

Shanghai Fangling Computer Software co., Ltd

The Specification of FLCAM

Shanghai Fangling
Computer Software co., Ltd

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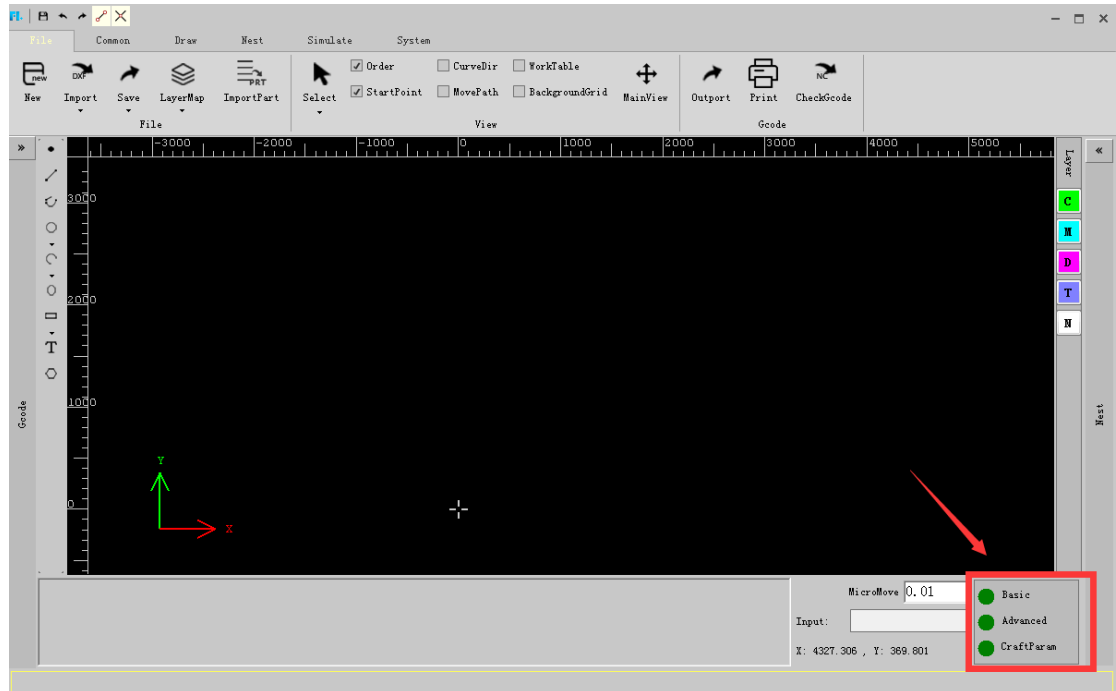
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I. Quick start

1.1 Functions & Features

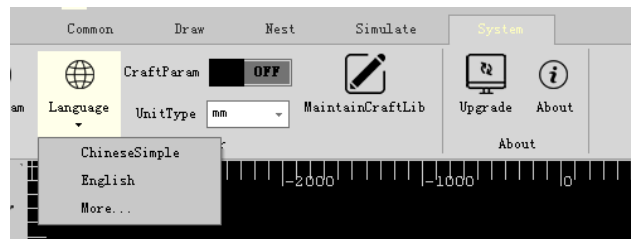
- Support to import DWG、DXF、CAM、ITF、NC、NC1、PRT、PLT、TXT format.
- When open/import external files, it will optimize automatically. Including:
Remove trivial、Remove duplication、Combine near、Auto smooth、Auto check in and out、Auto sort、Import text. Each function mentioned above can be user defined as well as manually implemented.
- Support common editing typesetting function. Including zooming、moving、mirroring、rotation、align、copy, etc.
- Set lead in and lead out、kerf compensation、micro joint、bridging、outer/inner cut、over cut easily by setting parameters.
- Automatically discriminate internal/external contour and determine the direction of kerf compensation and check leaders, etc.
- Time and effort saving automatic nesting function. Professional edition is more efficient than the standard one. (Details see Chapter 7)
- Professional edition supports multiple torch cutting. Users can set the number of torches. And multiple torches cut at the same time which can improve work efficiency.
- Multiple array. Such as: rectangular array、ring array、interactive array and full fill .
- Text layer can be edited alone.
- Flexible multiple automatic and manual sequence.
- Process order can be viewed optionally which is convenient for users to view or modify the cutting order.

1.2 Module Introduction



Modules are displayed in the lower right corner of the software. Green stands for open, red stands for not open. The function that did not open can contact software supplier to open.

1. Basic module includes tools、drawing、nesting and other basic functions.
2. The multi languages module includes Chinese and English, which can be modified in the system. Professional edition supports to add customized languages.



3.Functional comparison list of standard and Professional edition:

NO.	Category	Functions	Availability (× for no)	
			FLCAM_SE	FLCAM_PRO
1	Import	dxf、dwg、plt、cam、prt、itf、plate、nsln、txt、nc、cnc		
2		nc1	×	
3		Layer/Color Layer Map	×	
4		Batch import of multiple parts files	×	
5		Dxf、dwg、nc1 batch import	×	
6		Text sets part properties	×	

7		leads mode of import parts	×	
8	Select	Multiple Selection		
9	Display	Multiple Display		
10		View and save log information		
11		interactive sequence check		
12		Main view	×	
13	Process	Rectangular array		
14		Ring array		
15		Interactive array	×	
16		Full fill	×	
17		Auto/Manual/Split micro joint		
18		Kerf compensation		
19		common edge		
20		Advanced bridge	×	
21		Basic bridge		
22		Over cut		
23		Reference		
24		Cross check		
25		Layer cross check	×	
26		Lead: Line		
27		Lead: Arc		
28		Lead: Line+Arc	×	
29		Outer/Inner leads individual setting	×	
30		Outer/inner cut		
31		Direction		
32		Optimize		
33		Manual start point		
34		Batch start point	×	
35		Equidistance graphic	×	
36		Clear process		
37	Graphic operation	Transform: Move/Rotation/Mirror/Scale		
38		Size	×	
39		Simple Drawing		
40		Different types of Poly line	×	
41		Replace circle with point	×	
42		SHX font		
43		Text layer independent editing		
44		Delete		
45		Chamfer : Round、Chip、Concave		
46		Auto Chamfer		
47		Copy		

48		Measure		
49		Break	×	
50		Align	×	
51		Explode	×	
52		Set to component		
53		Auto combine		
54		Split component		
55		Close		
56		Manual sort		
57		Auto sort		
58		New		
59		Save		
60		Print		
61	Simulate	Simulate		
62		Pause		
63		Next		
64		Speed		
65	System	System parameter		
66		Multi languages		
67		Add custom language		
68		Import parameter		
69		Axis type		
70		Layout parameter		
71		Craft parameter		
72		Unit		
73		Maintain craft library		
74		G code format control file		
75		Spline trans fitness		
76		Remove trivial		
77		Remove duplication		
78		Combine near		
79		Auto smooth		
80		Auto check in and out		
81		Auto sort		
82		Text type		
83		Text default layer		
84		Turn to curves		
85	Nest	Nest fitness	Fixed	
86		Irregular plate nesting	×	
87		Margin	×	
88		Parts distance		

89		Rotate angle	45°/90°/180°	
90		Nest direction		
91		Nest start point		
92		Auto combine nesting	×	
93		Renest	×	
94		Save rectangle remnant	×	
95		Hole filling	×	
96		Multi torch cutting	×	
97		Torch direction	×	
98		Mark by part		
99		Whole plate marking		
100		Drill by part		
101		Whole plate drilling		
102		Match material	×	
103		Match thickness	×	
104		Nest consider layer	×	
105		Stop nest		
106		Manual nest		
107	G code	Export		
108		Check G code		
109		Auto Code Kerf Cut Parameter		
110		Enable edit		
111		Support Text code	×	
112		Save as		
113		Exit		

1.3 Operation shortcut key

In order for convenience of users to operate and draw graphics, the software defines various shortcut key operation. During operation, the information prompt window of the software also has corresponding operation prompt. Details are as follows:

Shortcut key	Function
Ctrl+A	Select all
Ctrl+C	Copy
Ctrl+Z	Undo

Ctrl+Y	Redo
Delete	Delete
Space、Enter	End drawing or input
Esc	Exit current state, enter graph selection state
A	Switch arc when drawing polyline
C	Automatically close when drawing polyline
D	Assign size when drawing rectangle
E	Delete
L	Switch line when drawing polyline
Shift + MOUSE LEFT	Rapidly rotate the selected shapes
POINT	Draw point
LINE	Draw line
CIRCLE & RADIUS	Draw circle with center point and radius
CIRCLED & DIAMETER	Draw circle with center point and diameter
CIRCLE2P	Draw circle with 2 points
CIRCLE3P	Draw circle with 3 points
ARC or ARC3P	Draw arc with 3 points
ARCSCAN	Draw arc with scanning
REC	Draw rectangle
RECR	Draw round angle rectangle
POLYGON	Draw polygon
MOVE	Move the selected shapes
MIRROR	Mirror the selected shapes
ROTATE	Rotate the selected shapes
SCALE	Scale the selected shapes
↑↓←→	Rapidly micromove, close and rotate

1.4 Acquire and install software

You can contact the supplier or customer service personnel to acquire software installation program. Before installation, please check if your system meets the requirements below:

Hardware:

Operating system higher than Windows 7

CPU with basic frequency above 1G

Software:

.Net Framework 4.0 or above

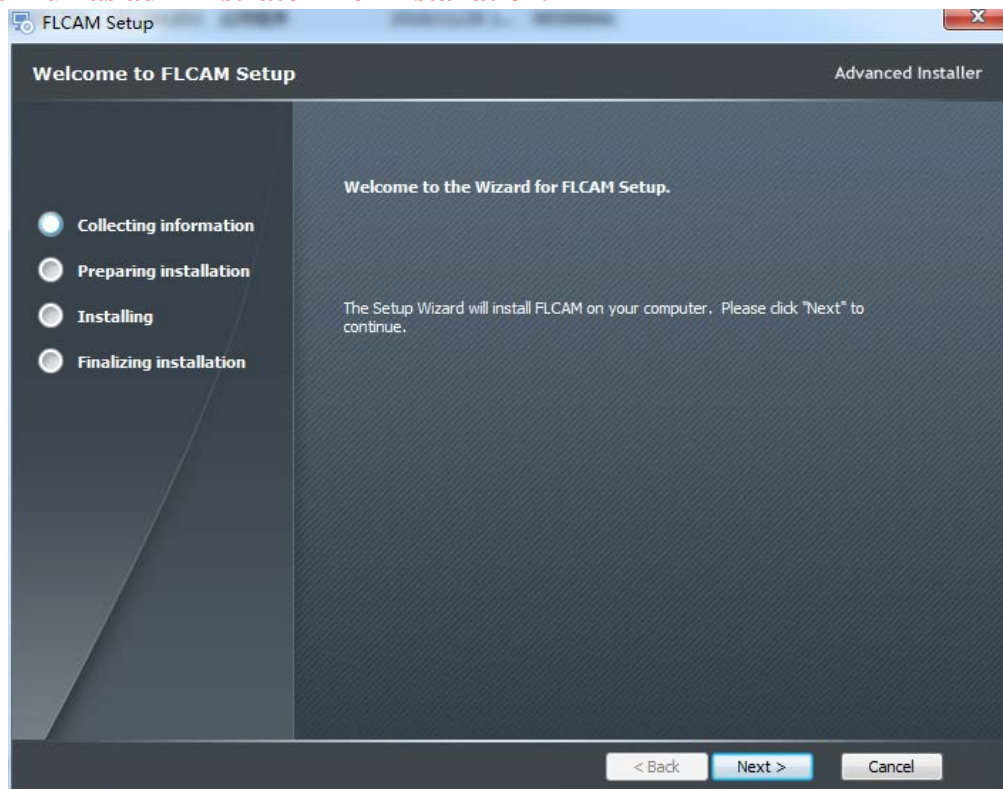
After checking the Install software, you can directly run installation program. Installation program needs administrator authority to run in WIN 10 operating system. To avoid that program file is modified, and ensure all drives to be installed normally during installation. Close 360 Security and anti-virus software.

Note: 360 Security cannot ensure no virus on your computer.

1.5 Start to use

1.5.1 Software installation

Please obtain latest version software installation package from software supplier, install it after unzipping setup .exe file. **Win 7 and above user shall right-click to select “run as administrator” for installation.**

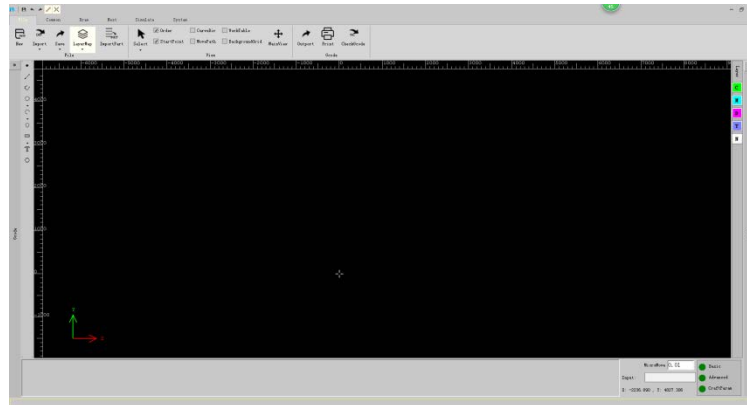


In installation interface click “**Next**” according to prompt, in pop-up

installation path selection interface select software installation catalogue based on your own demand, default is C:\Program Files (x86)\FL\FLCAM\ .You can modify the installation path as needed.

After installation, the desktop will display shortcut icon. If it does not display, manually open software installation catalogue, select FLCAM .exe file, right-click to select “Sent to” - “Desktop shortcut”, then the shortcut will appears on desktop.

1.5.2 User interface



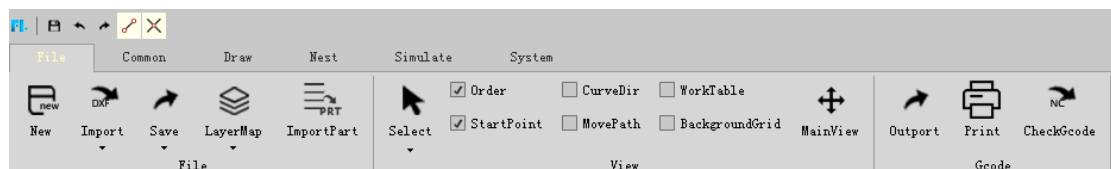
The software mainly includes six functional modules of “File”, “Common”, “Drawing”, “Nest”, “Simulate”, “System”. The user can import drawn graphic file or draw desired cutting drawing in the software, then process, nest the graph according to demand and generate G code file used for cutting.

The software also includes graph display field, state prompt box, command input bar, real-time coordinate display bar and shortcut process setup side bar, etc.

Part of the operation in the software is similar to that of AUTOCAD, including drawing mode, control mode of graph display interface: Press mouse left button to select, select from left to right and drag a area from right to left respectively. Roll mouse middle button upward and downward to zoom. Press mouse middle button to translate view. Drawing mode will be explained in detail in “Draw” chapter.

1.5.3 Toolbar

Toolbar mainly includes “File”, “Common”, “Drawing”, “Nest”, “Simulate”, “System” functions.



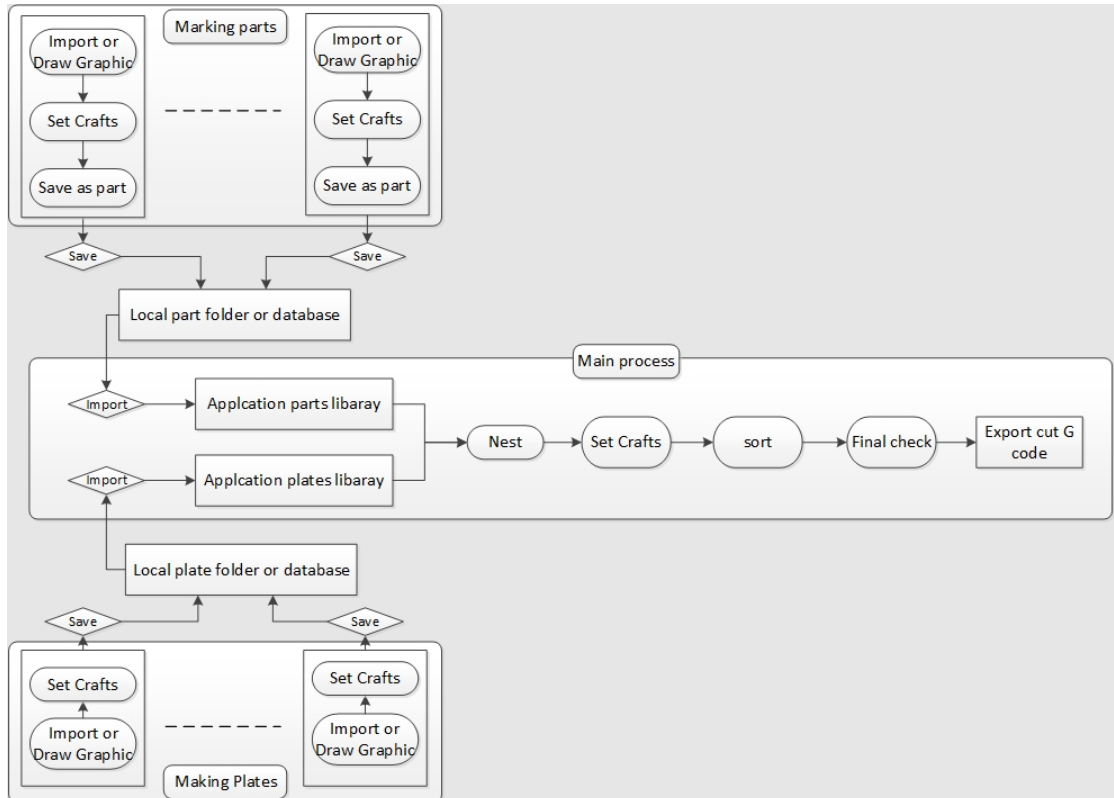
1.6 Operational process

The operating process of the software is divided into the following two types:

1. Import the cutting graph and export the G CODE directly.



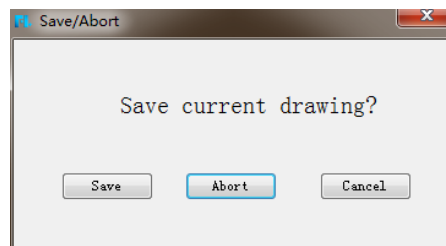
2. Making parts and plates, nesting and export the GCODE



The detailed operation flow of each step is described in the corresponding section below.

1.6.1 New

“**New**” is used to clear all contents in current drawing field and create new graphic content. After the operation, whether save the current drawing file will be prompted.

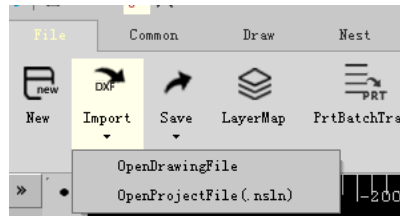


To select “**Save**” will save current drawing file. To select “**Abort**” will not save current drawing file. To select “**Cancel**”, the user can import or draw new graphic

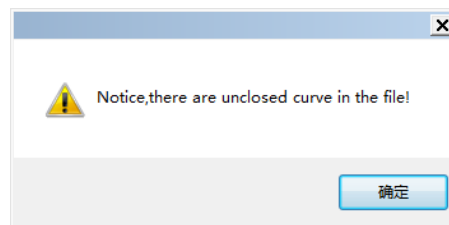
file again.

1.6.2 Import part

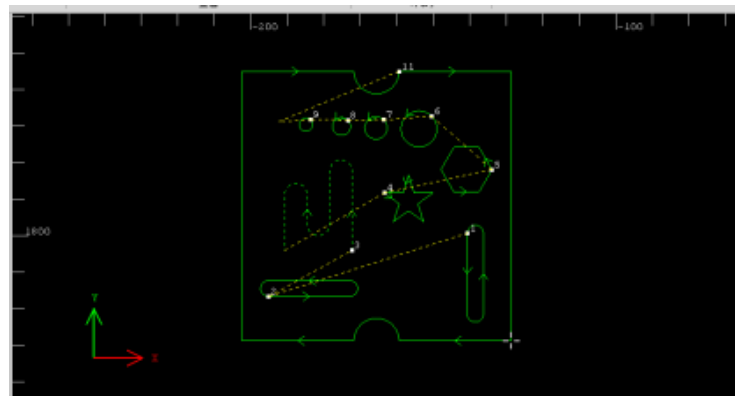
The software supports to import files of dwg、 dxf、 itf format (format of file saved by the software)、 and nc、 cnc、 txt、 plt、 nc1、 prt、 plate、 cam (file format of FASTCAM) and project file (nsln) .



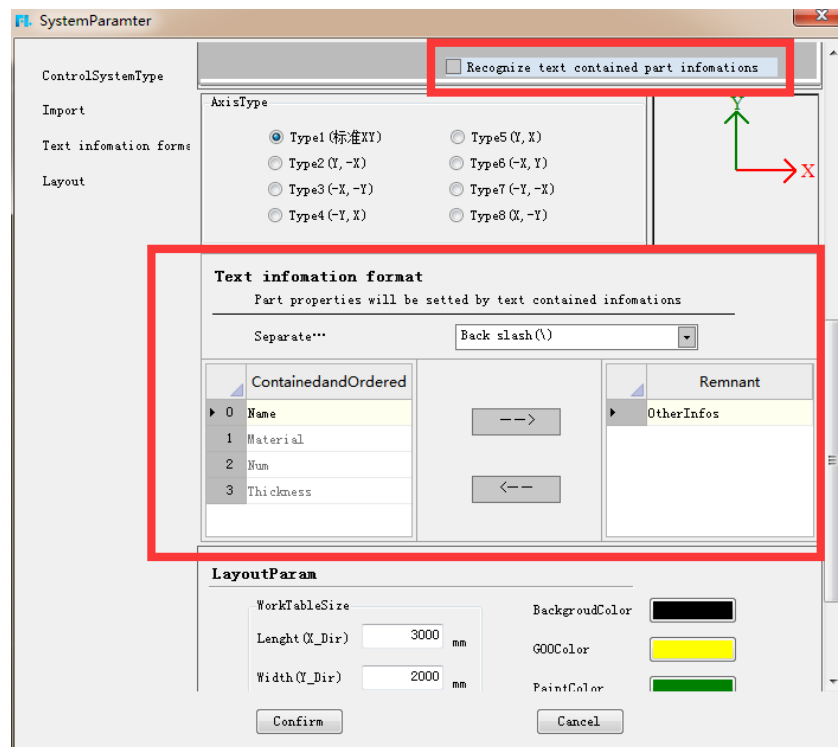
After selecting the imported document, and if the imported graph has unclosed graphic contour, the following prompt will be shown:



Click **“Confirm”** to continue the import, and it needs to assign an insertion point of the imported graph. It can be assigned by left-clicking or inputting coordinate of insertion point (format of import point is x coordinate, y coordinate). After assigning, the graph will be inserted to assigned point. After successfully imported, the interface will be as shown below:

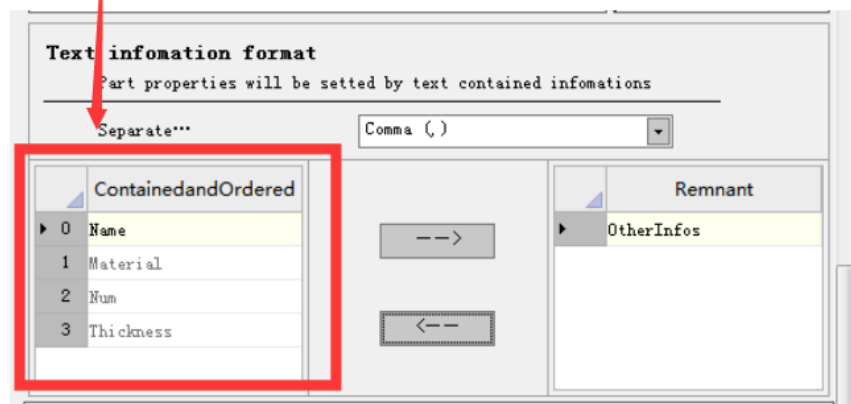
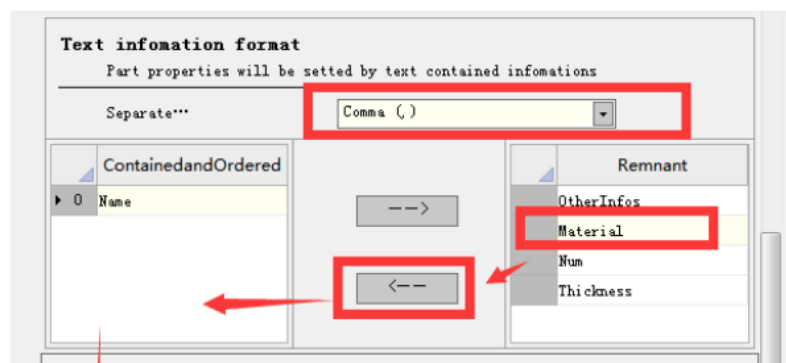


The professional edition supports **“Recognize text contained part information”**, which means part properties will be set by text contained information.

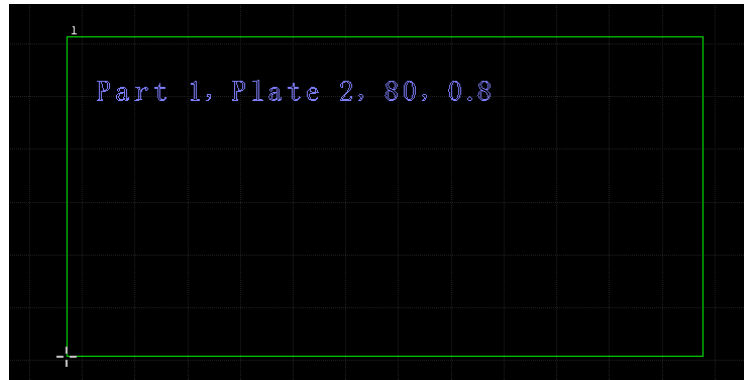


Example:

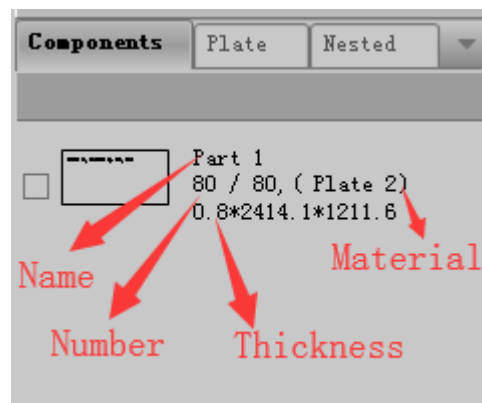
1. Tick **“Recognize text contained part information”** in the system parameter. Choose the separate symbol and contained information.



2. Import the part contained text information to the part library.



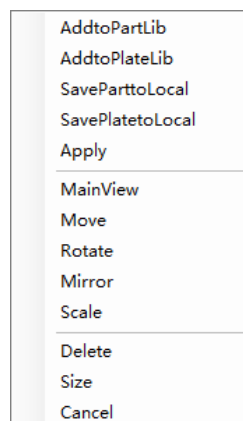
3. Add the part to the part library, and the part properties will be recognized automatically.



