

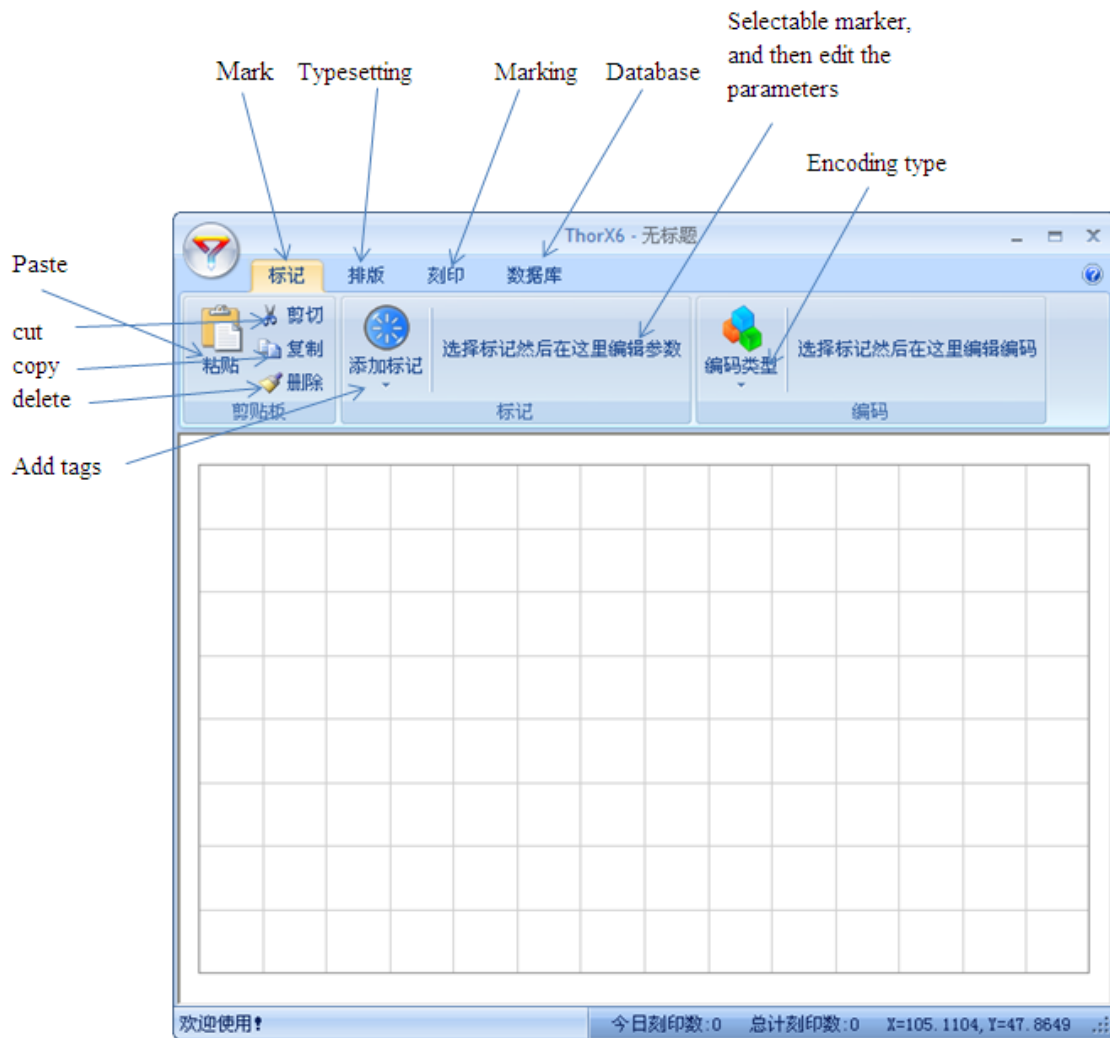
ThorX6 Industrial marking printing control system

**THE
USER
MANUAL**

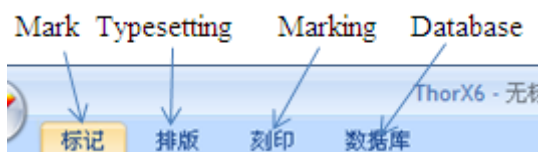
Based on the hardware software version
6.2.8.81212 establishment

一、 The main interface

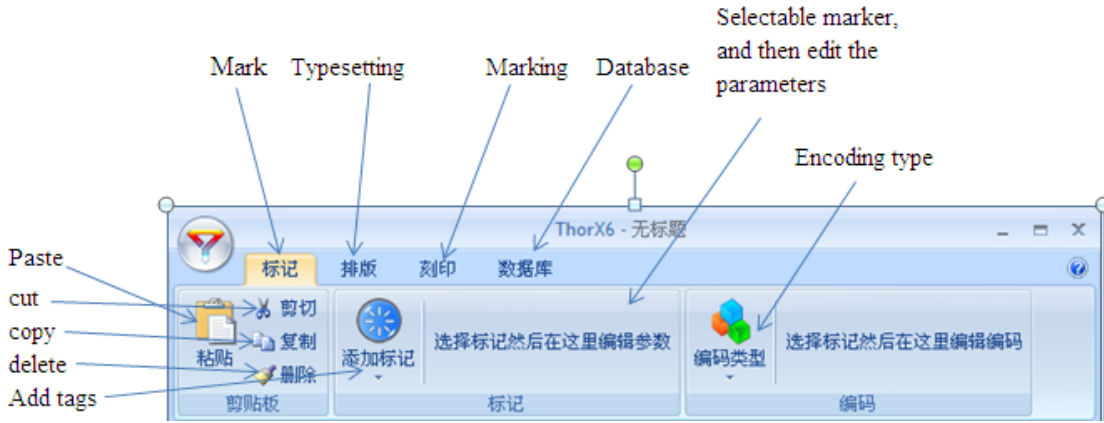
Double-click the desktop <<ThorX6 industrial marking engraved Control System>> (hereinafter referred to as ThorX6), start work, wait a few seconds the system startup is complete, then the main interface of ThorX6 is to be appeared, as followed:



ThorX6 the [file] to operate the main button, click this button to open the File menu, File menu contains all file operations-related functions, such as file open, save the file Etc.



