EzCad3.6UNI
User's Manual

All rights reserved

Contents

EzCad3.6UNI I

User's Manual I

Chapter1 Introduction 5

1·1 EzCad2 Brief Introduction 5

1·1·1 Software Installation 5

1·1·2 Software Function 5

1·1·3 Interface Introduction 5

1·2 About EzCad2 User's Manual 6

1·2·1 Contents Arrangement 6

1·2·2 Announcement 6

Chapter 2 File Menu 7

2·1 Open (O) 7

2·2 Save (S) 7

2·3 Object List 8

2·4 Object Properties 9

Chapter 3 Edit Menu 10

3·1 Cut (T) / Copy (C) / Paste (P) 10

3·2 Combine / Uncombine 10

3·3 Group / UnGroup 10

3·4 Hatch 11

3·5 To origin 16

3·6 Delet 16

All rights reserved

Chapter 4 Draw Menu 16

4.3 Rectangle 17

4.4 Circle 18

4.5 Ellipse 18

4.6 Polygon 19

4.7 Text 19

4.7.1 Character Properties 20

4.7.2 Curve text function 21

4.7.3 Circle Text 25

4.7.4 Barcode Text 26

4.7.4 Variable Text 31

4.8 Bitmap 45

4.9 Vector File 49

4.10 Time-lapser 51

4.11 Input Port 51

4.12 Output Port 51

4.13 Select 52

Icon on the top of the Draw Toolbar is used to select object. The pressed-down state of this icon indicates that the current command is "select". Now, you can use mouse to click object in the workspace to select it. 4.14 Node Editing 52

Chapter 6 View Menu 53

6.1 Zoom 53

Chapter 10 Marking 54

All rights reserved

10·1 Pen List····· 54

10·2 Marking Parameter Base····· 55

10·3 Mark-Control Bar····· 60

10·4 Machine Parameters····· 61

10·4·1 Field Parameter····· 61

10·4·2 Laser Control Parameter····· 63

10·4·3 Port parameter····· 67

10·4·4 Other····· 69

10·4·5 HardInfo····· 72

All rights reserved

Chapter1 Introduction

1.1 EzCad2 Brief Introduction

1.1.1 Software Installation

The EzCad2 software run on an PC with 900 MHz CPU and 256 MB RAM at least. In general, we recommend the fastest PC available. EzCad2 was developed in Microsoft Windows XP and will run in Windows XP and VISTA

The installation of EzCad2 is very easy. Users simply need to copy EzCad2 folder that is in the Install CD to hard disk, and then double click the Ezcad2.exe under the EzCad2's directory to run the software.

EzCad2 requires a software security device sometimes known as a 'dongle'. This device plugs into the USB port on the PC. If there is no dongle or the dongle do not install correctly, a caution will appears and the software will work at demo state. In demo state, we can evaluate the software but we cannot save files and cannot control laser device.

1.1.2 Software Function

Main functions of the software:

- Users can design their graphics freely.
- Various types of fonts are supported. Such as TrueType, SHX, JSF(Single line font defined by EzCad2), DMF(Dot Matrix Font), One-Dimensional bar code, Two-Dimensional bar code , and so on)
- Flexible variable text: changes the text real time while in laser processing. Excel datasheet is supported.
- Can through the serial port direct read text data
- Can through the network direct read text data
- Strong node editing function make the curve modification more easier
- The software can support 265 "pencils", which used to draw graphic and can be set different processing parameters.
- Common types of images are supported. (bmp, jpg, gif, tga, png, tif…)
- Common vector images are supported. (ai, dxf, dst, plt…)
- Image processing (Grayscale, White / Black Transformations)
- Powerful hatching functions, such as support round hatch.
- More convenient IO operations and more easier to harmonize the auxiliary equipments.
- Supports the dynamic focus (3 axis processing system)
- Supports directly the SPI G3 fiber laser and the newest IPG_YLP and IPG_YLPM fiber laser
- An opening language supporting system makes it easy to run the software in various languages platform.

1.1.3 Interface Introduction

- **Software starting interface**

The picture (Figure 1-1) appears while running the program, and meanwhile the initial operations takes place in the background.

All rights reserved

Figure 1-1 Program starting interface

- **Main Interface (Figure 1-2)**

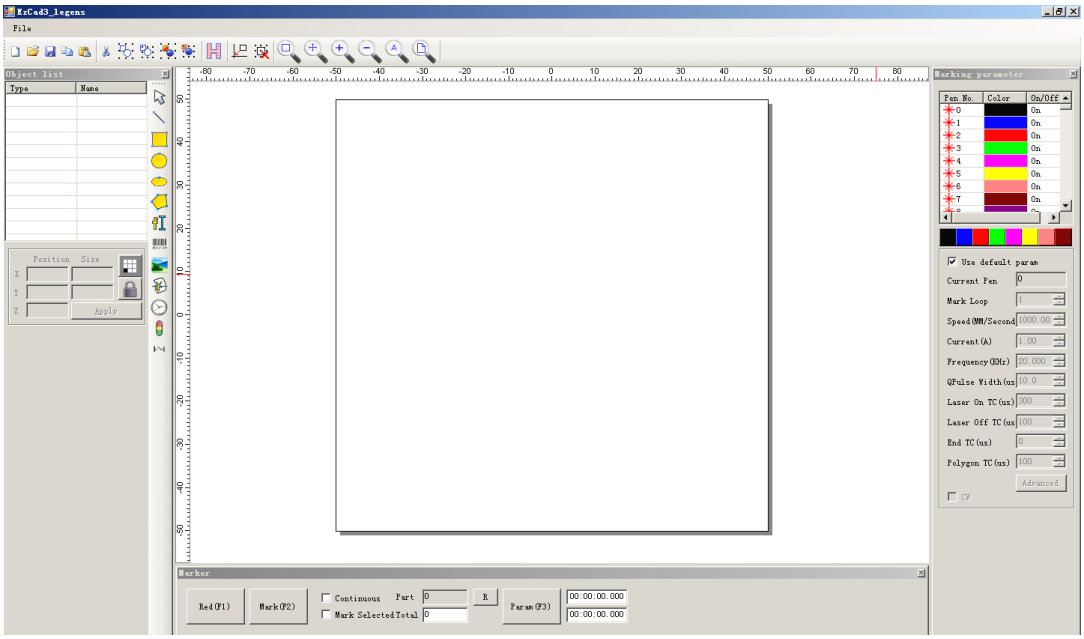


Figure 1-2 EzCad2 Main Window

1.2 About EzCad2 User's Manual

1.2.1 Contents Arrangement

The User's Manual will introduce each menu (File, Edit, Draw, Modify, View, Help) in turn.

1.2.2 Announcement

All rights reserved

Chapter 2 File Menu

The File Menu is used for open and save files (Figure 2-1)

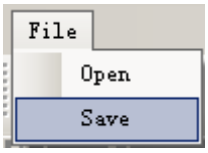


Figure 2-1 File Menu

2.1 Open (O)

"Open" is used to load a saved ".ezd" file, the software will pop an open-file dialog to ask you select the file you want to open, See fig 2-2. .

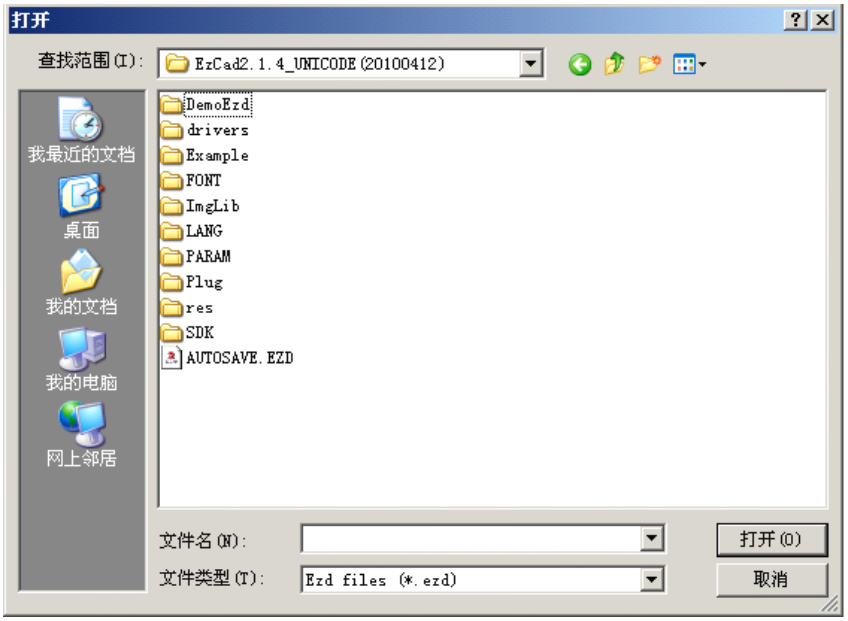


Figure 2-2 "Open" Dialog Box

The files saved with other file-format will not be opened by the "Open" command.

2.2 Save (S)

"Save" file is used to save the current state of a mark Document to disk. Writing a file to its current name is the same as the Save function.

All rights reserved

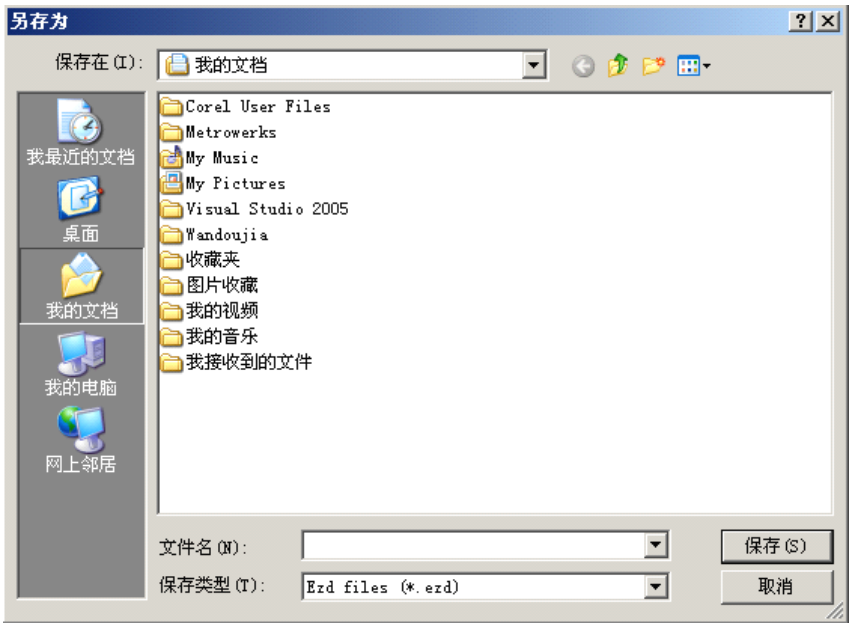


Figure 2-3 "Save" dialog box

If the current Document has already been named, "Save" is selected to save it under the name that was used to open the file, or the software will prompt to the user to choose a destination path and type a name.

2.3 Object List

Object List is in the left side of the main interface window.

Marked objects are grouped into an object structure or ungrouped to many objects. (Figure 2-12)

When in marking process, system will follow the order to mark the objects listed.

Users can rearrange the list by directly dragging the object up/down or right keyboard to change the marking order.

Users can double click the object bar to name them.

All rights reserved

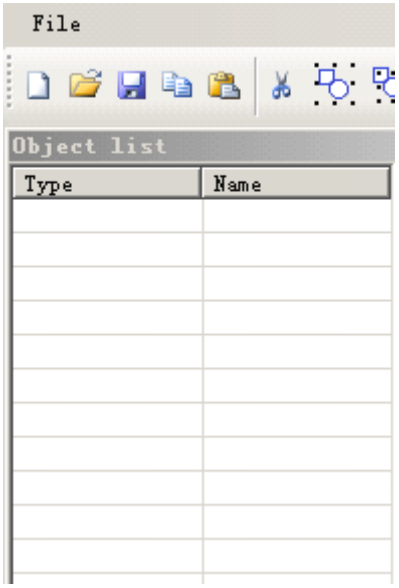


Figure 2-12 Object List

2.4 Object Properties

Object Properties are displayed in the left side of the main interface window

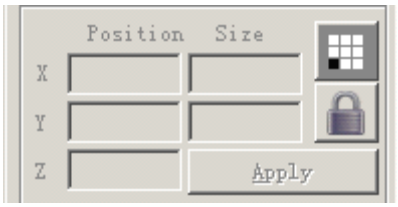


Figure 2-13 Object Property

- **X position:** the X coordinate of the point in the left button corner of the object selected.
- **Y position:** the Y coordinate of the point in the left button corner of the object selected
- **Z position:** the Z coordinate of selected object
- **X Size:** width of the object selected
- **Y Size:** height of the object selected
- : Lock the current width/height proportion of the object selected. If user changes the object's size, system will keep the X/Y ratio. Click the button will switch to unlock state

: The coordinate data **(X position, Y position)** is maped to which point of the object.

All rights reserved

Chapter 3 Edit Menu

3.1 Cut (T) / Copy (C) / Paste (P)

"Cut" will delete the object selected from EzCad2 and copy it to the clipboard. It can be inserted back into the .ezd file later using "Paste" function. Note that it will be lost if other data is copied to the clipboard.

"Copy" will copy the selected object to the clipboard and reserve the current object.

"Paste" will paste the object from the clipboard to current document file.

is copy,paste,cut button.

3.2 Combine / Uncombine

"Combine" will ignore all the selected objects' curve properties and combine those objects into a new curve combination with new curve properties. Same as other objects, this new combination can be selected, copied, pasted and set properties.

"Uncombine" will get the combination back to the curve objects separately. The objects after "Uncombine" may be different from those before "Combine". "Undo" should be used to restore the original objects

The feature Combine's icon in Toolbar is , and the feature Uncombine's icon in Toolbar is .

The shortcut keys of "Combine" and "Uncombine" respectively are: Ctrl+L and Ctrl+K.

3.3 Group / UnGroup

When selected the "Group" function will keep the selected objects' original properties and make them into a new object, and this new group, as the same as other object, can be selected, copied, pasted and set object properties.

"Ungroup" will turn the object which has just been grouped into previous situation. The object which has just been grouped by more than 1000 objects will become 10 objects. If the object is a vector file which has different pen color, it will become some objects according to

All rights reserved

color.

The icon of Group in Toolbar is , and UnGroup's is .

The shortcut keys of "Group" and "UnGroup" respectively are: Ctrl+G and Ctrl+U.

3.4 Hatch

"Hatch" is used to force EzCad to calculate the hatch fills for the current objects. The object to be filled must be closed curve, and if you choose many objects to fill, these figures can be objects nested mutually. Any two objects may not have intersectant parts (Figure 3-2)

Figure 3-2 Hatch

(Objects on the left can be filled; The two rectangles on the right may get unexpected result for they intersect each other.)

The icon of Hatch in Toolbar is , and when selected a hatch dialog box will appear as Figure 3-3 shows.

All rights reserved

Mark Contour: whether to show and mark the current object's contour or not

means when click 'Mark Contour', mark hatch line first then mark contour

means when click 'Mark Contour', mark contour first then mark hatch line

Hatch 1 / Hatch 2 / Hatch 3: Users may have three independent hatch parameters to hatch the same object at the same time. Each set of hatch parameters can be appointed a Pen No. which stands for a set of marking parameters.

Enable: whether to permit the validity of the current hatch parameter.

All Calc: Calculate all the selected objects as a whole. This is an optimizing option. In some cases the speed of marking may highly be raised. It will take long time to calculate large, complex objects. When not selected, the objects will be calculated separately.

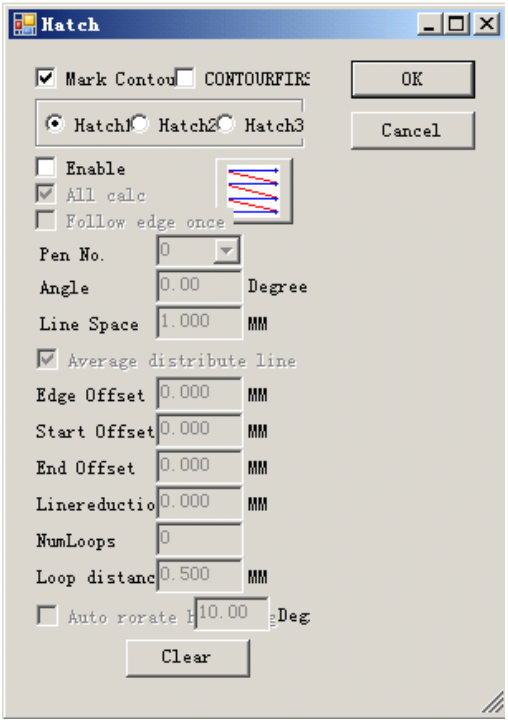


Figure 3-3 Hatch

For example: draw three rectangles, line distance is 1mm, angle is 0.

1. Do not click 'All Calc', system will mark as the order in object list, mark hatch line in the first rectangle then mark hatch line in the second rectangle, and so on.
2. Click 'All Calc', mark all the hatch line at one time, mark all the hatch that on the same line.
3. Marking result as follow fig 3-4:

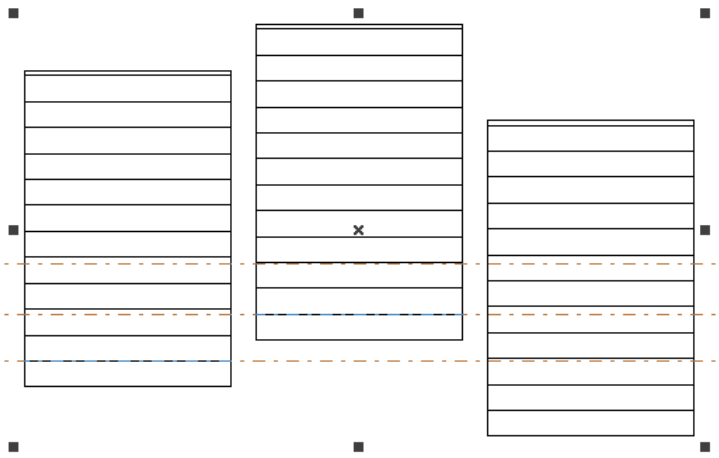


Fig 3-4(a) do not click 'All Calc', the hatch line are not in the same line

All rights reserved

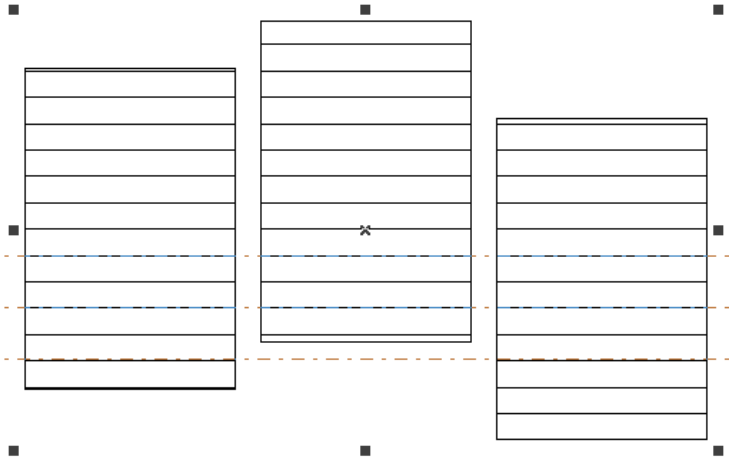
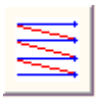
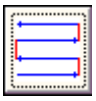


Fig 3-4(b) click 'All Calc', hatch line are in the same line

Type of Hatch: (Figure 3-5)

 **Unidirection hatch:** The hatch lines will be marked from left to right.

 **Bidirectional hatch:** The hatch lines will be marked from left to right first, and then from right to left.

Ring-like hatch: fills objects from the outside to the inside like a ring

Click the button will switch between the Unidirection, bidirectional, and ring-like hatch.

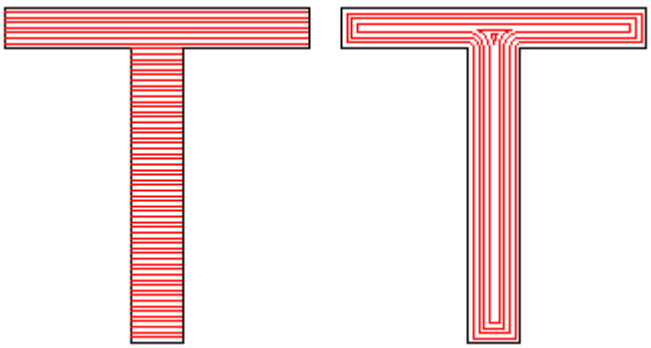


Figure 3-5 Types of hatch

(The left object is being filled by Unidirection Hatch or Bidirectional Hatch, and the right object by Ring-like hatch)

Angle: Hatch Angle stands for the angles between hatch lines and X axis, and Figure 3-6 is the feature when the angle is 45 degrees.