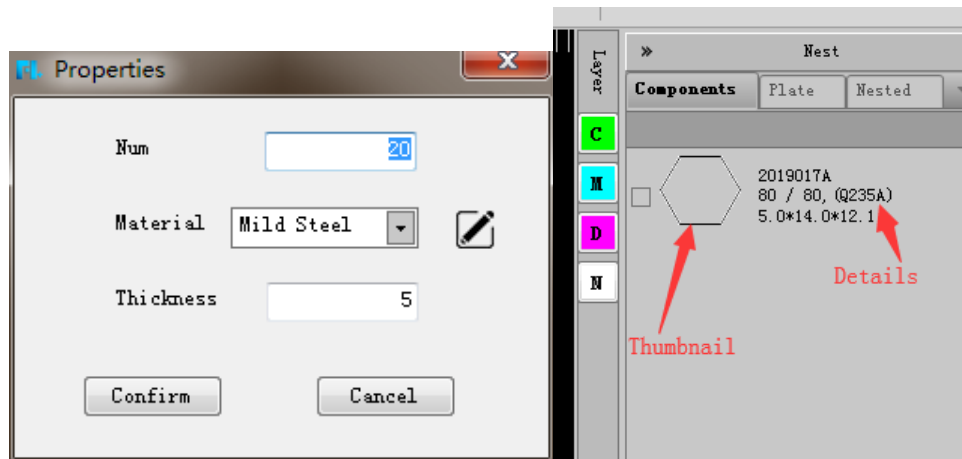
1.6.2.1 Add parts from drawing

In the nesting module, the parts that need to be nested should be imported and set the number of parts in advance. And the imported parts will be displayed in the part browser.

Select the part to be imported in the drawing area, and right click and the following dialog box will pop up:

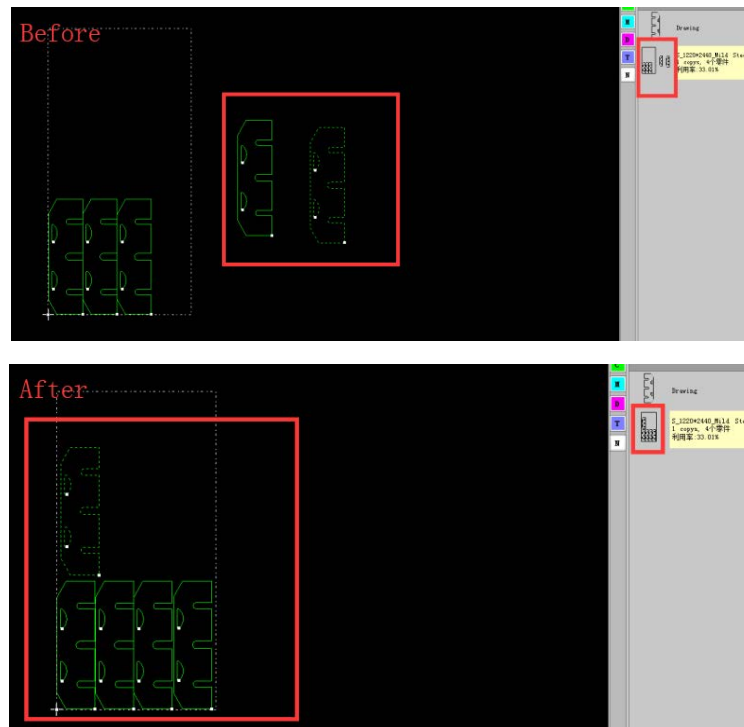


After clicking the “**Add to part lib**”, the part quantity setup dialogue box will pop up. After setting the quantity of parts that need nesting. Click “**Confirm**” and parts will be displayed in part browser. As shown below:



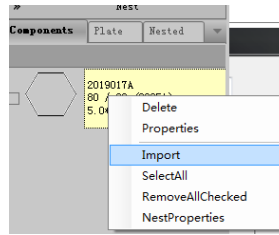
Part information displayed in the part browser includes thumbnail, name of the part, quantity of the part to be nested, total number of the part and size of the part.

Apply: Manually add parts (copy, array, drag and drop, etc.) to “Nested” results. As shown below:



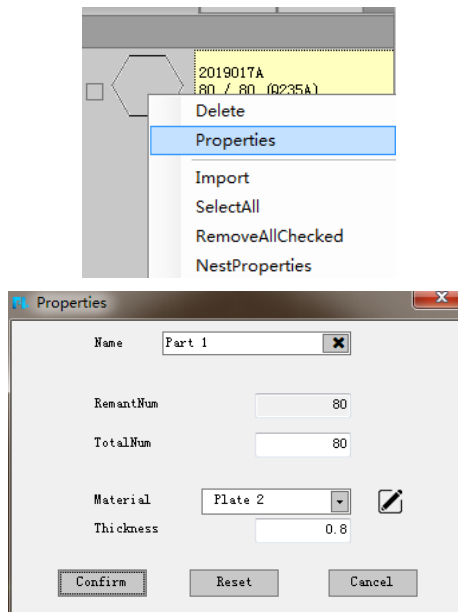
1.6.2.2 Add parts from local

Right-click in the parts browser on the right side of the software, and select “**Import**” in the pop-up interface to import parts that have been saved locally, as shown below:



1.6.2.3 Modify the part

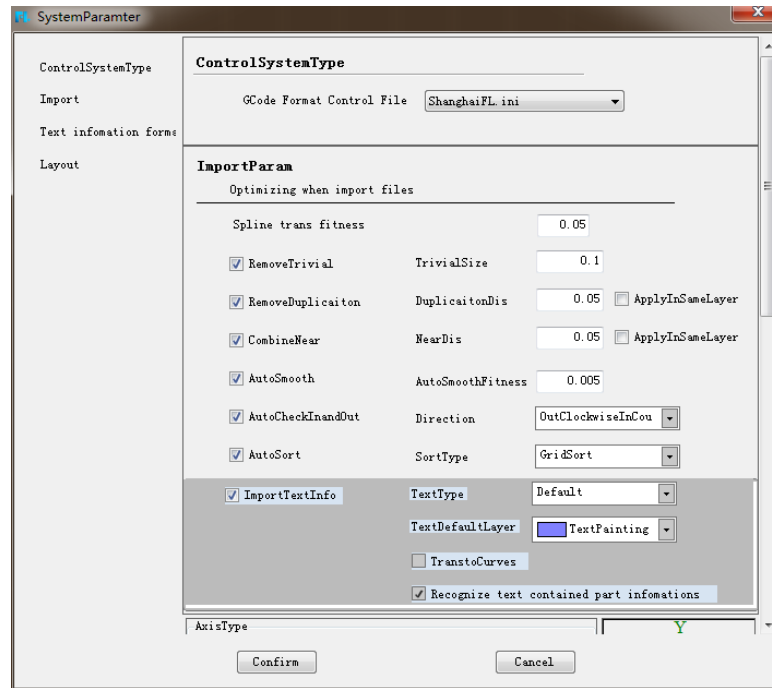
After right clicking parts in the part browser, the information box will pop up, as shown below:



1.6.3 Preprocess

During importing, the parts will be optimized automatically, including **Remove trivial**、**Remove duplication**、**Combine near**、**Auto smooth**、**Auto check in and out**、**Auto sort**、**Import text** operation. Parameters of the process can be set in system parameter, see the chapter “**System**”.

Note: the smaller the value of “**Spline trans fitness**”, the finer the curve. The bigger the value is, the rougher the curve.



The setting of text import:

1. Whether to import text. Hollow out or single line.
2. Choose the layer of the text.
3. Whether to transform to curves. If transformed to curves, the text will be shown in curves, which can add leads and micro joint, etc.
4. The text can be transformed to curves. But the curves cannot be transformed to text.

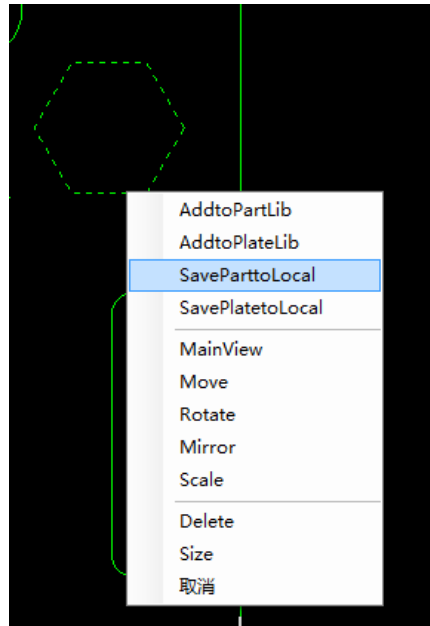
1.6.4 Save

The file can be saved as project file (.nlsn) 、 drawing (.itf 、 .dxf) 、 all nested (.dxf) .

Among them, the information of the project file saved is the most complete which is suitable for large file storage. After importing the project file, the software can resume the previous operations directly (the quantity of the part、 nesting result、 sheet information, etc.)



The designed parts can be saved to local for future use. Select the parts in the drawing zone and right-click to **“Save part to local”**.



Several parts can be selected for saving at the same time. But the saved file name of the several parts cannot be named separately. And the format of the saved file is prt.

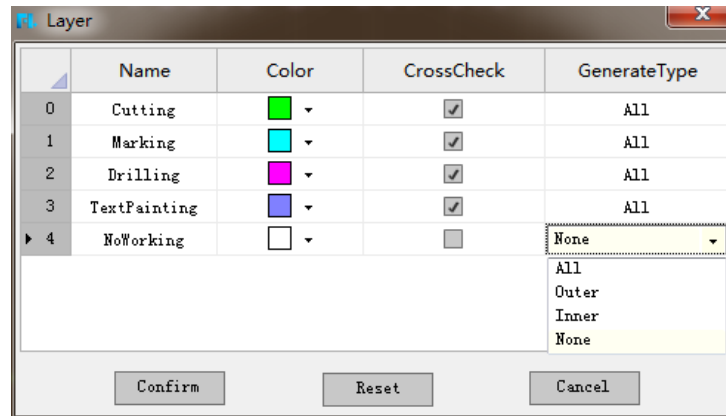
1.6.5 Layer

Process component of graph can also be modified as needed by clicking corresponding process in shortcut process bar at the right side of interface. Shortcut process bar is as shown below:



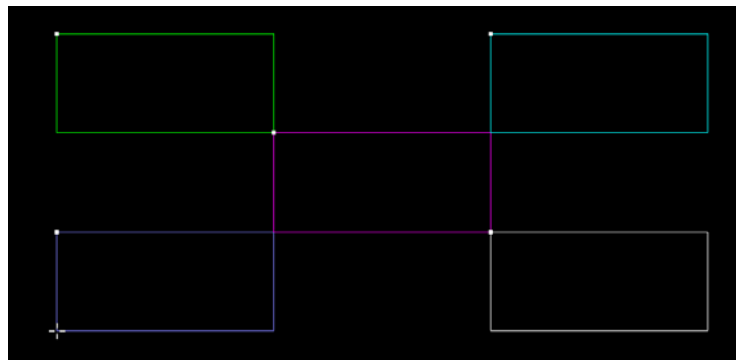
Corresponding layers in it are **Cutting layer**、 **Marking layer**、 **Drilling layer**、 **Text layer**、 **None operation layer**.

Double click the “**Layer**”, the prompt will pop up as following:



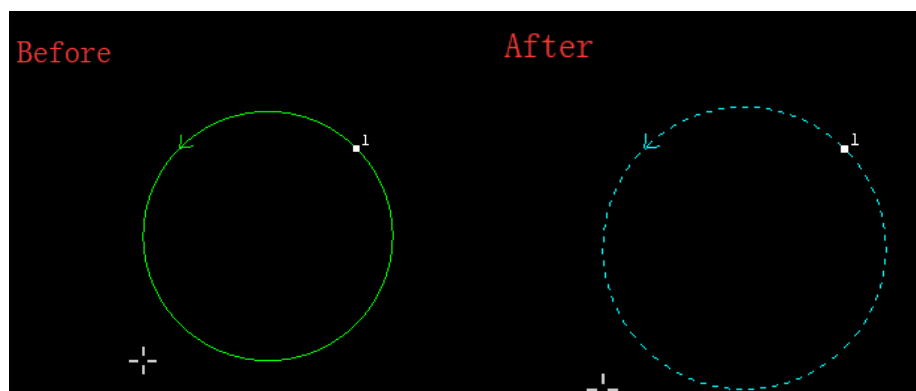
Users can drag the layer cutting order as needed. For example, the number “0” refers to the first to cut. The number “4” means the last layer to process. And the name of layer can be modified as needed. At the same time, users can choose the layer need cross check or not and choose the generate type.

“All” means the outer and inner contour of the part will all be processed. “Outer” means only the outer contour of the part will be processed. “Inner” means only the inner contour of the part will be processed. “None” means neither the outer and inner contour of the part will all be processed.



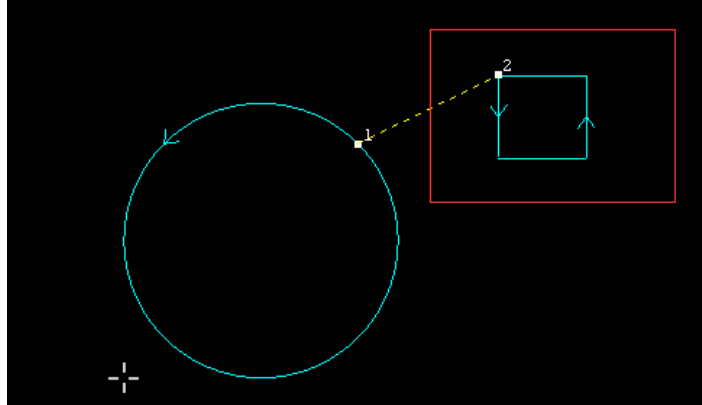
The different colors stand for different layers, as shown above. If you want to change the layer of parts, choose the parts and choose the layer at the right side of the software.

As shown below: the layer of the circle is cutting layer (green). Choose the **layer bar** to change layer (Marking layer: the blue one), the layer of the circle is changed from cutting layer to marking layer.

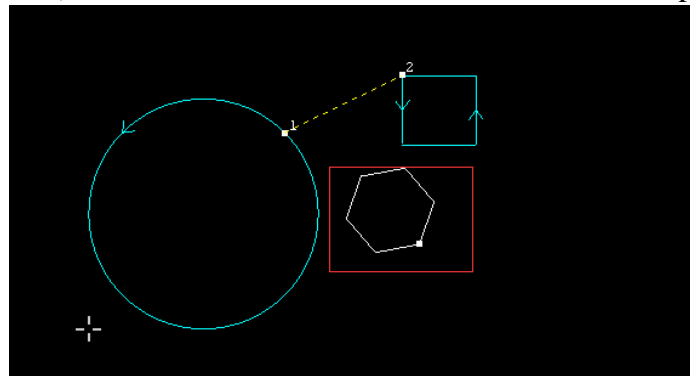


After changing the layer, in the next part drawing process, the layer is changed to the previous layer.

As shown before, the circle is changed from cutting layer to marking layer. Continue to draw a rectangle, and the layer of the rectangle is marking layer as just modified.

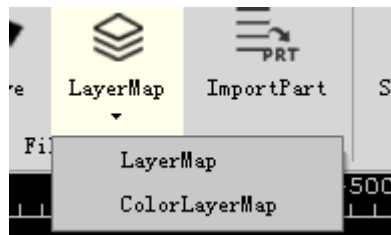


None operation layer (white) doesn't participate in cutting, so the parts of none operation layer (white) does not have order, curve direction and move path.



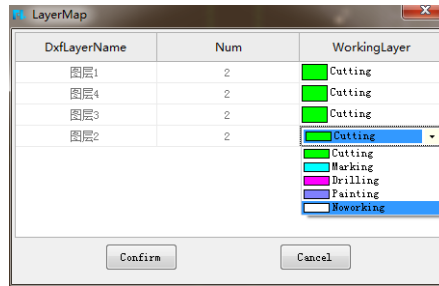
1.6.6 Layer map

Layer map is divided into layer map and color layer map.

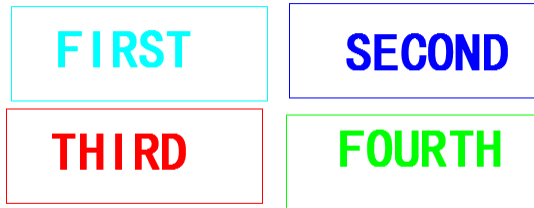


1.6.6.1 Layer map

Select layer map can modify the layer of the part, as shown below:

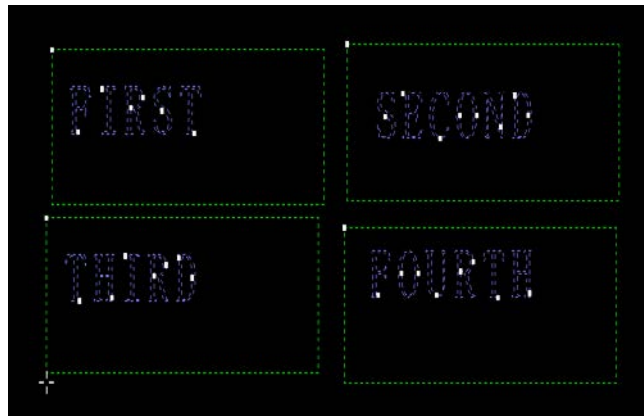


The layers of AUTOCAD correspond to FLCAM layers.

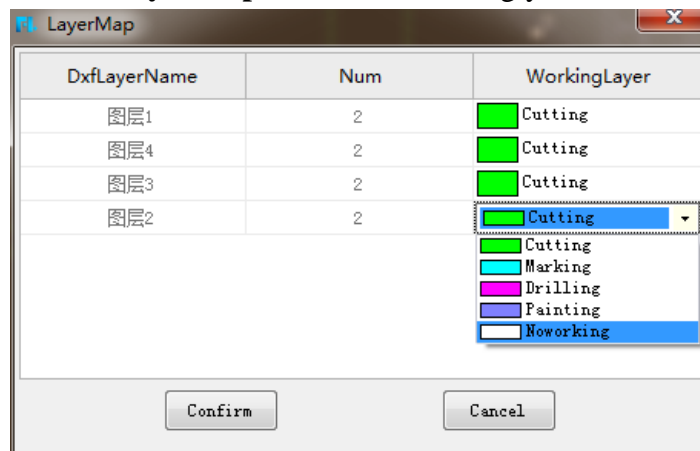


As shown above, there are four layers in CAD, respectively are layer 1, layer 2, layer 3, layer 4.

When imported to FLCAM, out contour are only cutting layer:



Choose the “layer map”, and set accordingly, as shown below:

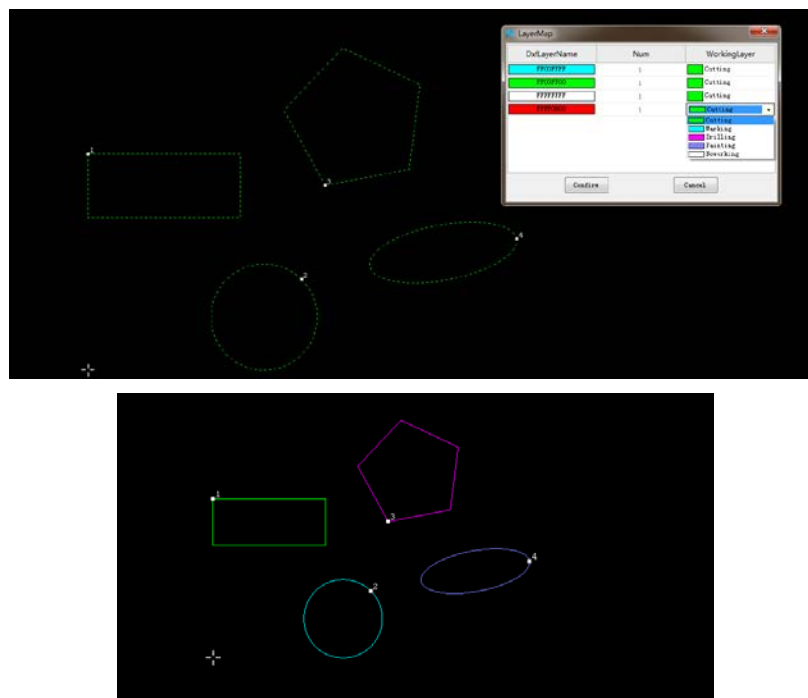


Set the appropriate layer, as shown below:



1.6.6.2 Color layer map

Besides the layer map, the software can layer map the parts according to their colors.

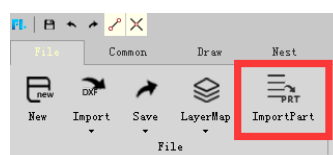


1.6.7 Import part

It supports to batch import parts to part library directly of dwg (Standard edition)、 dxf (Standard edition)、 nc1(Only professional edition support).

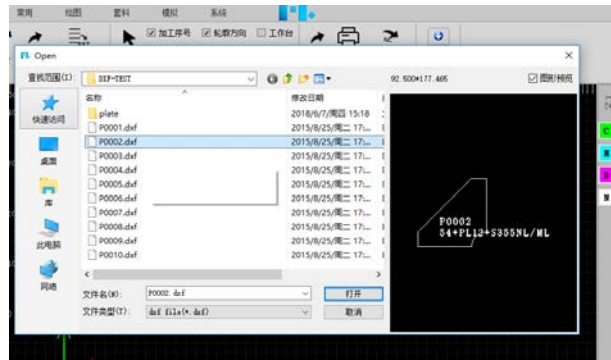
(Note: this function needs the user to confirm that all the files are correct. If not, the import will fail)

Click the button of the toolbar:

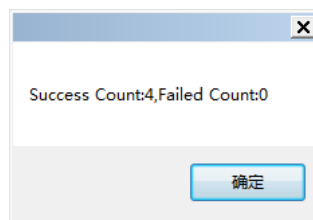


After the click, the box will pop up to select the files, and choose the dxf files

need to batch import, as shown below:



Select the dxf files need to batch import and click “**Open**”, the following box will pop up:



After clicking “**Confirm**”, the parts will be added to part library directly.


The software supports to batch import of multiple parts files. It will automatically recognize multiple parts in one file.

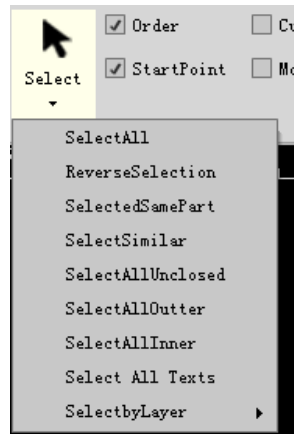
Dwg&nc1 files batch import is the same operation as dxf files batch import.

1.7 View module


View module provides abundant graph selection functions, seven display option switches.

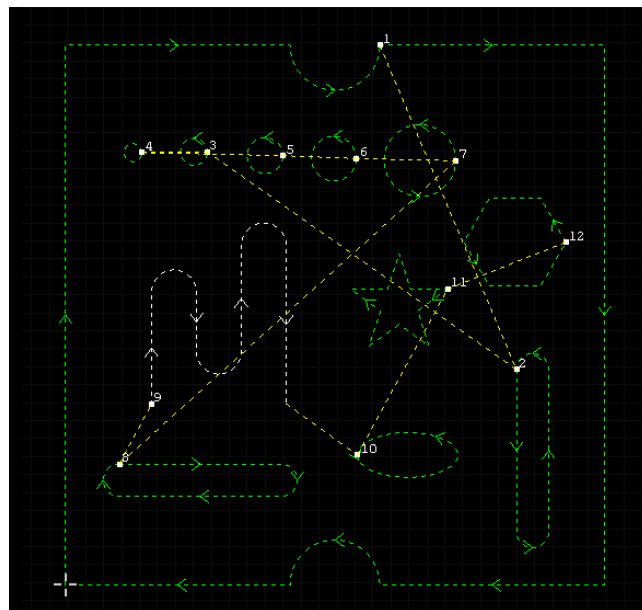
1.7.1 Select

Click “**select**” button  under “**File**”. Select includes **Select all**、**Reverse selection**、**Select same part**、**Select similar contour**、**Select all unclosed**、**Select all outer**、**Select all inner**、**Select all Texts**、**Select by layer**. Selected graphics will be displayed in the form of dotted lines.



1.7.1.1 Select all

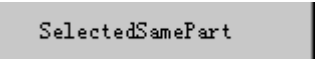
Click “Select all”  , all graphs are selected (displayed in the form of dotted line). It can also be realized by using shortcut key “Ctrl key + A key”, and can cancel selection by pressing “ESC” key. As shown below:




1.7.1.2 Reverse selection

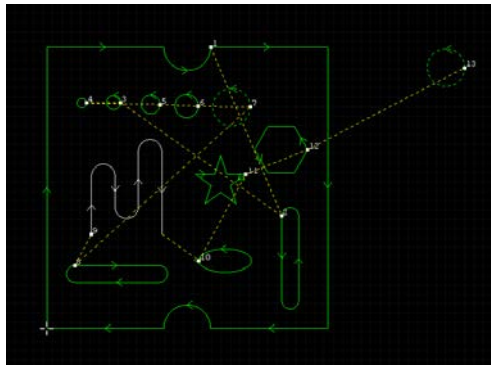
If choose the reverse selection, the software will select all other parts except the selected part.

1.7.1.3 Select same part


Choose the button  , select all other files with the same name based on the selected part which are shown as dotted lines.

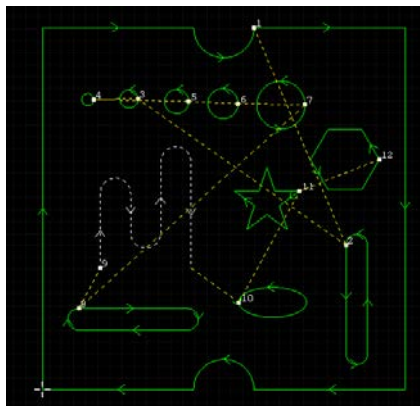
1.7.1.4 Select similar

The select similar contour  is to select graphs of same shape. When clicking a closed graph in drawing field, click “**select similar**” button, graphs same as the selected graph in drawing field will be displayed, display mode (in the form of dotted line). As shown in the following figure, two circles displayed in dotted line are obtained through selecting similar contour.



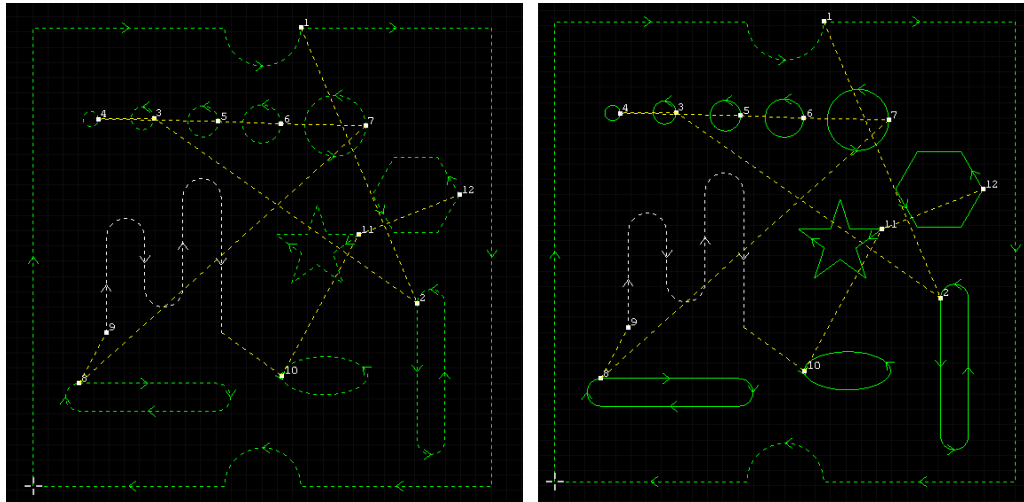
1.7.1.5 Select all unclosed

The select all unclosed  is to display segments that are unclosed in drawing field, display mode (in the form of dotted line). As shown in following figure, the unclosed is displayed in dotted line.



1.7.1.6 Select all outer

Select all outer [SelectAllOuter](#) is to display outer contour of parts and unclosed segments in drawing field, display mode (in the form of dotted line). If parts do not discriminate internal and external module, all sections will be displayed. As shown in below figure, the left side displays the graph without discriminating internal and external module, it can be found that all graphs are selected, the right side displays that external modules are selected and displayed with discriminating internal and external modules.