The ThorX6 function panel toggle button, click the appropriate text can be switched ThorX6 the function panel.



The ThorX6 the function panel, functions panel shows the ThorX6 different Functions interface.

ThorX6 the middle of the blank area is a WYSIWYG-style tag editing area, and maximum range of 10cm × 10cm each cell shows the Marker that can be engraved.

ThorX6 the bottom status bar, status bar will display ThorX6 message engraved quantitative information.

二、 ThorX6 operation

2.1 QUICK START

In this section, we will brief how to quickly create a text tag and a serial number tag, and these two markers on the needle, to determine the final position of the work piece on the engraving.

Click on the [tag] function panel [add tags] button in the pop-up list of tag types to choose one will want to establish the marker type, here we choose a [text] Select finished in a blank area of the ThorX6 the middle of the also is marked left mouse button, a [text] tag, the default parameters are established under the point of editing area. As shown below.



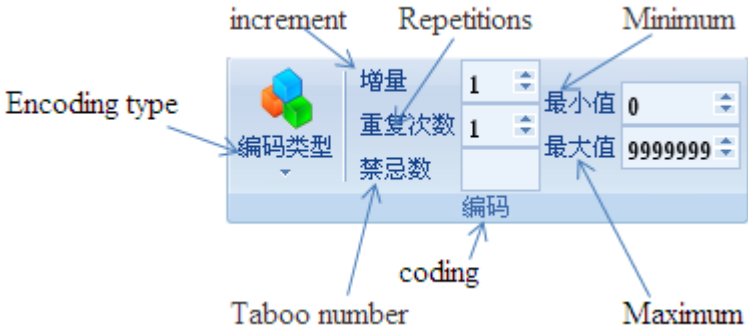
Note the [tag] function panel, the panel of [tag] function [tag] group of the relevant parameters of the tag we just created shows,



These parameters associated with the tag type, that is, choose a different tag type in the establishment of the mark and its associated parameters are different now [tag] function panel displays [text] that we just created the class labels parameters including the location of the tag, content, fonts, etc.. At this point, this [text] has been successfully established.

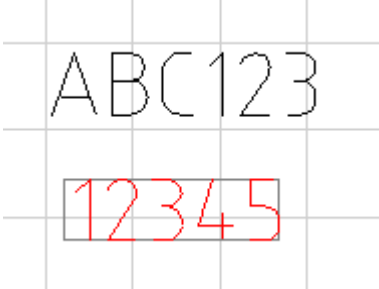
Now we use the same method, and then create a marker, but this time, we will create a

"serial number" tags. [Add tags] button pop-up tag type list, select [text] Similarly, the midpoint of the tag editing area to the left mouse button, then [Mark] [content] parameter of the function panel, the default ABC123 "changed to" 12345 "is not necessary to change the content, here we change it just for the content of the difference between the two markers. Next, on the right side of the [tag] function panel, click on [encoding type] button, then select [serial number] in the pop-up list of the type of encoding, attention to the tag "12345" has been changed to red to red to indicate that this marker the encoding type [serial number] [serial number] encoding parameters the same time, the panel of [tag] function [code] group, you can see.



These parameters are associated with the encoding type of the tag that is, choose a different type of encoding parameters is not the same. Now are the encoded parameters [serial number]. At this point, with [serial number] encoded tag has been successfully established.

Area of the Tag Editor, you build the markup might look like this, as shown below:



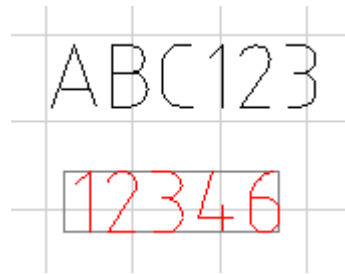
In this case may mark the location that you create I do not, it does not matter, you can use the keyboard arrow keys to move the final mark established for each click the arrow keys to mark the location will move you move 1mm. In the process of moving, you can pay attention to the engraved head of the engraving needle, engraving needle move with "12345" will change, which is a major function of the software each time you change the location of the marker, engraving needle will automatically aligned to the new mark position.

There is another more efficient way to change the location of the mark, use the mouse to click the first selectable marker, the marker was chosen after a frame surrounded by the alignment mark this frame surrounded, hold down the mouse left button, can be directly will mark the drag to a new location. Similarly, when you drag the location of the mark, engraving needle automatic alignment to the new location.

Engraving control software automatically pin characteristics, and can easily mark the location of mobile real engraved locations up to the actual work piece.

Move the two markers to the right place, then we can try these two markers engraved on the work piece, the engraving of the operation is very simple, click [engraved] open spin printed panel, then click [engraved] can be directly shortcut buttons to press the engraving operation [F9], marker started working, stamped machine your work piece stamped out the contents of these two markers, wait engraving machine work is completed, you will find the

serial number tag has occurred change, as shown below:



Serial number marked change from the "12345" "12346", this is the role of the serial number encoding, each using the serial number-coded tag will be engraved after automatic accumulation of a number, if you do not have to change the water No. encoding parameters, it will accumulate "1".