All rights reserved

Line Space: the space between two hatch lines

Edge offset: the distance between hatch lines and the object's outline (Figure 3-7)

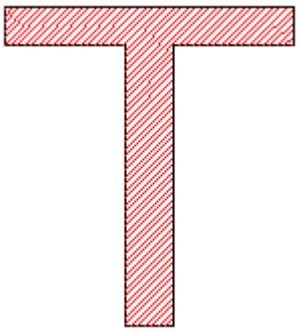


Figure 3-6 Degrees

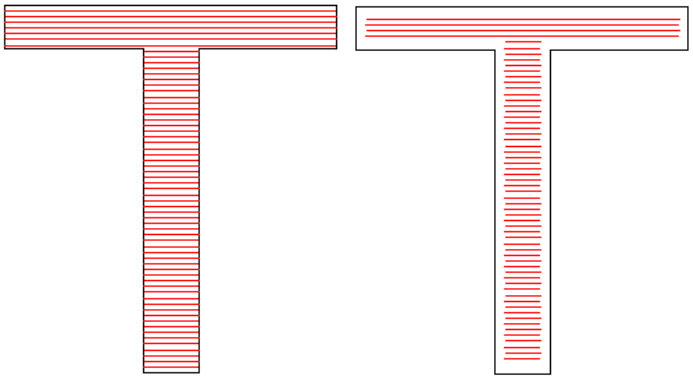


Figure 3-7 Border Distance

(The left object shows the figure when Edge offset is 0 and the right shows when it is 0.5.)

Follow edge one time: draws outline one time around the hatch lines after filling (Figure 3-8)

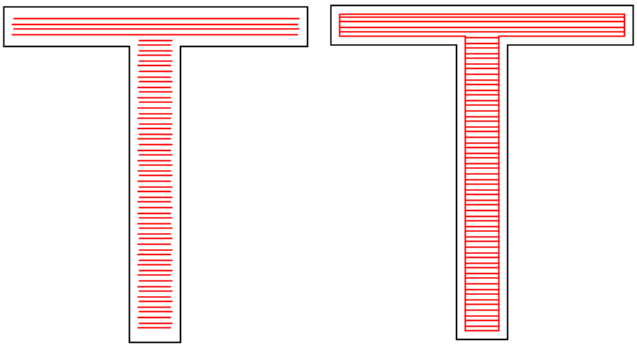


Figure 3-8 Follow edge one

(The left object do not enable this option and the right one do.)

Start Offset: the distance between the first fill line and the border of the object

End Offset: the distance between the last fill line and the border of the object

Figure 3-9 shows the feature when it is filled.

All rights reserved

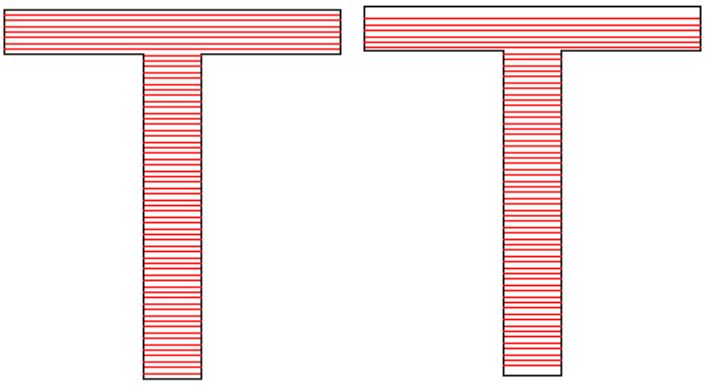


Figure 3-9 Offset Distances

(The left figure is the object when the Start offset and End Offset are 0,

and the right figure is the object when the Start offset and End Offset are both

0.5.)

Average distribute line: The solution the starting and ending hatch line are non-average distributes question when the object is hatched. After select this item, the software automatic adjust the hatch line space in the user setting hatch line space foundation, will let the hatch line average distribute.

Linereduction: The hatch line both sides reduction. (Figure 3-10)

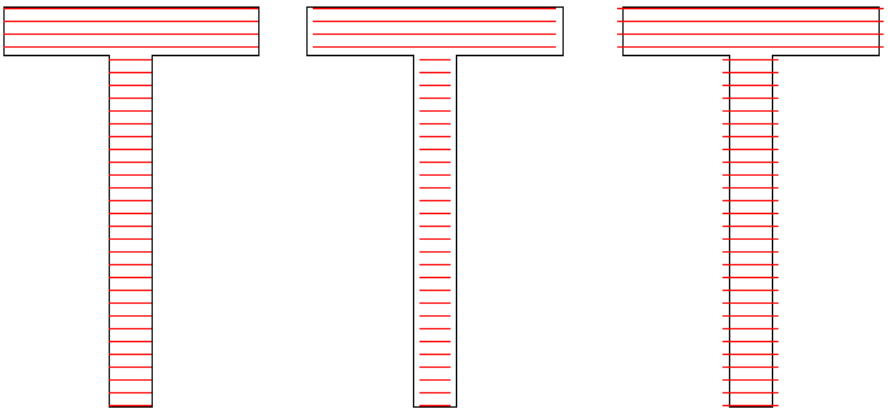


Figure 3-10 Linereduction

(The left figure is the object when the Linereduction is 0,the middle figure is the object

when the Linereduction is 0.5, and the right figure is the object when the Linereduction is -0.5)

NumLoops: The times of Ring-like hatch before the aclinicing hatch (Figure 3-11).

All rights reserved

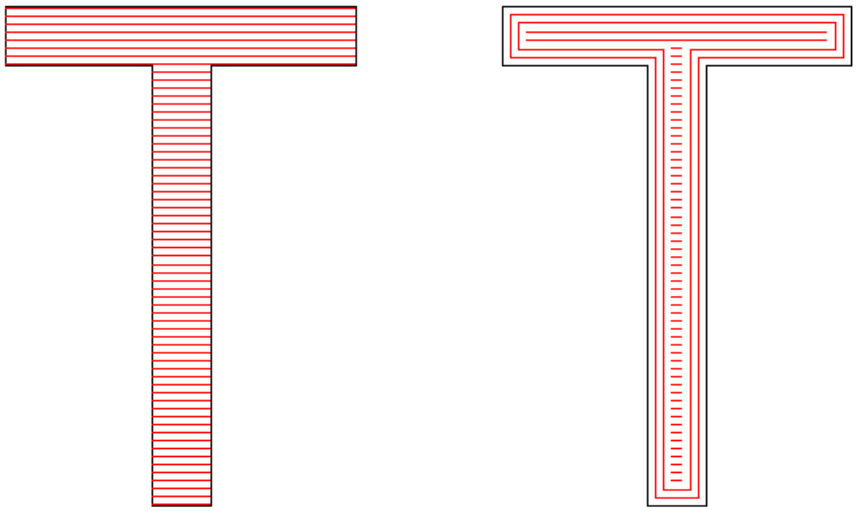


Figure 3-11 NumLoops

(The left figure is the object when the NumLoops is 0,and the right figure is the object when the NumLoops is 2)

Auto rorate hatch: Refers to after every marking, the hatch line will fill the revolving angle which we setted automatically to marking again. For example, angle is 0, aoto rotate angle is 30, the first mark angle is 0, the second is 30, the third is 60, and so on.

3.5 To origin

to origin

3.6 Delet

delet

Chapter 4 Draw Menu

"Draw Menu" consists of various common items for drawing, for instant, Dot, Line, Curve, Polygon, etc. Draw Menu has a Toolbar correspondingly, and all the operations can be achieved by pressing the icon on the Toolbar. For example, as Figure 4-1 shows, when you have selected the drawing command or the icon in Toolbar, the Present Command Toolbar on the top of the main window will be changed to show some options of the current command.

All rights reserved

（a）

Figure 4-1 Draw Menu

（The three pictures above stand for: (a) Draw Toolbar; (b) Draw Menu; (c) Command Toolbar）

4.3 Rectangle

To draw a rectangle, users can select command "Rectangle" in Draw Menu or click the icon .

Under the command "Rectangle", users can press the left button of the mouse and drag it to draw a rectangle.

All rights reserved

Under the command "Rectangle", users can draw a square by pressing the left button of the mouse and drawing it when press "Ctrl" key synchronously.

After drawing and selecting, the Properties Toolbar will display a feature like Figure 4-3 shows.

Arc radius: This refers to the smooth degree of the rectangle's four corners, and when the degrees are 100%, then the rectangle changes into a circle.

All corner Round: When selected, users can change the angles of the four corners at the same time just by changing one of them.

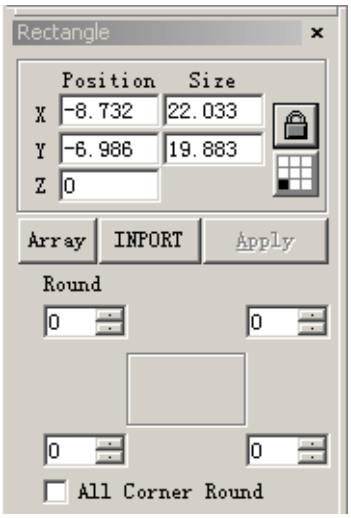


Figure 4-3 Rectangle Properties

NOTE: After changing the parameters in the Properties Toolbar each time, we must click "Apply" button to update the object with new parameters.

4.4 Circle

To draw a circle, users can select command "Circle" in the Draw Menu or click the icon .

Under the command "Circle", users can press the left button and drag it to draw a circle.

After drawing and selecting, the Properties Toolbar will display a feature like Figure 4-4 shows.

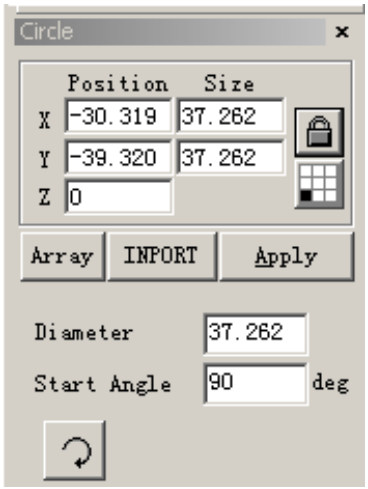


Figure 4-4 Circle Properties

Diameter: the diameter of the circle

Starting Angle: the angle between the starting point and the centre of a circle

: This figure refers to the drawing direction of the circle is clockwise.

: This figure refers to the drawing direction of the circle is anticlockwise.

4.5 Ellipse

To draw an ellipse, users can select command "Ellipse" in Draw Menu or click the icon.

All rights reserved

Under the command "Ellipse", users can press the left button of the mouse and drag it to draw an ellipse.

Under the command "Ellipse", users can draw a circle by pressing the left button of the mouse and drawing it when press "Ctrl" key synchronously.

After drawing and selecting, the Properties Toolbar will display a feature like Figure 4-5 shows.

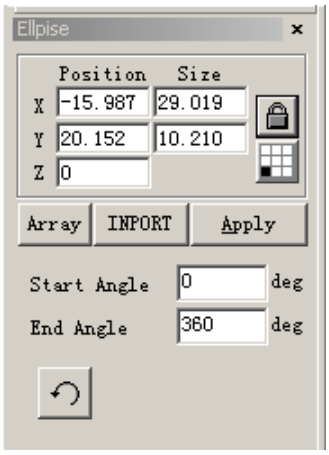


Figure 4-5 Ellipse Properties

Start Angle: the angle between the starting point and the centre of an ellipse

End Angle: the angle between the ending point and the centre of an ellipse

: This figure refers to the drawing direction of the ellipse is clockwise.

: This figure refers to the drawing direction of the ellipse is anticlockwise.

4.6 Polygon

To draw a polygon, users can select command "Polygon" in Draw Menu or click icon .

Under the command "Polygon", users can press the left button of the mouse and drag it to draw a polygon.

After drawing and selecting, the Properties Toolbar will display a feature like Figure 4-6 shows.

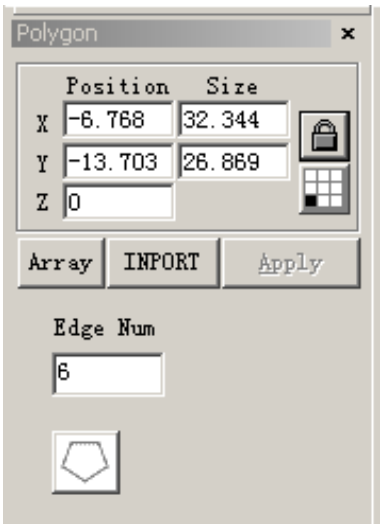


Figure 4-6 Polygon Properties

Edge Num: This item indicates the number of the polygon's borders, and that is at least three. Normally the border number is less than ten, and with borders more than ten the polygon will look like a circle.

: When selected, the current polygon to be drawn will be a convex polygon.

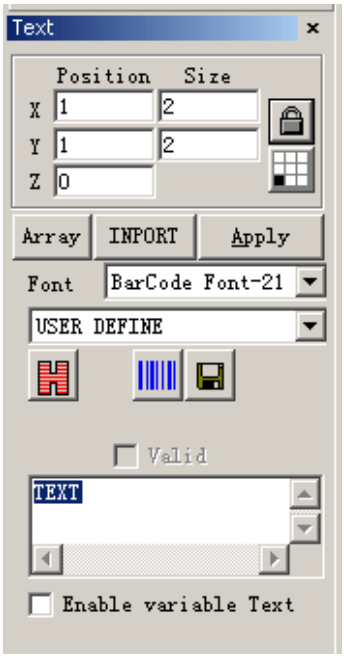
: When selected, the current polygon to be drawn will be a star.

4.7 Text

All rights reserved

Typing text directly in the workspace is supported in EzCad2, and many types of fonts are supported. To type text, users can select command "Text" in the Draw Menu or click icon.

Under the command "Text", users can set up a starting point at any position wanted in the workspace to type characters by left click mouse.



4-7 Character Properties

4.7.1 Character Properties

When selected, the Properties Toolbar will display a feature like Figure 4-7 shows. Users may change the characters by typing in the text box.

EzCad2 supports five types of text. (Figure 4-8)

When users select a type, a font list under that type will appear to show all the available fonts. Figure 4-9 is the list of TrueType.

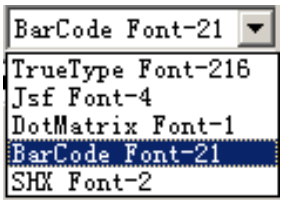


Figure 4-8 Types of Text

Figure 4-10 is the list of Barcode Type.

Height: the average height of characters

: Figure 4-11 shows the dialog box after clicking this icon.

: When selected, the current text aligns left.

: When selected, the current text aligns center.

: When selected, the current text aligns right.

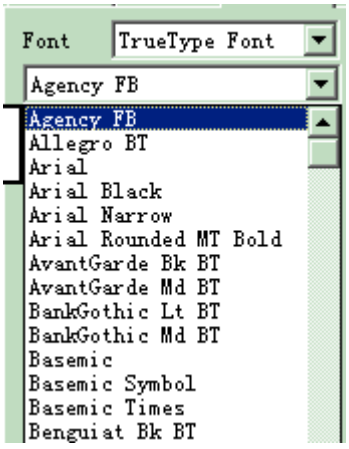


Figure 4-9 TrueTpye List

Bold: When selected, the current text become bold.

Italic: When selected, the current text become italic.

Enable the same width character: make the width of all characters the same

Char Width: the average width of characters

Char Angle: the degrees the characters incline

Char space: the distance between characters

Lines space: the distance between rows

Empty char width: the width of empty char

All rights reserved

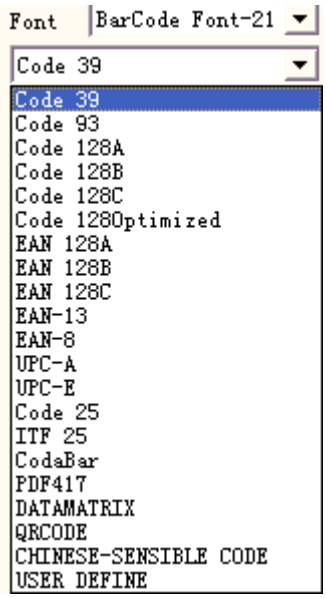


Figure 4-10 List of Barcode Type

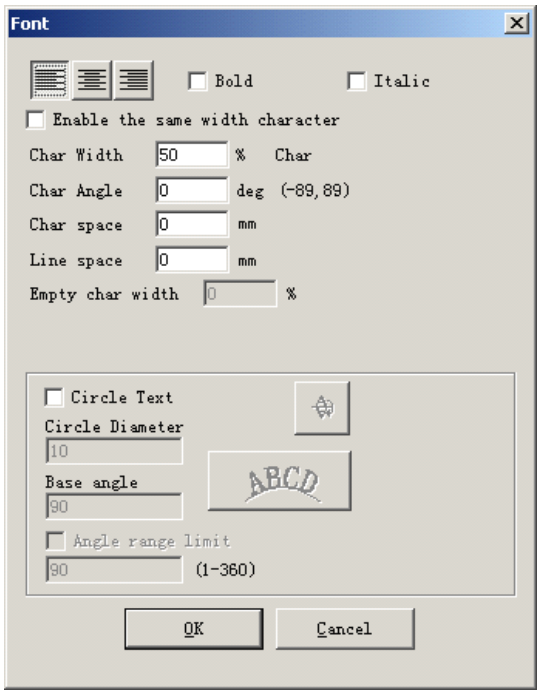
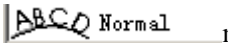


Figure 4-11 Character Options

4.7.2 Curve text function

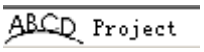
EzCad2 support curve text function, if the user draw text near enough from the curve, the text will arrange along the curve· When current text is curve text, click , fig *4-12* will pop-up*:*

All rights reserved



mean text will be parallel with the curve, as fig 4-13.

Fig 4-13 normal arrange



means text will be vertical with the curve, as fig 4-14.

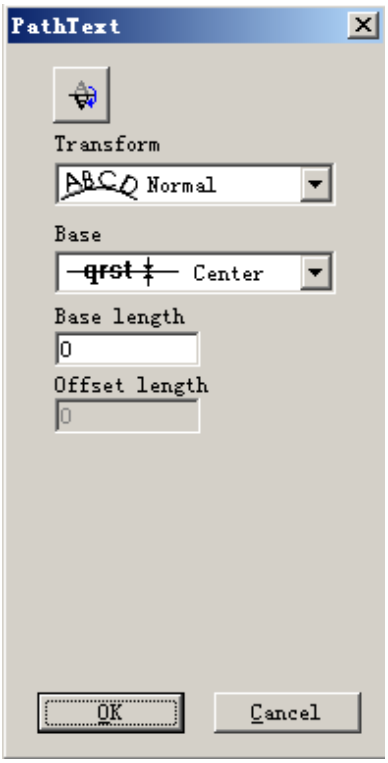


Fig 4-12 curve text

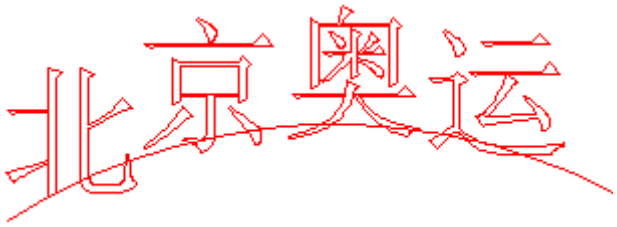


Fig 4-14 vertical arrange

means the base line of the text is superposition with the curve, as fig 4-13.

means the top of the text is superposition with the curve, as fig4-15.

All rights reserved

Fig 4-15 top arrange

means bottom of the text is superposition with curve, as fig 4-16.

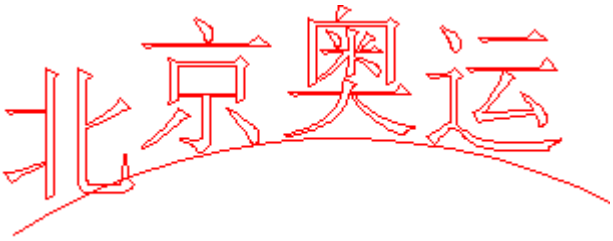


Fig 4-16 bottom arrange

means middle of the text is superposition with curve, as fig 4-17.

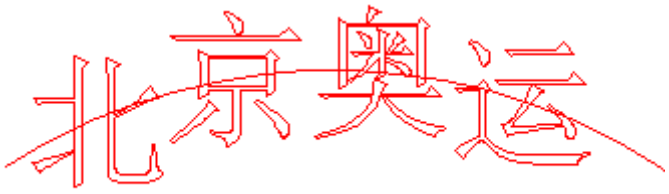
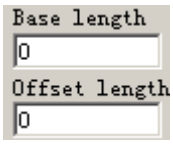


Fig 4-17 middle arrange

means text stay on the curve freely along with the curve, the position of the text is up to 

as fig 4-18.