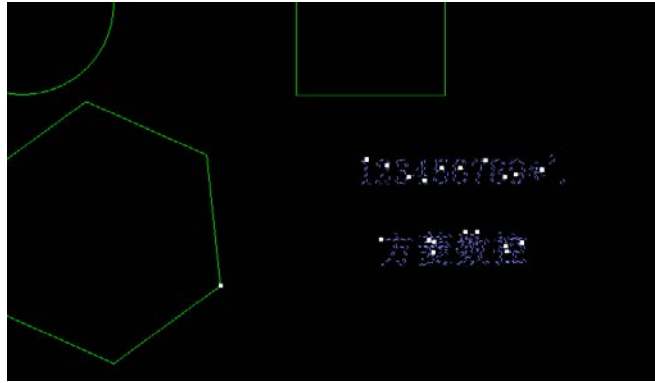
1.7.1.7 Select all inner

Select all inner [SelectAllInner](#) is to select inner contour of parts in drawing field, (in the form of dotted line).



1.7.1.8 Select all texts

All texts will be selected in the form of dotted line.



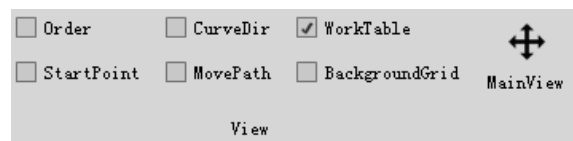
1.7.1.9 Select by layer

There are five layers in the software: cutting、marking、drilling、text、none operation layers respectively. Select by layer means to select the parts or components of the selected layer.



1.7.2 Seven display option switches:

Display “Order”、 “Start Point”、 “Curve Direction” 、 “Move Path”、 “Work Table”、 “Background Grid” and “Main View”. The “Move Path” displays color and line shape, which can be set in the system parameters, and see details in the system section. Users can check the function as needed.



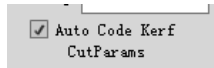
1.7.3G Code

17.3.1 Export

For the edited graphic file, it can be exported as txt、 nc and cnc format to save.



Click “**Output**” to export processing G code.



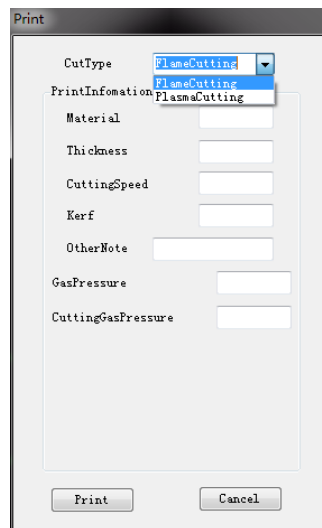
It can decide whether to compensate code according to processing demand.

Generated code can be used for processing.

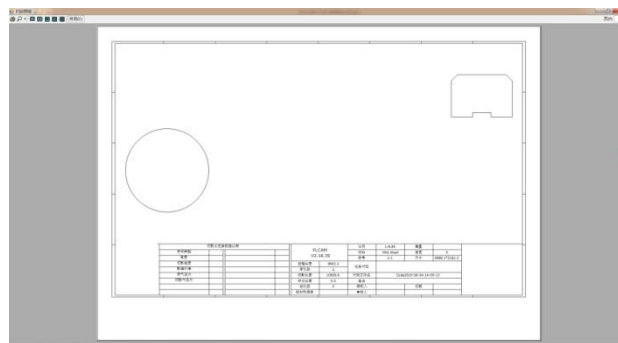
G code format can be switched in system parameter, see the chapter “**System**”.

Note: Output the text code: when the text (not curve) is setting to text layer, professional edition supports to generate text code.

1.7.3.2 Print



The users need to select the “**Cut Type**” of the current plate, and fill in the information according to the current plate to the “**Print**”. All the information will be shown on the final printout.

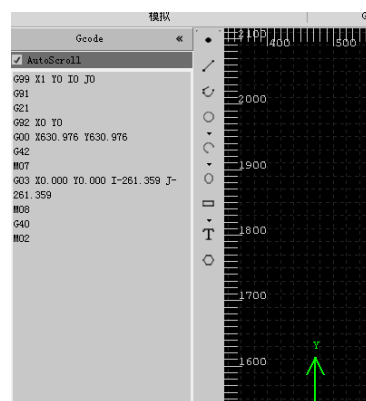


1.7.3.3 Check G code



When you need to check G code, you can choose .After imported, the G code can be checked on the left side of the software.

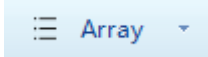
You can “**Edit**” or “**Exit**” the code when verifying it.

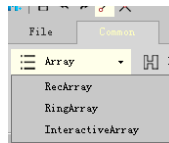


II Common

2.1 Toolbar

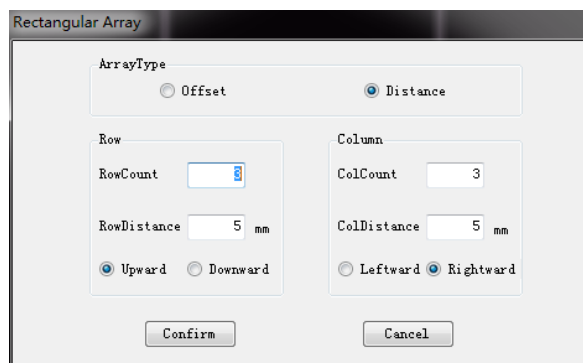
2.1.1 Array

The array is to copy graphs and array them in certain a direction, there is an “Array” button  under common toolbar. Array includes rectangular array, ring array and interactive array.

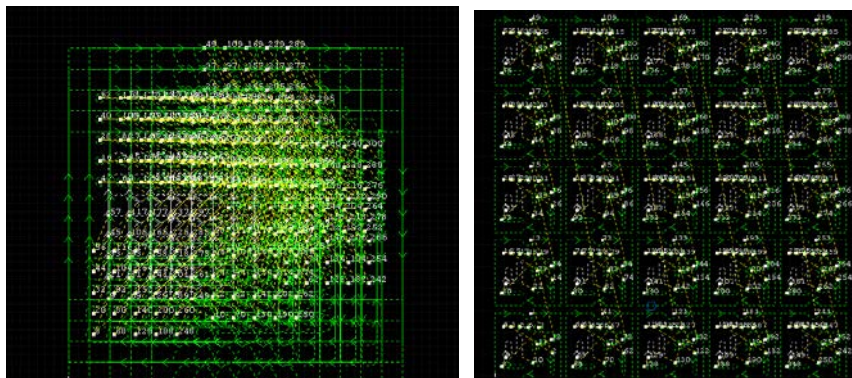


2.1.1.1 Rectangular array

Rectangular array includes “Offset” array and “Distance” array. First select graphs to be arrayed. If no graph is selected, no dialogue box pops up. After selecting rectangular array, the prompt interface as follow pops up:



After setting the parameter, the left side and right side of the following figure are graph arrayed based on offset and distance respectively

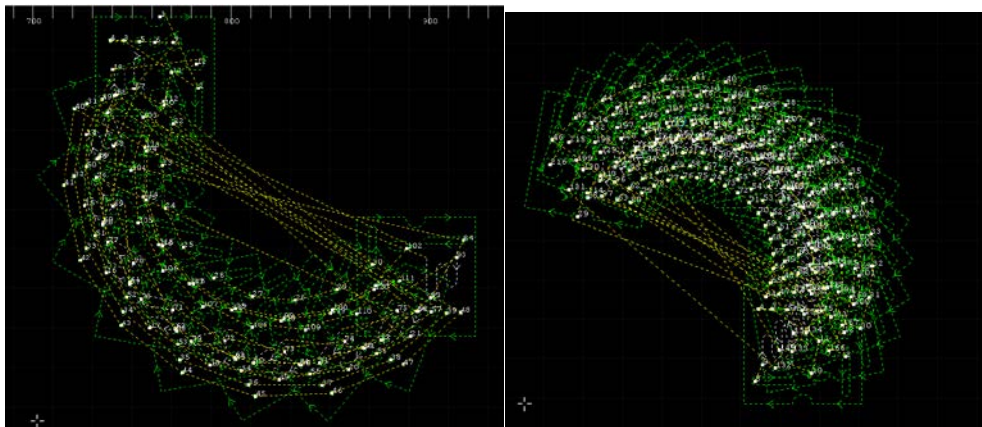


2.1.1.2 Ring array

Ring array needs to first assign array center position. After assigning, parameter input interface of ring array will pop up:

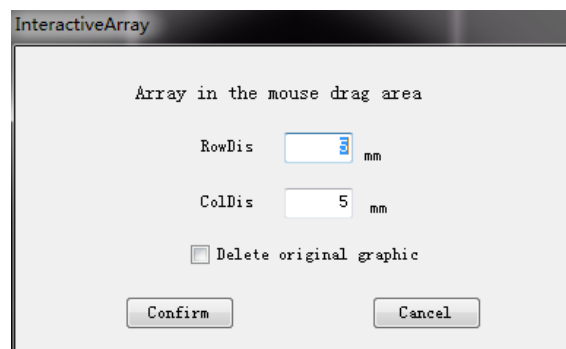


Ring array includes quantity and spacing angle based array: Quantity based is to array according to the quantity. Angle based array is to array based on spacing angle. The left side of below figure is to array based on quantity, with array angle 180 degrees. Right side is based on spacing angle, with array angle 180 degrees.

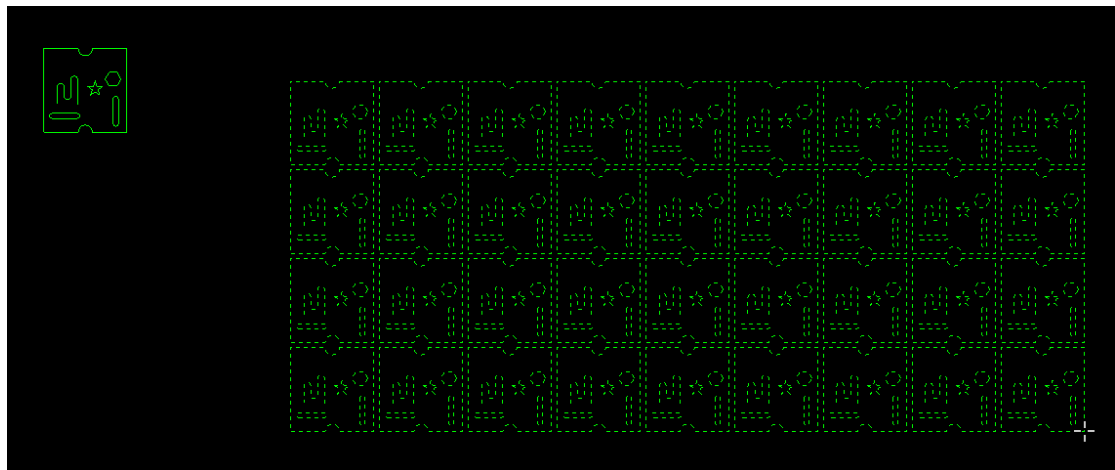


2.1.1.3 Interactive array

Interactive array can be arrayed within a specified area by dragging the mouse.

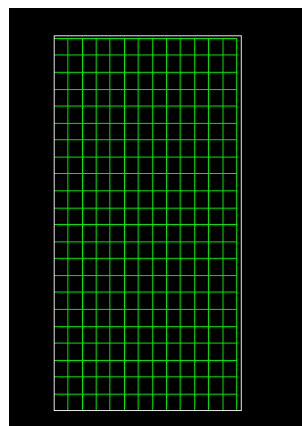
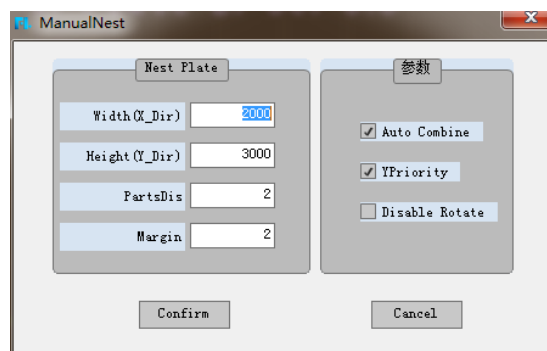


As shown in the following figure, drag the mouse to generate an array in the specified area:



2.1.1.4 Full fill

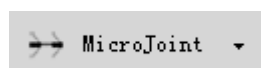
Select the part and input the parameter. At the same time, users can choose “Auto Combine”、“Y Priority”、“Disable rotate”.



2.1.2 Micro Joint


Micro joint includes manual and automatic and split micro joint. There is a

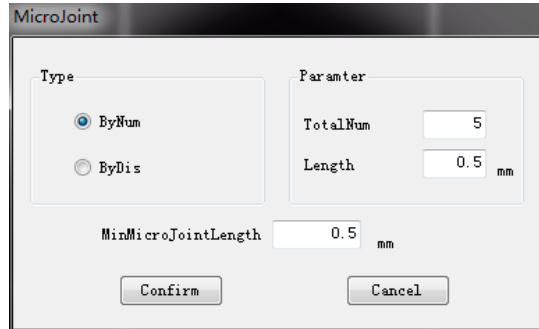
“Micro joint” button



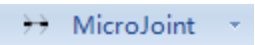

under the common toolbar.

2.1.2.1 Parameter setting

Before making the micro joint operation, users need to set micro connection parameter. There is a parameter setting  under “micro joint” button. After setting micro joint will be conducted according to the set value, and without setting micro joint will be conducted according to the default value. Micro joint based on quantity and based on distance. As shown in below figure:

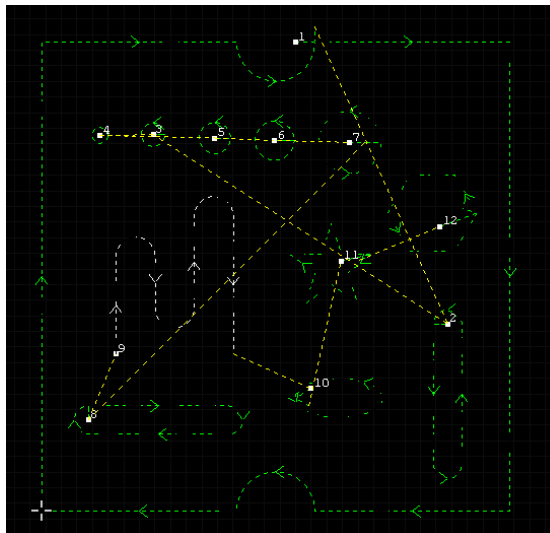


2.1.2.2 Micro Joint


After finishing parameter setting, click micro joint button  or “Automatic micro joint”  option under the button to conduct micro connection operation.

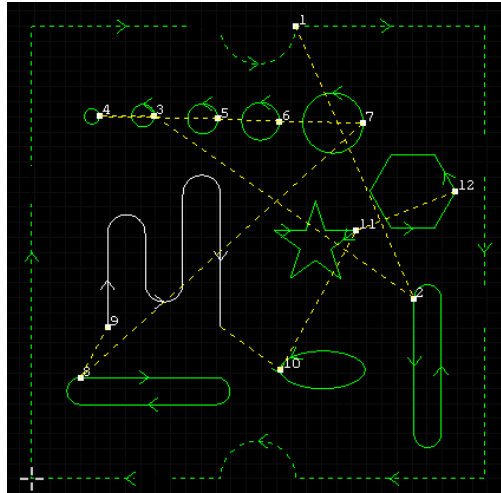
Manual micro Joint: directly click micro joint button to conduct manual micro connection. Click the point that need to add micro joint, and micro joint section will be added where mouse clicks;

Automatic micro joint: select graph and click automatic micro joint button, micro joint will be conducted. As shown in below figure is the effect picture of quantity based automatic micro joint.

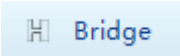


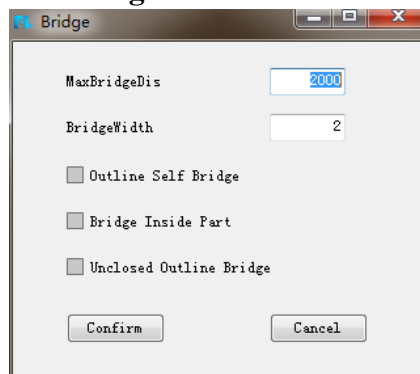
2.1.2.3 Split micro joint

After selecting graph, click “split micro joint”  under micro connection option. Then select position to be exploded on outer contour, left-click the segments, and the selected position will be exploded.



2.1.3 Bridging

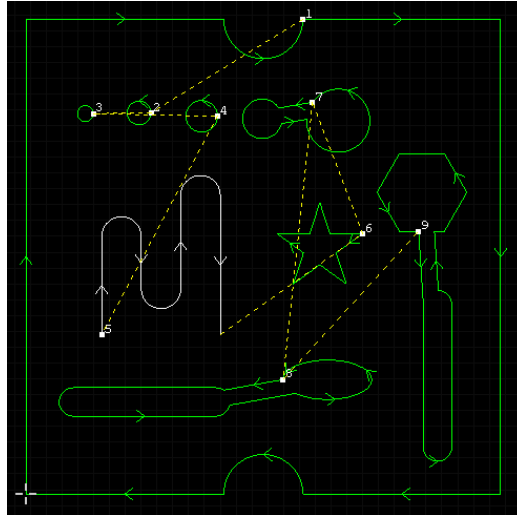
There is a “**Bridging**” button  under common toolbar. After clicking the button, click to select two graphs to be bridged, and the software will bridge the two graphs. The advanced bridge parameter can be chosen according to the cutting demands (Professional edition support): **Outline Self Bridge**、**Bridge inside part**、**Unclosed Outline Bridge**.




Note:

1. If bridging is not successful, check whether spacing between bridged graphs is larger than set distance.
2. Bridging can operate multiple graphs.
3. Bridging is irreversible, namely, bridging operation cannot be canceled.

As shown in the following figure is the effect of graph bridging:

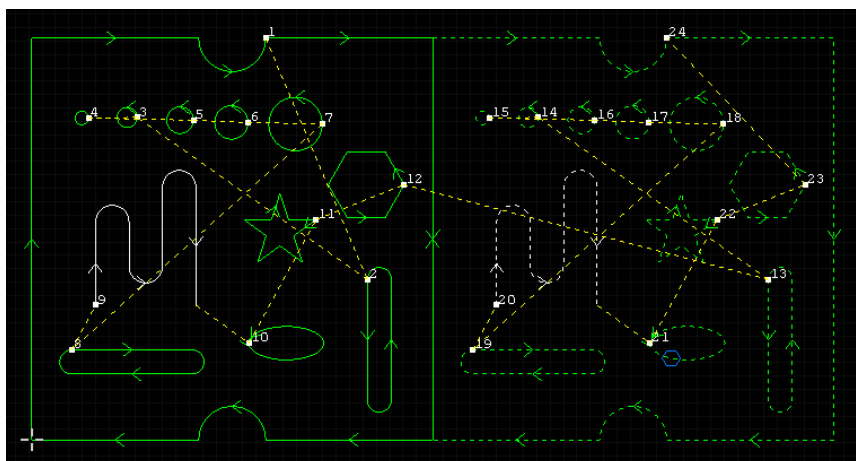


2.1.4 Common Edge

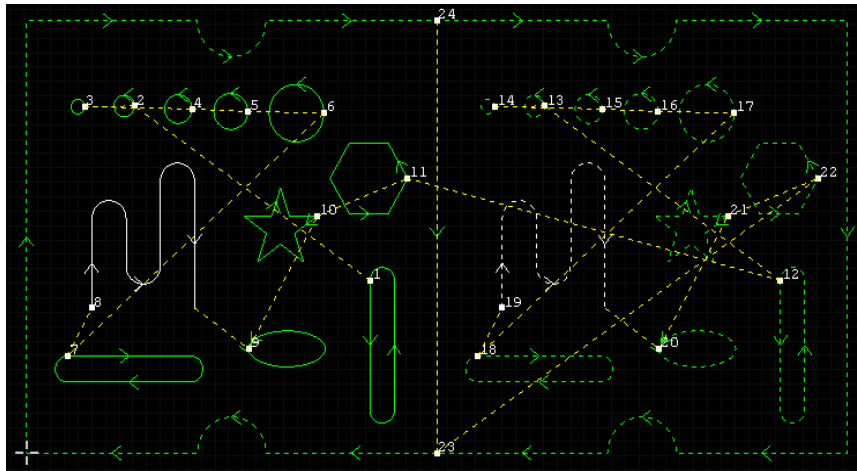
Common edge is the shared edges among parts during cutting to achieve the goal of running few paths. There is “**Common edge**”  **CommonEdge** button under common toolbar. Select outer contour of two graphs needing edge sharing, and select the close function in the lower right corner of the software interface and set the parameter: 0.01, then press the keyboard $\uparrow\downarrow\leftarrow\rightarrow$ key to close, finally click the “**Common edge**”.

As shown in below figures, picture 1 is two parts without sharing edge, it can be found that there are two directional arrows at the junction of two parts, picture 2 is common edge parts, there is only a arrow at the junction of two parts.

Note: The distance between parts that need to be common edged should be less than 0.1mm. If the distance is farer then that, you need to move or close the parts together.




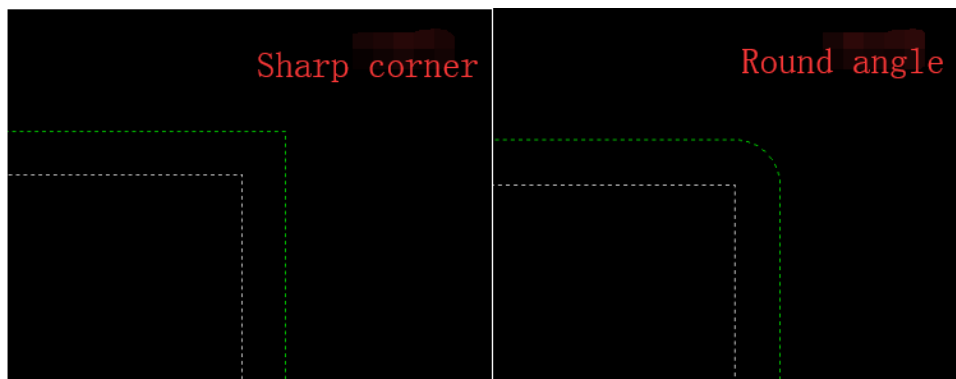
Picture 1



Picture 2

2.1.5 Kerf Compensation


Kerf Compensation is set up to prevent from kerf resulting from laser or flame during cutting. There is a “**Kerf Compensation**” button  under common toolbar. Width of kerf shall be measured based on actual cutting result. Compensated path is displayed in green, and the original contour is in white, and during processing it will cutting follow the compensated path.

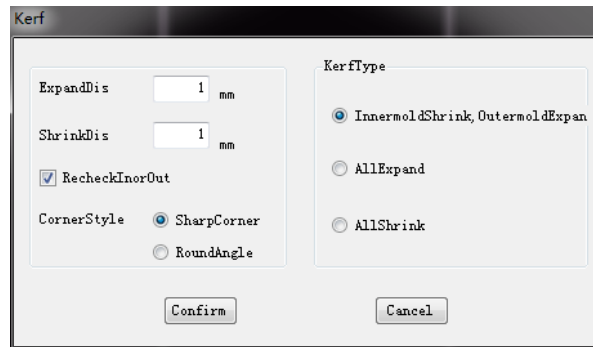


Kerf compensation in the software is conducted in two ways, one is to direct compensation in graph, and the other is compensation in code. Code compensation will be set to conduct in G code according to code compensation code of system parameter, see the chapter “**System**”.

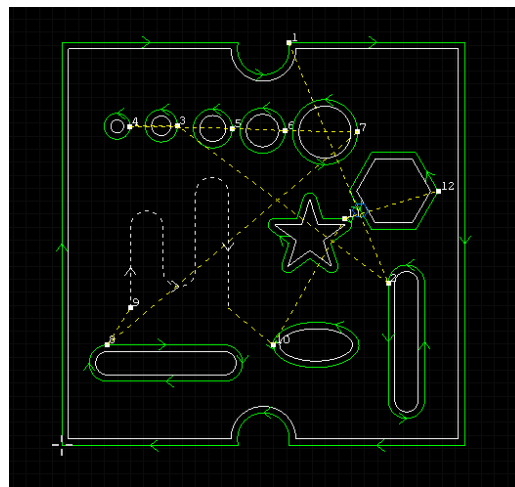
Compensation in graph includes 3 modes: **Inner mode shrink & outer mode expand**、**all expand**、**all shrink**. Compensation needs to display distance and mode of compensation in popped up compensation interface, attention shall be paid to:

1. **Unclosed contour cannot be compensated.**
2. **If compensation value of smaller contour is set too large, unexpected result may be resulted.**
3. **If it is necessary to re-discriminate inner contour and outer contour, please**


tick , after ticking, information about previously set inner and outer cutting will lose.

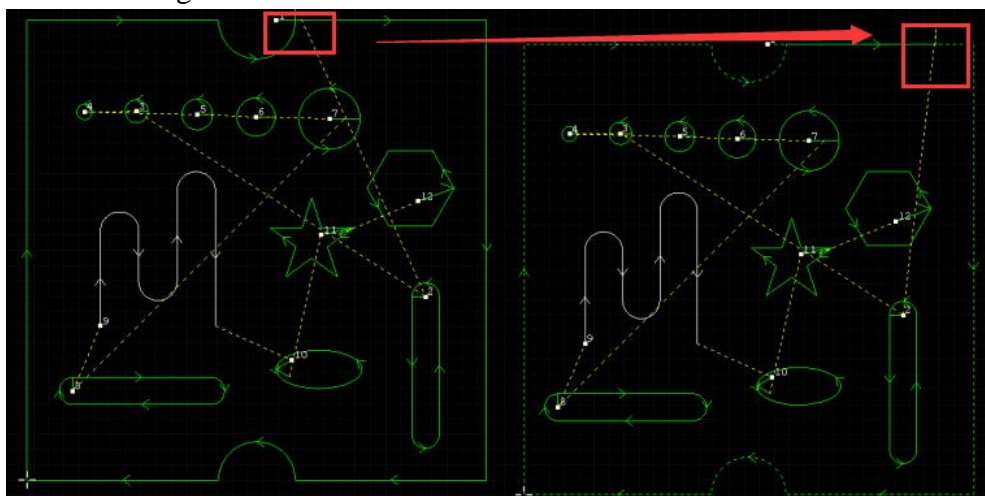


Below figure is the compensation graph of Inner mode shrink & outer mode expand with compensation distance 0.5mm.

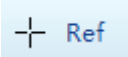


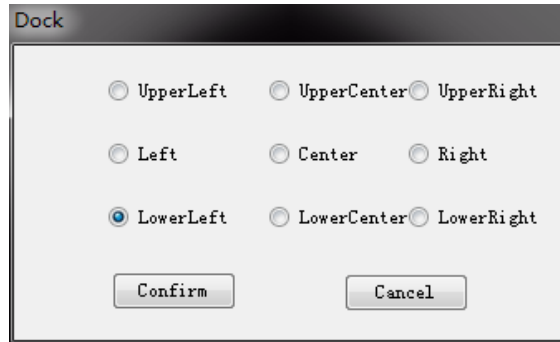
2.1.6Overcut

There is an “**Over cut**” button  **Overcut** under common toolbar, shifting in original Leader line, and it typically acts on outer contour. As shown in the left side of below figure, the position of yellow dotted line in graph 1 is the original position of the Leader line, by over cutting 20mm, the position of yellow dotted line in graph 1 has moved to right side.