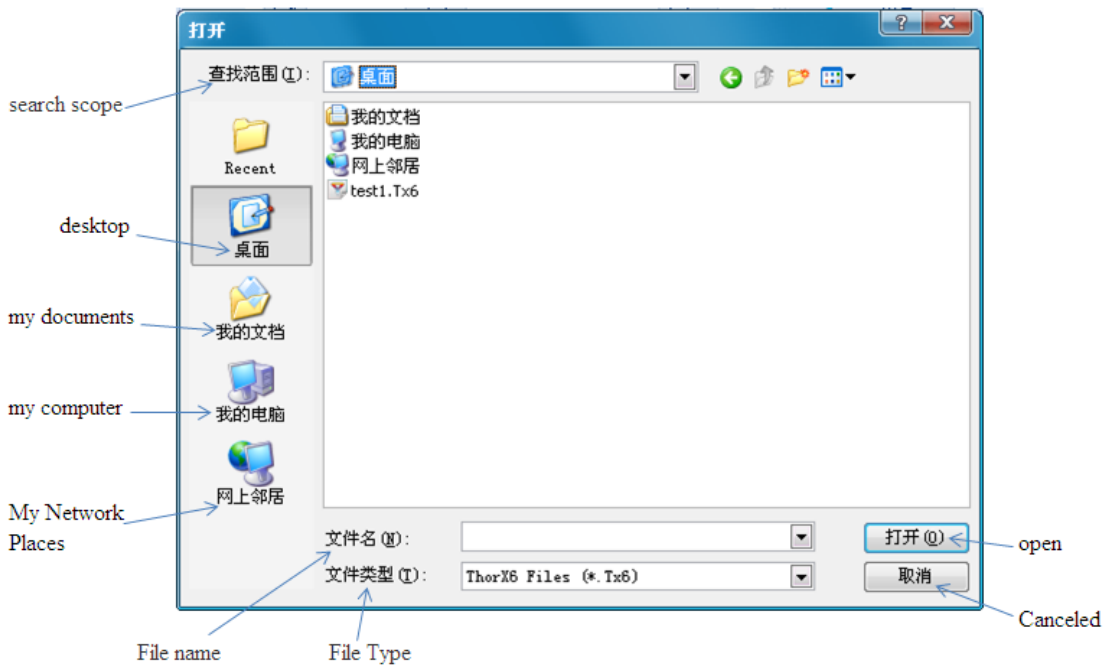
At this point, we have a preliminary understanding of the use of the engraving control software; more features will be individually introduced in later chapters.

2.2 FILE OPERATION

Click a ThorX6 file operation button, pop-up File menu.



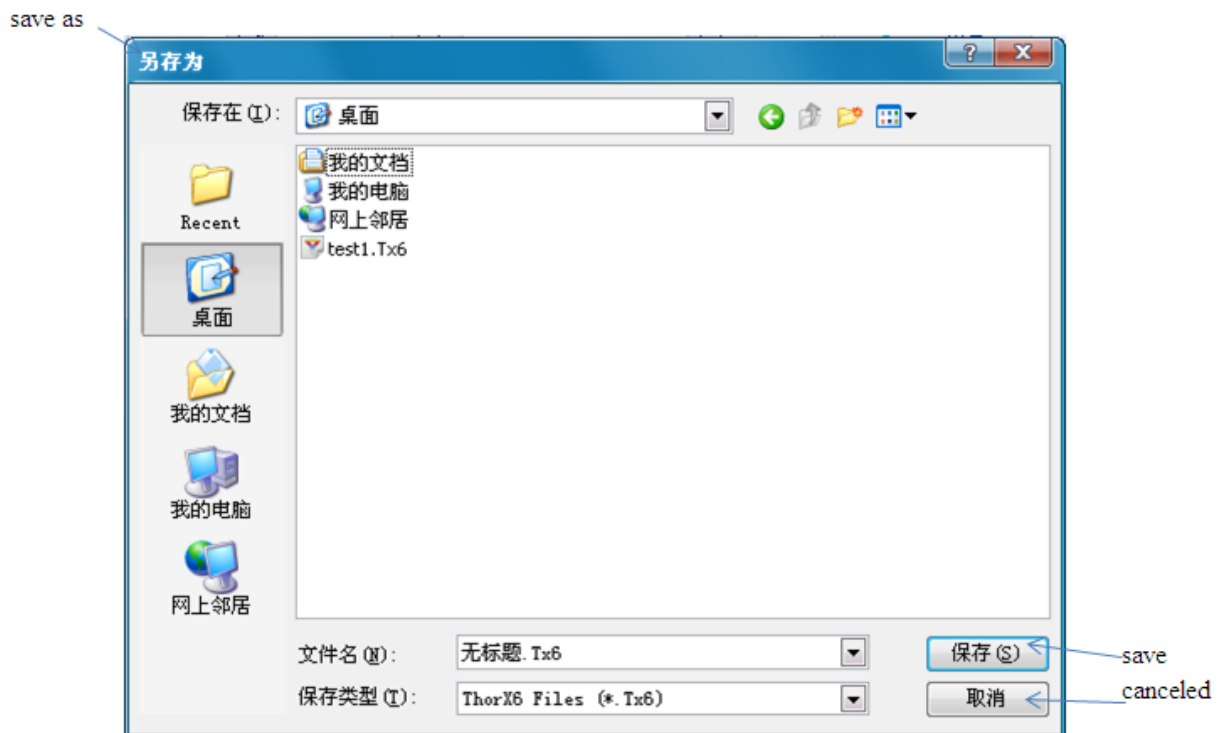
- New: Create a new file if the file being edited is not saved, the user will be prompted to save.
- Open: Open a file,



"Open" window will list all the engraved file in the computer folder, select one, click on the window in the [Open] button or press [Enter] key, the file is open.

Open the file, the file name will be displayed the ThorX6 window's title bar.

c Save: save the current file to your computer,



"Save" window lists all stamped file in the computer folder in the "File name" field, enter a file name, then click on the window [Save] button or press [Enter] key, the file is be saved.