All rights reserved

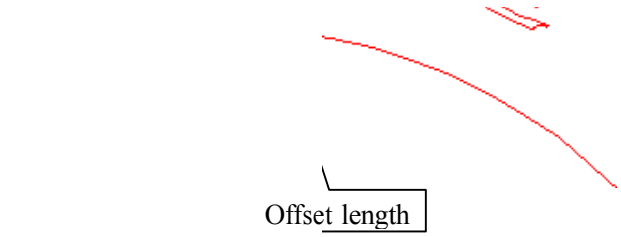
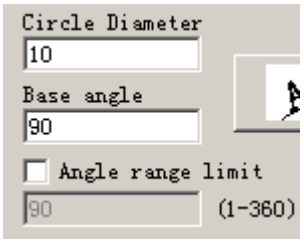


Fig 4-18 freely arrange

put text on the other side of the curve, after this function, fig 4-13 will like fig 4-19.

Fig 4-19 put text on the other side of the curve



when put text on circle, we use this function.

Base angle: means the angle of the base line of the text.

Angle range limit: when we click it, no matter how many characters we input, system will compress all the characters in the limit angle, as fig 4-20.

All rights reserved

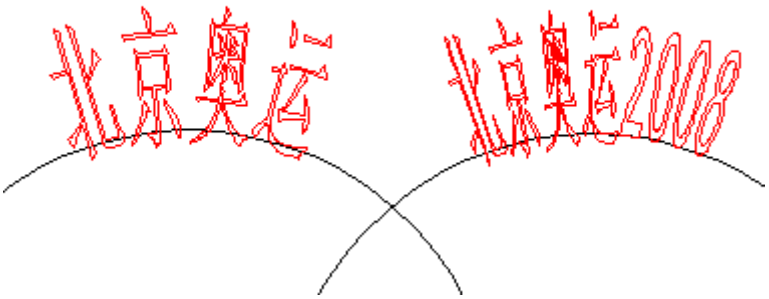
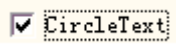


Fig 4-20 limit the angle as 45

4.7.3 Circle Text

EzCad2 supports circular text, after select 

in the figure 4-11, the text will align according to the user definition circle diameter.

The demonstration graph in Figure 4-12 is according to Figure 4-11 parameter making.

Base angle: The benchmark of the text aligning the circle.

Angle range limit: When checked, no matter how much chars that users type in, the text will be limited in the angle range. (Figure 4-13)

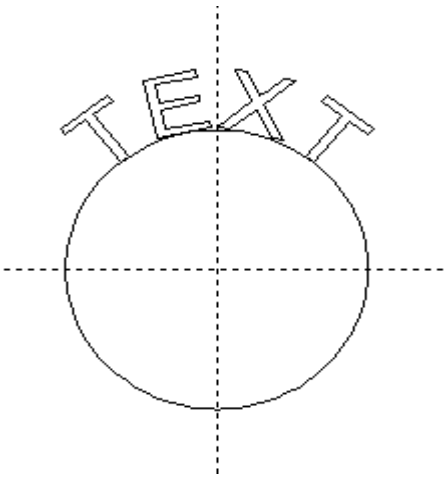


Figure 4-12 Circle Text

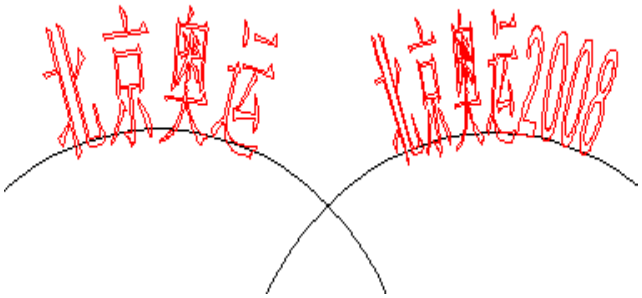


Figure 4-13 Comparison of Two Texts (Limiting Angle is 45 degrees.)

All rights reserved

4.7.4 Barcode Text

When users click the icon , a dialog box will be displayed as Figure 4-14 shows.

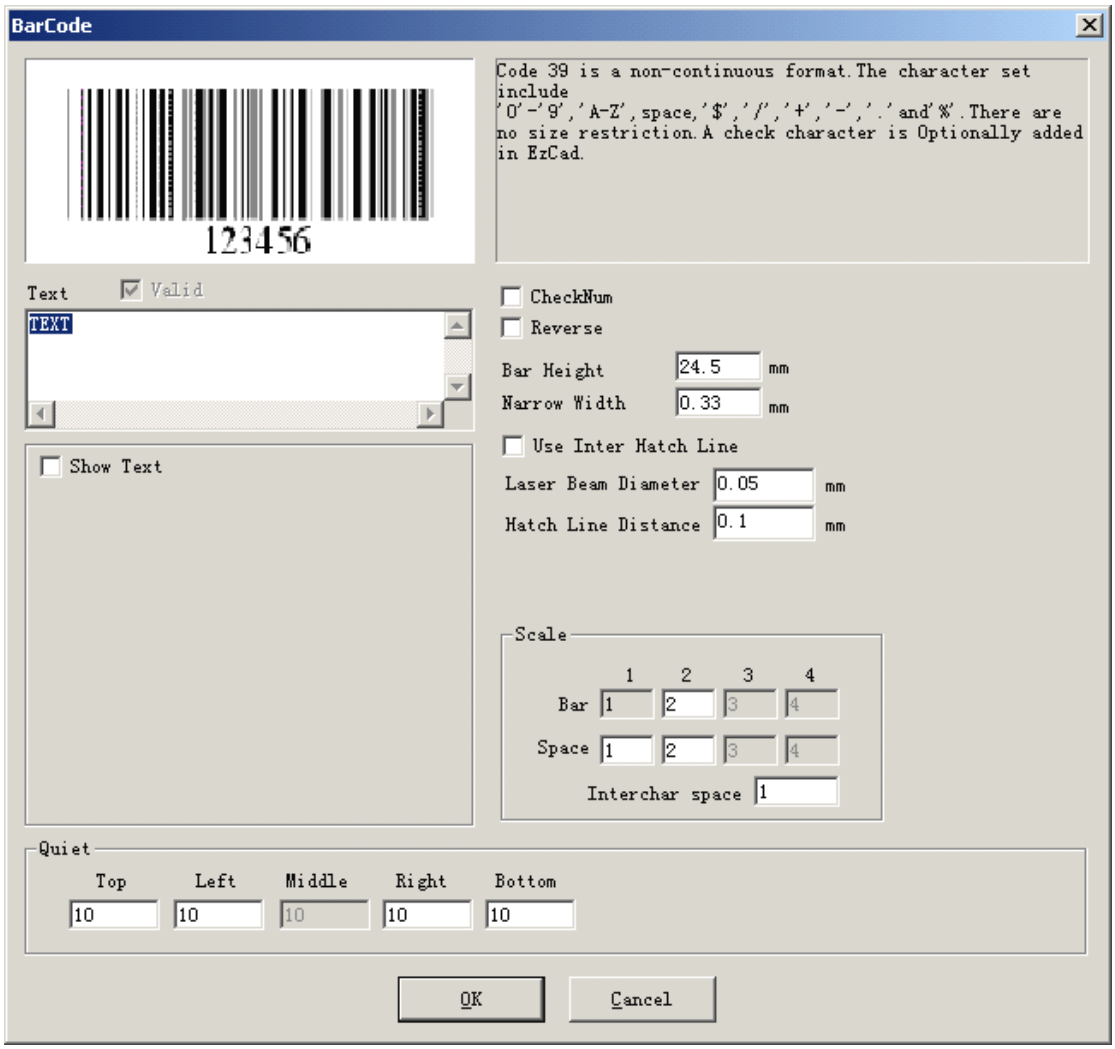


Figure 4-14 Barcode Text

1. **Sketch Map**

   The sketch map is that the current barcode will look like.

2. **Barcode Information**

   The barcode explanation shows some information about the current barcode's format, and if users are not very clear with the format, it is recommended to read the tip first to get to know what types of characters is valid.

3. **Text**

   This item refers to the text to be made into barcode. And if the characters users types in the Text space is valid, there will be a cross selected in which shows the current characters are valid for being made into a barcode.

4. **Show Text**

   Whether to show a corresponding text under the barcode (Figure 4-15)

All rights reserved

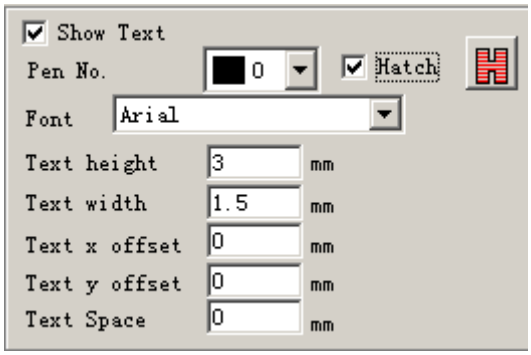


Figure 4-15 Show Text

Hatch: The text is hatched as the setting of hatch in the show text if the hatch is selected; otherwise the hatching is the same as barcode.

Font: The font of the current characters to be displayed

Width: the width of the characters

Height: the height of the characters

Text Offset X: When selected and set up, the text displayed under the barcode will be moved towards either the positive or the negative directions of X axis.

Text Offset Y: When selected and set up, the text displayed under the barcode will be moved towards either the positive or the negative directions of Y axis.

Text Space: the space between characters

5. **Quiet**:

Refer to the size of the barcode's blank area, when let the barcode "Reverse" valid.

- One-Dimensional Barcode

This kind of barcode consists of **bar** and **space** one by one. The barcode information is carried by different width and position of the **bars** and **space**, and the information volume they carry is decided by the width and the precision. Wider the barcode is, more the **bars** and the **space** included, and more information carried. This kind of barcode technology can store information towards only Unidirection through permutation and combination of the **bars** and the **space**, and so it is called one-dimensional barcode. Figure 4-16 shows a feature of parameter setting when a one-dimensional barcode is chosen.

CheckNum: This refers to whether the current barcode needs verify code. Users can freely choose which barcode they would like to add verify code on, and users have the decision whether to use the verify code or not.

Reverse: This refers to whether to reverse the parts which should be marked into the unexpected parts of an object. This function is used in some materials which appear light color after the marking.

Bar Height: the height of the barcode

Narrowest Width: This refers to the width of unit **bar**. Commonly a one-dimensional barcode consists of **bars** with four types of width and **space** with four types of width, 1 \ 2 \ 3 \ 4. The narrowest bar's width indicates the width is 1 unit.

All rights reserved

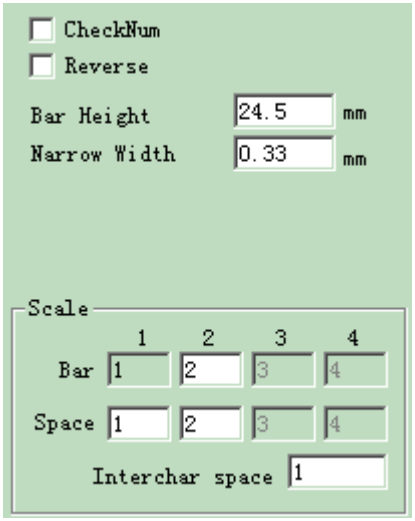


Figure 4-16 One-Dimensional Barcode Parameter Setting

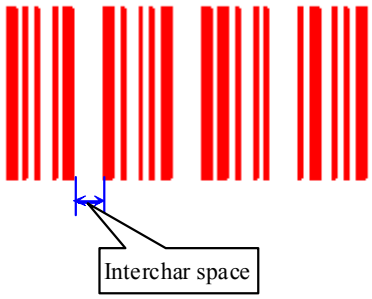


Figure 4-17 Characters' Distance

Interchar space: It is prescribed that some barcodes have distance between characters. (e.g. Code 39) This parameter is used to set this like Figure 4-17 shows.

Use Inter Hatch Line: If the facula diameter of laser bean is big, there will be a half facula over boundaries after common hatch, then the code gun can not distinguish because actual marking width is bigger than design width. So we specially design this hatch. The hatch line is bow line and don't have contour.

Laser Bean Diameter: The size of laser facula.

Hatch Line Distance: The space between two hatch lines

Scale:

Bar: setting the width of one bar.

Space: setting the width of the space,

Quiet:

Refer to the size of the barcode's blank area, when let the barcode "Reverse" valid. The actual size of the blank area is the multiple of the unit bar.

- Two-Dimensional Barcode

1. PDF417 Barcode

Figure 4-18 PDF417 Barcode

Figure 4-19 Compress PDF417 Barcode

All rights reserved

PDF is the abbreviation of the Portable Data File. Figure 4-18 is the demonstration of PDF417 Barcode and Figure 4-19 of the Compress PDF417 Barcode. Figure 4-20 is the parameter setting of the PDF417 Barcode.

Bar Height: the height of the barcode

Narrow Width: This refers to the width of the unit bar.

Level: the Error-Checking Level of PDF417 barcode, from 0 to 8

Lines and Columns: the lines and Columns of PDF417 barcode

Figure 4-18 shows a feature of a barcode with the row's number is four and the column's is four.

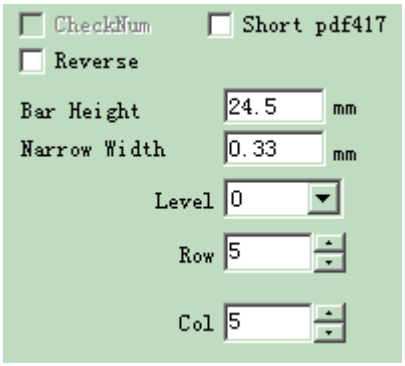


Figure 4-20 PDF417 parameter

2. Data Matrix Barcode:

Data Matrix is a kind of two-dimensional barcode based on Matrix, and currently there are two types: Ecc000-140 and Ecc200. EzCad2 supports Ecc200 at present.

Figure 4-21 shows the parameter setting of Data Matrix Barcode.

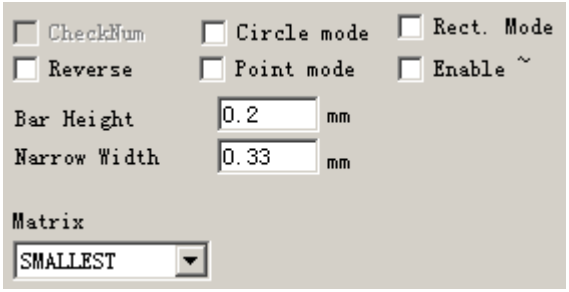


Figure 4-21 Data Matrix Barcode Parameter Setting

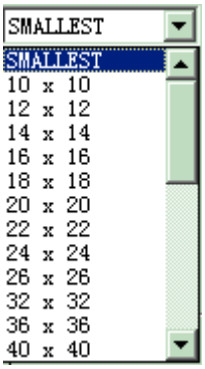


Figure 4-22 Data Matrix Barcode Size

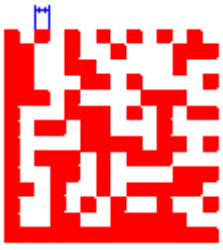


Figure 4-23 Data Matrix Barcode Width

Data Matrix has various fixed size, and users can choose what they want. If the smallest size is chosen, the system will automatically select the smallest frame to fit the all text users have

All rights reserved

typed.

Narrow Width: the width of the unit bar (Figure 4-23)

3. QRCODE Barcode:

QRCODE Barcode is two dimensional (2D) code format. The character set includes all ASCII values. There are no size restrictions.

The figure 4-24 ， 4-25， 4-26 are the parameter of QRCODE Barcode.

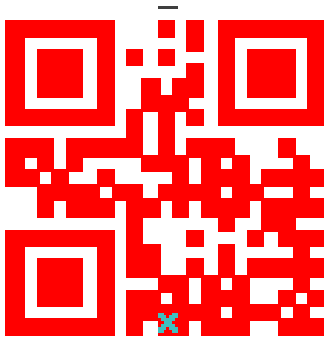


Figure 4-24 QRCODE Barcode

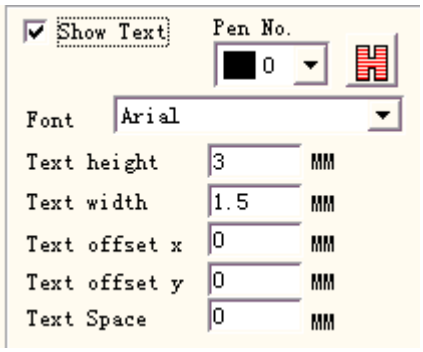


Figure 4-25 QRCODE Barcode text setting

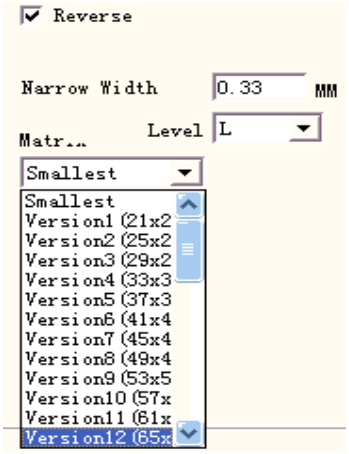


Figure 4-26 QRCODE Barcode Parameter Setting

4. USER DEFINE Code:

USER DEFINE Code is user can define code format by self. Figure 4-27 and figure 4-28 are the demonstration of user defines code.

All rights reserved

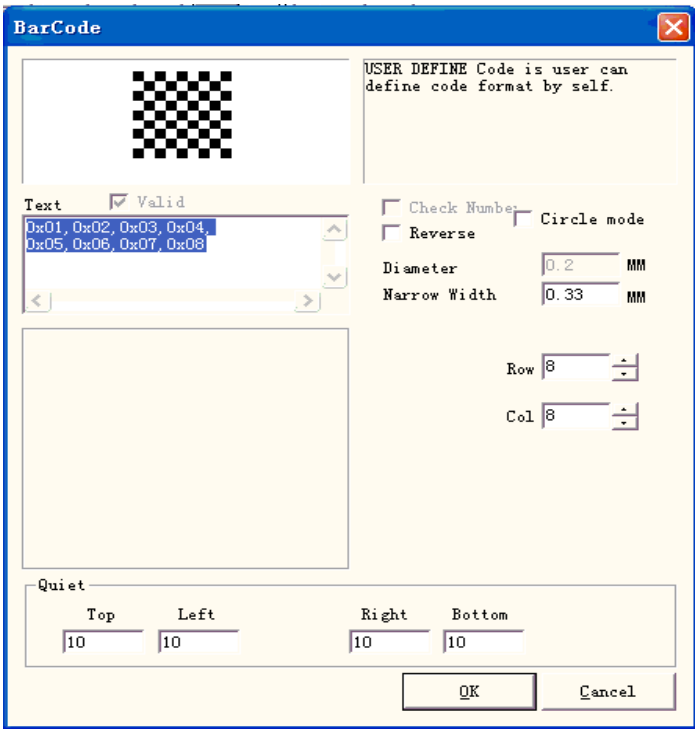


Figure 4-27 USER DEFINE Code Parameter Setting

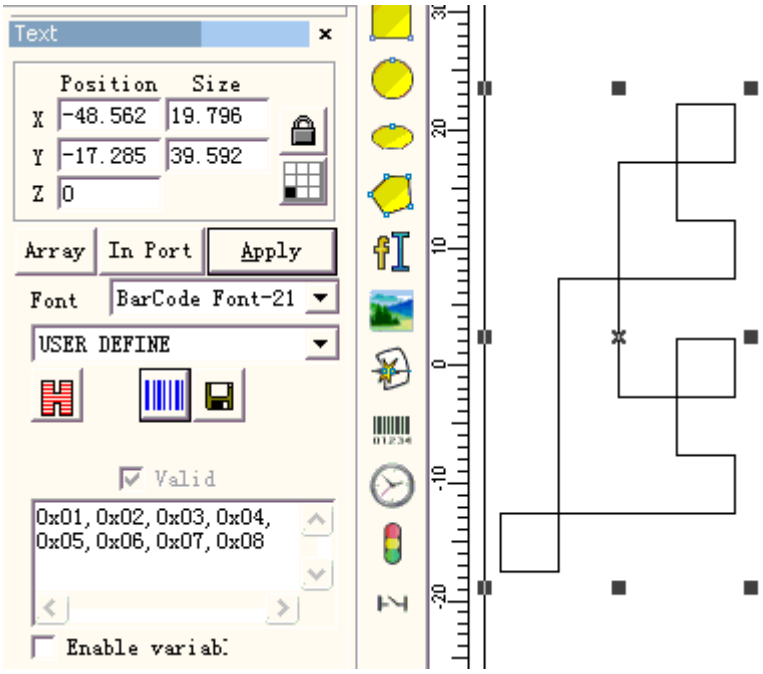
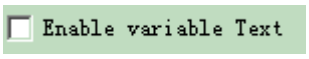


Figure 4-28 USER DEFINE Code

4.7.4 Variable Text

The function of variable text is available after 

is selected. Variable Text is a disciplinary and dynamic text which can be customized during the operation.