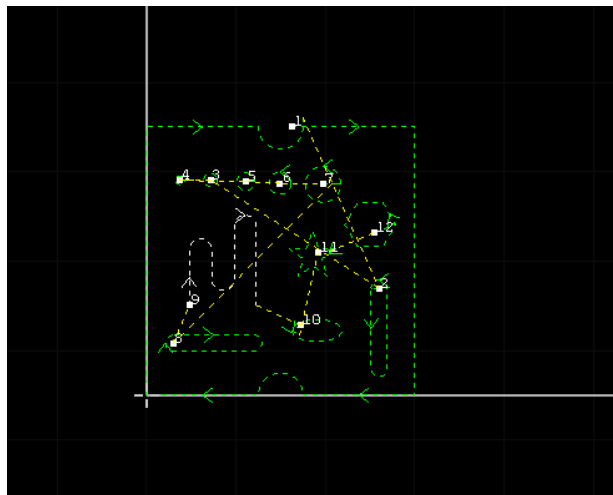


2.1.7Ref

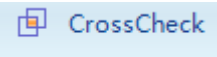
There is a “**Reference**” button  under common toolbar. The reference means to align points, aligning with origin. Currently docking point has 9 characteristic points, including upper left、upper、upper right、left、middle、right、lower left、lower、lower right.

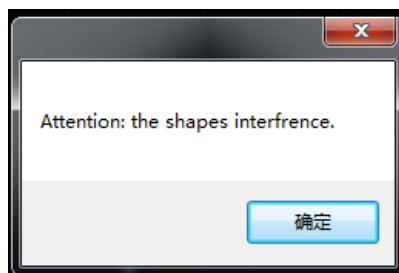


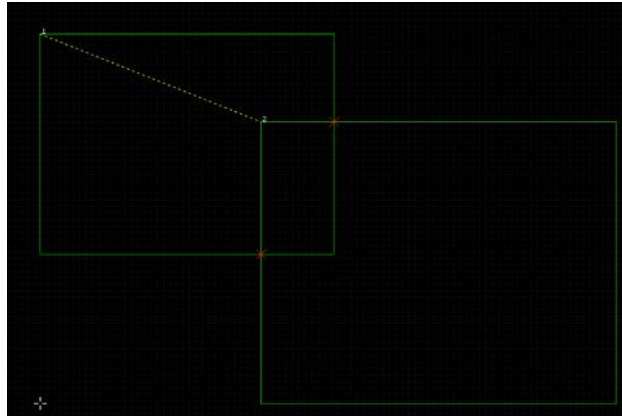
Default is lower left which means that the lower left of the graph aligned with the original point.



2.1.8 Cross check

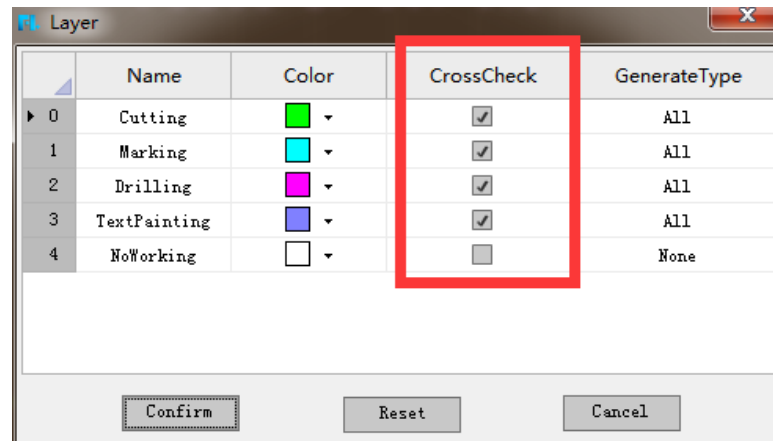
Cross check  can check whether there is overlapping region in processing drawing for graph point with interference prompt box will pop up, and it will be highlighted with red X in drawing field, as shown in below figure:





Note: The software will conduct **“Check cross”** operation automatically before exporting the G code. If there is an intervention prompt, please manually handle the place where there is graphic intervention.

The software supports to check layer cross. Users can tick the layer which need cross check.



2.1.9 Clear

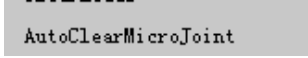
2.1.9.1 Clear compensation

There is a **“Clear compensation”** button ClearCompensate under **“Clear”** button. Clear compensation is to remove cutting compensation. It just needs to click to select graph and click clear compensate.

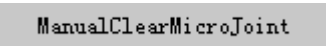
2.1.9.2 Clear leads

There is a **“Clear leads”** ClearLeads button under **“Clear”** button. Clear leader line is to remove leader line. It just needs to click to select graph and click clear.

2.1.9.3 Automatically clear micro joint

There is an “**Automatically clear micro joint**” button  under “**Clear**” button, to automatically clear all micro joint of selected graph. It just needs to click to select graph and click clear.

2.1.9.4 Manually clear micro joint

There is a “**Manually clear micro joint**” button  under “**Clear**” button. Manual clear micro joint will need users to manually assign points that need to clear micro joint. It just needs to click to select graph and click clear.

2.1.10 Leads

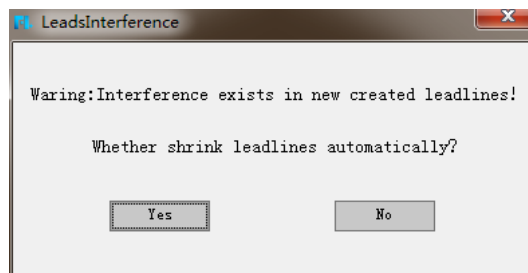
Add lead in and lead out to prevent parts from being cut destructively. We can set in “**Leads**” under common toolbar.

2.1.10.1 Set Leads



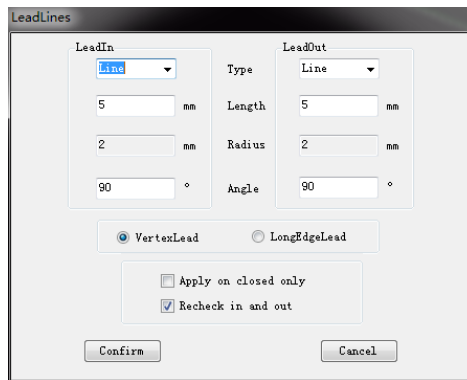
Lead in and lead out support three line types including **straight line**, **arc** and **straight line+arc**. When the setup is straight line you can assign length. If arc, you can assign its radius. If the leads are straight line and arc, assign length as well as radius. In addition, you can set the angle of lead in and lead out and whether to set leads at starting point.

Adding “**Leads**” will automatically process inner and outer contour. Outer contour leads are added outside, while inner contour leads is added inside. It shall be noticed that whether the length of added leads is suitable for parts. If the part is too small, while the added leads is too long, it is very possible to cut the part destructively. After adding the leads, if the leads are crossed, a prompt box will pop up. You need to select whether to shorten the crossed leads automatically according to the requirements, as shown below:



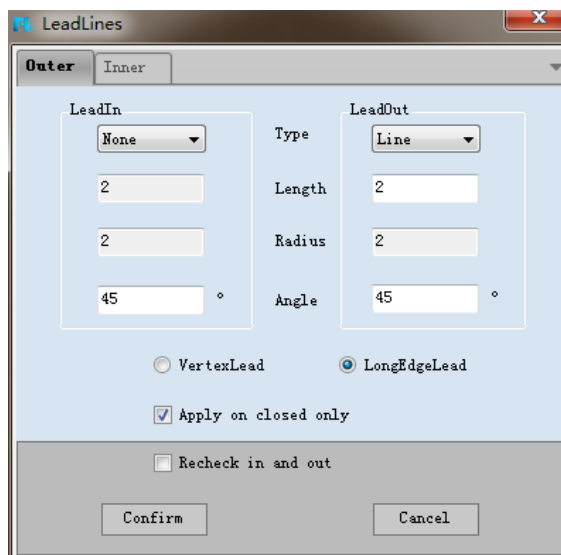
Click “**Yes**” will automatically shorten the leads.

Set the parameter as needed, shown as below:




Note: after ticking ☒ Recheck in and out, inner and outer contour will be discriminated according to actual graph, and information about previously inner and outer cutting will be lost.

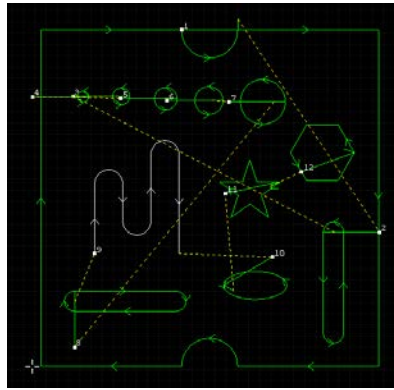
The professional edition supports advanced leads. Outer and inner leads can be set separately as needed.



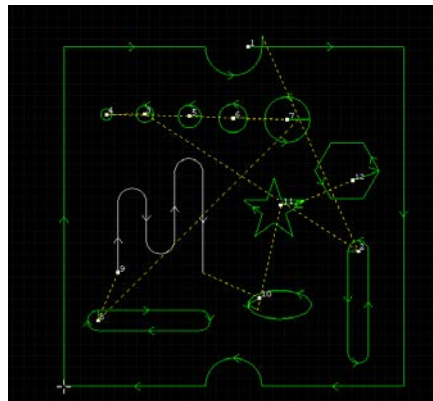
2.1.10.2 Leads Check

After adding leads, if there are leads intersection in graph, click “**Leads check**” button  under “**Leads**” button to eliminate, and leads will shorten automatically.

The picture 1 shows the leads are too long which exceed the closed curve. The picture 2 shows the leads check and leads shorten automatically.



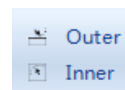
Picture 1



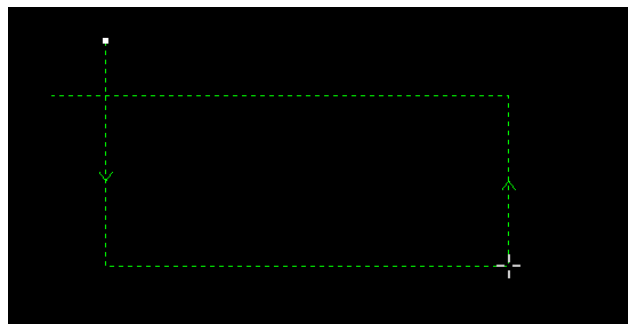
Picture 2

2.1.10.3 Inner/Outer Cut

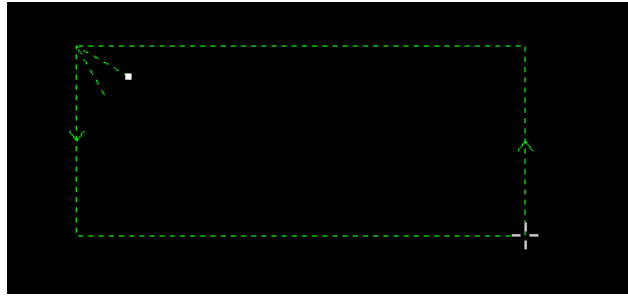
There are two buttons of “**Inner**” and “**Outer**” under common toolbar. The outer cut will swap leads outside contour. The inner cut will swap leads inside contour.



As shown below:



Outer cut

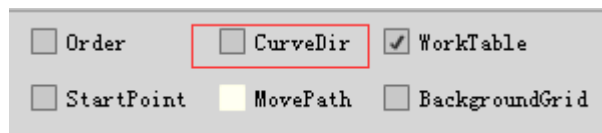


Inner cut

2.2 Modify

2.2.1 Direction

The software marks cutting direction of current contour in the form of arrow on drawn component, if you cannot see the direction arrow, please tick **“Curve direction”** in **“File - View”**.

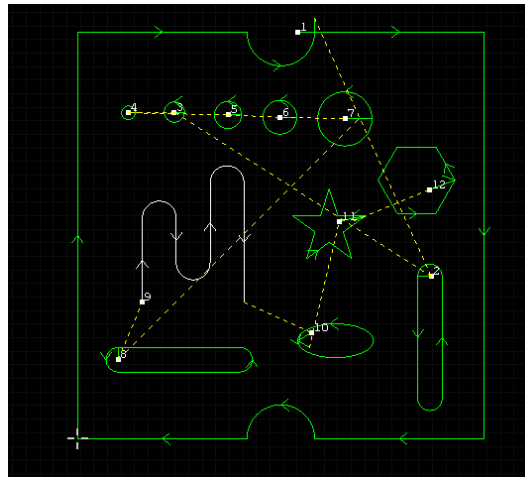


2.2.1.1 Recheck inner and outer

There is a **“Recheck in and out”** button RecheckInAndOut under **“Direction”** button. The software will automatically divide internal module and external module of graph after clicking which will make previously setting information about inner and outer cutting lost.

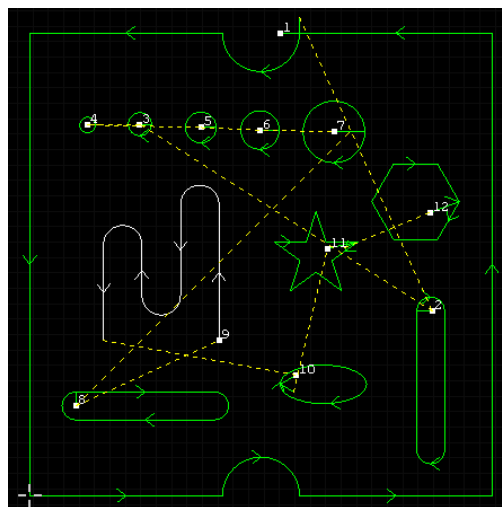
2.2.1.2 External clockwise & internal counterclockwise

There is OutClockwiseInCounterclockwise under **“Direction”** button. Only need to click, namely external contour is displayed clockwise, internal contour is displayed counterclockwise, as shown below.



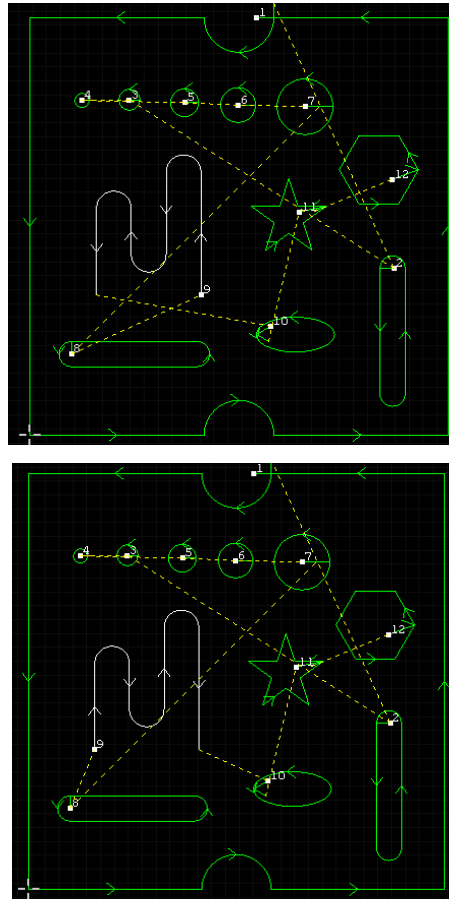
2.2.1.3 External counterclockwise internal clockwise

There is `OutCounterclockwiseInClockwise` under “**Direction**” button, it only needs to click. Namely display external contour counterclockwise, internal contour clockwise, as shown in below figure.



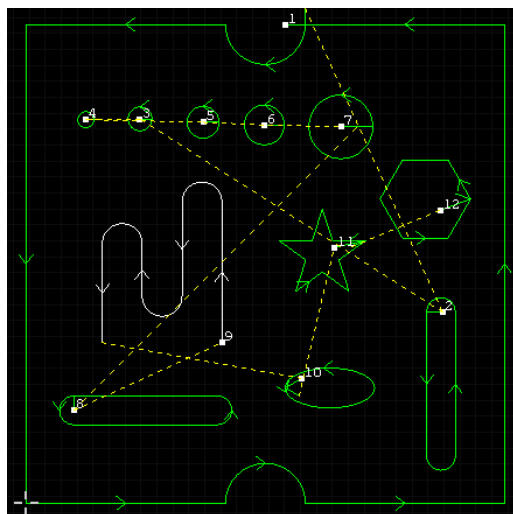
2.2.1.4 Reverse

There is a reverse option under “**Direction**”, you can reverse direction of selected graph. As shown in below figure the direction of unclosed curve is reversed.



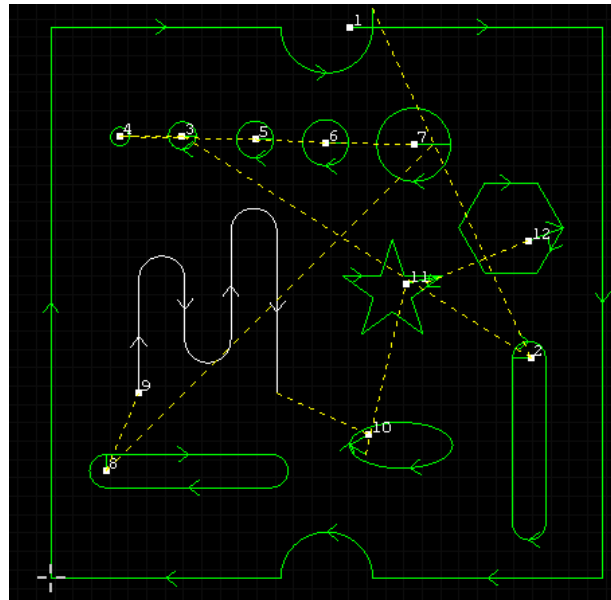
2.2.1.5 All Counterclockwise

There is `AllCounterclockwise` under “**Direction**” button. It only needs to click to change direction of selected figure to counterclockwise.



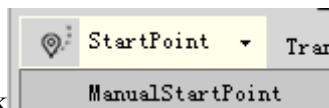
2.2.1.6 All Clockwise

There is `AllClockwise` under “**Direction**” button. It only needs to click to change direction of selected figure to clockwise.



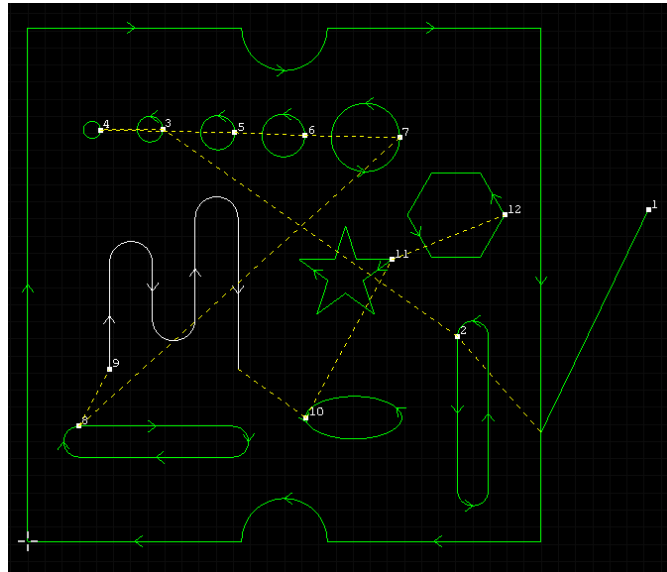
2.2.2 Start Point

2.2.2.1 Manual start point



Click `ManualStartPoint` button, if selected point is on graphic line, then the point becomes the start point of contour, otherwise the point will be used as origin of lead in and next assigned point is used as cutting point of the contour.

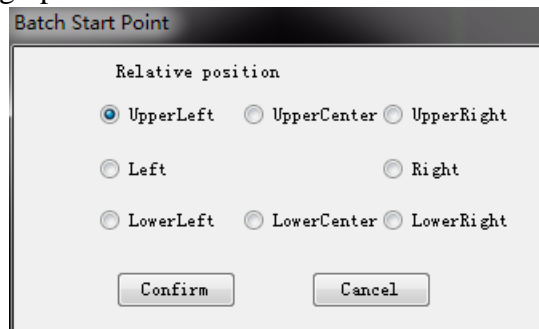
As shown in below figure, position of start point is put outside the outer contour.



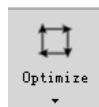
2.2.2.2 Batch start point

BatchStartPoint

It will batch the start point of the selected graphs. The position of the selected graph as shown below:



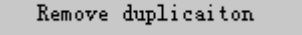
2.2.3 Optimization

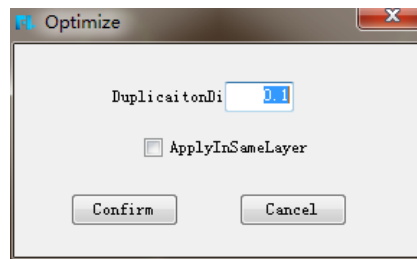


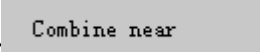
There is an **“Optimize”** button under common toolbar. Optimization has several functions:

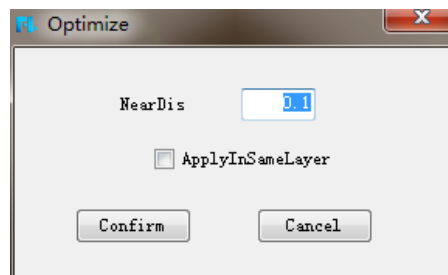
1. Remove trivial , and fill in the length of contour of minimal graph, default is 0.1mm. After filling in length of contour, clicking **“Confirm”**, if the length of curve shorter than the input length will be deleted.



2. Remove duplication . Fill in duplication distance (default is 0.1mm), then the duplication will be deleted.



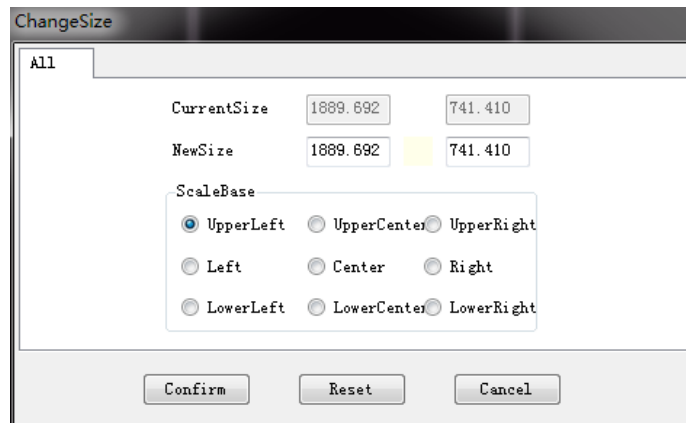
3. Combine near . Fill in near distance, default is 0.1mm, then two segments will be merged into a segment. Near distance between end points of the two segments decides whether they can be merged. Select two segments to be merged, click optimization button, input near distance and click confirm.



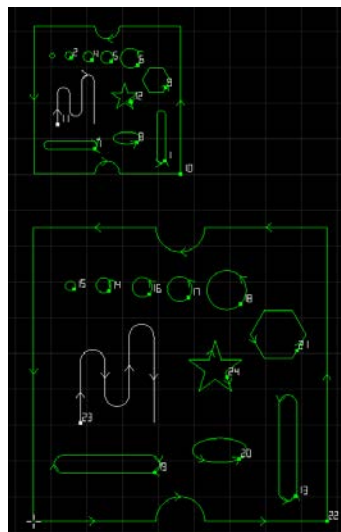
2.2.4Size



The function of “**Size**” could change the size of selected graph according to the needs which can also choose to change the base point. As following:



For example:



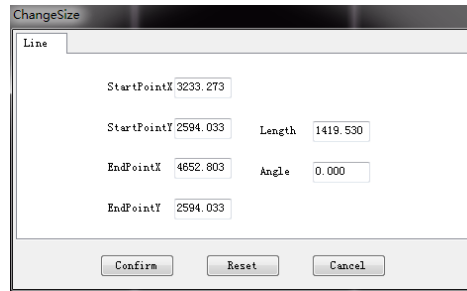
Point

The size change of point which can set the parameter of coordinate(X, Y)



Straight line

The size change of line can set the parameters as follows. Press the reset button if the parameter is incorrect.

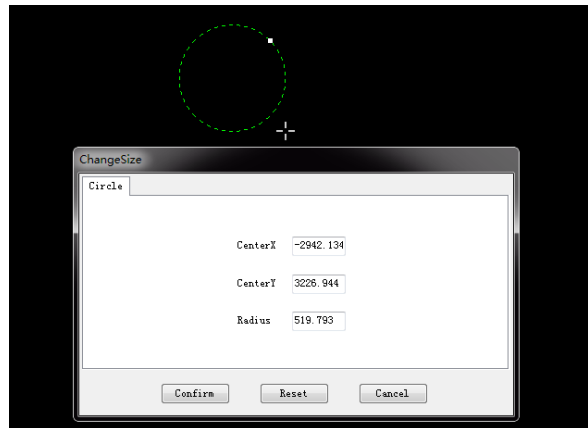


A screenshot of the 'ChangeSize' dialog box with the 'Line' tab selected. The dialog contains input fields for 'StartPointX' (3233.273), 'StartPointY' (2594.033), 'EndPointX' (4652.803), 'EndPointY' (2594.033), 'Length' (1419.530), and 'Angle' (0.000). At the bottom are 'Confirm', 'Reset', and 'Cancel' buttons.

Parameter	Value
StartPointX	3233.273
StartPointY	2594.033
EndPointX	4652.803
EndPointY	2594.033
Length	1419.530
Angle	0.000

Circle

The size change of circle can set the parameters as follows.

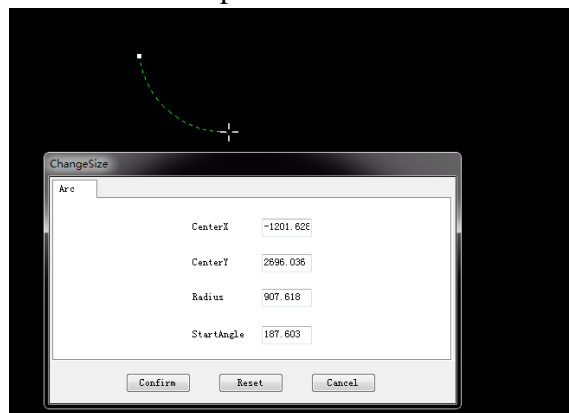


A screenshot of the 'ChangeSize' dialog box with the 'Circle' tab selected. Above the dialog, a green dashed circle is shown on a black background with a crosshair cursor. The dialog contains input fields for 'CenterX' (-2942.134), 'CenterY' (3226.944), and 'Radius' (519.793). At the bottom are 'Confirm', 'Reset', and 'Cancel' buttons.

Parameter	Value
CenterX	-2942.134
CenterY	3226.944
Radius	519.793

Arc

The size change of arc can set the parameters as follows.

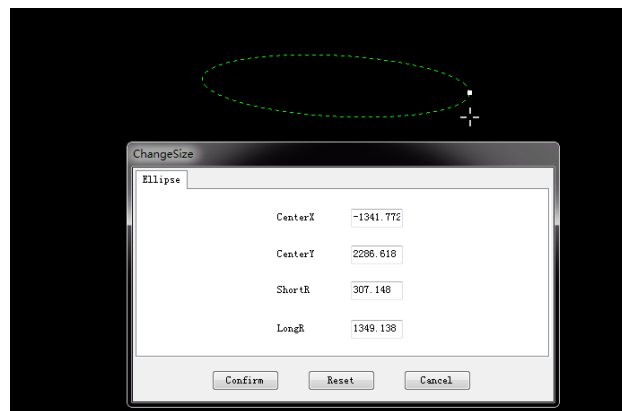


A screenshot of the 'ChangeSize' dialog box with the 'Arc' tab selected. Above the dialog, a green dashed arc is shown on a black background with a crosshair cursor. The dialog contains input fields for 'CenterX' (-1201.626), 'CenterY' (2896.036), 'Radius' (907.618), and 'StartAngle' (187.603). At the bottom are 'Confirm', 'Reset', and 'Cancel' buttons.

Parameter	Value
CenterX	-1201.626
CenterY	2896.036
Radius	907.618
StartAngle	187.603

Ellipse

The size change of ellipse can set the parameters as follows.