Note that the save function can be executed only when the contents of the file changes, this means that to save a fresh new file or just open the file does not make sense.

d Save as: to save the current file to another name. Operate with the [Save].

e Recently used files: This list will show the recently used files, click one of the files can

easily and quickly open it.

2.3 Mark of the establishment and editing

2.3.1 Create a text class marks

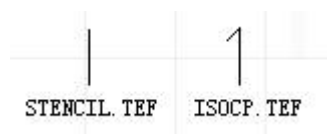
The contents of the text marked by the English characters, numbers, symbols, Chinese characters, and font parameters. Engraving control software consists of two kinds of text based markup standard [text], a fan text, the only difference between these two tags is just arranged in different ways, their basic parameters are mostly the same the text of the standards [text] tags is a common straight line arrangement, while the fan-shaped text to be ranked according to the specified radius of the fan and the starting angle. These two types of tags can be added in the [tag] button pop-up list of tag types be selected, as shown below:



Once selected, the type of tag will not be able to change.

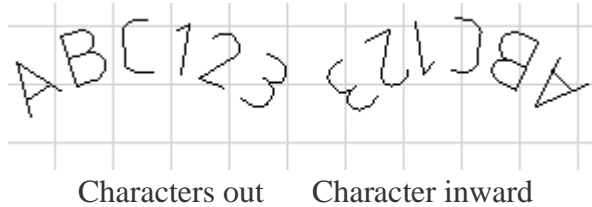
[Text] and [text] of fan-shaped building and editing is basically the same, together, we will introduce how to use them. Tag type list, select the mark of a good text type, and its related parameters will be displayed in the tag panel, which has been in the 2.1 Quick Start an introduction, here we will describe the role of these parameters.

- a. Content: As the name suggests, here you can change the tag text content.
- b. X, Y, and Z: the three parameters used to specify the location of the markers in the engraved area. This position differs according to different types of text marked. Standard [text] mark this location is the lower left corner of the indicators in mind, while the fan text is the center of a circle when the fan-shaped arrangement of indicators in mind. Note that the Z, Z-position only enabled Z-axis lift function when your engraving machine with lift function, the Z will be able to set a marker engraved plane height.
- c. Angle: marking around the X, Y, specify the location rotating angle. For the fan text, this perspective is the fan-shaped arrangement of the starting angle.
- d. English font: the name of the font tag content, English, numbers, symbols
- e. Chinese character fonts: the use of characters the font tag content, note that when you enter in the content of Chinese characters, the Chinese character font must select a valid Chinese character fonts, create tag may not be able to display Chinese characters or a direct result of the mark invalid.
- f. Word, the word-wide: the size of the characters in the tag content. Should be noted that here the word is word-wide and not an absolute limit on the size of the characters, it is only a reference size, the actual words of high word-wide will vary because of different fonts. The word-wide are set to 5mm, for example, the numeric characters "1" are generally not up to 5mm width, but also somewhat different with this width of the glyph changes, such as the font ISOCP.TEF "numeric characters" 1 "than font "STENCIL.TEF, numeric characters" 1 "is slightly wider. As shown below:



- g. Word spacing: the distance between the characters and the characters in the tag content.
- h. Radius (fan version): fan outside the inscribed circle of radius.

i. Radius (fan version): fan outside the inscribed circle of radius.



2.3.2 The encoding of the text class mark

Word class tags can be correctly defined marker code] tag defines the encoding of non-text class will not make sense. The markup code] will determine the word class tag to every engraving is complete character changes. Such as a "serial number" encoded word class tags in every engraving completed automatically add the value "1".

Tag coding can be used [mark] [code] button in the panel to choose.

Text class is marked with four kinds of encoding can choose from the following list:

a. Code: As the name suggests, no encoding means that this tag does not need to change every time stamped after the completion, so the coding parameters.

c Serial number: also known as serial number, in general, the end of the "serial number" is the numeric characters, or at least mark the contents of the numeric characters, if the end of the tag content is not a numeric character, this tag will not be able to be engraved. Its content does not match the encoding format of the serial number. Text class is marked with the "serial number encoded in each engraving is completed will be an numerical computation, the results of operations determined by the parameters of the" serial number".

1. Increments: increase the value of the amount of tag content value in each computing, in general.

2. The number of repetitions: tag content value in the engraving the number of times before the first operator.

3. The minimum allowed by the minimum value: the value of the tag content, if the value after the operation is less than this value will automatically change to the minimum value.

4. The maximum allowed by the maximum value: the value of the tag content, if the value after the operation is greater than this value will automatically change to the minimum value.

5. Contraindications: not allowed in the content of that marking numbers. Such as geographical taboo number "4", then you can fill in the "4", in computing, the tag content will automatically skip the number "4". Such as "123" in the engraving, it is completed directly changed to "125".

Note that regardless of the value of the tag content operations does not change the character length of the tag content, which means that when the serial number "AB9999" increase "a" becomes "AB0000" rather than "AB10000".

c. The VIN: VIN (Vehicle Identification Number), the Chinese name of the vehicle identification code to a car manufacturer in order to identify the specified code. The VIN is composed of 17 letters and numbers according to certain rules, of which 9 check digit. VIN-coded parameters and serial number "is basically the same, different, the VIN can be set to the length of the code at the end of the serial number For example, when the serial number length is set to 4:00, the VIN code" ABCDEFGH7JK889999, "in stamped when completed, will be changed to The "ABCDEFGH2JK880000" rather than "ABCDEFGH8JK890000.

d. Date: date, type of encoding directly only "format" parameter to change the contents of the tag, regardless of the tag content is what will change the grounds of the provisions of the format the date and time code. Format characters by a special code, these formatting characters determine the contents of the tag. The definition of formatting characters, see Appendix 1.