All rights reserved

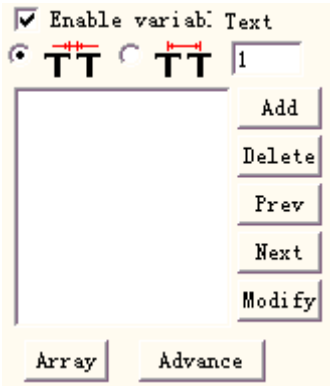
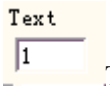
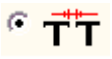


Figure 4-29 Variable text attributes



The adjacent character distance in current text character arrangement situation


What the adjacent character spacing's computation refers to is left side the character right boundary to the right side character left boundary distance, see the figure 4-30:

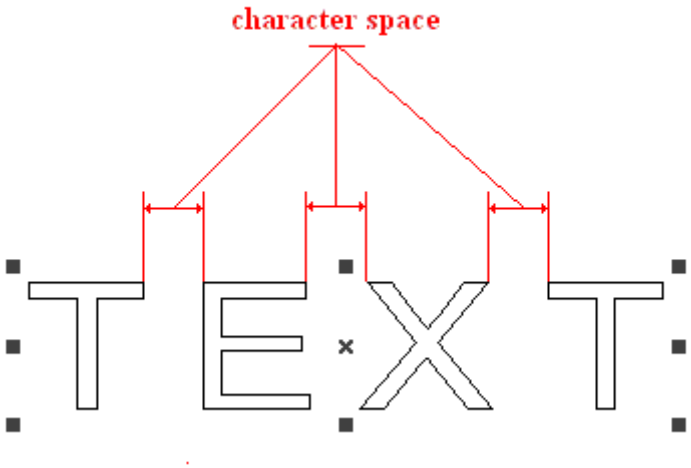


Figure 4-30 Calculate spacing according to character boundary

What the adjacent character spacing's computation refers to is left side the character center to the right side character center distance, see the figure 4-31:

All rights reserved

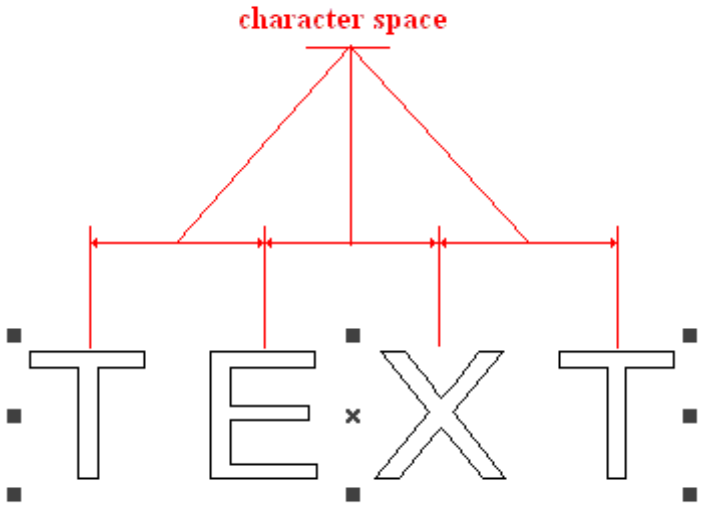
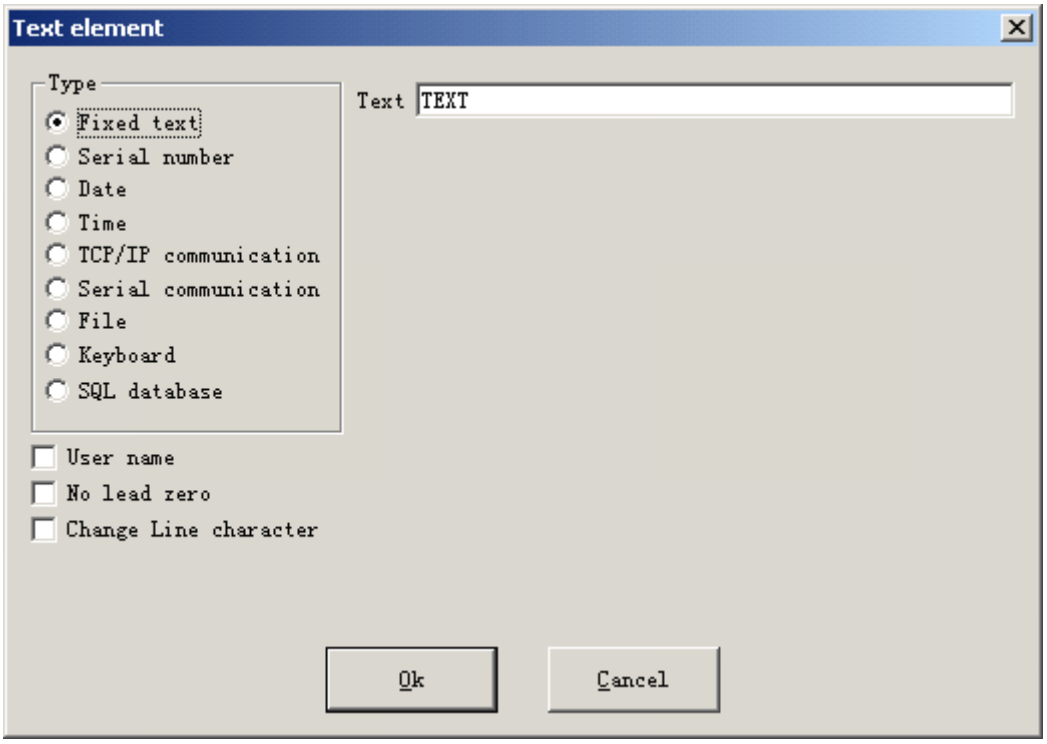


Figure 4-31 Calculate spacing according to character center

Array is the special array uses in the variable text array, when uses this array the time text to change automatically, but 2.11 object property said the array will not change the text object, this is the difference about these two array.

Inside the EZCAD2 international edition the variable text is a character string according to successively the order by each kind of different real-time change text element. The user may according to need to increase each kind of variable text element, may carry on the order of rank to the text element.

After the user click "increases", the system will display a dialog box as Figure 4-32 shows.



All rights reserved

Figure 4-32 Text element dialog box

Currently EzCad2 supports 9 types of variable text:

Fixed text: refers to the fixed invariable element in the operating process.

Serial number: The system will change the text according to the fixed increment when in the operating process.

Date Code: When the operation is taking place, the system will automatically pick up the date information from the computer as a new formed text.

Time: When the operation is taking place, the system will automatically pick up the time information from the computer as a new formed text.

TCP/IP communication: When the operation is taking place, the system will pick up the text from the network

Serial communication: When the operation is taking place, the system will pick up the text from the serial port

File: The system will seriatim read what to be marked in the customized text file line by line.

Keyboard: Users can type text to be marked through keyboard when the marking is in process.

SQL database: The system will seriatim read what to be marked in the database line by line.

Fixed text

The fixed text is refers to the fixed invariable element in the operation process.

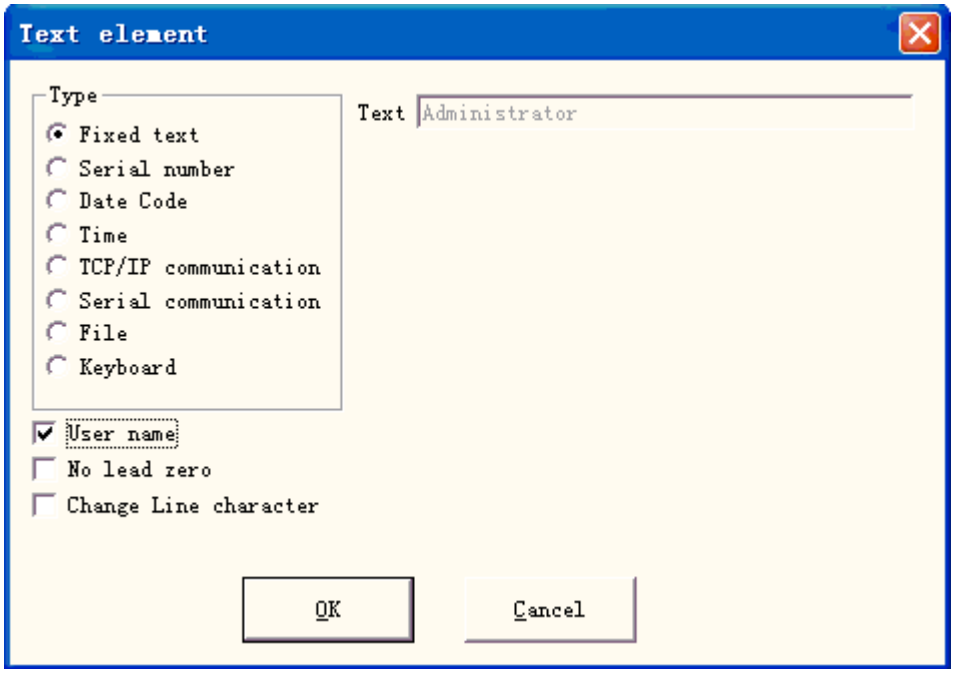
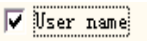


Figure 4-33 Fixed text

Change Line character: uses in variable text, can resolve the question about multi-text must branch marking. When application, increases one change line character between two variable texts, the software according to the change line character position automatic text branch. If many texts need to divide into the multi-lines, only need in the behind where want to branch's text to

All rights reserved

increase one change line character.

The fixed text has a special option is 

, when chooses this item, the system uses the current user name to replace the fixed text automatically.

Below explains with examples the situation needs to use in the fixed text the user name function.

If the present must process one batch of work piece as shown in Figure 4-34, because the worker is every day three number of runs in turn, in order to control the quality to need each operator marks his own name, does not process the part in the work piece. Because only the designer and the administrator have the jurisdiction of change processing document, the operator is unable to change the processing document to increase own name, this time needs to use in the fixed text the user name function.

The administrator must enable "You must enter and password before using" (see Chapter 2.6.7), then sets a user name and the password for each operator. The designer completes the processing document which as shown in Figure 4-34, the last text sets the user name in the object list. After like this each operator goes to work, after opening EZCAD2, must input own user name and the password, in processes this document time, the system alters to automatically the last text operator's name.

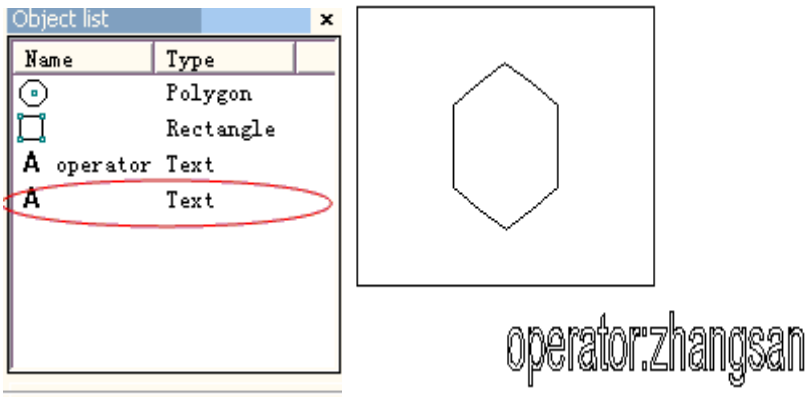


Figure 4-34 the processing example has the user name in the fixed text

Serial number

Serial number text is a text which is changed according to the fixed increment when in the operating process.

When selected, a serial number parameter setting will automatically appear in the variable text dialog box. (Figure 4-35)

All rights reserved

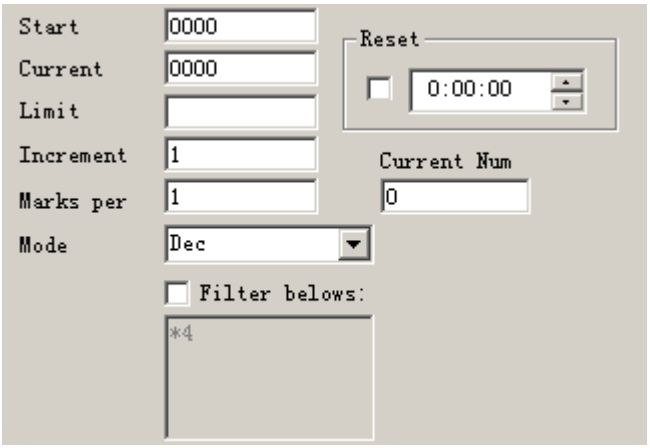


Figure 4-35 Serial number parameter definition

Mode: The mode current series number used, see the figure 4-36.

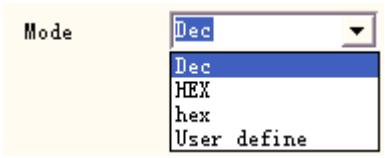


Figure 4-36 Serial number mode

Dec: Series number carry according to decimal system, the effective character is from zero to nine.

HEX: Series number carry according to capital letter hexadecimal system, the effective character is from A to F

hex: Series number carry according to small letter hexadecimal system, the effective character is from a to f

User define: The series number carry defines according to user define system, after selecting, the system will display a dialog box like Figure 4-37 shows.

All rights reserved

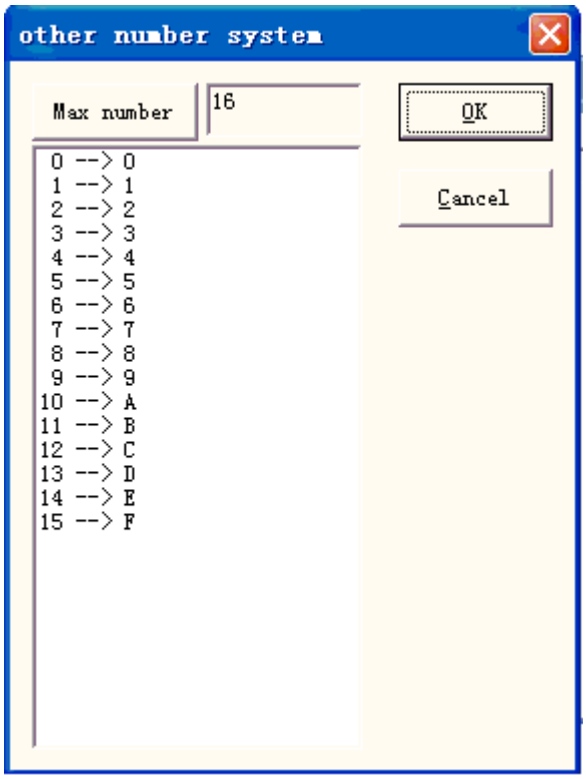


Figure 4-37 User define other number system dialog box

The user can define carry ways discretionary between 2 to 64, only needs to define the max number, and then revises each serial number correspondence the text

Start SN: This item indicates the first serial number to be marked at the present

Current SN: the serial number to be marked at the present

Limit: when mark the limit serial number, it will back to start serial number automatically

Increment: the increment of the current serial number. The value may be plus or minus

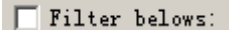
When the increment is "1", and if the starting serial number is 0000, there will be an increment "1" added on the previous serial number. For example, 0000, 0001, 0002, 0003 … 9997, 9998, 9999, and when it comes to 9999, the system will be back to 0000 automatically.

When the increment is "5", and if the starting serial number is 0000, the serial number is: 0000, 0005, 0010, 0015, 0020, 0025 …

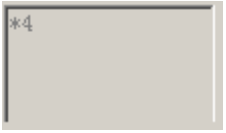
Others can be analogized by this.

Marks per: the marked number. This item indicates how many times every serial number is marked before changing.

Current num: the marking time of current serial number, when marking number equals to marks per, it will turn to 0 automatically



if click it, software won't mark special number in special digit.



won't mark numbers end with 4, * means any digit.

Reset: The number will become the start SN in the set time.

All rights reserved

Date Code

When the operation is taking place, the system will automatically pick up the date information from the computer as a new formed text.

When selected, a date parameter definition will be shown in the dialog box automatically. As Figure 4-38 shows, users can directly choose the type they prefer.

Figure 4-38 Data parameter definition

Year — 2008: Use computer clock's current year for corresponding text, the form is four characters.

Year — 08: Use computer clock's current year for corresponding text, the form is two characters: latter two digits are effective of the year.

Month — 07: Use computer clock's current month for corresponding text, the form is two characters.

Day—04: Use current computer clock's each month's date for corresponding text, the form is two characters.

Day — 186: The use current computer clock this day takes the corresponding text from January 1 number of days, the form is three charactes. (What 001 represent is on January 1 , what 002 represent is on January 2, what 003 represent is on January 3, ex analogia)

Day of week—5: Use current computer clock's week date for corresponding text, the form is one character

Week of year—27: The use current computer clock this day is this year's several week for the text which corresponds, the form is two characters (from January 1 to January 7 is 01, from January 8 to January 14 is 002, ex analogia)

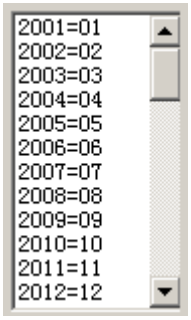
Date: When system read computer clock's date, needs to add on the the displacement date is the finally date, this function mainly uses in the work piece processing having the production date and guaranteeing nature date professions and so on food.

User-defined month character: When selected the month as the corresponding text, the Figure 4-39 will be shown. Users can define the month character, changes to other characters that no longer uses the digit which the software defaulted, only needs double-clicks the selected month, input the month other characters, finally the month which shown on the software workspace is with the input character.

All rights reserved

Figure 4-39 User-defined month character

click it, follow dialog will show, user could define year as user need



Time

When the operation is taking place, the system will automatically pick up the time information from the computer as a new formed text.

When selected, a time parameter definition will be shown in the dialog box automatically. As Figure 4-40 shows, users can directly choose the type they prefer.

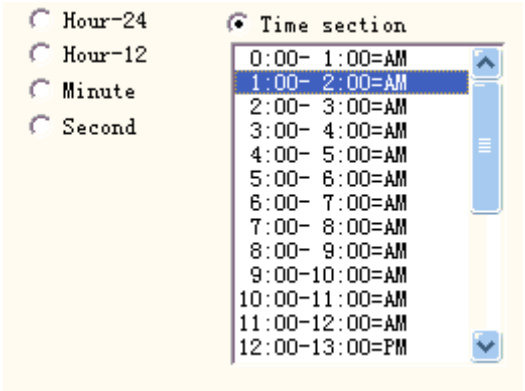


Figure 4-40 Time section

Hour－24: Use current computer clock's hour for the corresponding text, the time format is 24-hour-setting

Hour－12: Use current computer clock's hour for the corresponding text, the time format is

All rights reserved

12-hour-setting

Minute: Use current computer clock's minute for the corresponding text.

Second: Use current computer clock's second for the corresponding text.

Time Section: Divides into 24 time sections one day of 24 hour, the user may define each time section is a text. This function mainly uses in the work piece the processing needing to have the number of runs information.

TCP/IP communication

When the operation is taking place, the system will pick up the text from the network.

Notice: The network interface in here is the network interface uses in TCP/IP agreement.

When the user selected the "TCP/IP communication", the parameter defines will display automatically in the dialog box, see the figure 4-41:

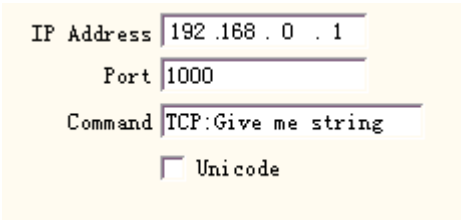


Figure 4-41 TCP/IP communication parameter definition

IP Address: select the IP address which from reads the data

Port: select the port the TCP/IP communication used

Command: When the system processes to this text object, the system through the network interface to transmit this order character string to a computer assigned the IP address, request the computer sends the character string needs to process at present, the system will not return until the computer replied, after the response of the computer, the system will process the returns text automatically.

Unicode: After choosing this option, the system to the computer transmission which and the read character is the Unicode form, otherwise is the ASCII form.

The following example showed how to use this function:

Now has a customer to process 10000 work pieces, on the work piece the marking content is a text, but each work piece must process the text content is dissimilar, therefore, before each work piece processing, must real-time read the processing content through the network from the local area network a computer server (IP: 192.168.0.1 port is 1000) on.