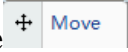



A screenshot of the 'ChangeSize' dialog box with the 'Ellipse' tab selected. Above the dialog, a green dashed ellipse is shown on a black background with a crosshair cursor. The dialog contains input fields for 'CenterX' (-1341.772), 'CenterY' (2286.618), 'ShortR' (307.148), and 'LongR' (1349.138). At the bottom are 'Confirm', 'Reset', and 'Cancel' buttons.

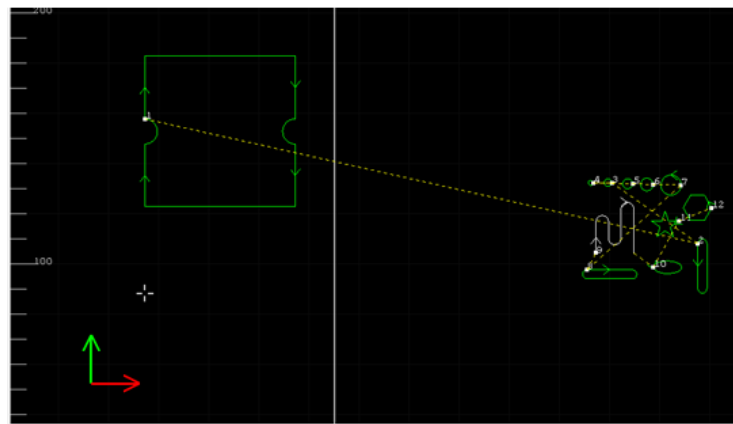
Parameter	Value
CenterX	-1341.772
CenterY	2286.618
ShortR	307.148
LongR	1349.138

2.2.5 Graph transformation

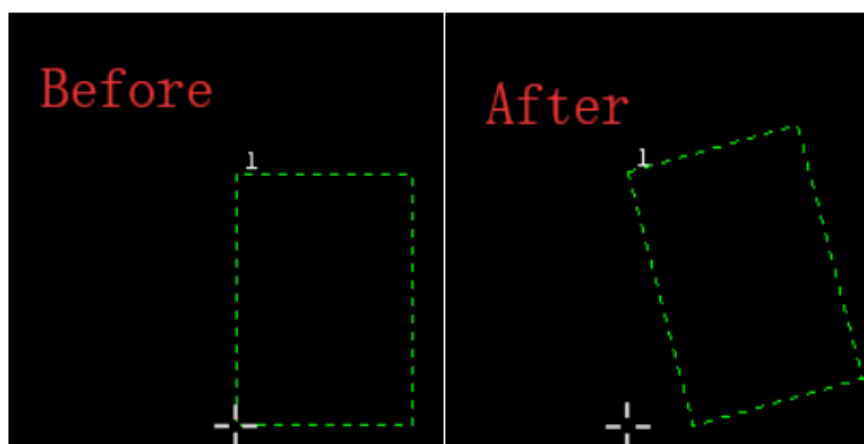
There is a “**Transformation**” button . Graph transformation includes **Move**, **Rotate**, **Mirror** and **Scale**.

Move : click translation option under “**Transformation**”, select base point of translation in drawing field, then select end point of translation in a direction, then graph is translated. You can also select to drag graph to translate.

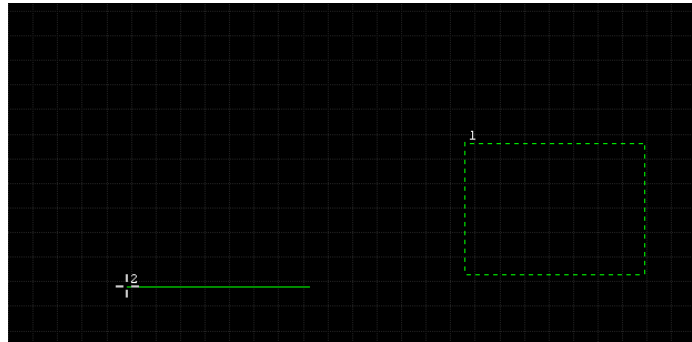
Rotate  click rotation option under “**Transformation**”, select rotation point in drawing field, or input base point into below input box. Then mouse slide or input angle of rotation in input box.



Rapidly rotate the selected shapes: Choose the part and press “Shift”, then drag the mouse. The part will rotate once at 15° .



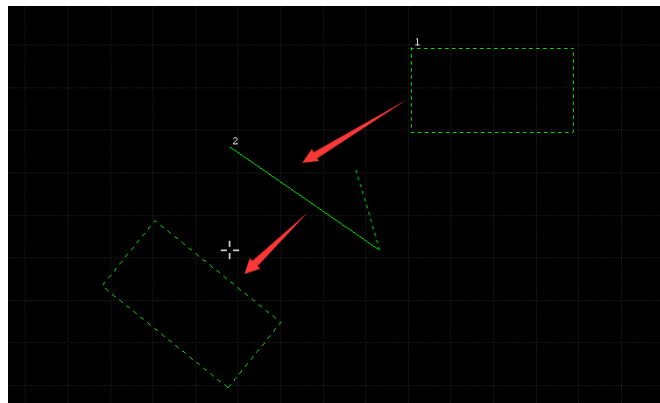
Relative rotate: the part can rotate according to the relative position.
Case: the following rectangle will be rotated according to the relative line.




1. Choose the rectangle and set the base point position. Users can specify the angle or choose relative rotate.

```
Rotate, please specify the base point position:
-2245.931,1237.794
Rotate, please specify the angle(or RelativeRotate(R)):
r
RelativeRotate, please specify the relative angle:
-2245.931,1237.794
RelativeRotate, please specify the second point of relative angle:
-4198.915,2865.280
RelativeRotate, please specify new angle:
147.624
Rotate accomplish
```

2. If choose the relative rotate, users can input “R” and press **Enter** to confirm. The set the relative angle according to the log information.
3. Drag the mouse to rotate the part to get the rotated part.

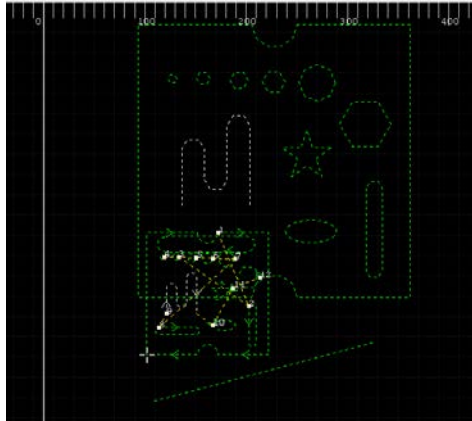


Mirror  **Mirror** : There is a mirror option in “**Transformation**” button,

first select the graph to be mirrored, after clicking mirroring button, select the base point to be mirrored in drawing field, then slide mouse to mirror.

Scale  **Scale** : There is a zooming option in “**Transformation**” button, first

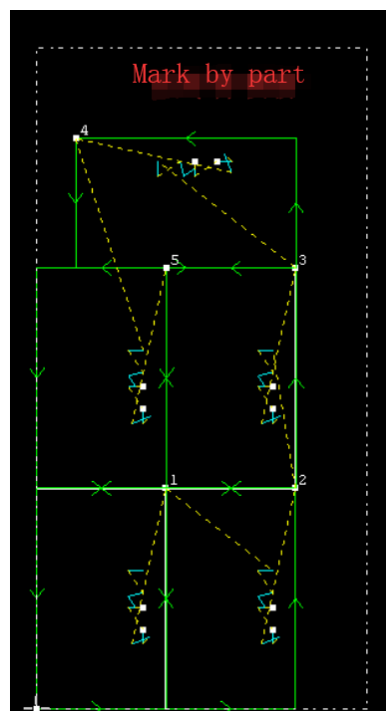
select graph to be zoomed, after clicking zooming button, select base point to be zoomed, then slide mouse to zoom. You can also input ratio of zooming in input box.



2.2.6 Marking

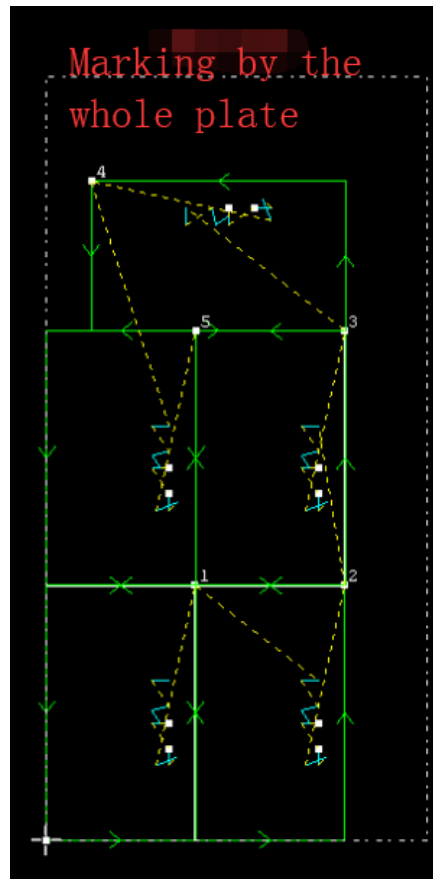
2.2.6.1 Marking by part

Marking by part: marking the single part as a processing unit. Marking on the part firstly and then cut the part. (Refer to the move path)



2.2.6.2 Marking by whole plate

If choose the function of marking on the whole plate, which will finish all plate marking before cutting the parts of the whole plate.(seen the move path)



2.2.7 Drilling

2.2.7.1 Drilling by part

Drilling on the part and cut the part, and drill on the next part and cut the next part.

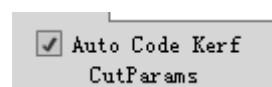
2.2.7.2 Drilling by whole plate

Drilling on the whole plate firstly and then cut the parts.

2.2.8 Auto code kerf cut parameter


There are two types of kerf compensation. One is to add kerf compensation on the parts directly. The other is to add kerf compensation on the code, which will be set in G code according to the code compensation mode of system parameters.

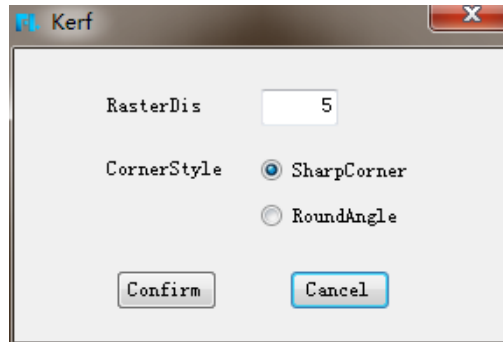
If there is no compensation operation for the contour of the part, users can check



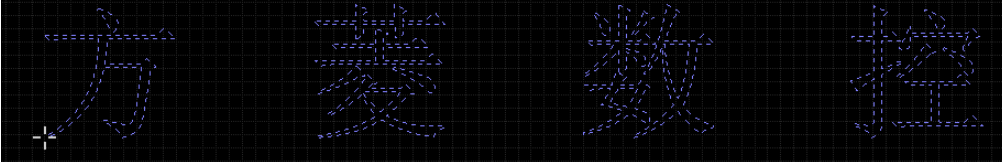
to add kerf compensation on the parts.

2.2.9 Equidistance graphic

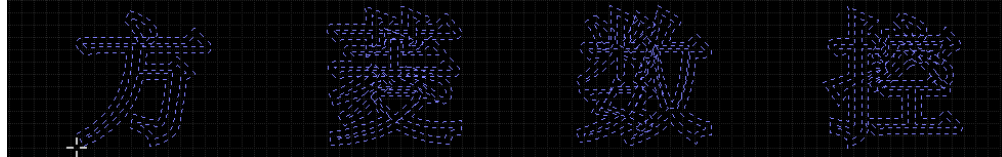
Equidistance graphic  can make isometric process of line and text (need to transform to curve).



Before



After



III Graph operation

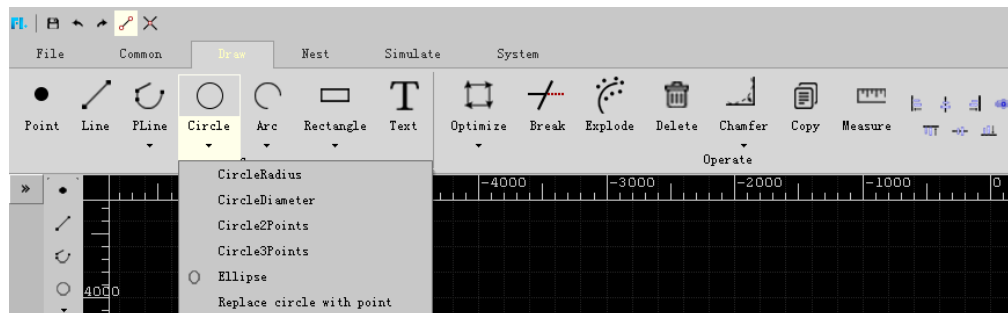
All drawing operations in the software are similar to those in AUTOCAD. All operation of assigned target point can be accomplished in two ways: left-click drawing field in the screen; keyboard input, and keyboard input shall be in accordance with the format of *X coordinate, Y coordinate*, for example, (50, 100).

Layer property of drawn graph can be set in “**System parameter**”, can also be quickly switched by clicking “Process bar (at right side of the software).

During drawing operation there will be hints for next operation in “prompt box”, please finish drawing operation by referencing prompt. During drawing you can exit current drawing process by pressing ESC key. During drawing when moving mouse to approach existing graph, position of capture point will display for convenience to control drawing accuracy.


End input or drawing by pressing “**space**” or “**ESC**” key.

The software supports drawing operation of basic graph, including dot, line, polyline, full circle (center of circle and diameter, center of circle and radius, circle through two points, circle through three points), arc (three-point type, scanning type), ellipse, rectangle (typical rectangle, rounded rectangle), polygon, text, etc., also supports operations such as deletion, chamfer, copying and measurement of graph. As shown in the following figure:

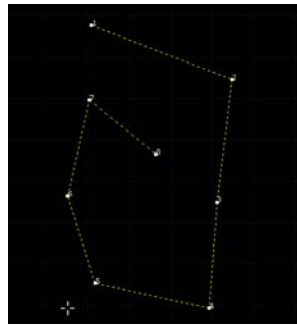


3.1 Graph operation


3.1.1 Draw single point

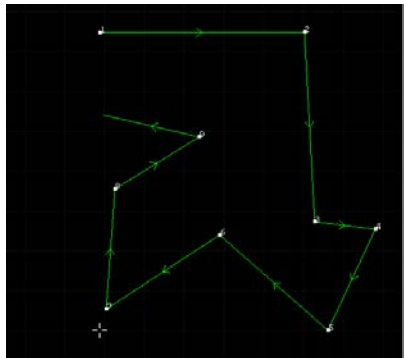
There is a “**Single point**” button  in drawing toolbar, you can click it. You can draw a point in drawing field, or you can fill in coordinate of point in the input box, format of input coordinate shall meet requirement, otherwise input error will be prompted.

Delete point, select the point to be deleted, you can delete it by pressing key “**E**”.




3.1.2 Draw a line

There is a **“Line”** button  in drawing toolbar, you can click it. Click **“Line”** button, you can draw a point in drawing field, or input end point of line according to prompt of input box.

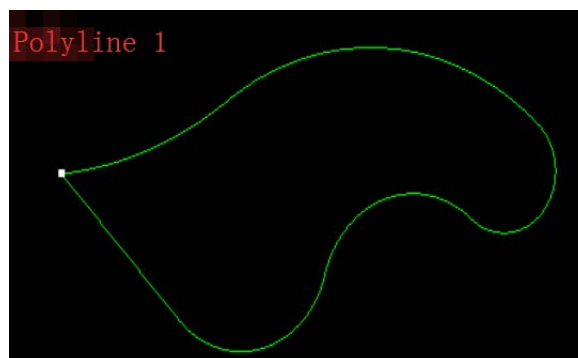


3.1.3 Poly line

There is a **“Poly line”** button  in drawing toolbar, you can click it. Click **“Poly line”** button and you can draw a point or input a poly line according to prompt of input box.

There are two kinds of poly line: poly line 1 & poly line 2.

Poly line 1: The arc will be drawn in tangent form.




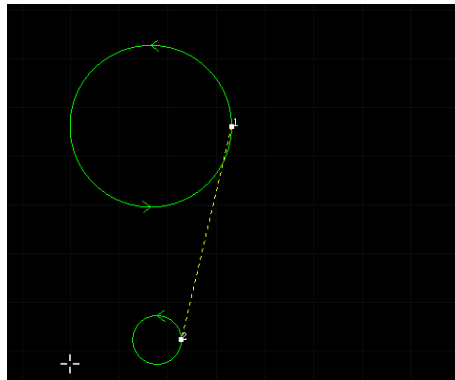
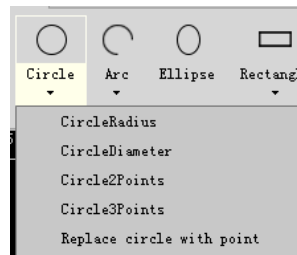
Poly line 1: The arc will be drawn in any form.



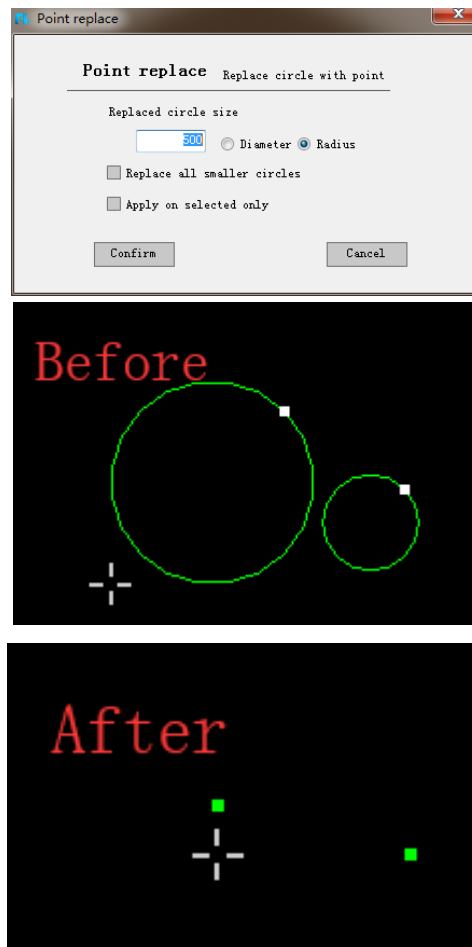
During drawing process you can press A, L to switch arc or line, press C to close current poly line and end drawing, or press ESC to end the current drawing.

3.1.4 Circle

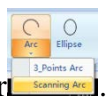
There is a “**Circle**” button  in drawing toolbar, you can click it. Drawing circle has four modes, including center of circle and diameter, center of circle and radius, circle through two points, circle through three points, you can finish drawing by operating according to prompt box.



Replace circle with point: this function can replace circle with isolated points. Please input the size of the replaced circle (diameter or radius). Users can tick “**Replace all smaller circles**” or “**Apply on selected only**” as needed.

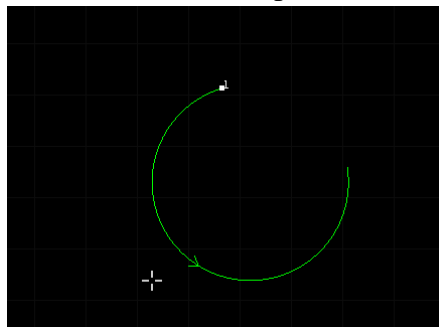


3.1.5 Arc


There is an Arc option under drawing toolbar .

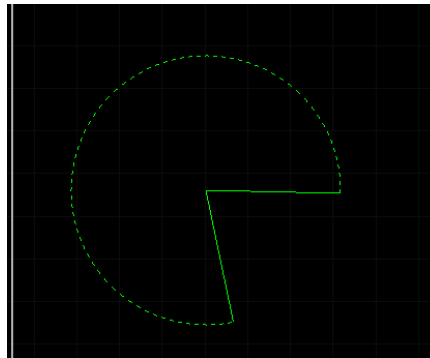
3.1.5.1 3_Points arc

Use three-point method to draw an arc, the first point is starting point of arc, second point is middle point of the arc, the third point is finishing point of the arc.




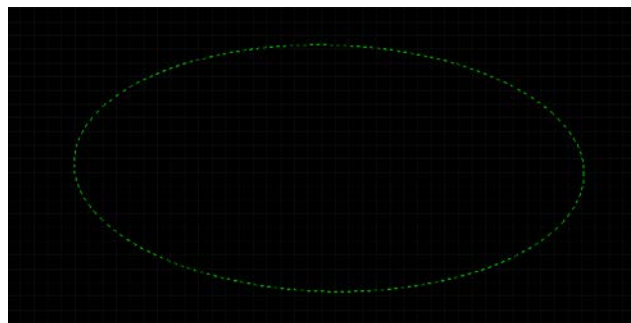
3.1.5.2 Scanning arc

Click “Scanning arc” button  under arc button, draw an arc in scanning approach, the first point is center point of the arc, then slide mouse to select the second point, use the distance between two points as radius of the arc to decide radius, slide mouse to decide contour of arc.



3.1.6 Ellipse

There is an “**Ellipse**” button option  under “**Circle**”, you can draw an ellipse by clicking it. First assign position of center of ellipse by inputting through mouse or input box, then input an end point of major semi-axis through mouse or input box, at last input position of an end point of minor semi-axis through mouse or input box.



3.1.7 Rectangle

There is a “**Rectangle**” button  under drawing toolbar, click it to draw normal and rounded rectangle.

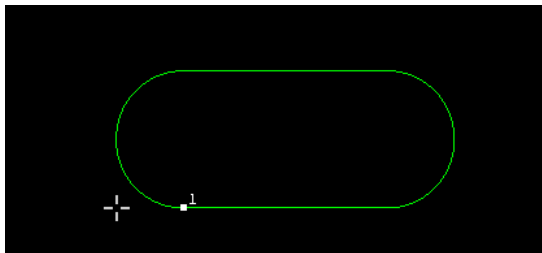
3.1.7.1 Normal rectangle

There is typical rectangle option under “Normal rectangle” button, it can be clicked. First input a corner point through mouse or input box, finish rectangle drawing by inputting another corner point through mouse or input box.



3.1.7.2 Rounded rectangle

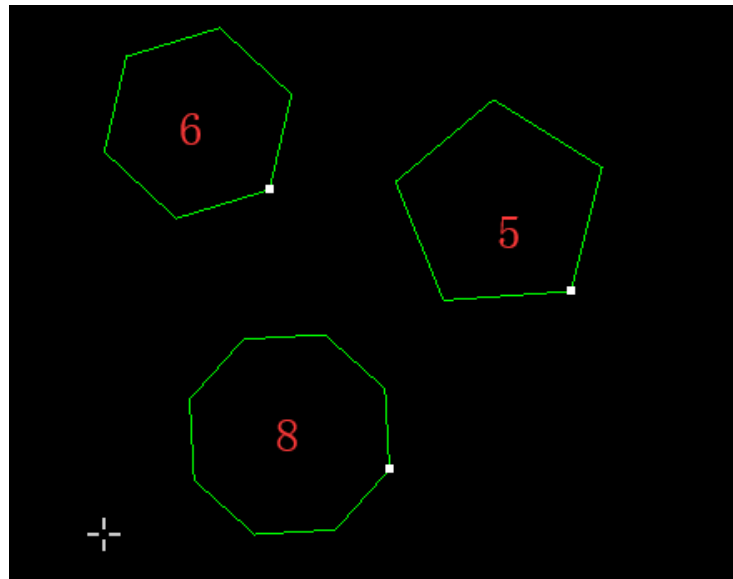
There is a rounded rectangle option under “**Rectangle**” button, it can be clicked to select. Drawing method of rounded rectangle is same as typical rectangle. Users can fill the radius of fillet by sliding mouse or through input box.




3.1.8 Polygon



There is “RegularPolygon” under “**Poly line**” toolbar, it can be clicked. First click “Regular polygon” button, input number of edge of polygon, default is 6, you can select default by press space key. You also need to assign position of center of polygon, mode of polygon (inscribed to circle I, circumscribed to circle C) and radius of circle in sequence to finish drawing.

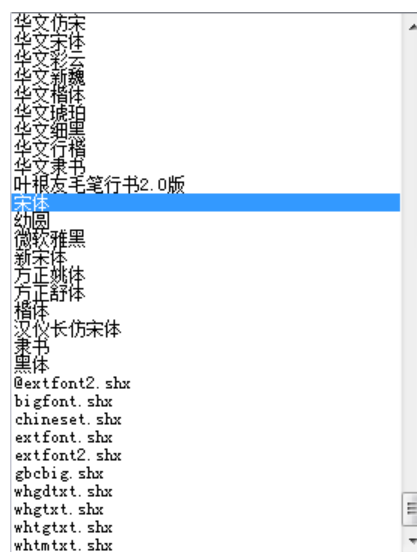


3.1.9 Text

When adding text, click , the following dialogue box pops up, input text、height、character distance、declining angle to be inserted, then assign insertion point.



The font of the text can be selected, as shown below:



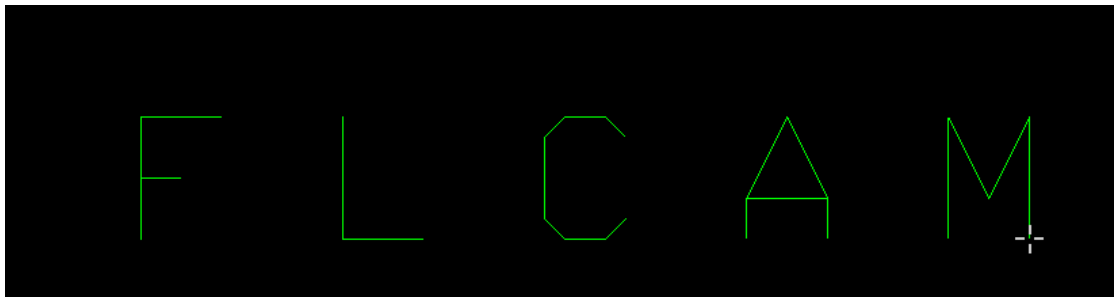
Hollow out & Single line & Tilt font

When select the hollow out or single line, you can set the font as well as the character distance and declining angle.

Hollow out

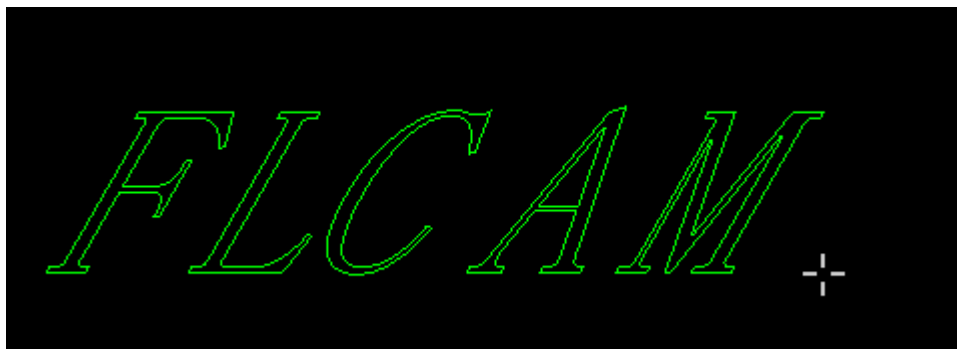


Single line



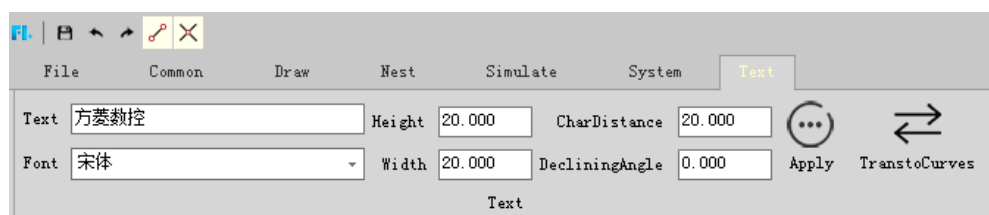
Tilt font

Text with 30 ° inclined effect is as follows



The software supports to edit the fonts separately.