2.3.3 Establish graphics mark

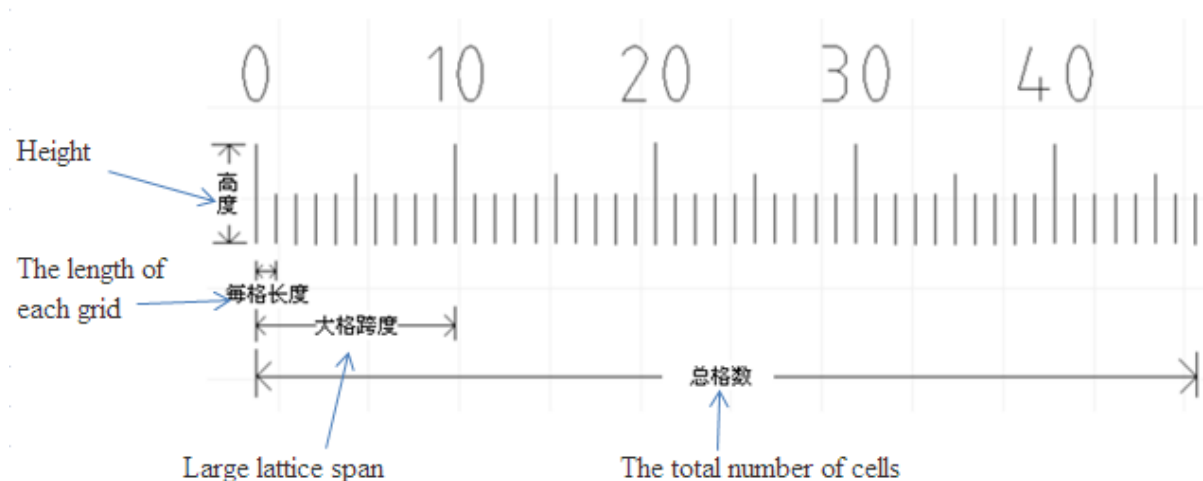
To create a graphical marker is the same word class tags, but the parameters of the graph mark entirely, as the tag type list, select the graphic, and then click the left mouse button in the Tag Editor area, then an empty tag graphics will be created. [Tag] panel, click the Browse button to open a file dialog box, then choose a suitable graphics file in the file dialog, the graphic marker is successfully established.

Parameters the X, Y, Z, rotation angle, meaning the same word class tag is the same, "width", "height" is used to determine the actual appearance of the size of graphics, "Keep ratio" option will make the graphics always maintain the original proportion of internal this means that, when you change the width of the graph, the height of the graphics will be graphics ratio calculated automatically Similarly, when you change the height of the graph, the width of the graphics will be the proportion of the graphic itself is automatically calculated .

2.3.4 Establish ruler mark

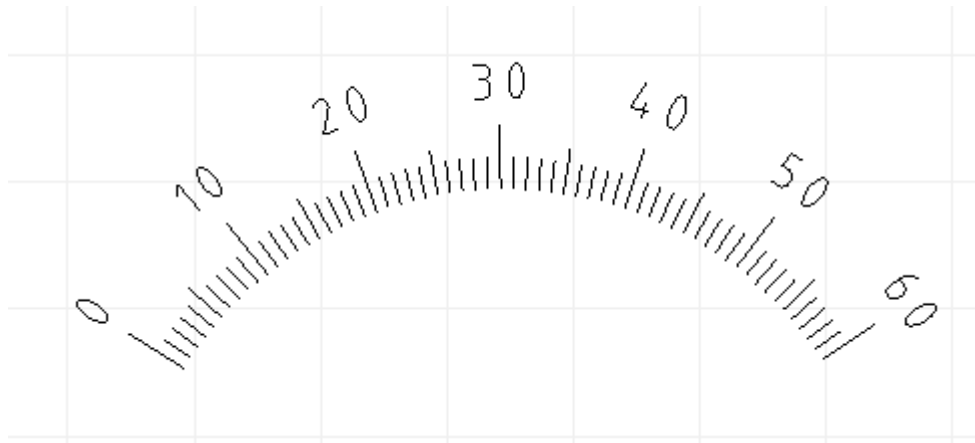
The scale of many parameters, the following chart to illustrate the meaning expressed by some of the basic parameters:

Various parameters and functions as follows:



- The total cell number: Indicates the total number of cells of the ruler.
- Length of each cell: that the ruler the width between each cell, the millimeter.
- Value of each cell: Note that each grid value "and" the length of each grid is a different concept, the actual width of the grid width of each cell in the scale, the grid value "that the scale where each cell represents the value, usually the case this value is set to "1", but there are special circumstances, for example: Create a ruler in inches, then it should be entered in grid width 25.4 in the grid values type 1, 25.4 mm equals 1 inch.
- Ruler Height: that the total height of the ruler (part of the character does not count) mm unit.
- Small proportion of the grid: that a small percentage of the grid height and scale the height of.
- In the grid ratio: represents the percentage of height and scale the height of the grid lines.
- Start value: Indicates the scale value of the start bit. Under normal circumstances, "0".
- Large grid span: that within a large grid cell number.
- Decimal places: if the value of the scale contains a decimal, indicates that these values of decimal places.
- Fan-shaped radius: If the fan radius is set to a valid value (not "0"), you can create a

fan-shaped ruler, as shown below:



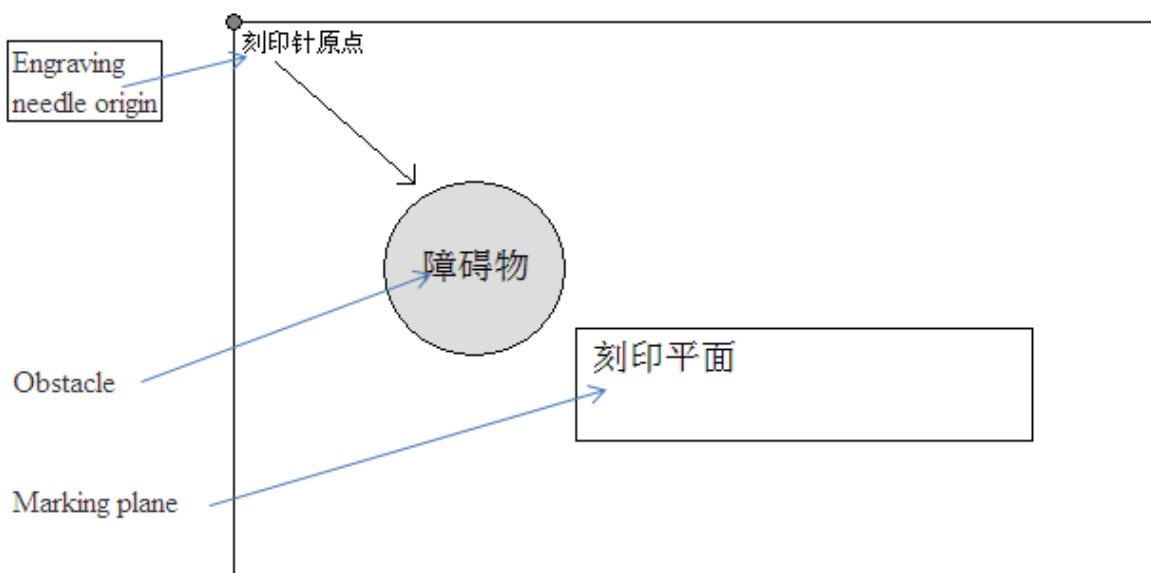
- k. Digital fonts: Set the font of the numeric characters on the ruler.
- l. Font location: numeric characters from the marked distance.
- m. The word-wide, word, word spacing: these parameters are the same word class tags, please see the instructions of the word class tags.
- n. Word angle: the angle of rotation of numeric character.
- o. Display figures showing the number of the grid: the decision on the ruler shows the numeric character.

2.3.5 Establishment of bypass points

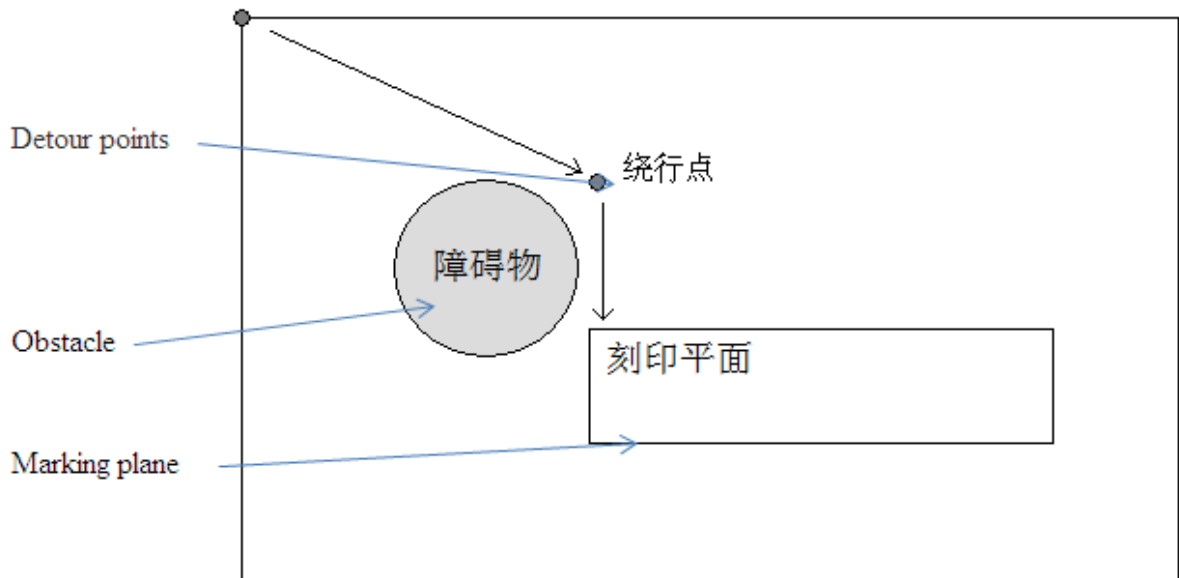
Some work piece engraved near the horizon may be, there are some obstacles, these obstacles in the engraving process may hinder the engraving needle trajectory, and then you need to find ways to make the engraving needle to bypass these obstacles during operation.

The engraving control software can bypass point set in the control area in the engraving, so as to achieve the purpose of bypassing the obstacle. Bypass point "means engraving needle must be from this point of the bypass, and then went under an engraved tag.

As shown below, if the engraving needle starting from the origin location, engraved plane is reached, we will run into obstacles, then you need a bypass point to guide the engraving needle to get around this obstacle.



The method is very simple to create a bypass point, the tag type list, select the bypass point], then this point to move to the bypass location, as shown below:



When engraving began engraving needle first went to the bypass point shown by the arrow direction, and then walks to the engraving flat, thus bypassing the obstacle.

2.3.6 Editing marks on the needle

Mark position, in addition to the described in a view operation using the arrow keys, mouse, another ThorX6 [alignment] function available, which in some cases, [alignment] features than manually move the marker position is more effective and accurate. Click menu [mark], [alignment] can open a submenu of the [alignment] function; [alignment] function has a multiple alignment as follows:

- a. Center of the circle / the starting point: to mark the center or starting point of alignment, this alignment is generally used to align the center point of the two fan-shaped text tag.
- b. Left-aligned: to mark the left of the leftmost edge of the subject, the left edge of the other markers to.
- c. Align Right: the right edge of the rightmost mark of the right edge of the other markers together.
- d. Align the top: the top mark on the edge of the subject, the other mark on the edges together.
- e. Prevail in the lower edge of the bottom mark the bottom edge of the other markers to align the bottom:.
- f. The level of the center: multiple tags aligned to the center line of the same level.
- g. Longitudinal center: multiple markers aligned to the same longitudinal center line.
- h. The combination of the line: a combination of multiple markers in a row.