1. Open ezcad2 to establish a text object, adjust the text size, the position and the processing parameter.
2. Choice the text object, select the "enables variable text", click the "increase" button, the system will spring a Figure dialog box as 4-32, select TCP/IP communication, set the network interface parameter, the IP address parameter fills in server computer's IP, here is 192.168.0.1; the port parameter sets to use in the communication the port number, here is 1000, the network interface parameter must identically with the server computer on , otherwise it will cause to be unable communication.
3. Set the command is TCP: Give me string.(This command may for the random server

All rights reserved

definition command)

4. After closing the dialog box, click the application button.
5. Click F2 to start to process, the computer will send the command "TCP: Give me string" to the server immediately through the net mouth, and waited for that the server will return.
6. After the server discovered the network interface receives the command is "TCP: Give me string", reads the database immediately to obtain the text which the current must process, then gives the local computer through the network interface reply.
7. After the local computer obtains the text which must process, changes the processing data to transmit immediately to the marking board.
8. After the marking board receives the processing data, control the machining to mark the work piece immediately.

Flow chart as shown in Figure 4-42:

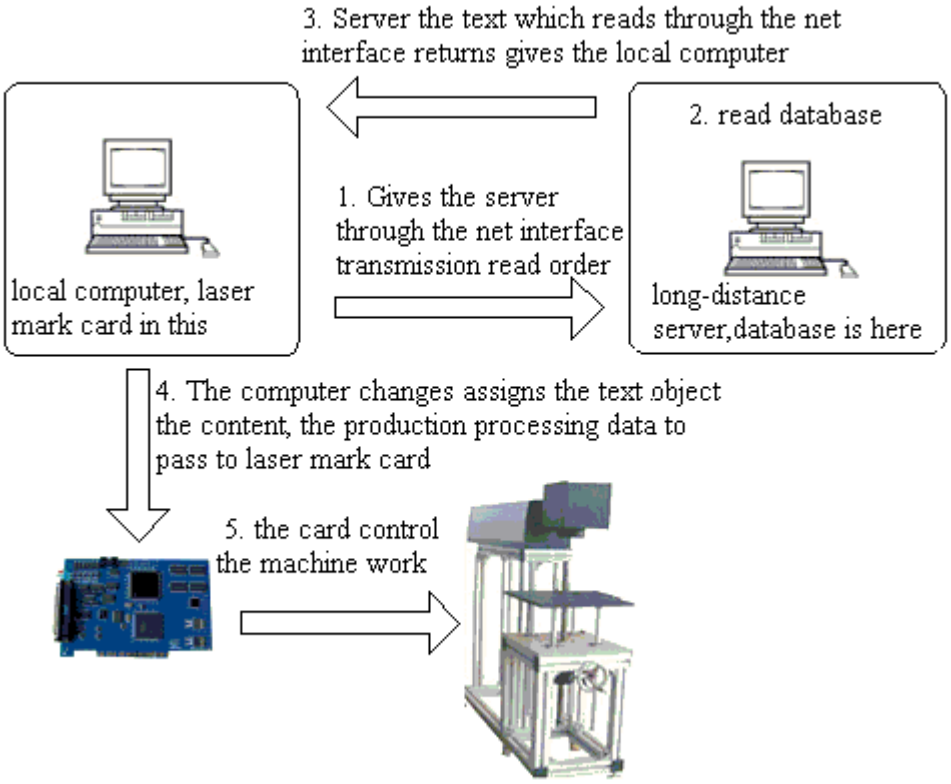


Figure 4-42: TCP/IP communication flow chart

Serial communication

When the operation is taking place, the system will pick up the text from the serial port.

When the user selected the "Serial communication", the parameter defines will display automatically in the dialog box, see the figure 4-43

All rights reserved

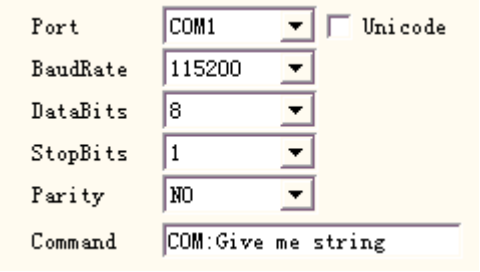


Figure 4-43 Serial communication parameters

Port: the port which computer and peripheral equipment connection used

BaudRate: the BaudRate which the serial communication used

DataBits: the DataBits which the serial communication used

StopBits: the digits of StopBits of which the serial communication used

Parity: select the digits of Parity which the serial communication used

Command: When the system processes to this text object, the system through the serial port to transmit this order character string to a peripheral equipment, request the peripheral equipment sends the character string needs to process at present, the system will not return until the peripheral equipment replied, after the response of the peripheral equipment, the system will process the returns text automatically.

Unicode: after choosing this option, the system to the computer transmission which and the read character assigns is the Unicode form, otherwise is the ASCII form.

The following example showed how to use this function:

Now has a customer to process 10000 work pieces, on the work piece the mark content is a text, but each work piece must process the text content is dissimilar, therefore, before each work piece processing, must real-time through the serial port (On serial port parameter establishment server: the BaudRate is 15200, the DataBits is 8, the StopBits is 1, the Parity is NO)the content which the read must process to other server on.

1. Open ezcad2 to establish a text object, adjust text size, the position and the processing parameter.
2. Choice the text object, select the "enables the variable text", click the "increase" button, the system will spring a Figure dialog box as 4-32, select Serial communication, the setting of serial port parameter must with server's serial port parameter correspondence (the BaudRate is 15200, the DataBits is 8, the StopBits is 1, the Parity is NO), the port for current the port number which uses with it connected server, the serial port parameter must establish identically with the server computer on
3. Set the command is COM: Give me string. (This command may for the random server definition command).
4. After closing the dialog box, click the application button.
5. Click F2 to start to process, the computer will send the command "COM: Give me string" to the server immediately through serial port and wait for that the server will return.
6. After the server discovered the serial port receives the command is "COM: Give me string", reads the database immediately to obtain the text which the current must process, then gives the local computer through the serial port reply.
7. After the local computer obtains the text which must process, changes the processing

All rights reserved

data to transmit immediately to the marking board.

8. After the marking board receives the processing data, control the machine to mark the work piece immediately.

Flow chart as shown in Figure 4-44:

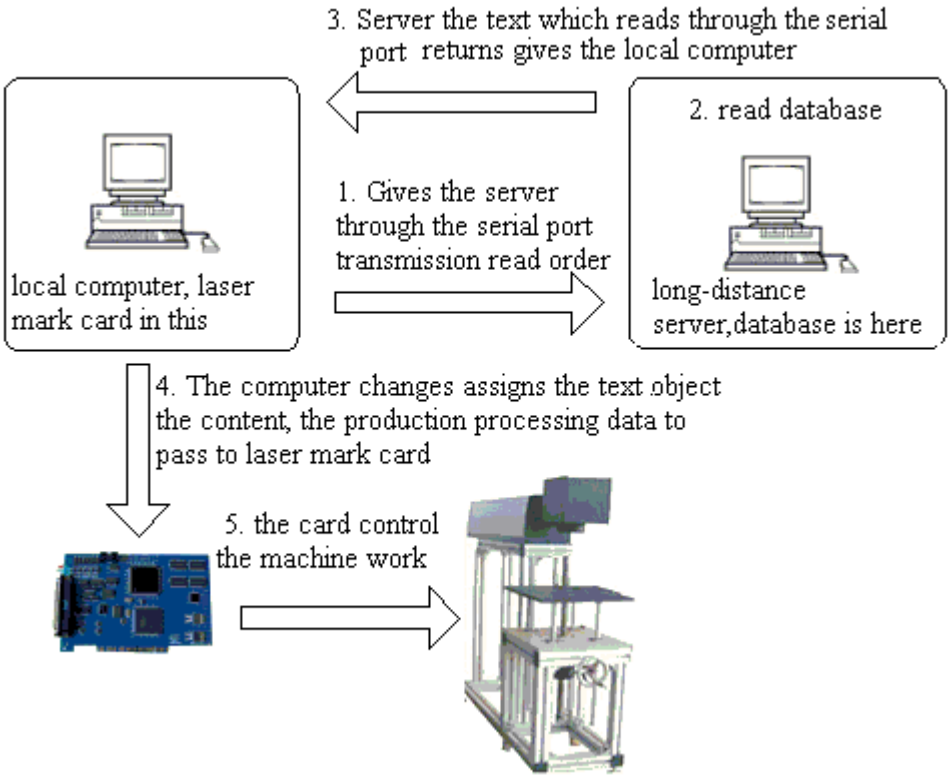


Figure 4-44 Serial communication flow chart

File

Txt files and Excel files are supported now.

1. Txt files

When select TXT file, a dialog box as Figure 4-45 shows will be displayed to ask for the file's name and the current text's line number.

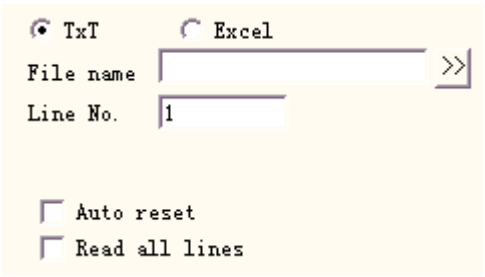


Figure 4-45 TxT document parameter definition

Auto reset: If checked, the line number will change to 0 automatically when reach the last line. The next mark will start from the first line again.

Read all lines: When processes to the text document direct read entire document.

2. Excel files

All rights reserved

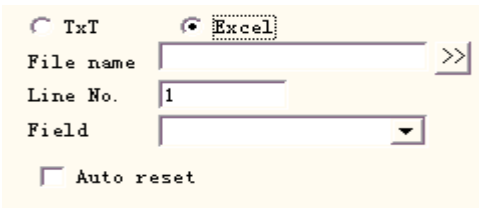


Figure 4-46 Excel document parameter definition

We have to appoint the file name, Field name, Line number to tell the software which cell in the excel table will be mark.

File name: The text string of the first row in the datasheet1. This parameter indicates which column will be marked.

Keyboard

The keyboard element is the text which must process from the keyboard entry by the user, when select the keyboard element, a dialog box as Figure 4-47-a shows will be displayed to ask for the user set the keyboard element parameter.

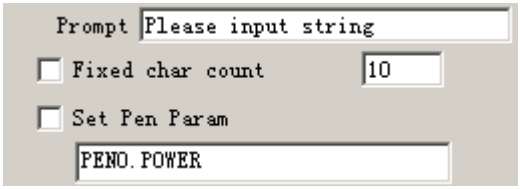


Figure 4-47-a Keyboard element parameter

Fixed char count: user must input string with digit equals to this count

Prompt: In the processing, the system will spring the input dialog box which ask for the user input the processing text when meets the keyboard variable text, like the figure 4-47-b shows, this time the user direct by-hand input the text.

Set Pen Param: When selected, we can get power, speed, frequency from the keyboard entry, only through setting pen*.power, pen*.speed or pen*.freq. The "*" is number of pen.

The keyboard element function uses frequently in this kind of situation when the processing needs the real-time input to the processing content. If the customer present need processes one batch of work pieces, on each work piece is printed with a bar code, when processing needs the user with the bar code scanning gun real-time scans the work piece to read the content on the bar code, then with laser to mark to the work piece assigns in the position, at this time can use the keyboard element function. At the processing time system springs like the figure 4-47-b shows the dialog box, the operator with the bar code scanning gun scanning bar code work piece on, the bar code scanning gun inputs the read content to the dialog box inside and closes it automatically, then the system will start to process the content read a moment ago automatically .

All rights reserved

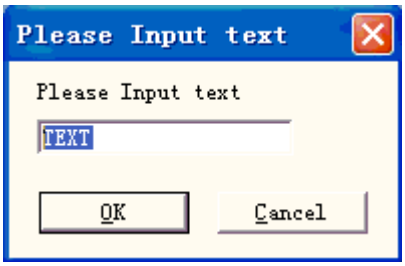


Figure 4--47-b Keyboard input text dialog box

4.8 Bitmap

To add a photo, users may select command "Bitmap" in the Draw Menu or click icon in the Toolbar

Figure 4-51 Add a photo

Then the system will pop a dialog box as Figure 4-51 shows to open a graphic file.

The current supported graphic file formats are: Bmp; Jpeg, Jpg; Gif; Tga; Png; Tiff, Tif;

Show Preview: When users select a graphic file, there will be a preview displayed in the dialog box.

Put to center: put the photo's center in the origin

When finishing adding a photo, a "Bitmap" parameter setting will appear in the Property

All rights reserved

Toolbar as Figure 4-52 shows.

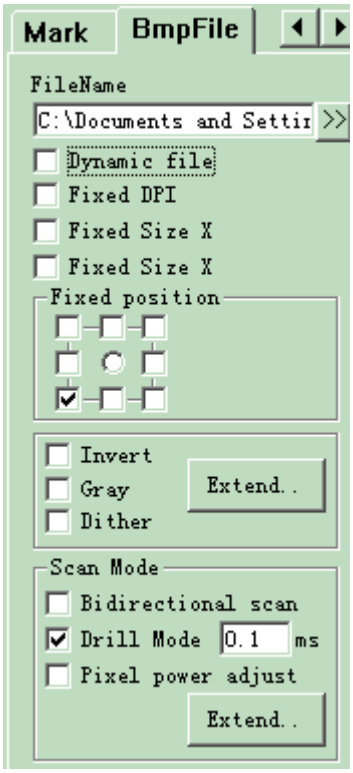


Figure 4-52 Bitmap Parameter

Dynamic file: whether to reread files when in process.

Fixed DPI: When selected, the system will fasten the unfixed DPI of dynamic photo. The higher the DPI's level is, the closer the dots gather; and the photo's precision is better, then the marking time is longer.

DPI: dot per inch; 1 inch is about 25.4 millimeters

Fixed Size X: When checked, the width of the dynamic photo will be preserved in an appointed size, and if unchecked, the photo's width will be the original size of the photo.

Fixed Size Y: When checked, the height of the dynamic photo will be preserved in an appointed size, and if unchecked, the photo's height will be the original size of the photo.

Fixed position: the benchmark the dynamic photo based on while in size changing

Image Manipulation:

Invert: run negative effect on photos (Figure 4-53)

Figure 4-53 Invert Effect (Left is original.)

Gray: change color photos into grey of level 256 (Figure 4-54)

All rights reserved

Figure 4-54 Color and Grey (Left is original.)

Dither: This effect is similar with the function "Grey Adjust" in Adobe PhotoShop. It uses color black and white to simulate grey image, so as to achieve a grey effect with dots arranged in different densities, as Figure 4-55 shows. (The white bar in the photo was caused by display, which will not be marked.)

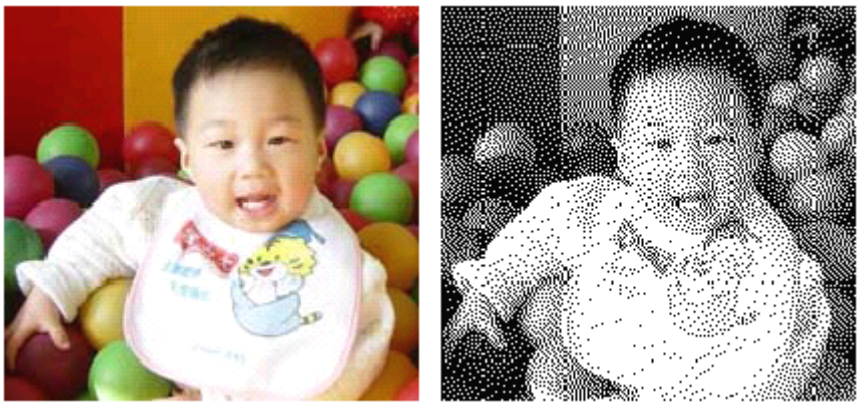


Figure 4-55 Dither

Click the "Expand" button to run the "Bitmap" dialog box. (Figure 4-56)

All rights reserved

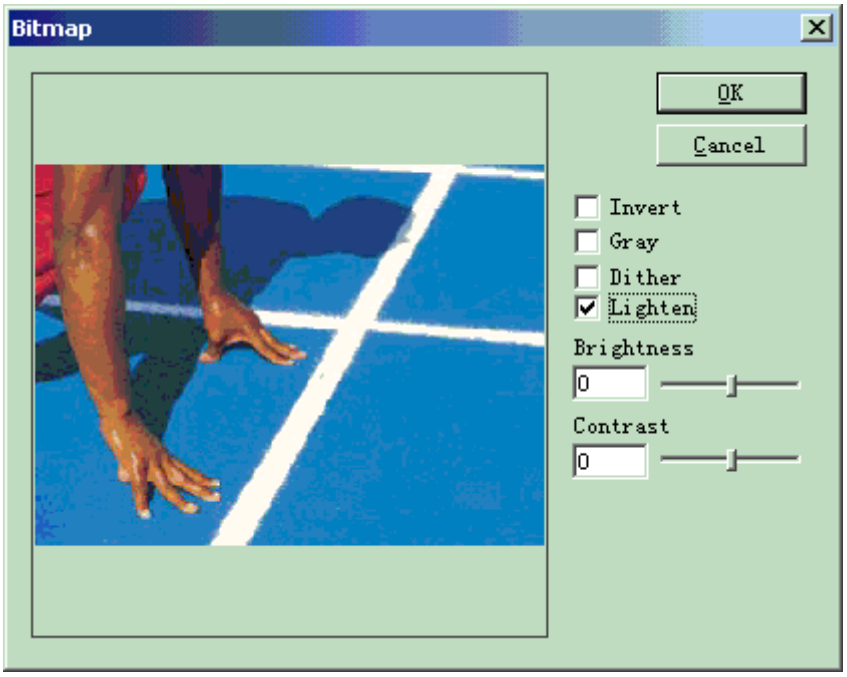


Figure 4-56 Bitmap Dialog Box

Lighten: adjust the current image's brightness and contrast values.

Scan Mode:

Bidirectional Scan: the scan mode is bidirectional when in marking process (Figure 4-57)

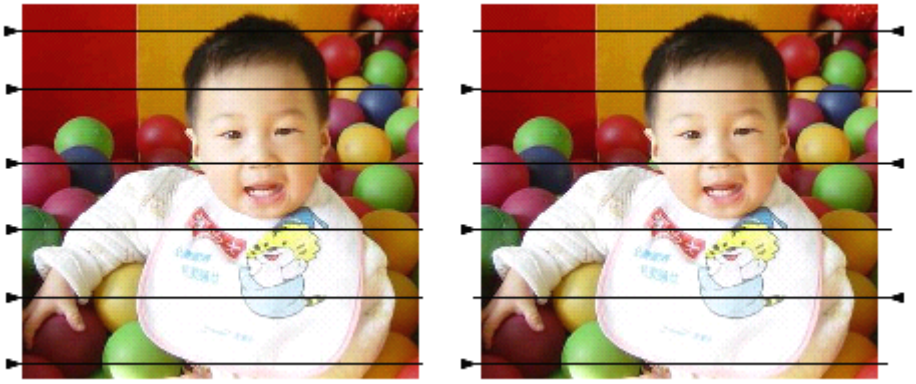


Figure 4-57 Left is unilateral scan; right is bidirectional.

Mark Mode:

Drill mode: whether the laser is kept on or restricted in appointed time for each dot's marking when in process

Adjust Power: whether the laser's power is adjusted according to each dot's grey level when in process

Expand Parameter: Figure 4-58

All rights reserved

Y Scan: The scan will run along Y axis line by line.

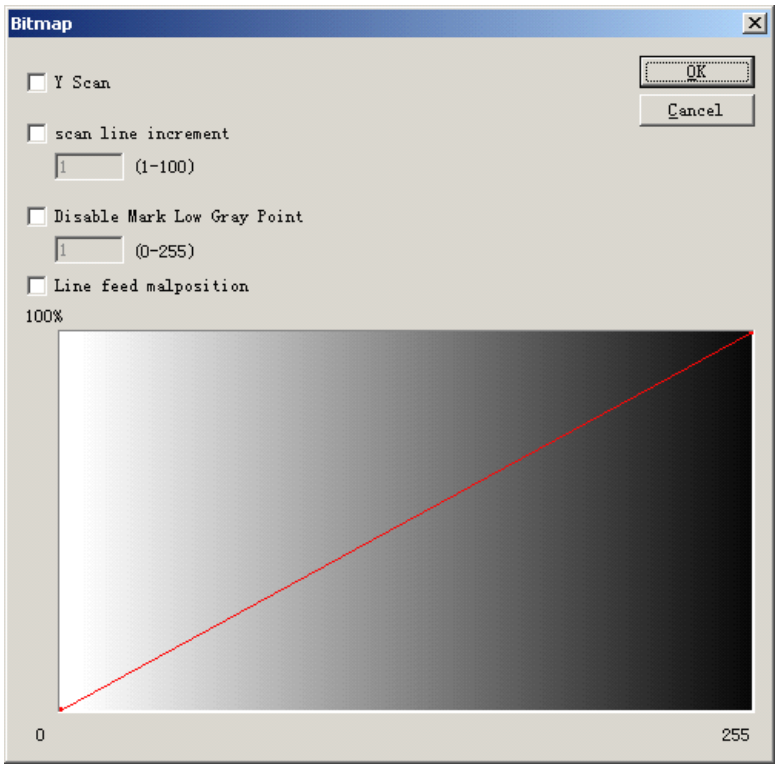


Figure 4-58 Scan Parameter

Scan line Increment: This item indicates whether to scan line by line or skip some lines. This function may quicken the marking speed when in low precision marking requirement.

