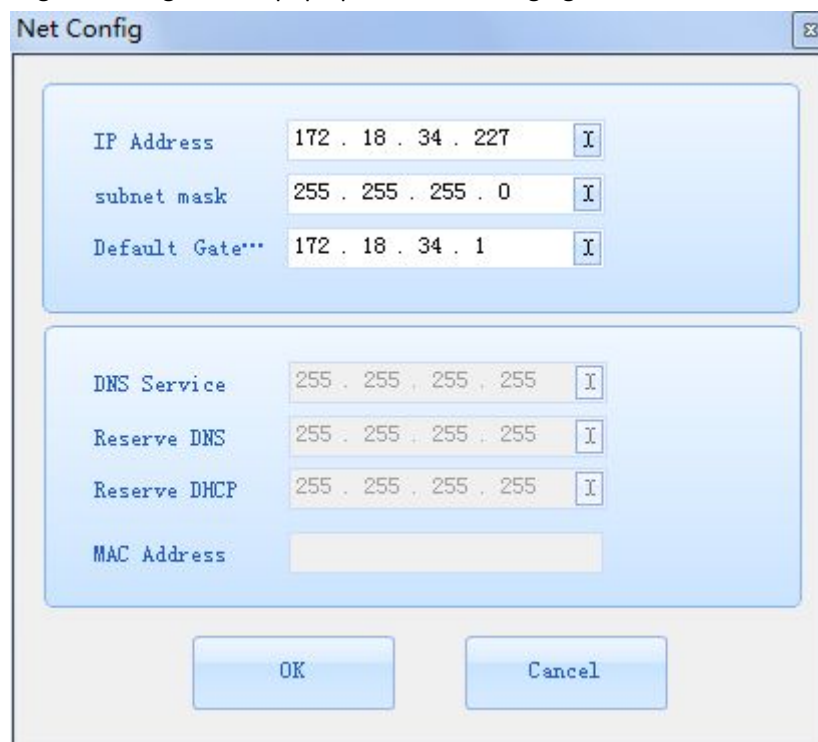
A screenshot of a "Net Config" dialog box. The window has a title bar with "Net Config" and a close button. The main area is divided into two sections. The top section contains three rows: "IP Address" with the value "172 . 18 . 34 . 227", "subnet mask" with "255 . 255 . 255 . 0", and "Default Gate*" with "172 . 18 . 34 . 1". Each row has a small "I" icon to its right. The bottom section contains three rows: "DNS Service" with "255 . 255 . 255 . 255", "Reserve DNS" with "255 . 255 . 255 . 255", and "Reserve DHCP" with "255 . 255 . 255 . 255". Each row has a small "I" icon to its right. Below these is a "MAC Address" label followed by an empty text field. At the bottom of the dialog are two buttons: "OK" and "Cancel".

Figure 6.5 Network configure dialog box

Write to device: Fill IP address, subnet mask, and default gate way in, click "OK" button, a dialog box will pop up and ask whether confirm to harden parameter.

Click "Confirm" to revise IP address, subnet mask, and default gate way. Switch device on again (Make sure PC and device are in the same segment), then click "Network Connect", fill the revised IP in and click "Connect Test", the device with revised IP will able to be seen at top right corner.

NOTE: When revising, please make sure the device is connected.