When this spacing is determined, multiple markers will be the distance of this interval to form a row. Note that where a combination of one line, only refers to the marked location grouped together, the combination of content rather than labeled with each marker between independent, but from the location point of view, arranged in a row.

As we have repeatedly mentioned, every time you change the location of the tag engraving needle will automatically align to the new mark position. This is the engraving control software automatically stitch should be noted that pin this function only for the selected single marker, that is, when you also move more than one mark, engraving needle will not try to standards. Click on the menu [mark], [pin] can open sub-menu of the [pin] function, [the needle] functions with a variety of ways as follows:

- a. The lower left corner: engraved for the prospective to mark the lower left corner.
- b. The lower right corner: engraved for the prospective to mark the lower right corner.

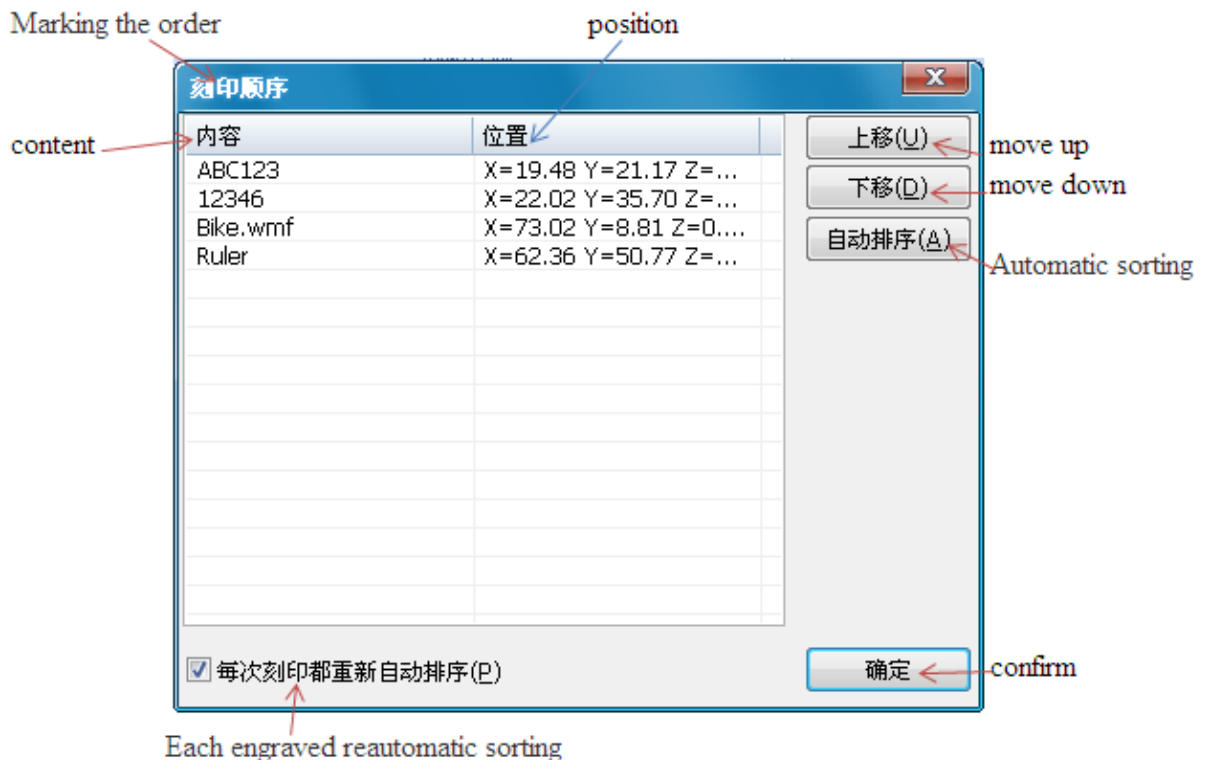
- c. The upper left corner: engraved for the prospective to mark the upper left corner.
- d. The upper right corner: engraved for the prospective to mark the upper right corner.
- e. The center / starting point: engraved for prospective to mark the center or starting point, this needle is generally used to make the engraving for the center point of quasi-fan text.
- f. Stop on the needle: Select when to move the marker, engraving needle will not go alignment, unless re-operation of the pin.

When you select in the menu the way of a pin, the next time you move the marker, engraving needle will align the way you choose, for example, when you select the bottom right corner of the needle, so every time you move the marker the lower-right corner of the engraving needle will go to the alignment marks, rather than the lower-left corner of the default.

2.6 Engraving operations and set

2.6.1 Marking the order

[Engraved] panel contains the functionality required by all the engraving operation, but before the start in the engraving, we should first understand the concept of the engraving order. When the view is only a marker, engraved order does not make sense, but when the view contains multiple tags, most of the time we need to set the engraving order to speed up the engraving process. By default, the engraving is to mark the establishment of the order, that is, the mark established in the first create tag the first to be stamped, engraved, sometimes, this is no problem, but if we believe that this order is not reasonable, you need to make adjustments. Click on the menu [engraved], [stamped order] to open engraving order to adjust the window, as shown below:



Engraved order to adjust the window, the list are listed according to the current engraving order the content and location of all markers in the view, select one, then click "Move Up" or "Move Down" to change this tag can be engraved order. A more simple approach, simply click the "Auto Sort" button, the engraving control software will automatically top to bottom, from left to right order of all the tags to sort, this is the most

commonly used sorting method.