Select the text, the prompt box will allow you to modify the text. Finally, click “**Apply**” to complete the text modification.



Note:

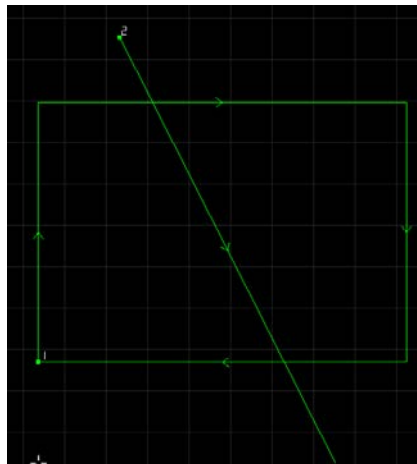
1. Only when the text is set to text painting layer, can the code be generated.
2. The text can be transformed to curve, while the curve cannot be transformed to text.
3. The text can be transformed to curve, which can have technology (add leads、compensation、over cut, and so on).
4. Support for multi lines text drawing: input \P to line feeds.
5. When the text is transformed

3.2 operational module

3.2.1 Break



The function of “Break” of the “**Drawing-operation**” and use it to break selected lines at the assigned point. It is general used with the function of capturing intersections. Please make sure that capture intersections switch keeps opening



3.2.2 Explode



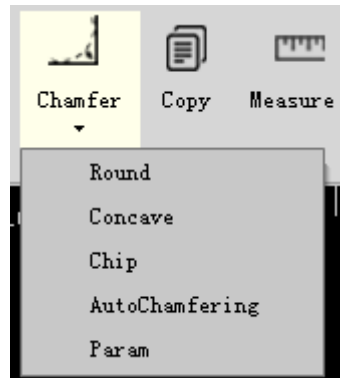
The function of explode can blow up closed graphics which will assist in drawing complex irregular graphics.

3.2.3 Delete

Select the component to be deleted, press Delete key or E key to delete the component.

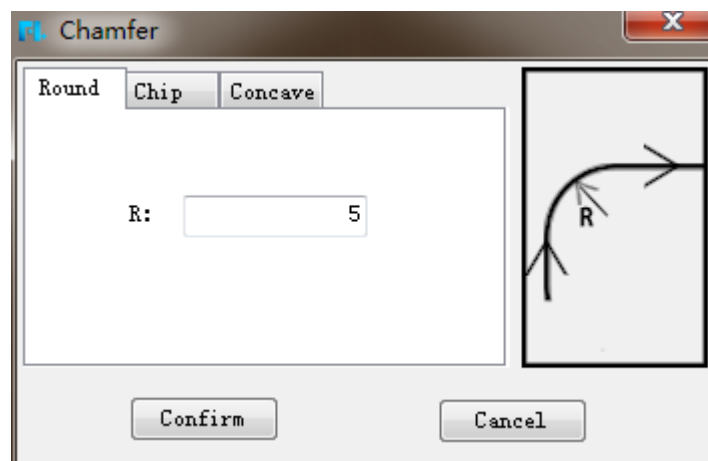
3.2.4 Chamfer

There are four types of chamfer: round, concave, chip and auto chamfer.

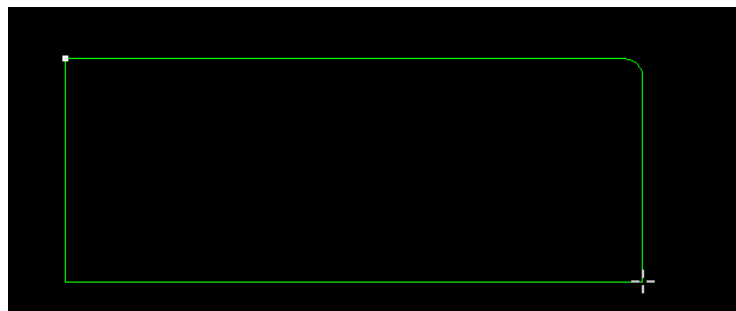


3.2.4.1 Round chamfer

Round chamfer has the function of modifying Inflection point to arc smooth connection. Before round chamfer, you need to set the parameter firstly. As shown below:

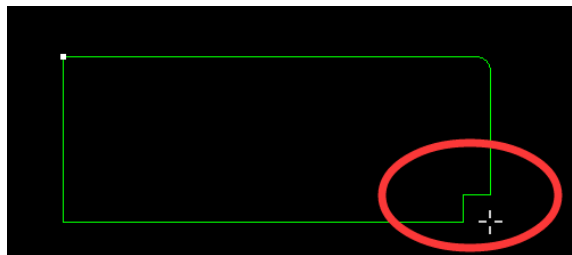
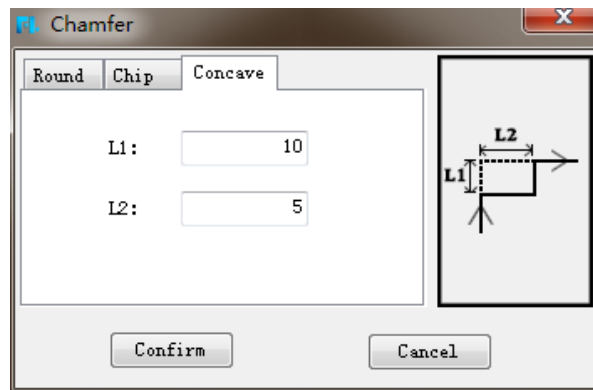


Click “**Confirm**”, the selected corner will be round chamfered. As shown below:



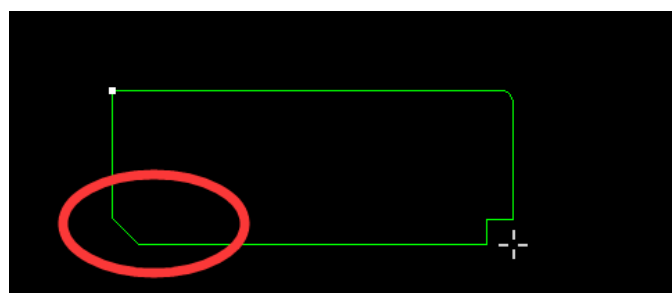
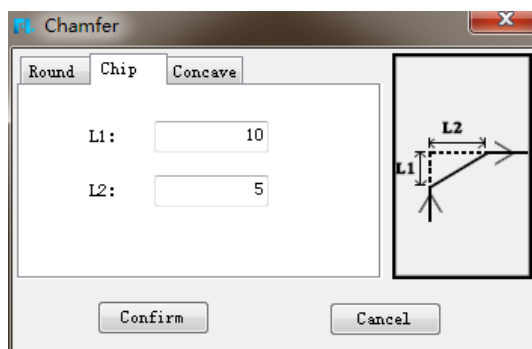
3.2.4.2 Concave chamfer

Concave and chip chamfer needs to set the first length L1 and second length L2 of chamfer which can be done according to sketch map. During the process, users can press ESC to exit chamfer.



3.2.4.3 Chip chamfer

Set the parameter of chip chamfer, and choose chip chamfer.



3.2.4.4 Auto chamfer

Auto chamfer has the function to round chamfer every corner automatically.

3.2.5Copy

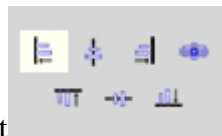
After clicking copy or pressing Ctrl + C, select graph copied, now it needs to assign insertion position of copied graph.

3.2.6Measurement

Need to assign the first point and second point of measurement, result of measurement will be displayed in prompt box in green:

```
Mesure, please specify the first position:
(506.667,1593.333)
Mesure, please specify the end position:
(1313.334,1140.000)
Mesure result, distance:925.323,X distance:806.667,X distance:-453.333
```

3.2.7Align



There are seven types of alignment. The user can align the selected graph as needed.

IV Nesting

4.1 Components

4.1.1 Set to components

Select the graph and can set it to component.

4.1.2 Split components

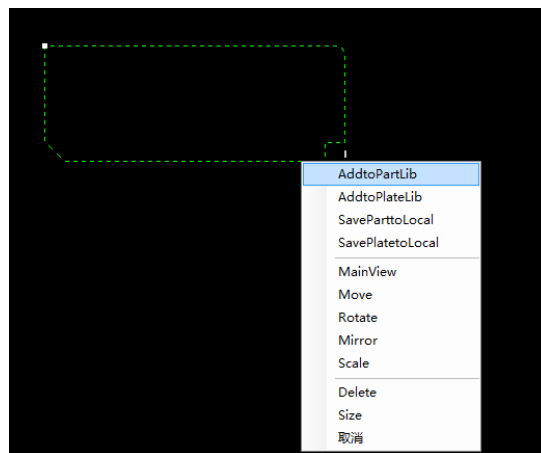
Select the graph and can split component.

4.2 Auto nesting

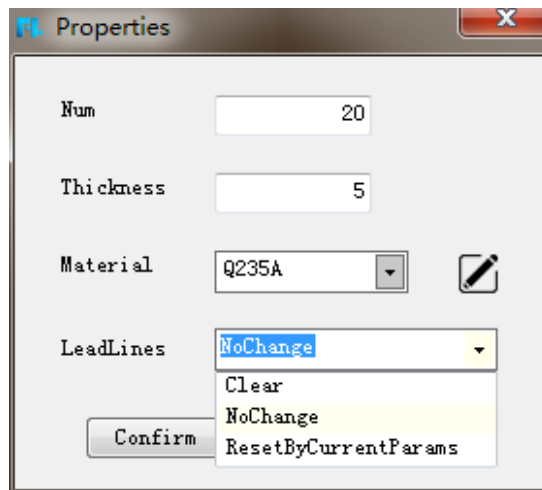
4.2.1 Add part

Before auto nesting, you need to add parts to part library.

Select the parts need to nest and right-click to add to part library. As shown below:



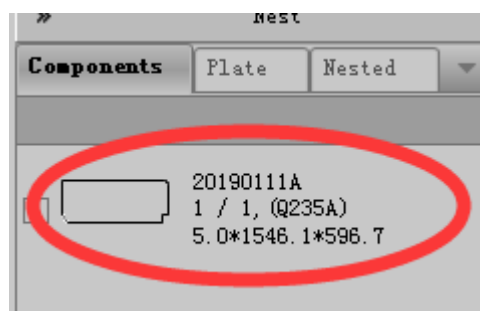
Then the following dialog box appears. You can set parameters: part quantity, material and thickness. At the same time, users can set the leads mode: no change、clear the parts original leads、 reset leads by current parameters.



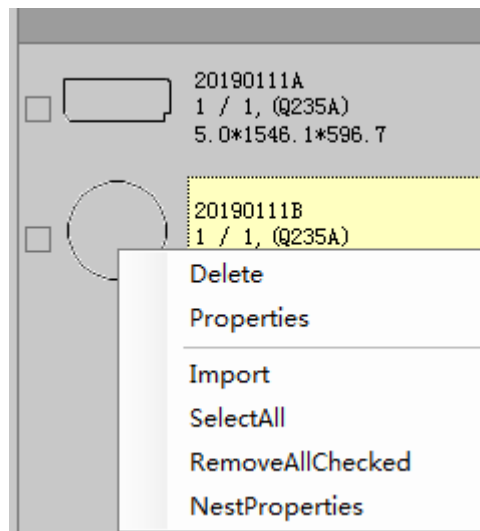
“Material” can be customized. Click  to input material. As shown below:



Click “**Confirm**”, the part information will show on the right side of the software, including part thumbnail and part information.



If you want to change the parameter of the parts, you can right-click the parts in the part library to modify the parameter. Choose “**properties**” to modify the current part. Choose “**nest properties**” to modify all the parts. Change the parameter as needed. As shown below:



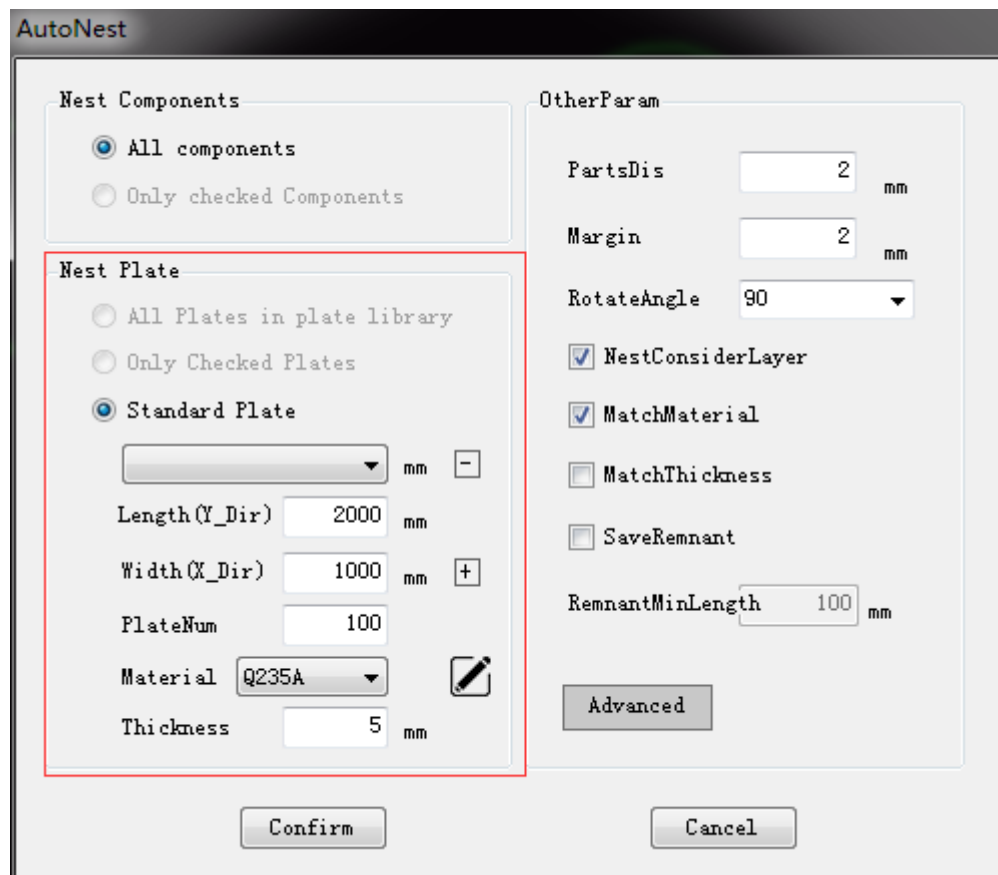
The first line of “All” can batch modify the properties of parts.

Index	Name	RemantNum	TotalNum	Material	Thickness	Rotate Step	Auto Comb...
0	All	*	*	*	*	*	<input type="checkbox"/>
1	20190821A	20	20	Q235A	5	45	<input type="checkbox"/>
2	20190821B	20	20	Q235A	5	45	<input type="checkbox"/>
3	20190821C	20	20	Q235A	5	45	<input type="checkbox"/>

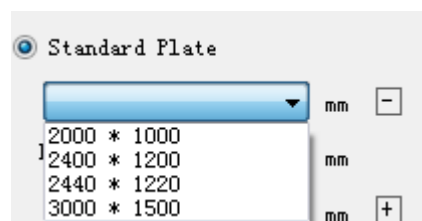
4.2.2Add plate

4.2.2.1Rectangular plate

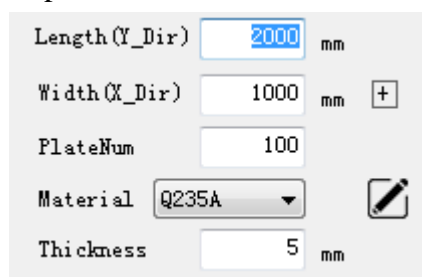
The parameter of rectangular plate can be set in the auto nesting. As shown below:



You can select the standard plate:

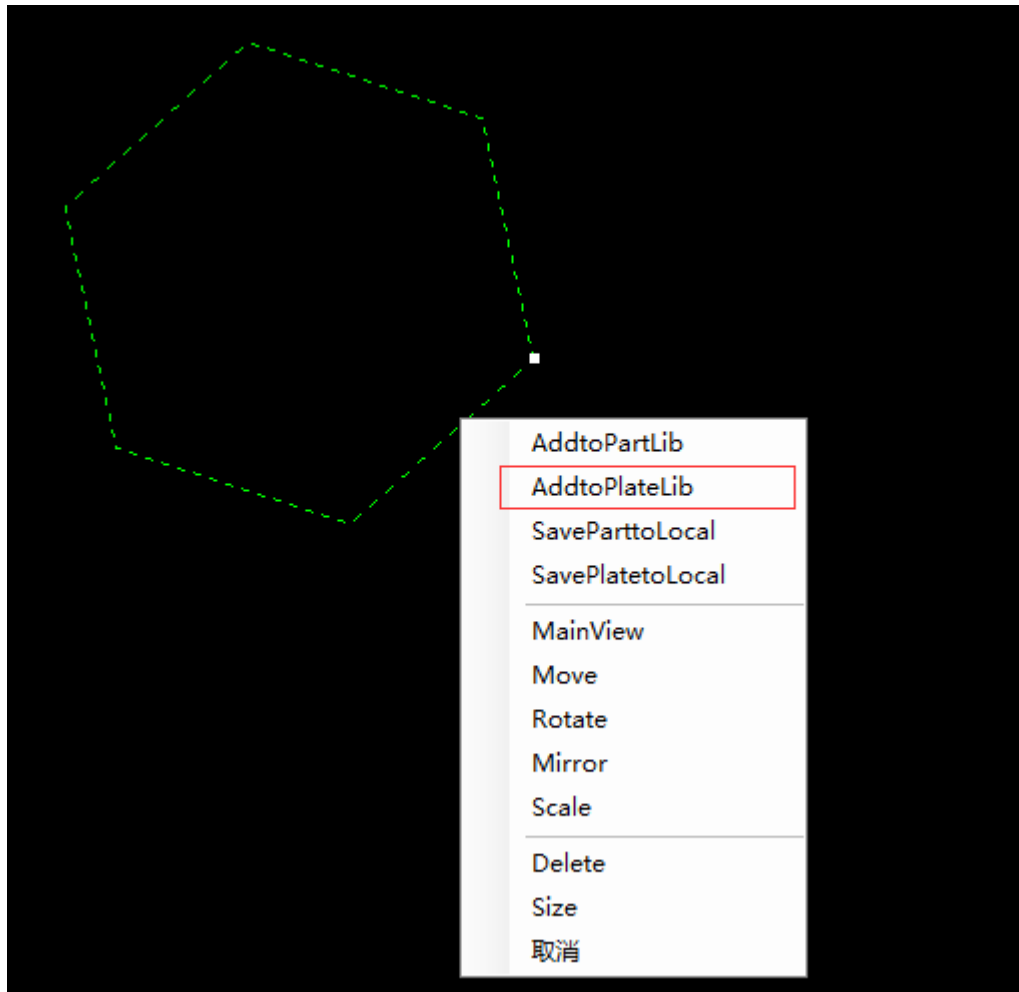


Or you can customize the parameter:

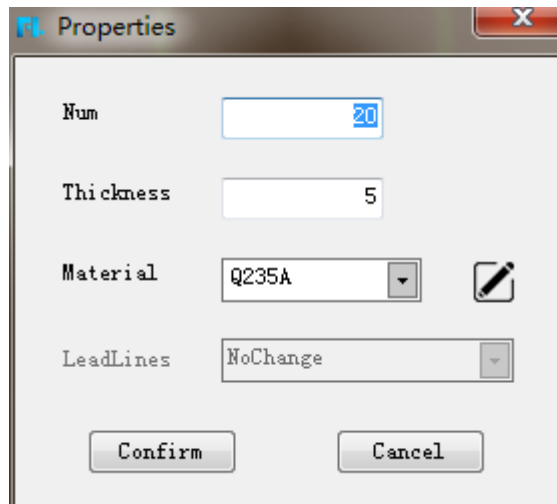


4.2.2.2 Irregular plate

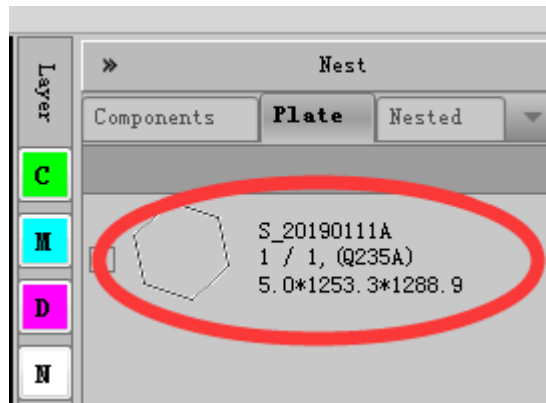
If you need to nest on irregular plates, select the plates, right click the mouse, and select "add to the plate library" as shown in the figure below:



The parameter of the plate can be set. As shown below:



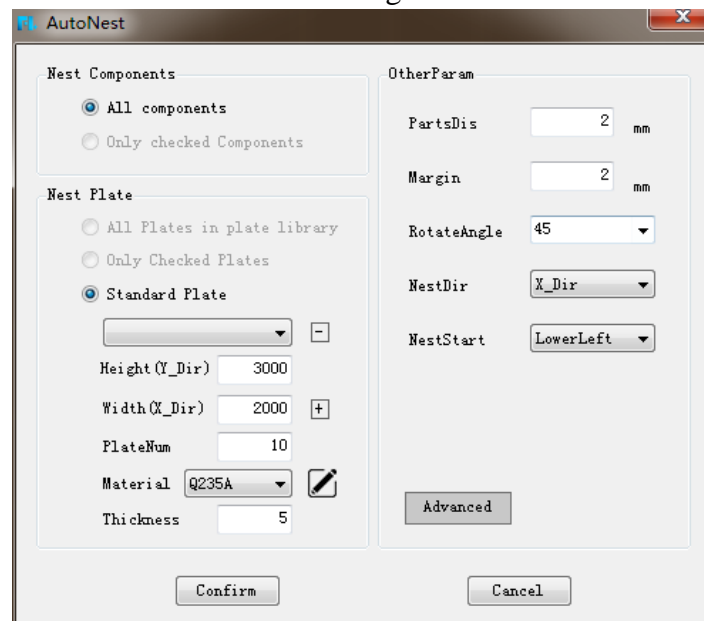
Click “**Confirm**” the plate information can be displayed on the plate library on the right side of the software, including plate thumbnail and plate information. As shown below:



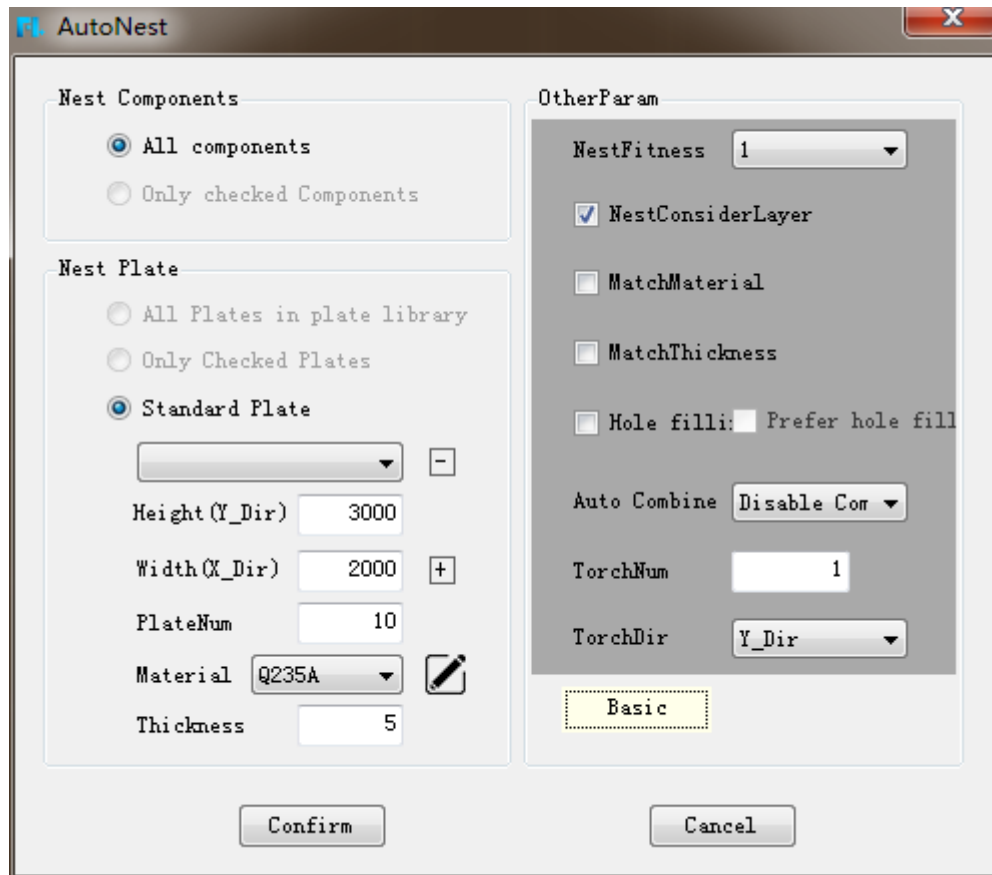
4.2.3Auto nesting



Automatic nesting can be selected after the parts are added to the parts library. The parameters of the automatic nesting are as shown below:



Set the parameter as needed. The advanced parameter including: nest fitness、nest direction、nest start point、hole filling、prefer hole filling and auto combine. As shown below:

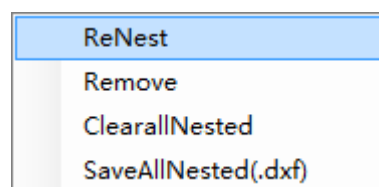


After setting the value of nesting, click “**Confirm**” to start automatic nesting. After automatic nesting, the result is as shown below:



If you are not satisfied with the above automatic nesting, you can delete the nesting result in "nesting". Reset the parameters, and then automatically nesting again, or manually modify the nesting result.

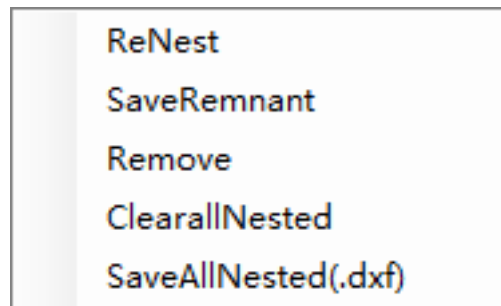
The “**Renest**” function of the nested sheet can nest the current nested sheet again by right-clicking and selecting the covered sheet in the "nested" browser.



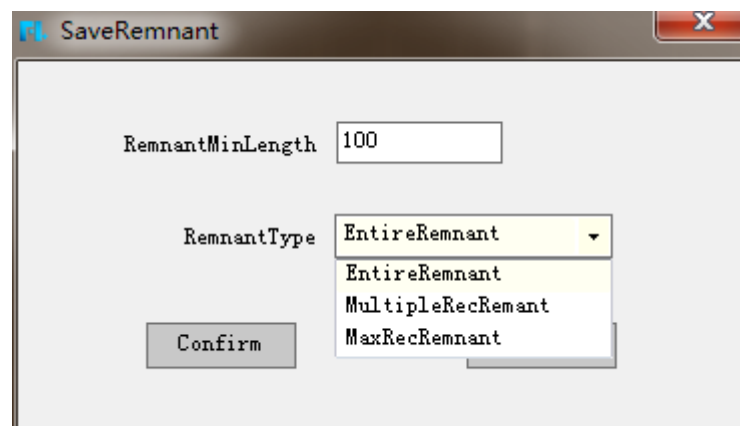
If you want to re-nest, you can choose to clear all nested. Parts in the parts library will restore the quantity of nesting, modify the parameters, and re-nest.