Disable Mark Low Gray Point: This item indicates that every point is marked or only marking bigger gray points. This function may quicken the marking speed when in low precision marking requirement.

Line feed malposition: The point isn't aligned between two adjacent rows, but the point is aligned with the position which is the middle of two points in the previous line, to avoid the trace of marking.

Gray-Power figure: For improving marking results, can modify some of the gray scale corresponds to the power

4.9 Vector File

To input a vector file, users can select command "Vector File" in Draw Menu or click icon .

All rights reserved

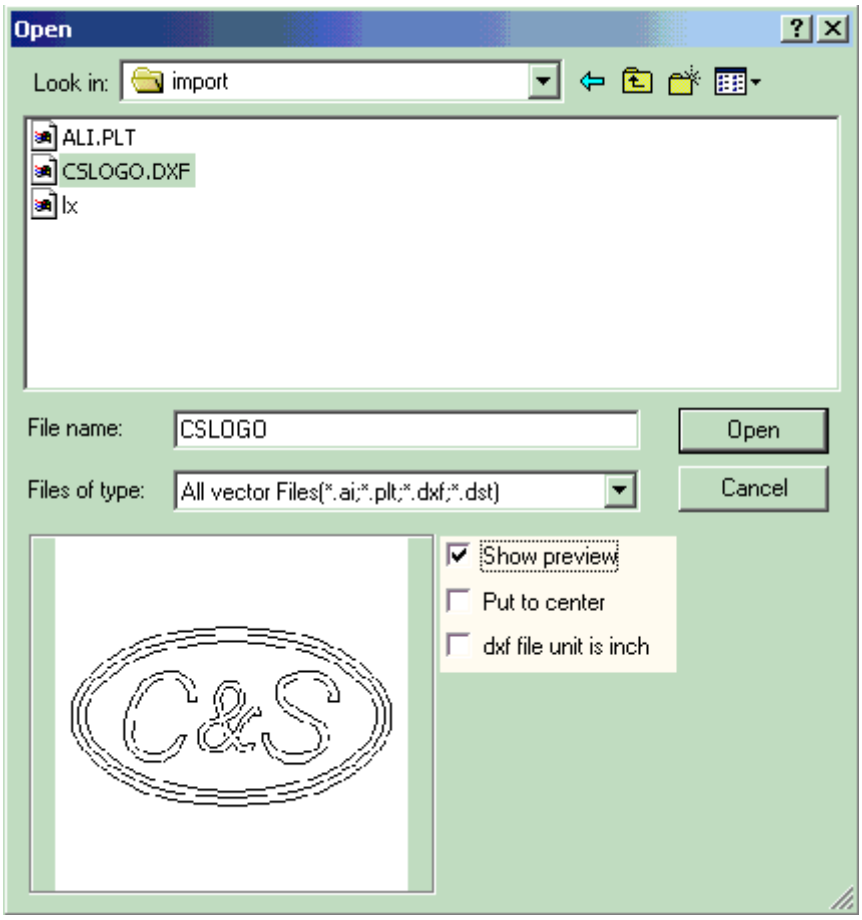


Figure 4-59 Input a Vector File

There will be a dialog box pop up to ask for the vector file to be inputted.

The current supported vector file formats are: PLT; DXF; AI; DST; SVG; NC

NOTE: If the vector files includes color information (when draw it by image software like CorelDraw, AutoCAD, Photoshop and so on), Ezcad can distinguish the color automatically. Then user can pick the object according to the color or pen (see Chapter 4.12) and set marking parameters (see Chapter 10.1 "color", "pen")

All rights reserved

When users have opened a vector file, a vector file parameter setting as Figure 4-60 shows will appear.

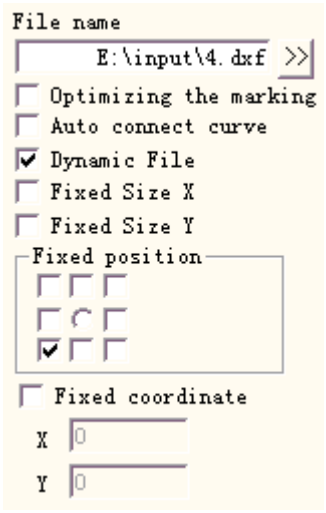


Figure 4-60 Vector File Parameter Setting

4.10 Time-lapser

To input the Time-lapser, users can select command "Time-lapser" in Draw Menu or click icon .

When selected, there will be a property setting of the time-lapser displayed in the Property Toolbar as Figure 4-61 shows.

Waiting time: The marking will pause until the specific time has passed.

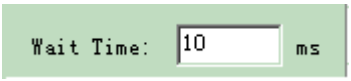


Figure 4-61 Waiting Time

4.11 Input Port

To check the Input signal, users can select command "Input Port" in the Draw Menu or click icon .

When selected, there will be an input port property setting appearing in the Property Toolbar as Figure 4-62 shows.

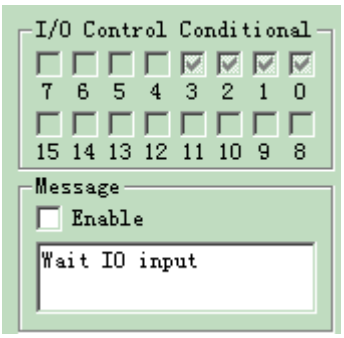


Figure 4-62 Input Parameter

I/O Control Condition: The software will pause until the input signal is the same as the I/O control condition.

Message: If checked, the software will pop up a message box to info the user. The message text can be custom defined.

4.12 Output Port

To output signal, users can select command "Output Port" in the Draw Menu or click the icon .

When checked, there will be an output port property setting appearing in the Property Toolbar as Figure 4-63 shows.

All rights reserved

: This icon indicates that the system will export a high-level voltage (TTL compatible) when the operation is taking place at the current output port.

: This icon indicates that the system will export a low-level voltage (TTL compatible) when the operation is taking place at the current output port.

: This icon indicates that the system will export a fixed-level.

: This icon indicates that the system will export a pulse.

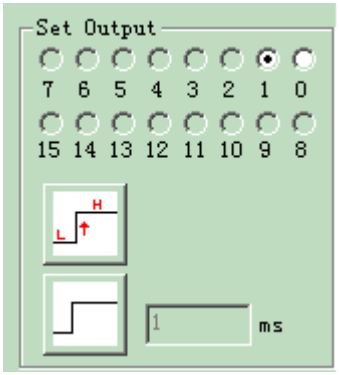


Figure 4-63 Output Parameter

4.13 Select

Icon on the top of the Draw Toolbar is used to select object. The pressed-down state of this icon indicates that the current command is "select". Now, you can use mouse to click object in the workspace to select it. 4.14 Node Editing

All rights reserved

Chapter 6 View Menu

6.1 Zoom

The Toolbar of the zoom Menu is , and there are six types for different requirements.

: This item is used to fill the whole view area with the appointed area. Users may use mouse to select rectangle area to zoom in. If pressing the right button of the mouse, the current view will zoom out for one time with the mouse pointer's position as the center; and if pressing the left button of the mouse, the current view will zoom in for one time with the mouse pointer's position as the center.

: To move the current view

: Zoom in

: Zoom out

: Fill the whole view area with all the objects

: Fill the whole view area with the whole workspace

All rights reserved

Chapter 10 Marking

Figure 10-1 is the Marking Properties Table.

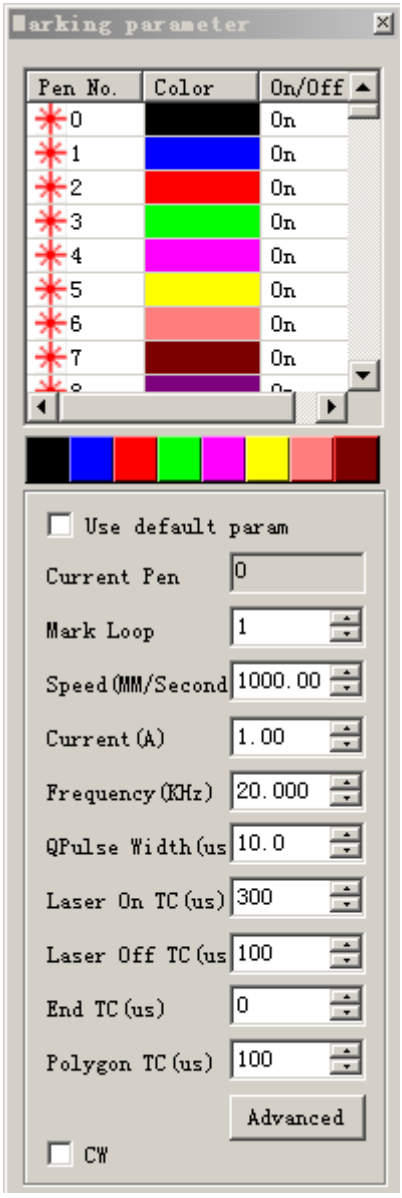


Figure 10-1 Marking Properties Table

10.1 Pen List

In EzCad2, every document file has 256 pens, 0 to 255 numbered, and they are located in the top of the Marking Properties Table. Each pen is corresponding to a group of marking parameter and the parameter base's name is after the color.

: This item indicates that objects with selected pen's number will be marked. Users may customize the color by double-clicking the color sticker.

: This item indicates that the current object has not been marked with a pen's number, and it will not be marked.

Color: the current pen's color

Apply Parameter Button: The buttons show as Figure 10-2

When pressed the button, the pen number of the current object will be changed to the one that the color stands for.

When pressing the right button of the mouse, a shortcut menu will appear as Figure 10-3 shows.

Figure 10-2 Button to apply parameters

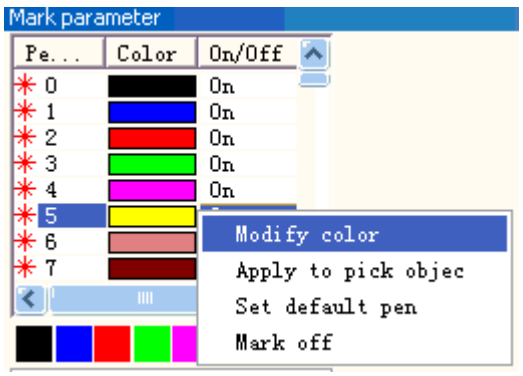


Figure 10-3 Shortcut Menu

All rights reserved

10.2 Marking Parameter Base

Marking Parameter Base is a base filled with all marking parameters which have been set by users already.

YAG: YAG indicates that the current Marking Parameter is for YAG laser machine, and if not, it is for CO2 laser machine.

Select param from library: When press this button, a dialog will pop up as figure 10.2-1 shows. We can save the parameters to disk files, or to delete parameters from files.

Loop count: loop times to mark an object

Speed: the current marking speed

Power / Current: In CO2 mode, this item indicates the power percentage of the current marking parameter, and 100% refers to the biggest power of the laser equipment. In YAG mode, this item indicates the current of the Q-switch.

Frequency: the laser machine's frequency in the marking parameter

Q pulse Width: the high-level's time of the Q pulse if the laser equipment is Q-switch YAG laser machine

Start TC: When the scanhead has to execute a mark command, the scanner mirrors first have to be accelerated up to the defined marking speed. In the beginning of the movement, the laser focus moves very slowly which may result to burn-in effect at the start point. To avoid this, We insert a delay (**Start TC**) at the beginning of each mark command. When the laser eventually turns on, the mirrors have already reached a certain velocity. However, if this value is too large, the first part of the vector will be cut off. Also negative value is supported.

Laser Off TC: The delay time of the laser shutting down after marking finished. Proper time can wipe off the burn-in effect at the end. This value cannot be negative.

End TC: The **End TC** parameter is used to control how long the software will wait at the end of a series of vectors. The wait is required because the software is always "ahead" of the hardware and must wait for the hardware to catch up. This delay applies to the end of all vectors in which the laser is to be turned off after execution.

Polygon TC: the Polygon TC parameter is used to control how long the software will wait at vector connection points. The wait is required due to the lag time between the software/DAC position and the actual hardware/mirror position. This timer applies to all vectors whose endpoint is also the start point of the next vector (polygon connection points). In other words, this timer applies to end of all vectors in a series of connected vectors, except for the last one (the end of last one is controlled by the **End TC** parameter). The three connected points in a square or the intermediate connection points in a polyline circle are examples of points the **Polygon TC** parameter can effect. The starting point of the square is controlled by **Start TC** parameter. The last corner of the square is controlled with the **End TC** timer.

Clicking "Advanced" will prompt an advanced parameter dialog box as Figure 10-5 shows.

All rights reserved

Jump Speed: set a jump speed of the scanner for the current parameter

Jump Position TC | Jump Dist TC: After each jump movement, the system will delay some time then execute the next command. The actual delay time is calculated by the following formula:

Total delay = (Jump Distance *Jump Dist TC) + Jump Position TC

End compensate: Only when in high-speed operation or this parameter need not to be set. This parameter is used to mark a little bit more as an ending increment at the end of an operation. Negative value is supported.

Acc Distance: In those applications that require laser marking without variation of intensity, we have to add an accelerated segment before the start point to reach the homogenous marking results.

Point Time: This parameter is used to set the marking time if there are dot objects.

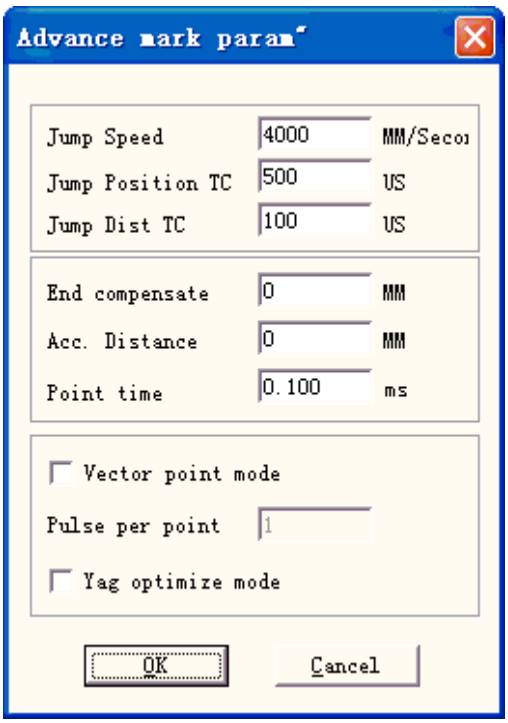


Figure 10-5 Advanced

Vector point mode/Pulse per point: Marking the vector graph using point mode, and force the pulse number while marking each point

YAG optimize mode: While marking on the high reflection material using YAG laser, optimize the hatch arithmetic. Note: the function is used to resolve the irregular lines when marking on the high reflection material using YAG laser. If you want to use this function, you must connect the PWM signal to the pulse modulate signal of the Q-switch.

Now let's take it into practice:

Mark a rectangle with size 40×20 and fill it with the following parameters: **Mark Contour/ Edge offset**=0 **/ Line Distance** =1.0 **/Hatch Angle**= 0 **/ Unidirectional hatch**

Set the marking parameters like this:

Parameter Name: XX ---- the name users customize (easy to understand it's means.);
Loop count: 1;
Marking Speed: XX ---- the speed users need;
Jump Speed: XXX ---- the jump speed users customize (It is suggested to use 1200 –2500.);
Power Percentage: 50%;
Frequency: 5KHZ;
Start TC: 300;
End TC: 300;
Polygon TC: 100;
Jump Position TC: 1000;
Jump Distance TC: 1000;

All rights reserved

End compensate: 0;

Acc. Distance: 0;

There may be several results to mark this hatched rectangle.

Case #1: The hatch-lines and the border are separated. (Figure 10-6) This is because the **Start TC** Value is too big, and it needs to be smaller.

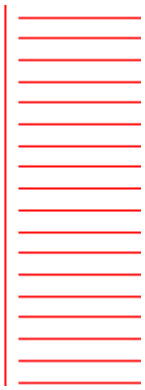


Figure 10-6 Case #1

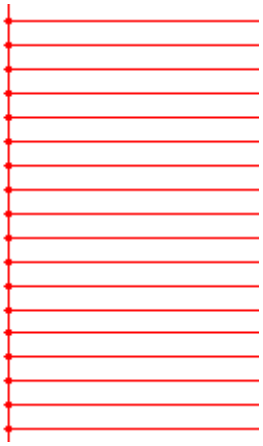


Figure 10-7 Case #2

Case #2: The hatch-lines and the border are intersected (burn-in effect). (Figure 10-7) This is because the **Start TC** Value is too small, and it needs to be higher.

Case #3: Uniform result. (Figure 10-8)

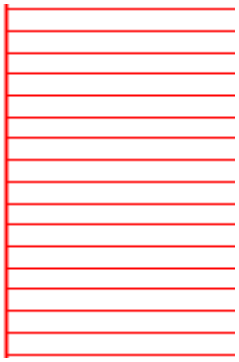


Figure 10-8 Case #3

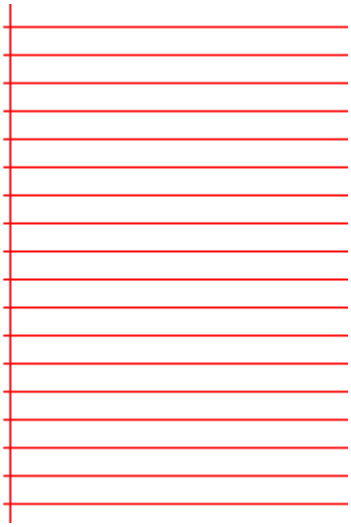


Figure 10-9 Case #4

Different manufacturers use different Laser sources and scanner (gavlo), so the performances are also different. Sometimes when however users modify the **Start TC**, the hatch-lines and the

All rights reserved

border cannot be superposed. Here users need to set the **Acc Distance** Parameter (Values from 0.05 to 0.25). But this may cause the 4th case: the hatch-lines are beyond the border, as Figure 10-9 shows. Users may increase the **Start TC** Value or lower the **Acc Distance** Parameter, and if the two parameters are adjusted well, there will be a perfect result.

- Adjust **End TC:**

  Still mark the hatched rectangle mentioned above

  Here are three possible cases about the hatch-lines and the border's relative positions.

  Case #1: The fill-lines and the border are separated, as Figure 10-10 shows. This is because the **End TC** is too short, and users need to raise it.

Figure 10-10 Case #1

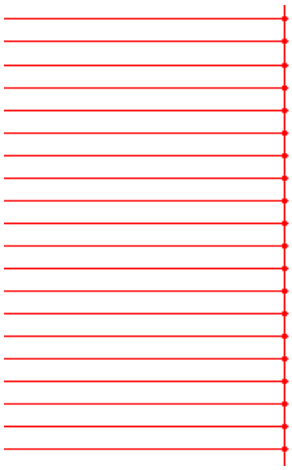
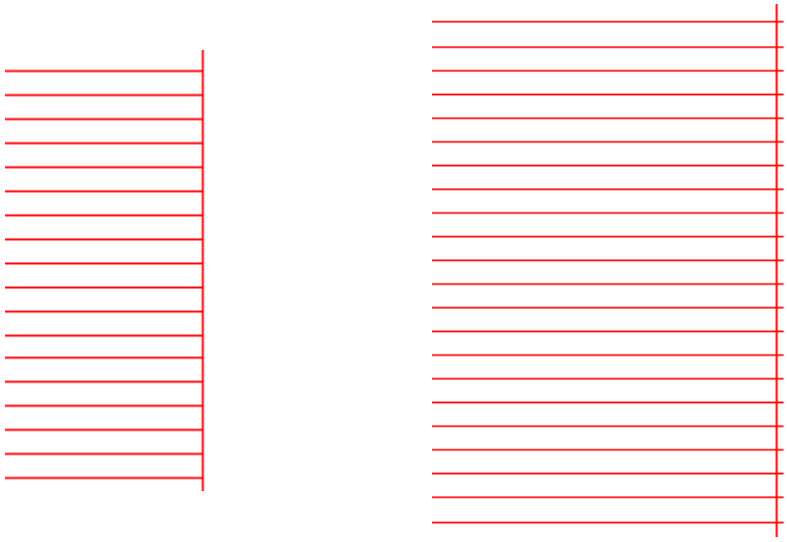


Figure 10-11 Case #2

Case #2: Burn-in effect as Figure 10-11 shows. This is because the **End TC** is too long, and users need to shorten it.