2.6.2 Engraved settings

Engraving speed "refers to the moving speed of the engraving needle state in the engraving," idling speed "refers to the engraving needle in a non-engraved state road speed (idling), set up correctly and match the two speeds, does not affect the accuracy to achieve efficient engraving. Under normal circumstances, the idling speed can be higher than the engraving speed, but preferably not more than 20.

Speed setting is simple; you can directly drag the speed control lever can also be entered directly in the text box on the right speed parameter.

Also in the case of parameter settings window does not open the Marker can be used directly on the numeric keypad "+", "-" on the engraving speed quickly set up a "+", "-" will enable engraving speed increases or decreases by 1, if on the keyboard, hold down the [Shift] key, press the "+", "-" will enable engraving speed increase or decrease 10.

Engraving needle engraving process is controlled by high-pressure gas, the proper co-ordination of the operation of the high-pressure gas, adverse engraved to avoid "missing document" and "tail", as shown below:



Marking each character of each successive stroke, high pressure gas source will be open, so as to drive the high-frequency impact of the engraving needle and engraved, but due to the high-pressure gas in the inflatable need for a short time, in this time period, has begun engraving needle, high-pressure gas is yet to reach, there will be a phenomenon of missing document. Generated in order to avoid this situation, in the high-pressure gas source is open, so that the engraving needle place to pause a short time to wait for the arrival of high-pressure gas, so that you can effectively avoid missing document the phenomenon. This is a short pause time we referred to as "put pen to paper delay, under normal circumstances will only take about 2-8 Millisecond

The end of each character of each successive strokes engraved, high-pressure gas source is turned off, but because of the high-pressure gas within the inflatable pipe may also retained part of the gas release is not finished at this time, the engraving needle began to move, then this part of the retained high-pressure gas may be driven by the high-frequency impact of the engraving needle, there will be smearing. In order to avoid the generation of this case, after the closure of the high pressure gas source, so that the engraving needle place to pause a short time to wait for the high-pressure gas release completely, so you can avoid smearing. This is a short pause time referred to as "lift the pen delay", "put pen to paper, delay," lift the pen delay "under normal circumstances, only about 2-8 Millisecond.

Put pen to paper delay "and" lift the pen delay setting is simple; the delay parameters can be entered directly in the text box on the right.

If your engraving machine installed pneumatic fixture, this fixture set a delay amount, engraved "button is pressed there is enough time to clamp the work piece and push the work

piece reach engraving bit. This amount of the delay is called "Gripper delay."

Marker engraved body is a mechanical device, after repeatedly engraved prone to slight error, if this error is not amended, will increase in the number with the engraved been accumulated down, eventually leading to the engraving position deviation designed an automatic reset function to correct this error. Under normal circumstances, each engraved about 200 automatically reset by the engraved number and engraving the complexity of the system is reset automatically. This parameter we call "reset frequency".

Rotating work piece diameter can be set to the diameter of the work piece when the rotating rotary printing.

Under normal circumstances, each engraving is completed, should allow the engraving needle back to the specified coordinates (generally the origin of coordinates), the next time stamped when starting from the coordinates, the coordinates we refer to as "standby from the standard" standby from the standard set by the user free anywhere in the engraved area.

2.6.3 Engraving operation

Marking: to immediately begin the engraving process.
Engraved only selected tags: engraved view, select the tag.
Automatic continuous engraving: by the specified time automatically stamped mark
Reset: reset to the engraving needle mechanical origin.

2.6.4 Engraved in the same number compared

Marker control software with engraved serial number and VIN number data with the function, after the completion of each normal engraving, engraving software will record all the engraved serial number and VIN number tag content, whenever the user will be engraved the same content, pop-up windows warning the user to be confirmed.

Should be noted that this feature has been named the saved file, and never saved the temporary stamped content, engraving machine control software not be compared with the numbers.

Appendix 1 Date coding format character

%a: Week Abbreviations (English form)
%A: Week full name (English form)
%b: Month abbreviation (English form)
%B: Full month name (English form)
%c: Date Time (format: day / month / year: hour: minutes: seconds)
%d: Day (01-31)
%H: Hour (24 hours the system 00-23)
%I: Hour (12 hours the system 00-12)
%j: The first few days in the year (001 – 366)
%m: Month (01 – 12)
%M: Minutes (00-59)
%p: 12-hour morning or afternoon (AM/PM)
%S: Seconds (00-59)
%U: The first few weeks of the year (Sunday beginning of the week 00-53)
%w: Day of the week (Sunday is “0” 0–6)
%W: The first few weeks of the year (For a week on Monday 00-53)
%x: Date (form: day/month/year)
%X: Time (form: hour: hour: minutes: seconds)
%y: Year (Short format 00-99)
%Y: Year (4 full formats)
%%: : Percent sign

Appendix 2 Hardware parameters of the formula

Step= Diameter of the motor gear $\times\pi\div 360\times$ Motor step angle \div Drive the number of segments

In most cases, we use the motor gear mostly diameter 14.23, motor step angle of 1.8 the number of segments of the drive for 32 this time step the calculation results are as follows:

$$\begin{aligned}\text{Step} &= 14.23 \times 3.14159265359 \div 360 \times 1.8 \div 32 \\ &= 0.006985134915716515625 \\ &\approx 0.0069851349 \text{ (10-bit can be retained after the decimal point)}\end{aligned}$$

Rotation coefficient= Motor step angle \div Reduction ratio \div Drive segment

In most cases, we use the motor step angle of 1.8 rotary mechanism reduction ratio is five times the number of segments of the drive for 32, then the rotation coefficients of the calculation results are as follows:

$$\begin{aligned}\text{Rotation coefficient} &= 1.8 \div 5 \div 32 \\ &= 0.01125\end{aligned}$$