4.2.4 Save remnant

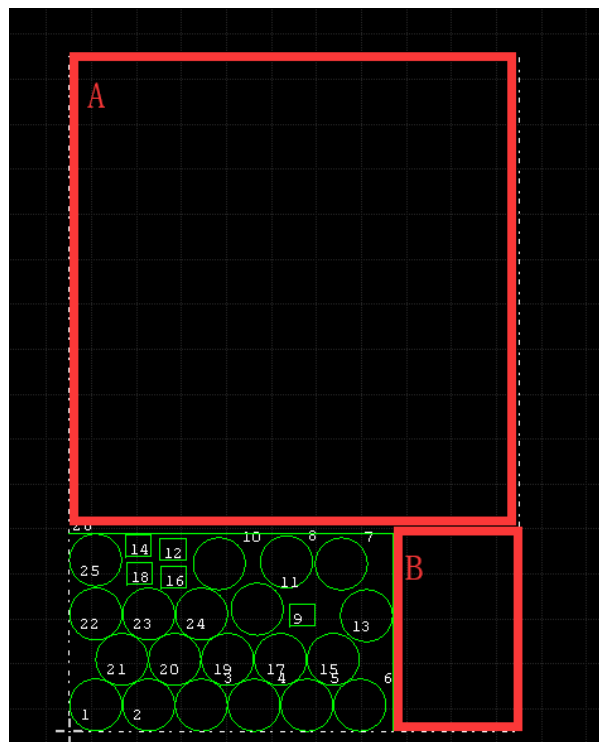
Users can right click the nested result after the nesting. Choose “**Save remnant**”.



Users can choose the remnant minimum length and remnant type.



Example:



Entire remnant: save the whole remnant of A+B

Multiple rectangular remnant: save remnant A+ remnant B

Max rectangular remnant: save remnant A

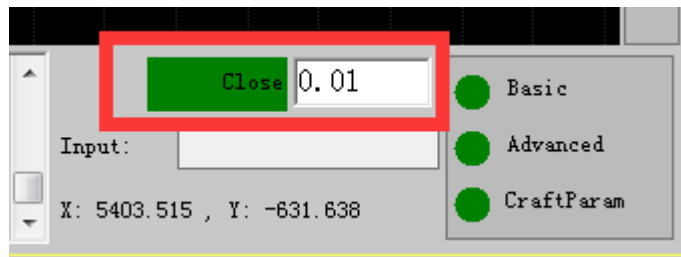
The remnant will add to plate library. Users can renest or save the plate to local for next nesting as needed.

4.3 Manual nest

When the result of automatic nesting needs to be partly modified, manual nesting operation can be selected.

4.4 Close

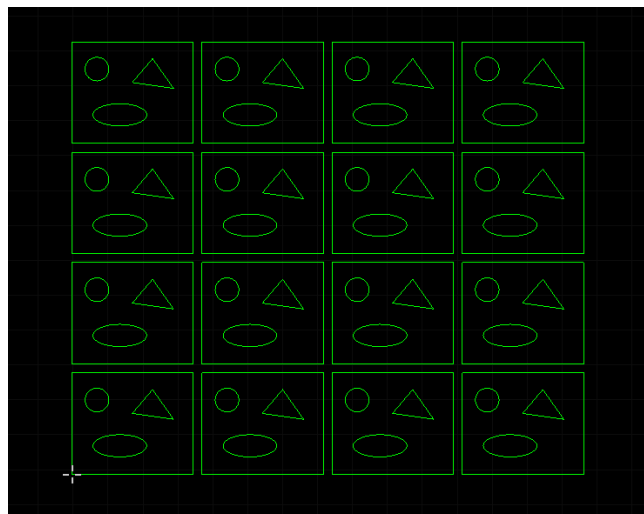
If the selected graphs need common edge operation after nesting, please select graphs that need common edge. First conduct close operation of graphs, the default is 0.01mm.



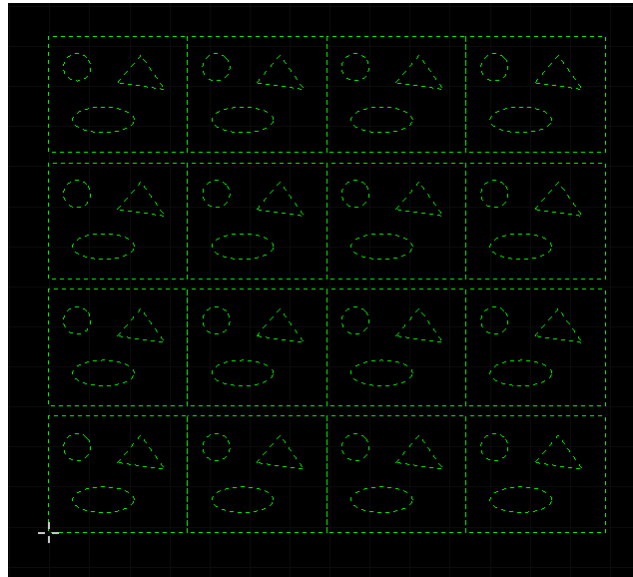
Approaching operation includes 4 approaching modes as follow:



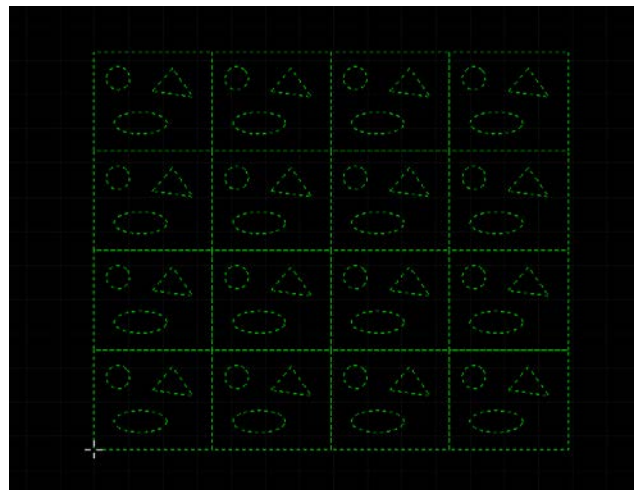
Effect of approaching is shown as below.



Before Close



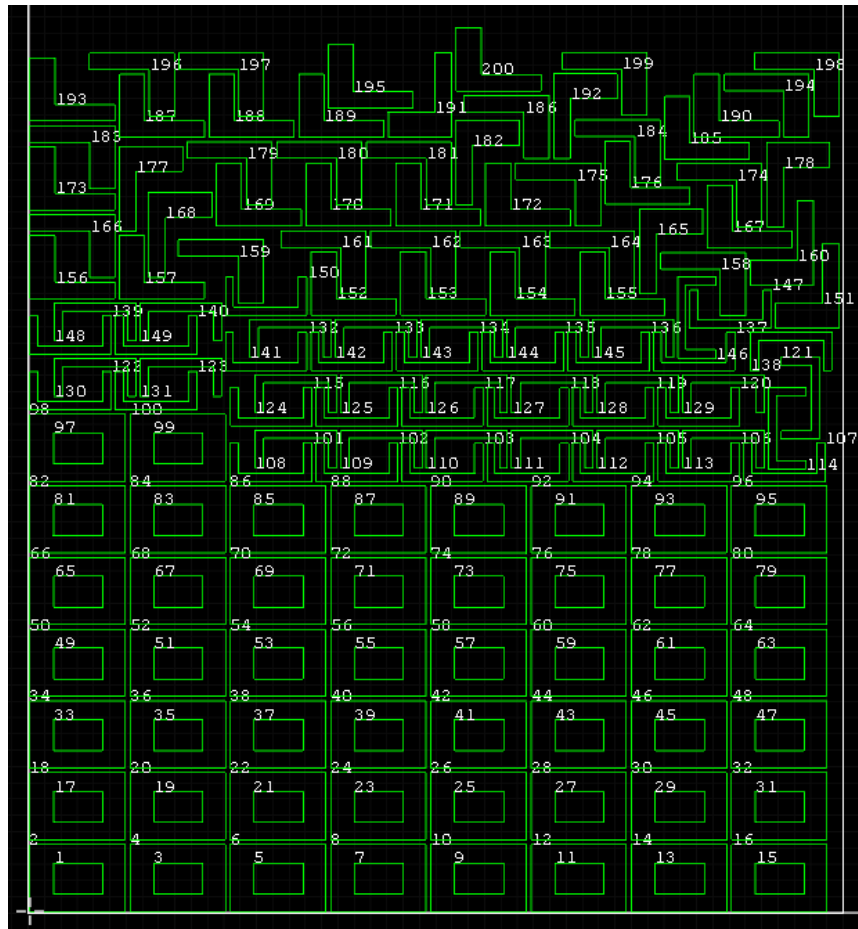
close to left




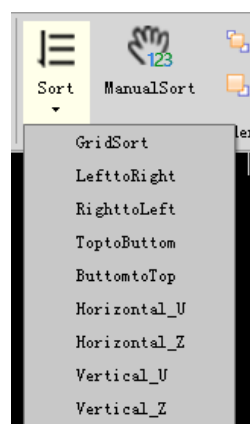
close to top


4.5Sequence

After ticking **“file”** - **“view”** - **“order”**, cutting sequence of the contour will display at start point of each contour, as shown in below figure:



If current cutting sequence is unsatisfactory, you can click  to automatically sequence, currently there are 9 automatic sequencing methods, as shown below:



It also supports manual sequencing, after clicking it , successively click contours according to processing sequence needed, contour clicking sequence will change.



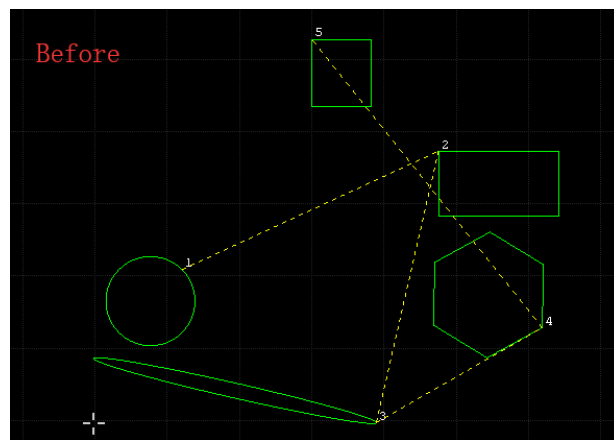
They can help to quickly shift sequence of selected contours. It is suggested to tick **“order”** and **“move path”** in the display to make it more convenient to observe the path.

Two ways to manual sort:

1. Click all the parts according to the needed sequence. The sequence will be sorted according to the order users click.
2. Sort manually from anywhere.

Case(Sort manually from anywhere):

There are 5 parts. The number 1 and number 5 will remain unchanged. Number 2、3、4 need to resort to attain optimal move path.



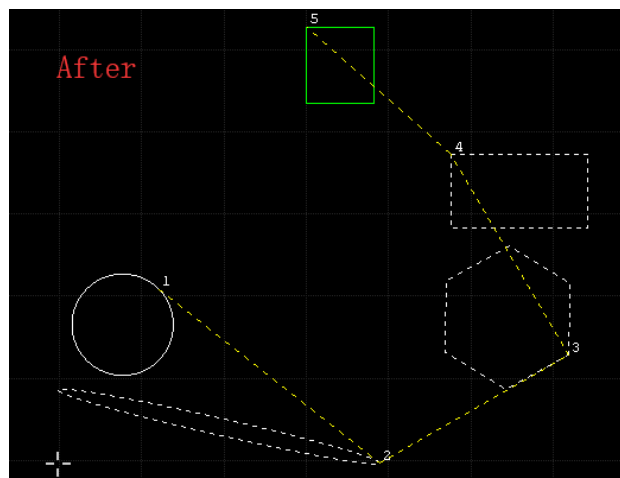
Users only need to click the “2”、“3”、“4” parts orderly to change the sequence. For example:

Click “3” part firstly and the “3” will changed to “2”.

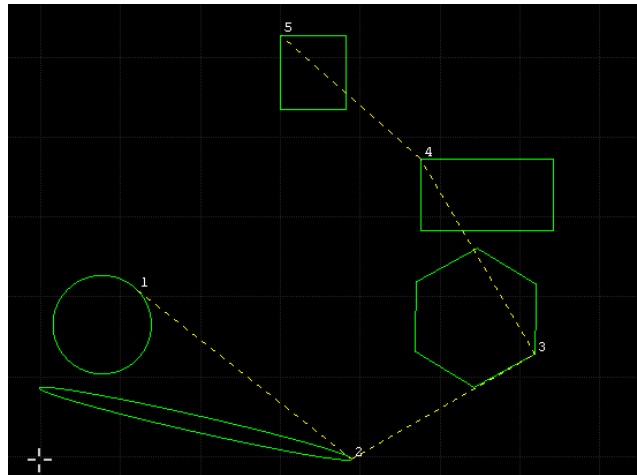
Click “4” part firstly and the “4” will changed to “3”.

Click “2” part firstly and the “2” will changed to “4”

The color of the parts of determined order will be shown in white during the clicking.



Finally, press “Esc” to exit the operation, and the color will be restored as before.

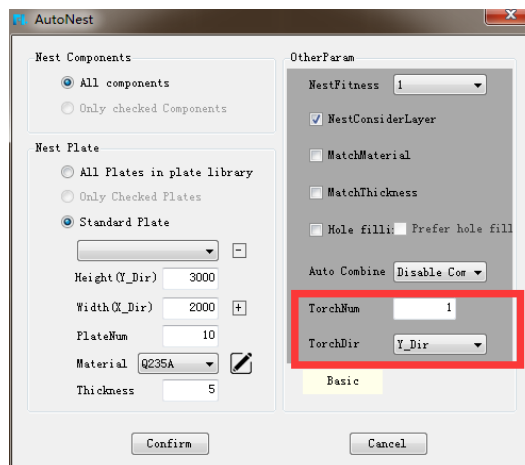


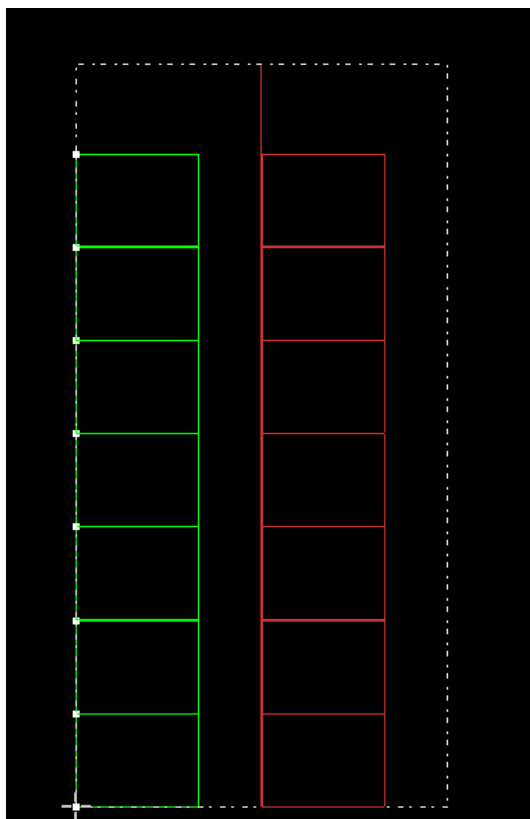
The software supports interactive sequence check. Users can click “-” or “+” to check the parts order, and the part will be shown in dotted line.



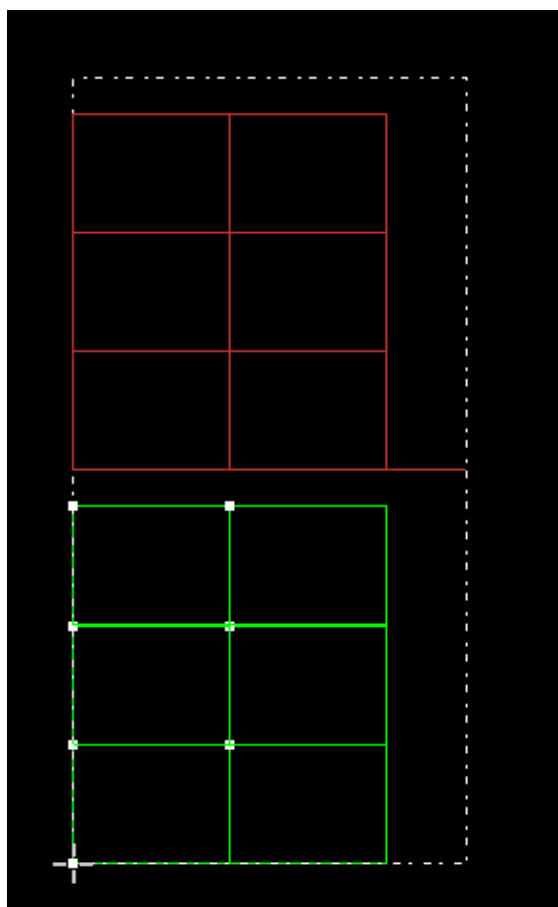
4.6 Multi torch cutting

The software supports multi torch cutting on the rectangular plate. Users can set the torch number and the torch direction.





Torch direction: Y axis



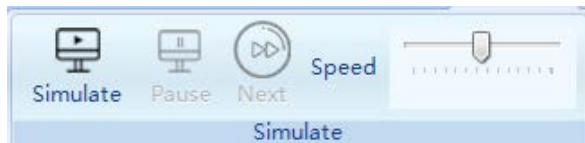
Torch direction: X axis

V simulate

5.1 Simulation

Automatic simulation can help to detect if current cutting meets the requirement.

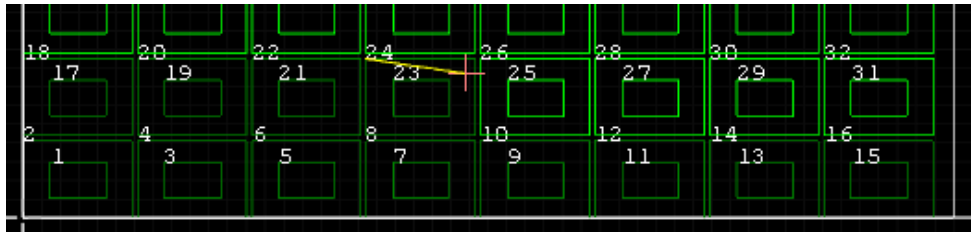
Note: current simulation in software is simple simulation, unable to completely reflecting real situation during cutting.



It can modify current simulation speed in simulation “**Speed**”, click



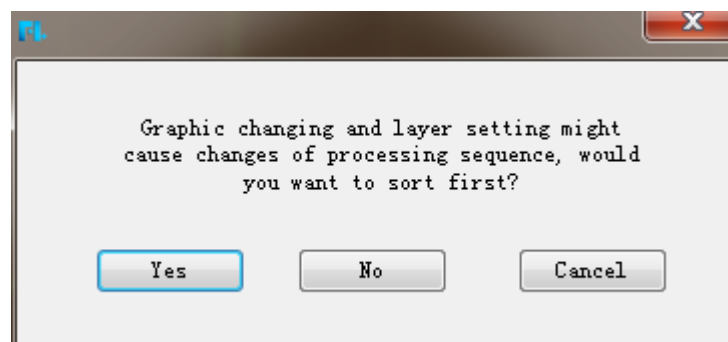
“**Simulate**” to begin automatic simulation, now “simulate” button changes to button. After simulation beginning, already cut parts will change color, as shown in below figure:



Click “**Stop**” button to stop current simulation.

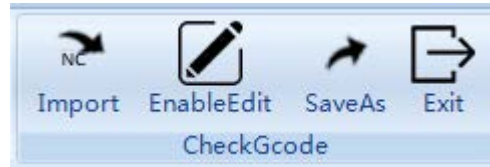
During the simulation you can press the space key or “**Pause**” button to pause and click the “**Next**” button to entering the step-by-step process. During this process, you can also select any line of G code in the GCODE browser on the left to view the graph.

When click “**Simulate**”, it will pop up the prompt to remind users need to sort first or not because graphic changing and layer setting might cause changes of processing sequence.



5.2 GCODE Checking

Version after V1.1.0.266 added the function of “GCODE Checking”, this model can check any type of G code and simulate it.



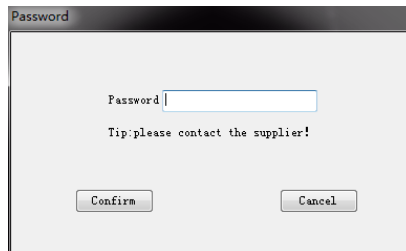
Click the “Import” to import the G code file, then the G code will show in the “GCODE” browser, run simulate to check the code.

This model also supports G code editing and saving.

VI System

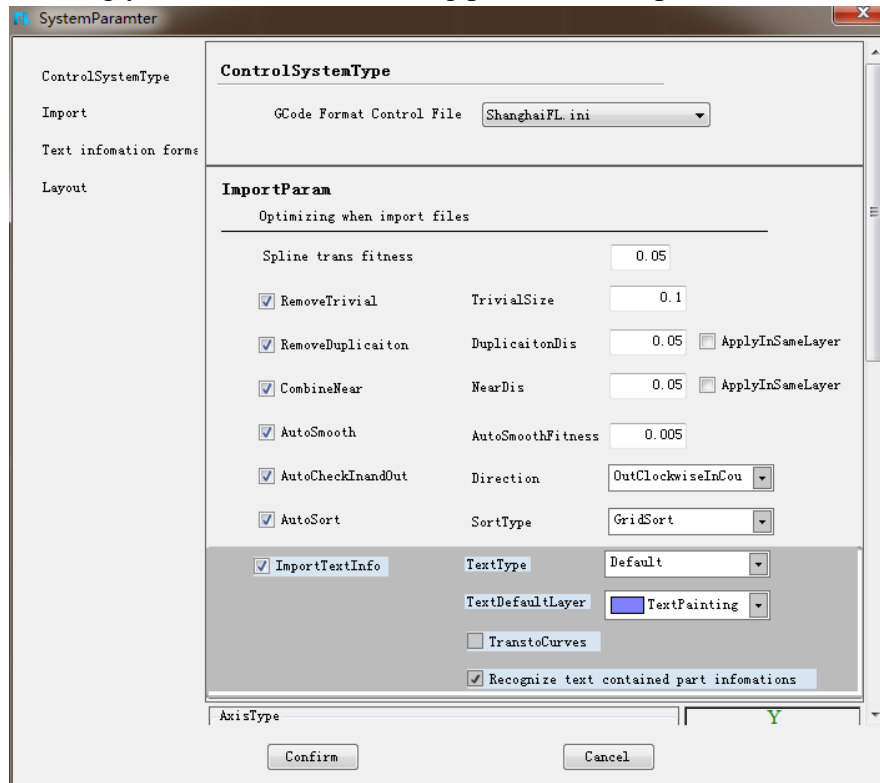
6.1 System parameter

Clicking “System parameter”, password prompt box will pop up, as shown below



Please ask software supplier for password.

After entering you will see the following parameter setup interface:




Here includes G code format control file, importing parameter, text information format, layout, etc. You can make corresponding modification as required. After modification click “**Confirm**”, parameters will be saved.

Note: modification of system parameter will influence system operation, please operate carefully.

6.2 Language



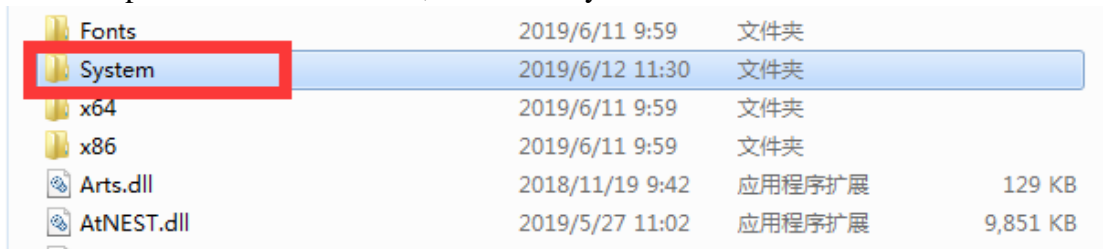
We provide multiple languages. You can click  to change the language that you want.


Now we support Chinese Simple and English.

The professional edition supports to add language by users.

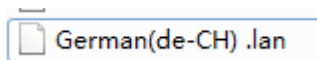
Example of adding German:


1. Open the file of FLCAM, and find “System” file.

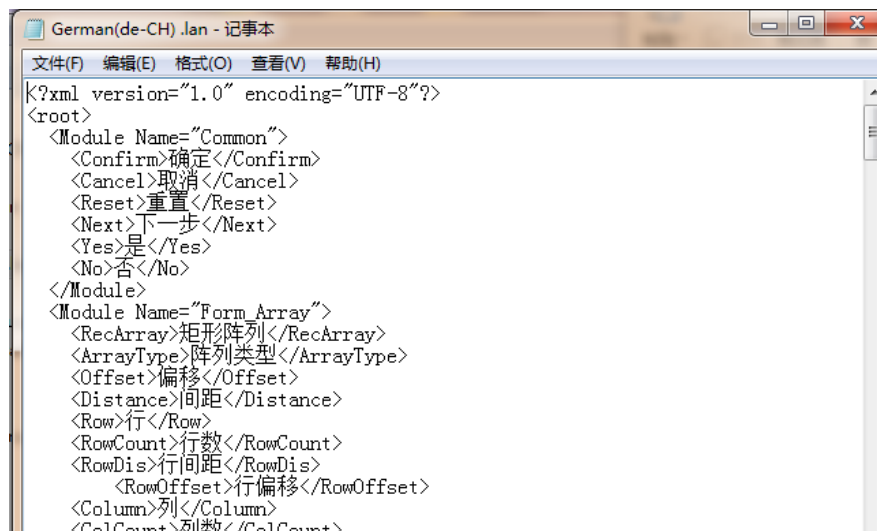


2. Copy  Chinese_PRC(zh-CN).lan or  English(en-US).lan .

3. According to the linguistic code reference corresponding link:
<http://www.lingoes.net/en/translator/langcode.htm>, rename the file of German.



4. Open the file  German(de-CH).lan .



5. Replace the Chinese into German, and save it. Reopen the software, the language can change into German.

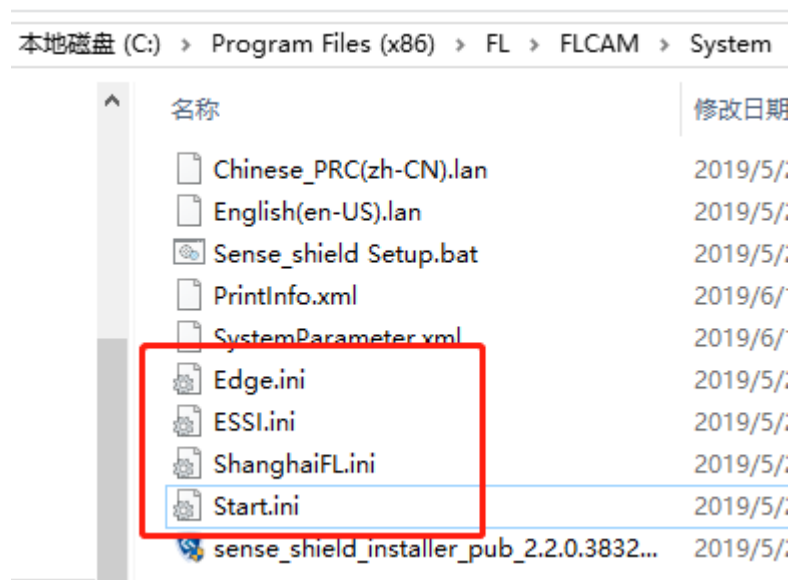


6.3 G code format control file

In order to facilitate users of different control systems to configure the generated code, “**G code format control file**” is added. Users can modify the current control file or add **ini control file** that meets the current system requirements according to the format description of the existing control file.