Case #3: Perfect result as Figure 10-12 shows.



All rights reserved

Figure 10-12 Case 3

Figure 10-13 Case 4

Different manufacturers use different Laser sources and scanner(gavlo), so the performances are also different. Sometimes when however users modify the **End TC,** the hatch-lines and the border cannot be superposed. Here users need to set the **End Compensate** (Values from 0.05 to 0.25). But this may cause the 4th case: the hatch-lines are beyond the border, as Figure10-13 shows. Users should lower the **End Compensate** to reach the perfect result.

- Adjust **Jump Position TC | Jump Dist TC :**

Below is the adjust steps:

Set the two Jump TC items' values (Position TC value and Distance TC value) as 0 and then mark the rectangle.

If the start segment and ending segment of the hatch-line are bent, users need to increase the two Jump TC's values until there is no bend appearing.

Note: The Jump TC is too big may influence marking efficiency. The scanner (gavlo) have better performance, the lower the two Jump TC's value is.

- Adjust **Polygon TC:**

If mark a rectangle with size 40×20, you may find three possible results about the rectangle's corners:

Case #1: As Figure 10-14 shows, it is changed into arc angle which should be right angle, and this is because the **Polygon TC** is too short, here users need to raise the value.

Figure 10-14 Case #1

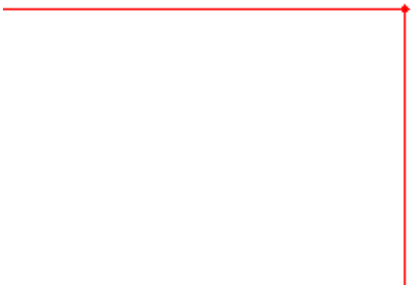


Figure 10-15 Case #2

Case #2: As Figure 10-15 shows, although the right angle is what it should be, the corner of the angle is heavy marked, and this is because the Polygon TC is too long, here users need to shorten the value.

Case #3: As Figure 10-16 shows, it is right angle and there is no heavy marking. This is the result we want.

All rights reserved

Figure 10-16 Case #3

When finish setting these parameters already, you may start to mark. It is recommended that users had better not modify the parameters which have been adjusted well. If they were changed, the result would be changed too.

Users can use the same way to set other parameters and save them in the parameter list. By doing this, users can reduce the repeated works and raise the work efficiency.

10.3 Mark-Control Bar

The Mark-Control Bar is located at the bottom of the main interface window, as Figure 10-17 shows.

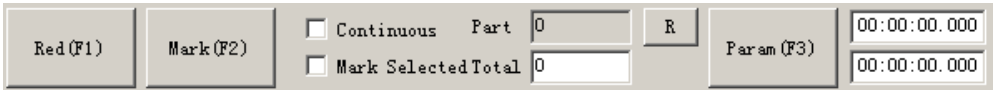


Figure 10-17 Mark-Control Bar

Red: This item is used to mark the frame of the object without laser output so that users are convenient to orient the workpiece. This function is available in those laser machines which have guide light.

Key "F1" is the shortcut key of this function for guide light show.

Mark: to execute marking

Key "F2" is the shortcut key of this function.

Continuous: mark the objects repeatly until user stop the mark

Mark Selected: only those selected objects would be marked

Part: the total counts that the mark command has been executed

Total: The total counts that the mark command should be executed. The value would decrease 1 automatically after the mark command has been executed each time. It is unavailable under the mode of Continuous Marking. When in marking process, if the amount number is more than 1, the marking operation will not stop until the marking number is 0.

Parameter: machine parameter

All rights reserved

Key "F3" is the shortcut key of this function.

10.4 Machine Parameters

10.4.1 Field Parameter

See Figure 10-18

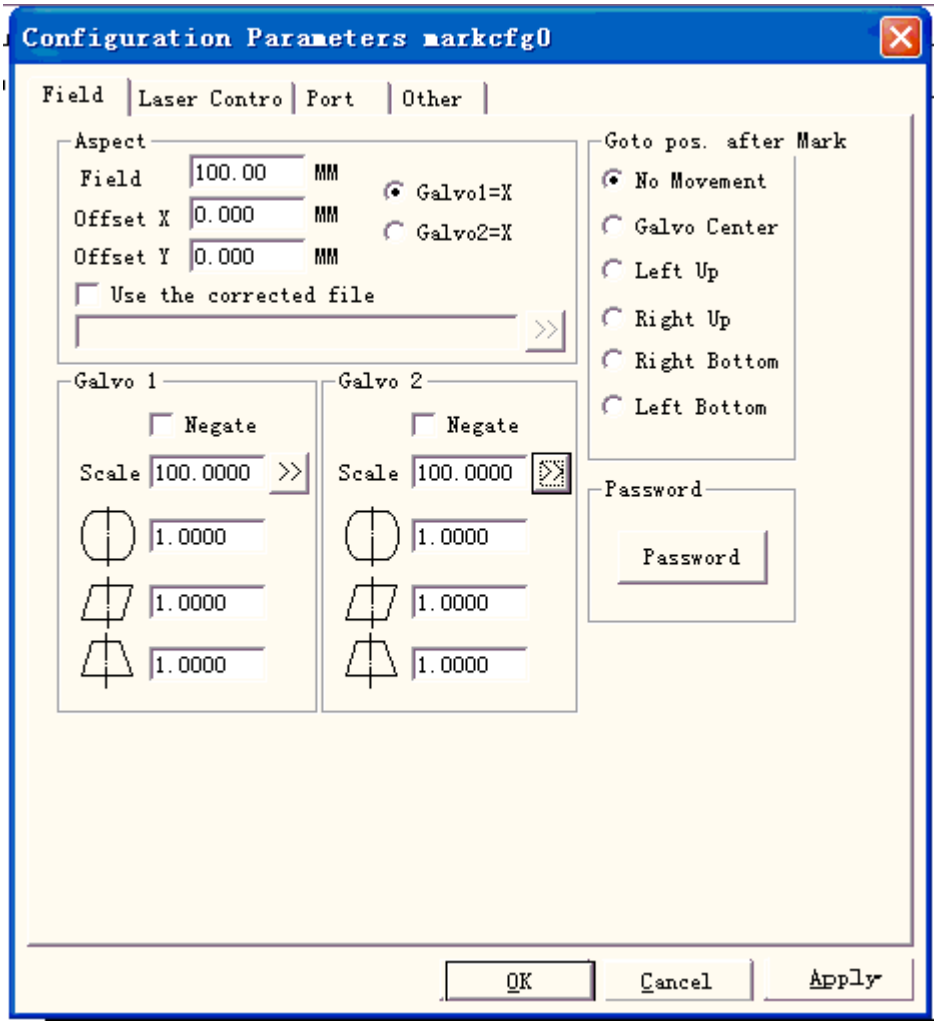


Figure 10-18 Area Parameter

Field: the widest range for marking

Gavlo 1=x: the track of gavlo 1 uesd as the X axis

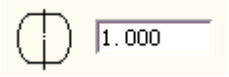
Gavlo 2=x: the track of gavlo 2 uesd as the X axis

Offset X: The offset distance on X direction of scanhead.

Offset Y: The offset distance on Y direction of scanhead.

Use the corrected file: Use the correction file generated by our CorFile.exe soft.

Negate: the opposite direction of the current gavlo



This item refers to the distortional correction coefficient, and the default value is 1.0 (range from 0.875 – 1.125). If your design is as Figure 10-19 shows but the marked work is Figure 10-20 or Figure 10-21, you will have to increase the coefficient on the X axis

All rights reserved

direction for Figure 10-20 and lower the coefficient on the X axis direction for Figure 10-21.

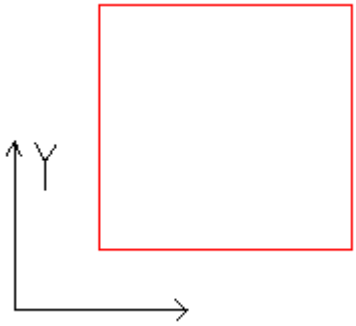


Figure 10-19 Your Design

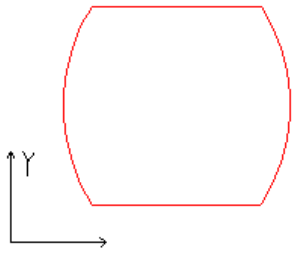


Figure 10-20 Marked Work

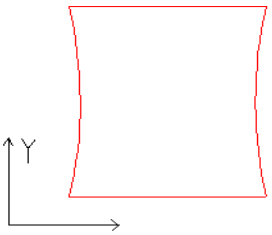


Figure 10-21 Marked Work

This item indicates the parallelogram correction coefficient, and the default is 1.0 (range from 0.875 – 1.125). If your design is as Figure 10-19 shows but the marked work is Figure 10-22, you will have to adjust this parameter to correct it.

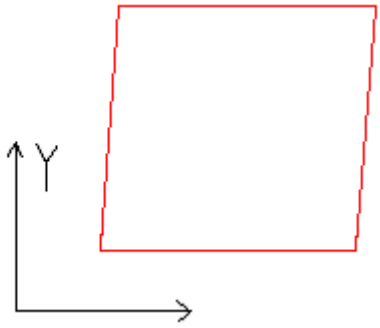


Figure 10-22 Marked Work

Scale: It refers to the flex percentage, and the default is 100%. This parameter will be adjusted when the trim size marked is different from the setting size. If the trim size is smaller

All rights reserved

than the designed one, users can raise this parameter; if the trim size is bigger than the designed one, users can lower this parameter.

Note: If there are some distortions with the Laser scanner (gavlo), users should firstly adjust the distortions and then the flex percentage.

When setting scale, we may press the button , and a dialog will pop up just like figure 10-23.

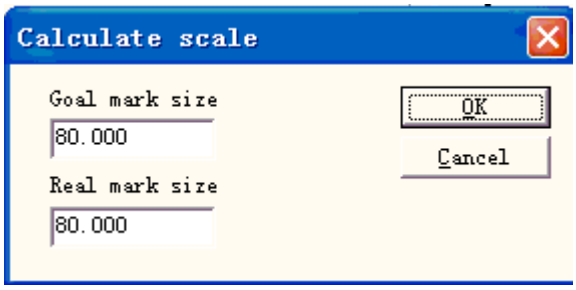


Figure 10-23 Set the scale

Goal mark size: the size set in the software.

Real mark size: the measured size of the object that have been marked on the workpiece. The software will calculate the scale automatically according to these two values.

After mark Go to: The gavlo jump to the appointed position when finishing marking

password: after set the password ,we must input it can enter the Param Dialog Box.

10.4.2 Laser Control Parameter

See Figure 10-24:

All rights reserved

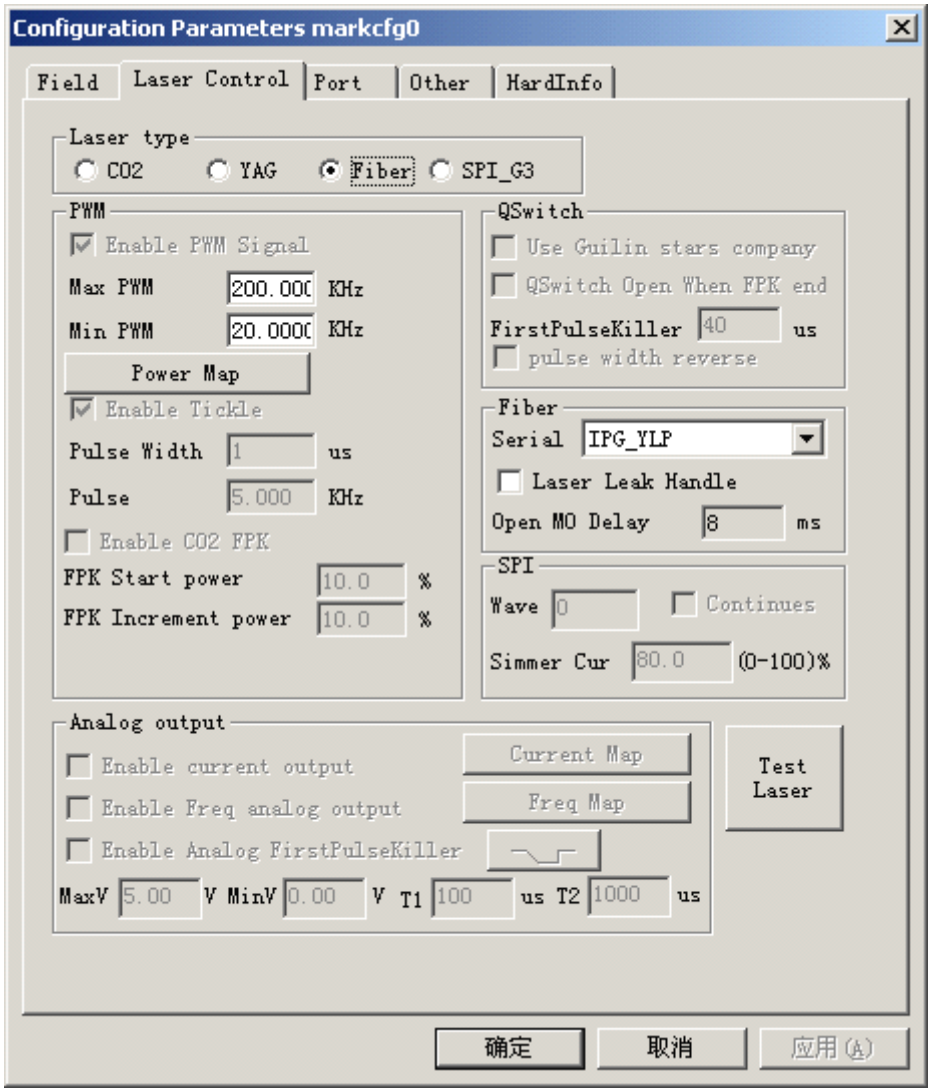


Figure 10-24 Laser Parameter

Laser type:

Co2: It indicates that current laser size is Co2 laser.

YAG: It indicates current laser size is YAG laser.

Fiber: It indicates that current laser size is fiber laser.

SPI_G3: It indicates that current laser size is SPI laser.

Note: this function only support USBLMC control card.

PWM:

Enable PWM signals: The PWM signal will be output from Control Card

Max. PWM freq: the max frequency of the PWM signals

Enable Tickle: Let the preionization signals active for some CO2 laser sources.

Pulse Width: the pulse width of the preionization signals

Pulse Period: the frequency of the preionization signals

Use Digital Q-switch driver: This function is for digital Q-switch. If check this function, the output port 1 and 2 cannot apply in other purpose. This mode mainly design for Digital Q driver of Guilin Xingchen

Q-switch Open when F.P.K End: If Checked, the Q-switch modulation signal will begin

All rights reserved

pulsing after the FPS delay has expired. Otherwise Q-switch pulsing begins at the end of the Start TC delay and coincidentally with the beginning of the FPK signal.

First Pulse Killer (F.P.K): the lasting time for the first pulse suppression

Pulse width reverse: Reverse the PWM signal. See figure 10-25

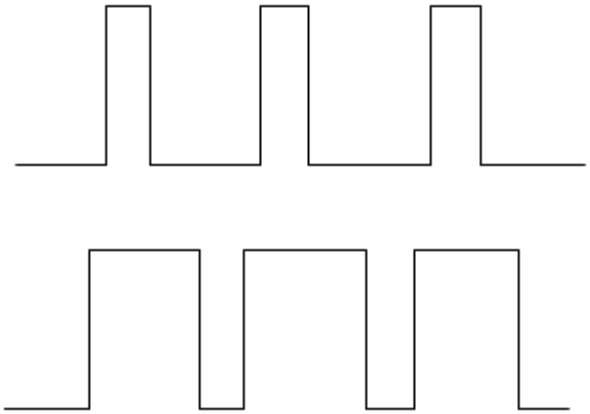


Figure 10-25 pulse width reverse

Enable Power Analog Output: Enable the control card to output analog signal which used to control laser power.

Power Mapping: This is power emendation function, used to set the power percentages of the customized and the corresponding one, as Figure 10-26 shows. If the customized power percentage is not in the displays of the Power dialog box, the system will pick the linearity margin values.

Enable Frequency Analog Output: Enable the control card to output analog signal which used to control Q-Switch frequency

Frequency Mapping: This is frequency emendation function, used to set the frequency percentages of the customized and the corresponding one, as Figure 10-27 shows.

Enable CO2 FPK: can wipe off the burn-in effect at the start.

Enable CO2 Pulse Mode: When selected, the point dist will appear in the parameter, and the software will be calculated the scan speed according to the setting. The marking points will meet the setting with this speed.

All rights reserved

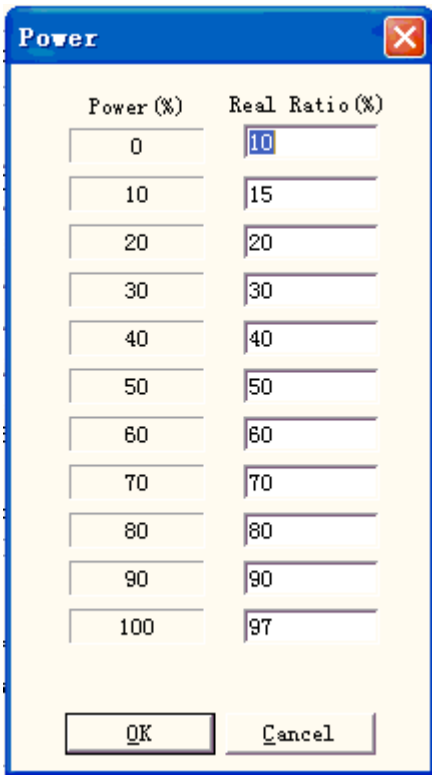


Figure 10-26 Power Map Dialog Box

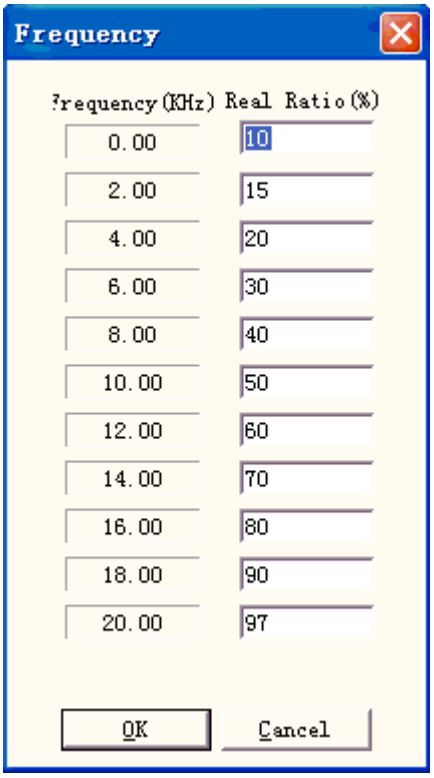


Figure 10-27 Frequency Map Dialog Box

Enable Analog First Pulse Killer:

Max: Max voltage of analog FPK.

Min: Min voltage of analog FPK.

T1: Time that the FPK signal changes from Max voltage to Min voltage, or reverse.

T2: If the time gap between the laser off and laser on is less than T2, the FPK would not output.

: The direction that the FPK changes.

About the T1 and T2 we can see figure 10-28：

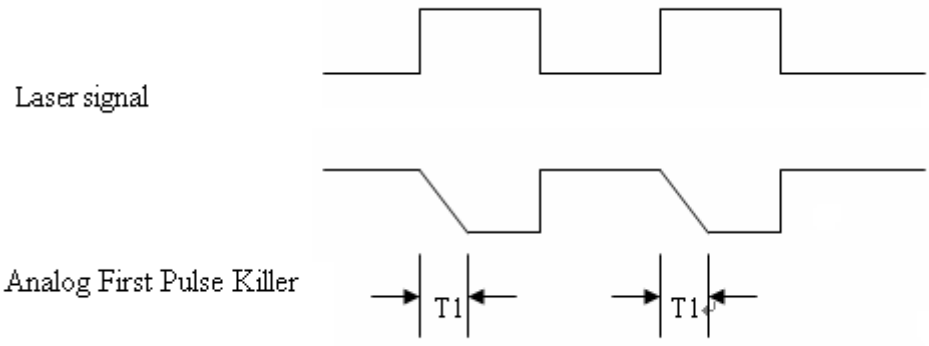
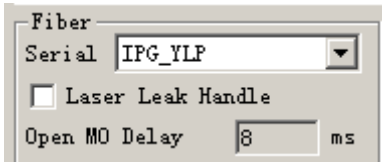


Figure 10-28

All rights reserved



After selecting fiber, the type of fiber laser will appear in the right, for example, ipg, ipgm, quantel, raycus, and the corresponding frequency range and MO delay will appear

Test laser

It is used to test whether laser is working normally or not. Hit "test laser" button presenting dialog box shown in graph 10-29:

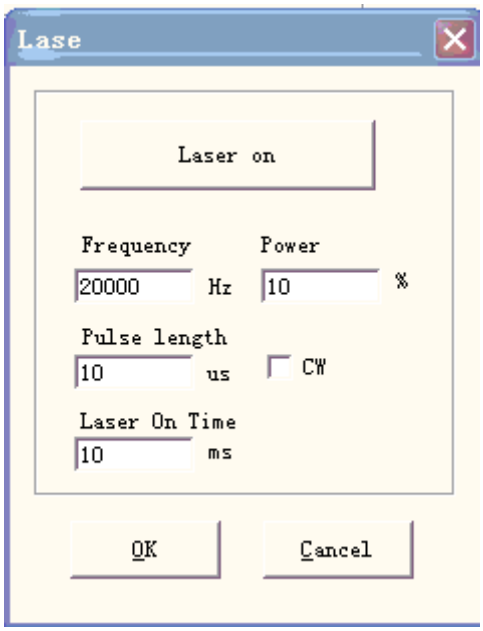


Figure 10-29 Test laser dialog box

Fill in the frequency, power, pulse width and laser on time and hit "Laser on". After that LASER open and it will close when reach the appointed time.

10.4.3 Port parameter

Equipment port parameter is shown in graph 10-30:

All rights reserved

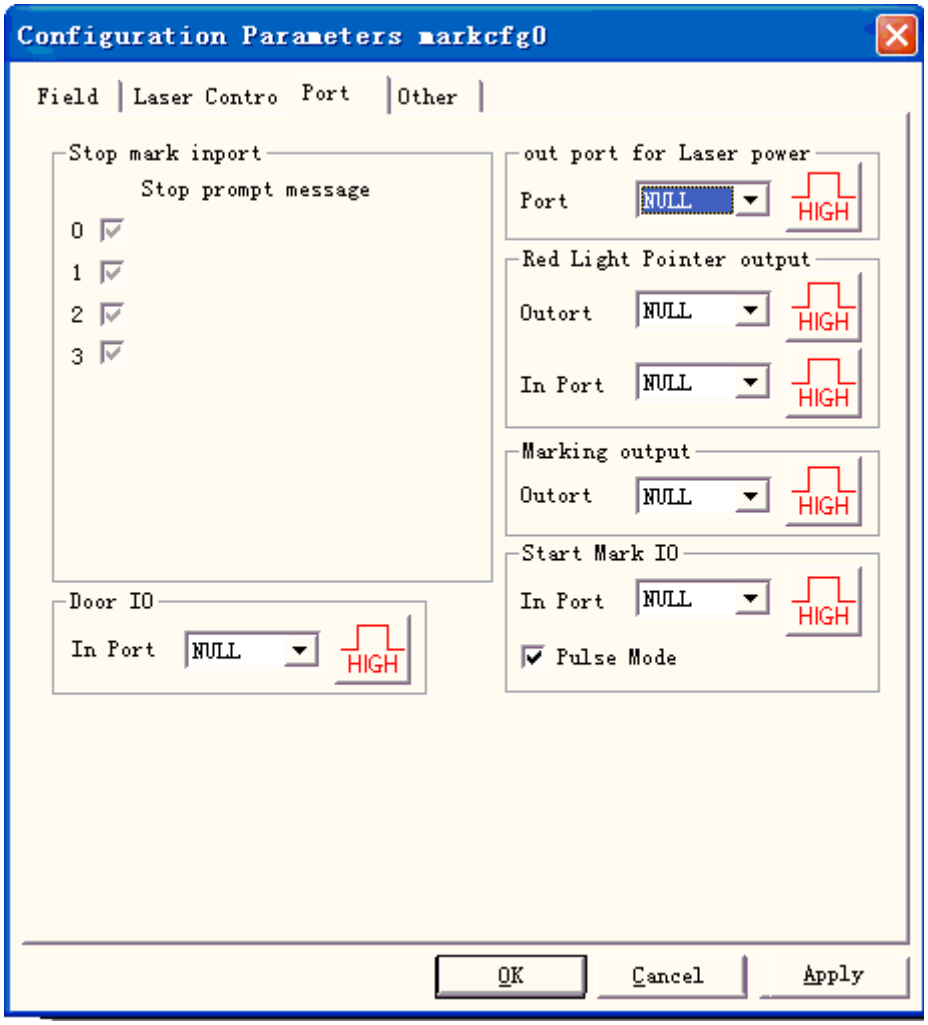
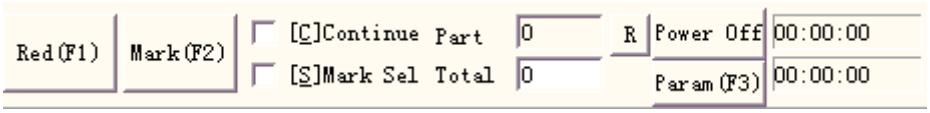


Figure10-30 Port Parameter Dialog Box

Stop Marking Input Port: When in marking process, if the system detects there is a corresponding input signal, the current marking operation will be ended, and prompt the users with error information.

Out port for Laser power: The port can be used to control the laser power supply. If you set this port, there is a 'Power off' button displayed on the marking bar, see the figure



Red light pointer I/O: The system will output High-level to the appointed output port when guide light show.

Marking IO: The appointed port will output high level voltage (TTL Compatible) while in marking.

Start Mark IO: In idle state, the software will start mark if detect the high level voltage from the appointed port

Pulse Mode: Checking this option means the soft receive the start signal as pulse mode, otherwise it is as level mode.

All rights reserved

10.4.4 Other

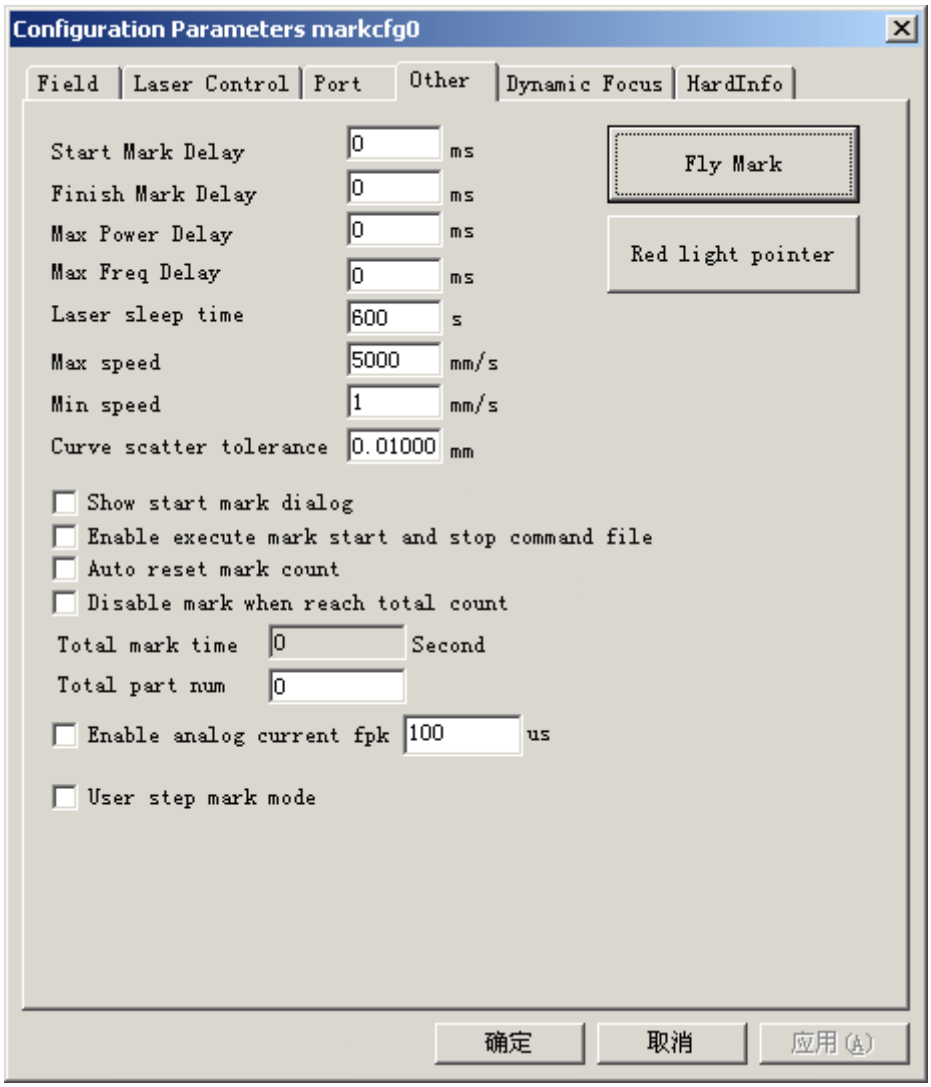


Figure 10-31 Other Parameter Dialog Box

Starting Mark Delay: The delay before marking.

Finish Mark Delay: The delay after marking

Max. Power Delay: The Max dealy when the laser power is changed from 0% to 100% during marking. When the power's range is changed less then 100% during marking, the time is less proportional to the Max vaule. This function is suit for the laser power supply with slow response speed. If the laser power supply's response speed is very quick, this value may be 0 ms.

Max. Freq Delay: Same as max power delay

Show start mark dialog: Every time inquired whether mark it before the marking

Enable execute mark start and stop command file: When the mark started and finishes needs to execute a command file first.

After enabling this function, when the marking starts, the system will seek for the start.bat document under the current software of contents automatically and executes it; After the marking had ended the system will seek for the stop.bat document under the current software of contents automatically and executes it.

The bat document format is simple, it can use the textual edit software (for example: The

All rights reserved

notepad, tablet and so on the other software) to direct compilation. Bat is the pure ASCII code text document, altogether has 3 orders.

1. The examination input port orders IN, for example IN2=1 expression system examination input port 2, if IN2 is the high level downward carries out, otherwise has waited for that IN2 turns high.
2. The establishment output port orders OUT, for example OUT4=1, the expression system establishment output port 4 is the high levels.
3. The time delay orders DELAY, for example DELAY=1000, expression system time delay 1000 milliseconds.

Auto reset mark count: after the mark stop, the software reset mark count automatic

Disable mark when reach total count: set the total count, when the amount reached, the software will not continue mark.

User step mark mode: When the marking according to the establishment the Galvo smallest distance movement, delay fixed time after each movement distance, this function mainly uses in the strong laser power hitting the depth, the step delay is bigger, the laser marks in the pause position deeply.

Enable analog current fpk: the time when the analog current is 0 before marking.

Fly Mark

Mark with working line simultaneously. Hit "fly mark" button presenting the dialog box shown in graph 10-32.

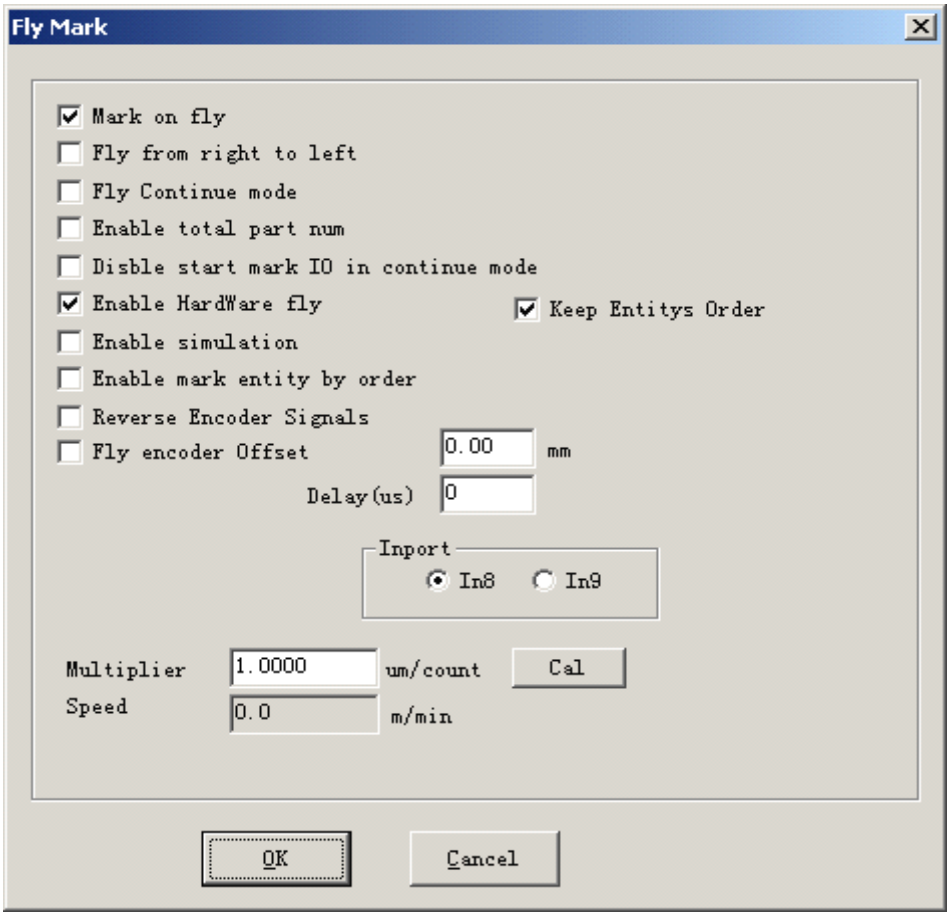


Figure 10-32 Fly mark set dialog box

All rights reserved

Fly mark: choosing this item refers to enable "Fly mark" function.

Fly from right to left: Choosing this item indicates that stream line direction is from right to left.

Fly continue mode: Choosing it indicates mark object is continuous one, namely, we need to mark content on continuous object. (Such as: wire ,cable and so on).

Enable total part num: Selecting it indicates the mark "total number" set is effective.

Disable start mark IO in continue mode: it indicates that software doesn't test start mark port when marking continuous object. Otherwise, software will test input signal while marking every time.

Enable hardware fly mode: It indicates that using rotation coder follow linear speed automatically.

Enable simulation e: It indicates that using simulation hardware method produce linear speed. It requires appointing speed.

Enable mark entity by order: Selecting it indicates that software will mark content according to its order in the list in turns. Otherwise, software will mark content according to its position in working space from left to right.

Keep Entities Order: Selecting it indicates that software will mark content according to its order in the list in turns. The all contents keep opposite locations as drawing.

Reverse Encoder Signals: the signals from encoder is reversed.

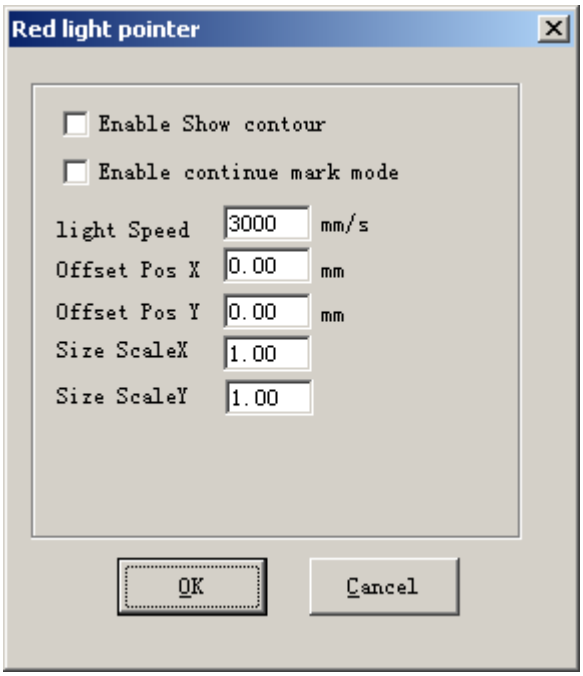
Fly encoder Offser: the position of marking is in front of actual.

Inport: choose port of flying signal for Board Version 2.2.6 or update.

Fly speed coefficient: The calculation formula is shown as follows:

Fly speed coefficient = perimeter of coder tachometer wheel / coder pulse per revolution;

Red Light Pointer:



Enable show contour: When selected, the red light show the object frame, not the rectangle been made from the max coordinate and the min coordinate of the object.

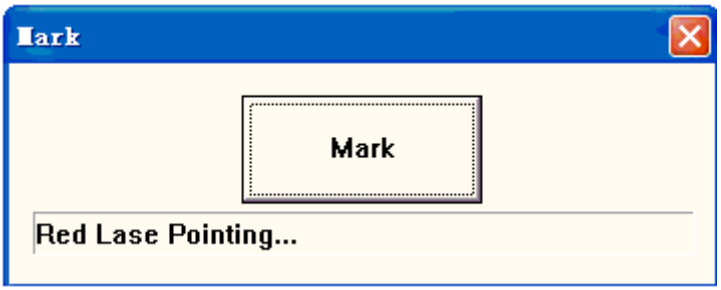
All rights reserved

Red Light Pointer: Refers to guide light

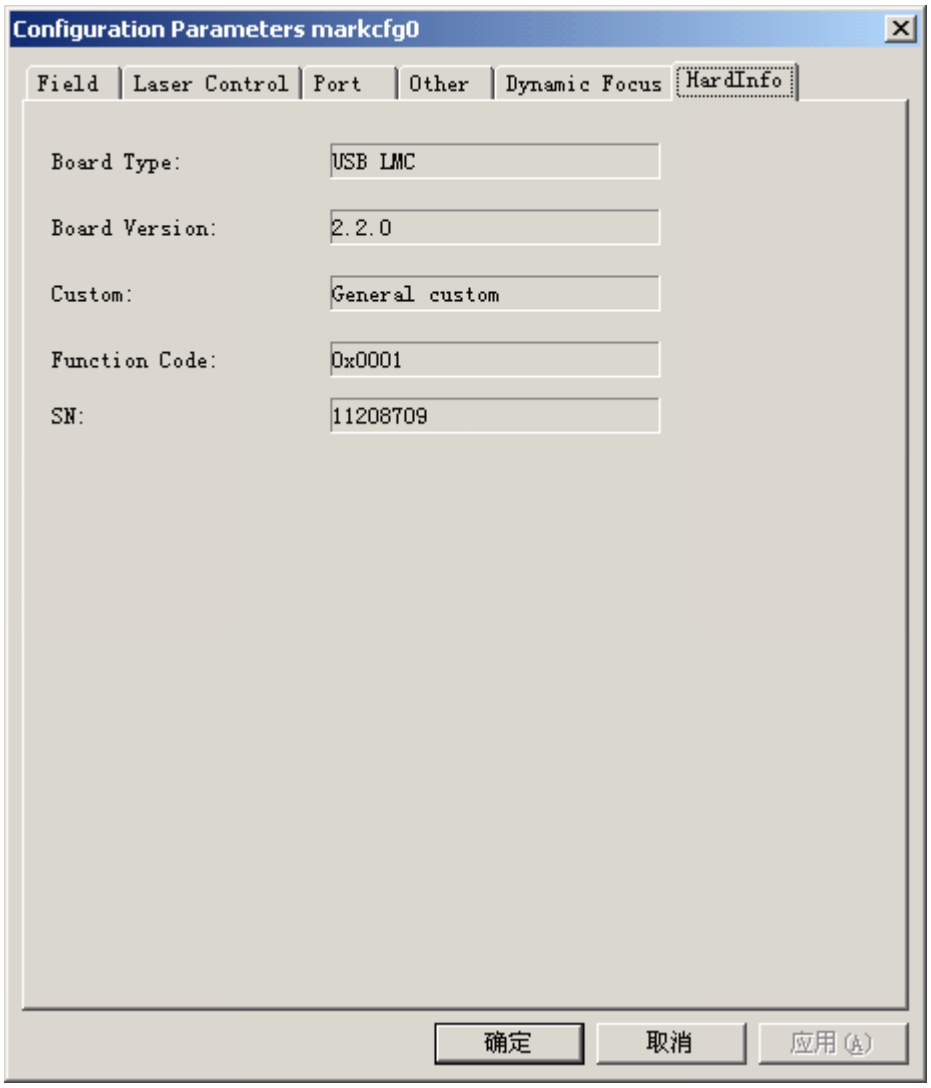
Light Speed: the speed of guide light

Offset Pos X and Y: it is used to compensate the position error between guide light and the laser beam.

Enable continue mark mode: enable this function, return the software surface, click "Param" then the dialog box popup shown as following Figure， it will be appear after mark stop every time, the Red Laser Pointing always exist.



10.4.5 HardInfo



There are Board Type, Board Version, SN in the HardInfo.

All rights reserved