After the installation of FLCAM, there are four kinds of code control ini files under the System folder of the installation directory.

The default path is “C:\Program Files (x86)\FL\FLCAM\System”.



If the current control system is not in the above four built-in ranges, you can copy any of the ini files, modify them, rename them and put them in the above path.

The following points should be noted when modifying ini files:

Do not modify the part of equal sign and the content before it of each control code.

For example:

The current required line interpolation instruction is G1, then change the “**G01**=G01” in index 3 to “**G01**=G1” in the ini file, and do not change the red bold paragraph.

If the segment that are not needed, users can delete the content after equals sign of the current field instead of deleting the entire segment.

For example:

There is no need to generate G90 or G91 code segments in the current system, so “**G90**=G90” and “**G91**=G91” can be modified to “**G90**=” and “**G91**=”. Please do not change the red bold segments.

Some index segments have the following words“可根据需要增加或删除行”which means “add or remove rows as needed”. Users can add new control fields under the current index.

For example:

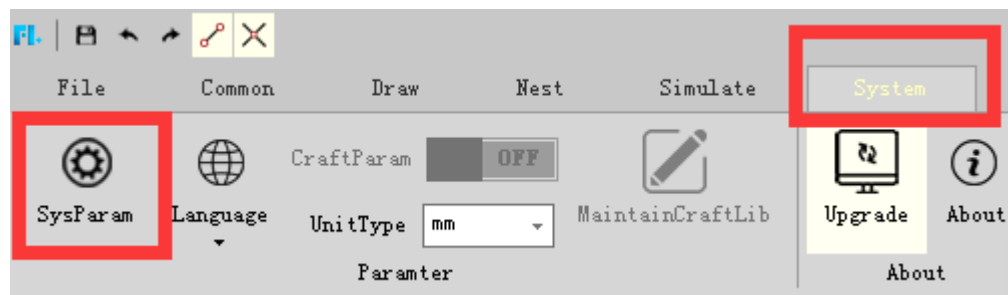
The current generated code terminal is “%”“G99 X1 Y0 I0 J0”“G92 X0 Y0”. The contents of index 1 can be modified as follows:

	[NC_HEADER]	
[NC_HEADER]		/*文件开头 索引0*/
/*文件开头 索引0*/		/*程序开头代码，可根据需要增加或删除行*/
/*程序开头代码，可根据需要增加或删除行*/	MyHeader=%	
Header1= G99 X1 Y0 I0 J0		Header1= G99 X1 Y0 I0 J0
Header2= G92 X0 Y0		Header2= G92 X0 Y0

Before

After

After the modification of the ini file, please copy to the System folder of the installation path. When generating G code for the first time, select “G code format control file” in the “**System-System parameters**” interface.




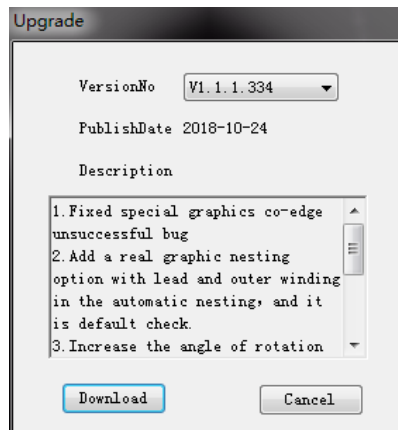
Note:

1. Improper modification may cause wrong generation G code. Please contact the developer for assistance.
2. Improper modification may cause the generated G code to be unable to be recognized by the current control system or cut correctly. Our company is not responsible for this.

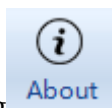
6.4 Checking upgrade

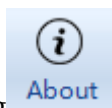


Clicking  to get all the version information, you can download the available version to replace the current version manually.



6.5 About



Clicking , software version information will be displayed, as shown below:



VII Standard VS Professional

Details of function differentiation can refer to Chapter 1.2 of specification.

Besides the functions of the standard edition, the professional edition has the advantages of more convenient operation、richer technology、more efficient nesting, which can save time and manpower、reduce costs、improve production efficiency.

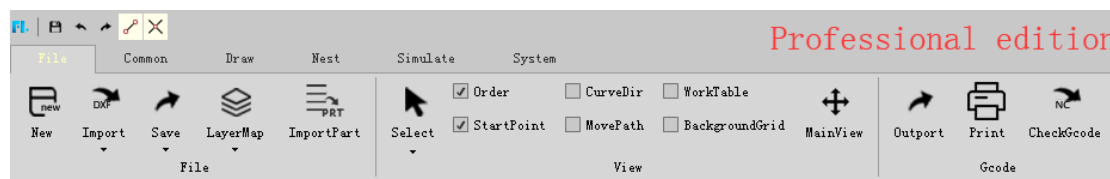
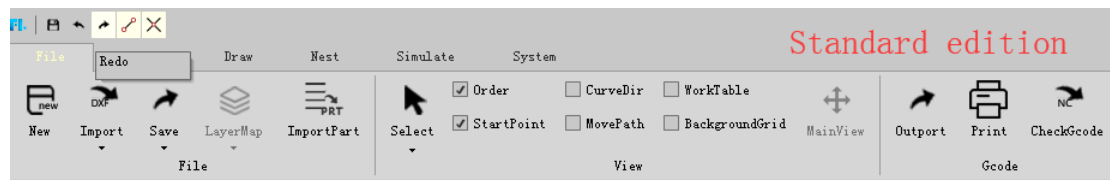
The professional edition has the advantages as follows:

1. More convenient operation

- More diversified import: Support to import NC1 files.
- Support text code: When text (not curve) is set to text layer, the professional edition supports to generate text code.
- Layer map and Color layer map can batch set cutting process quickly.
- Main View can facilitate users to find minified parts.
- Support user-defined language addition: Users can add the languages they need which can facilitate different language users to operate the software.
- The professional edition provides users with more convenient operation and saves time of importing parts and setting layers, which greatly improves work efficiency.

The functional bar comparison:

Note: The gray button in the standard edition cannot be clicked, which means the functions cannot be used in the standard edition.



2. Richer technology

- Interactive array is convenient for users to array part.
- Diversified bridge parameters facilitate users to bridge.
- Size、Break、Explore facilitate users draw complex parts.

These functions make it easier for users to set the process of parts which can save time and improve work efficiency.

The operational bar comparison:

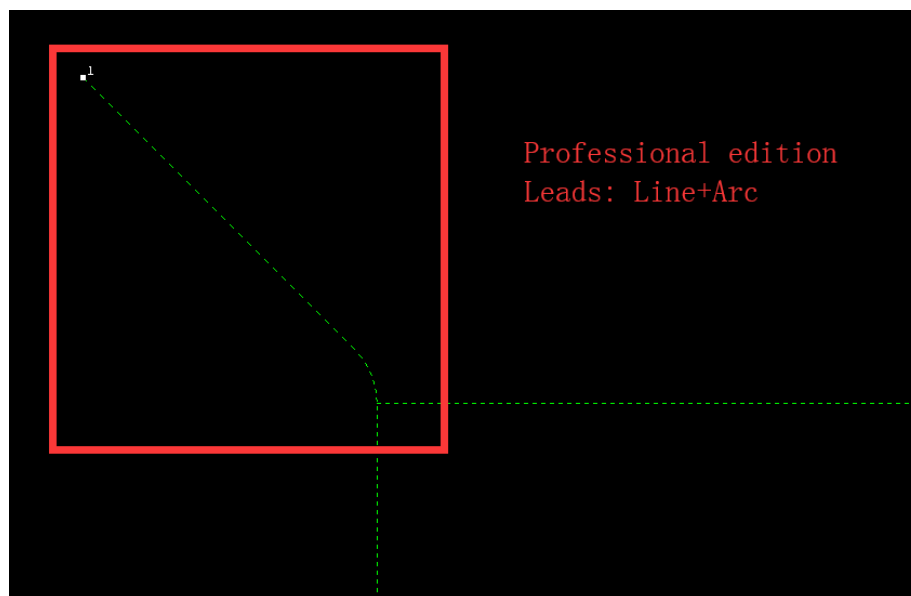
Note: The gray button in the standard edition cannot be clicked, which means

the functions cannot be used in the standard edition.



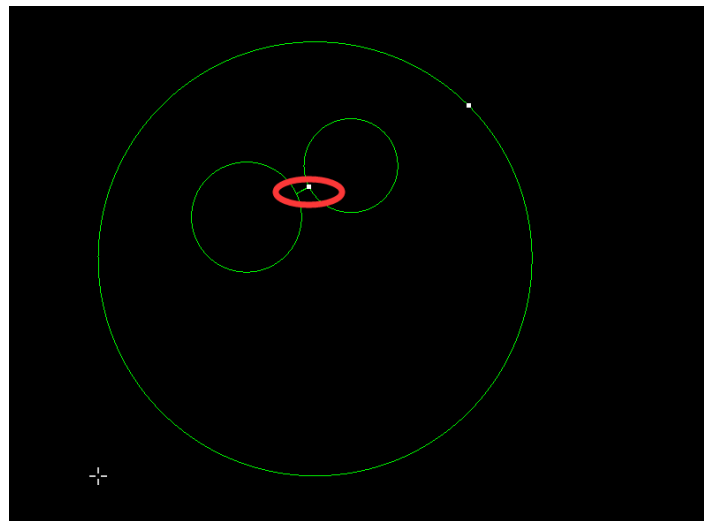
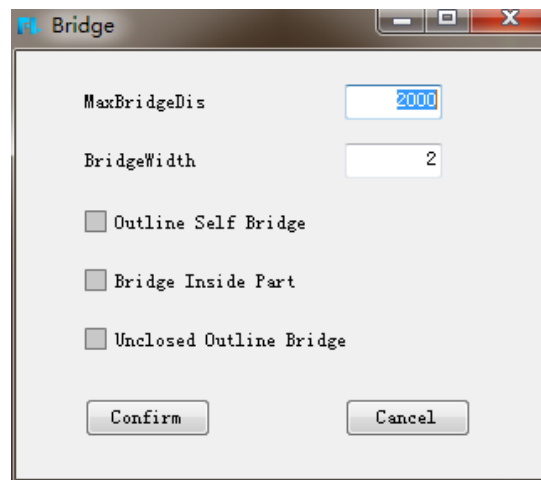
2.1 Leads

Besides line and arc leads of standard edition, professional edition has the third type of leads: line+arc, which can cut the part better.



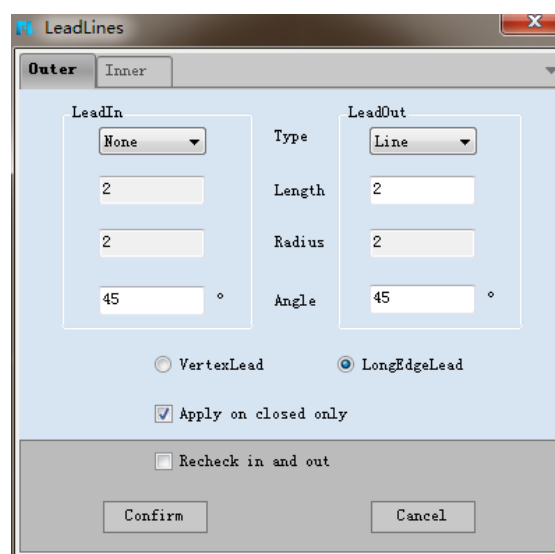
2.2 Advanced bridge:

The professional edition has more diverse bridge parameters than the standard one. For example: Outline Self Bridge、Bridge Inside Part、Unclosed Outline Bridge.



Inside parts bridge case

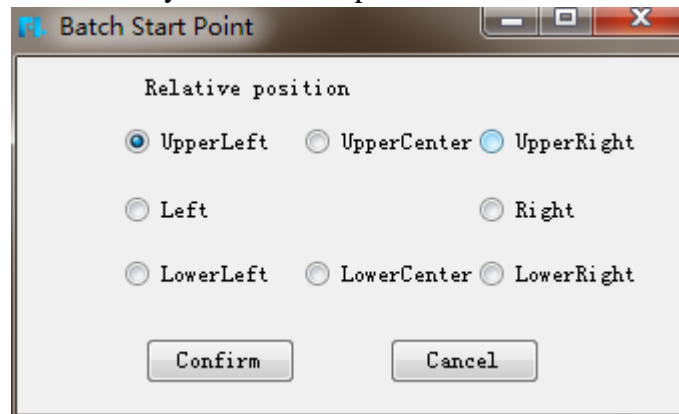
The professional edition supports advanced leads. Outer and inner leads can be set separately as needed.



2.3 Batch start points

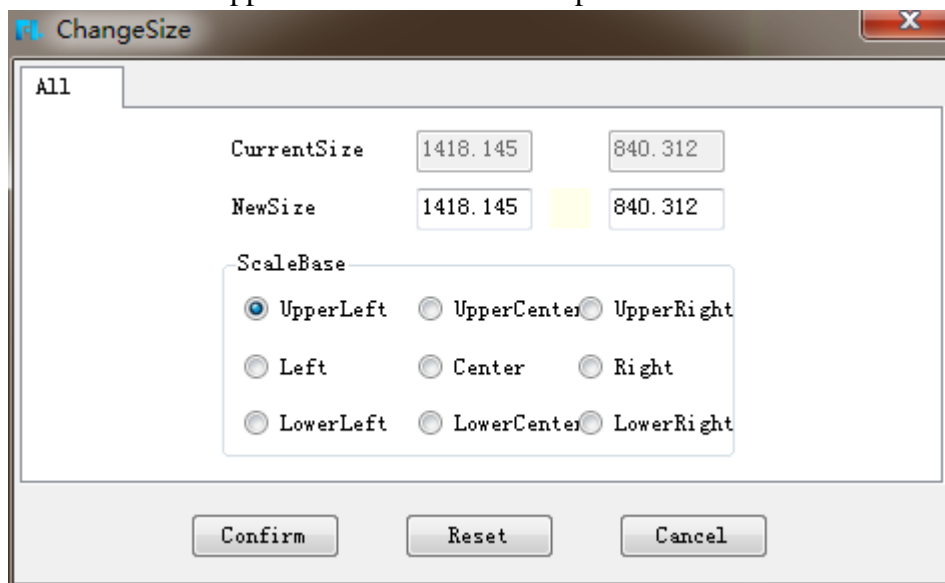
Professional edition supports to batch change start point. The selected parts can be

set start point simultaneously. The relative position is as follows:



2.4 Size

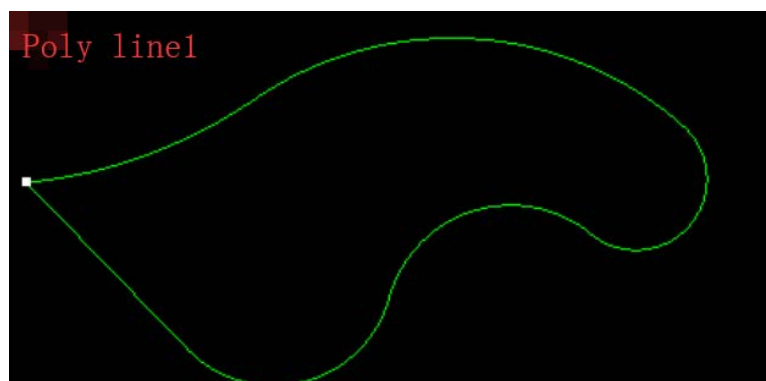
Professional edition supports to scale the size the parts and choose the scale base.



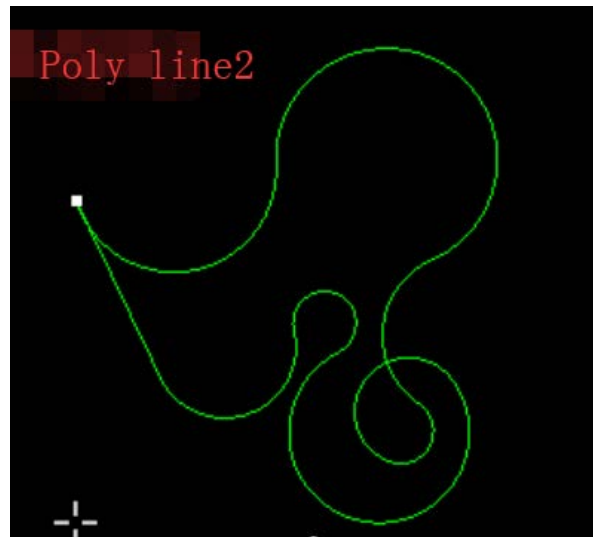
2.5 Different types of poly line

Besides the poly line1, professional edition supports poly line2.

Poly line1: The arc will be drawn in tangent form.

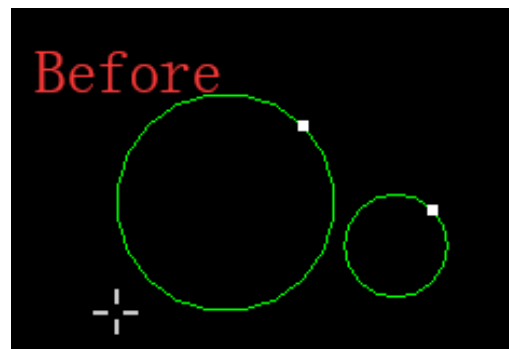
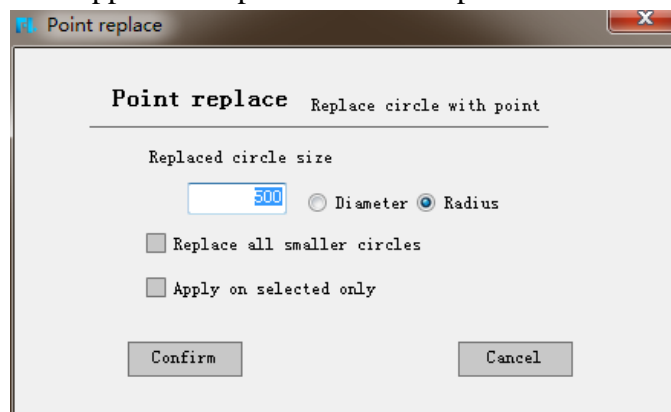


Poly line2: The arc will be drawn in any form.



2.6 Replace circle with point

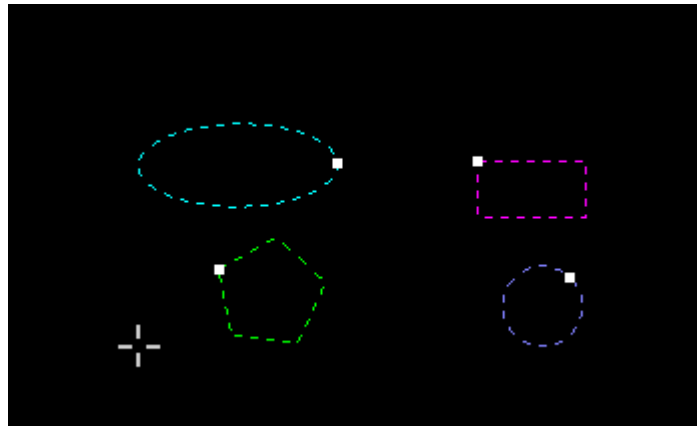
Professional edition supports to replace circle with point.



2.7 Layer map and color layer map

The professional edition can quickly batch imported parts layer or color

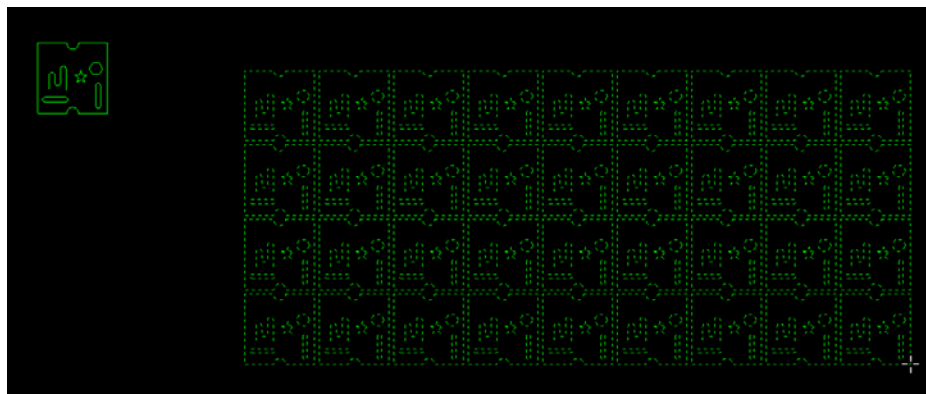
corresponding to each layer in FLCAM, which is convenient for users to operate the layers of parts and save time and effort.



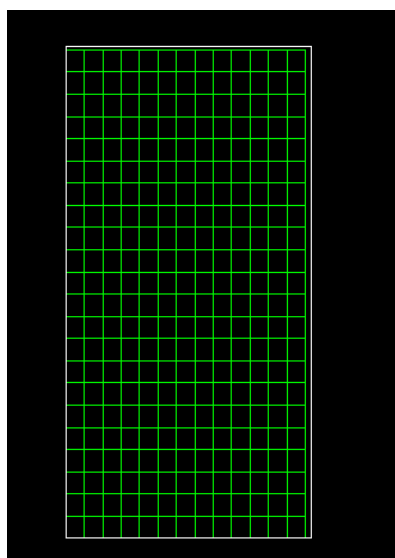
Layer map case

2.8 Interactive array and full fill

The professional edition supports to array within a specified area by dragging the mouse.



Interactive array



Full fill

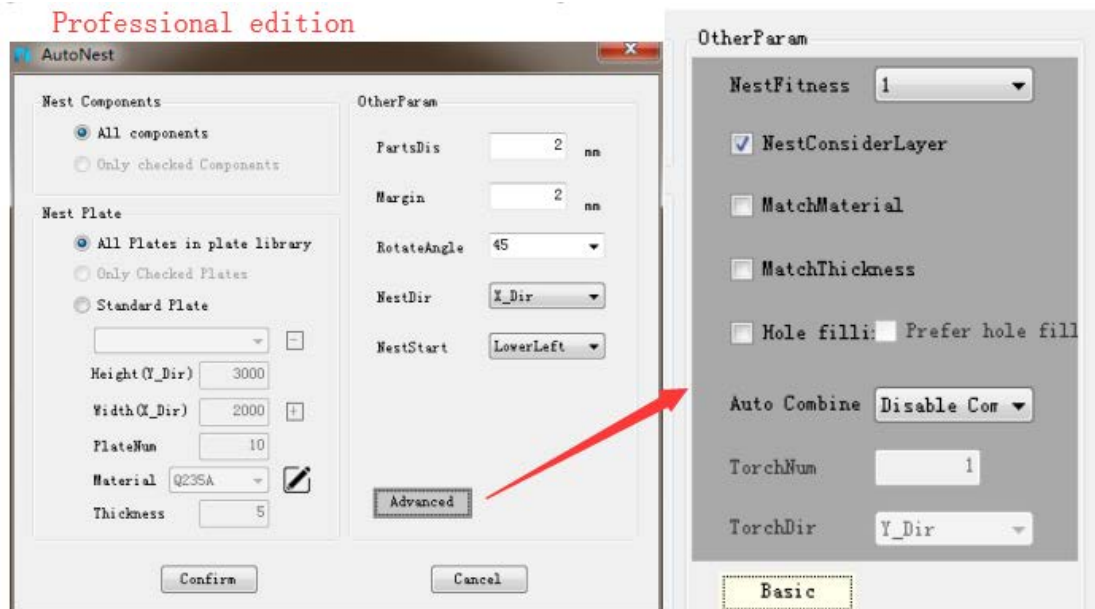
3. More efficient nesting

There are more nesting parameters in the professional edition. Such as:

Rotate angle(The professional edition can customize to input any rotate angle, while the standard edition can only select a fixed rotate angle(45°、90°、180°))、Auto combine、Match material & thickness、Save remnant.(Details refer to Chapter 1.2 of specification)

The more nesting parameters are, the more efficient nesting.

The parameters of the standard and professional edition comparison are as follows:



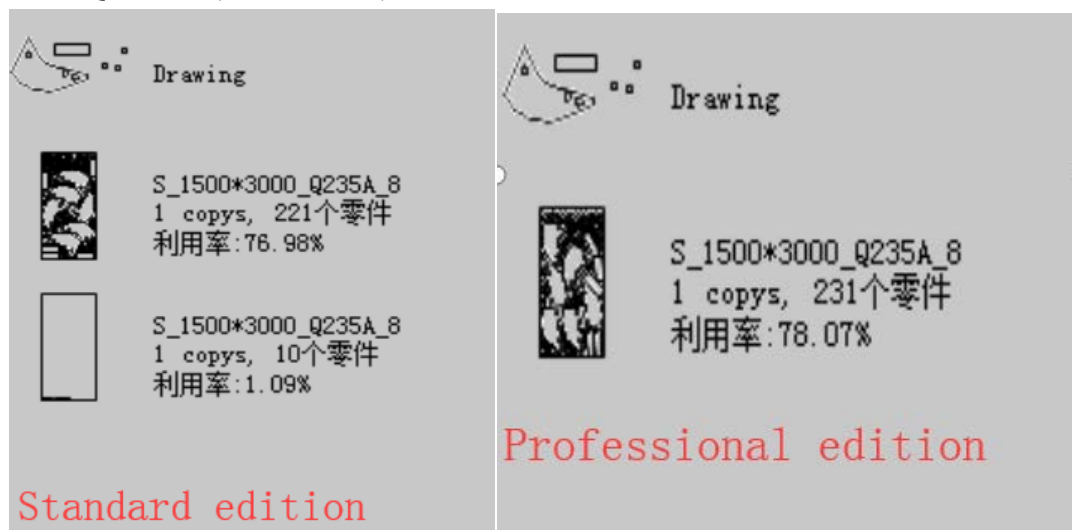
3.1 Rotate angle nesting case

Plate size: 3000*15000 (Both edition)

Rotate angle: Standard edition 45°、90°、180° (Three fixed angle)

Professional edition 5° (Customize rotate angle)

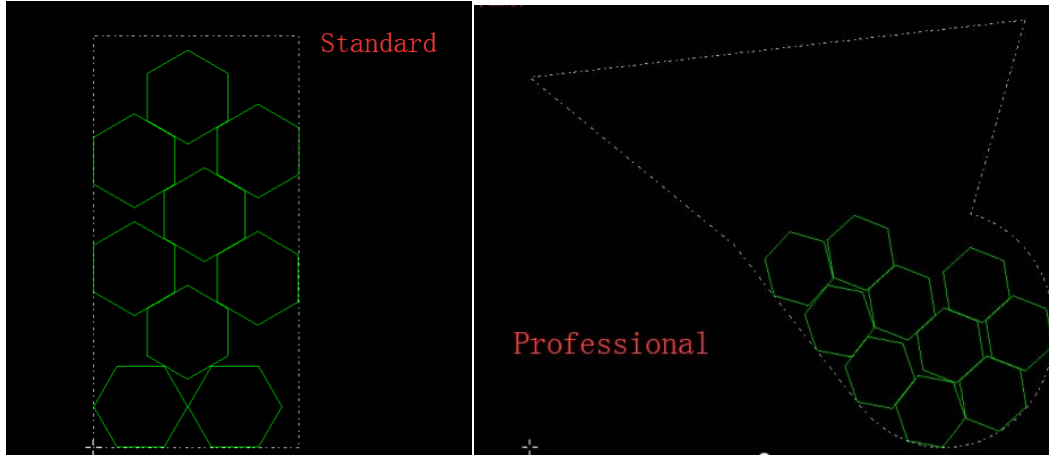
Parts: QTY 231 (Both edition)



As shown above, the standard and the professional edition nest 231 parts with different rotate angle. The nesting result of the standard edition needs two plates, while the professional edition only needs one plate. Therefore, the professional edition can save more material and improve the utilization rate.

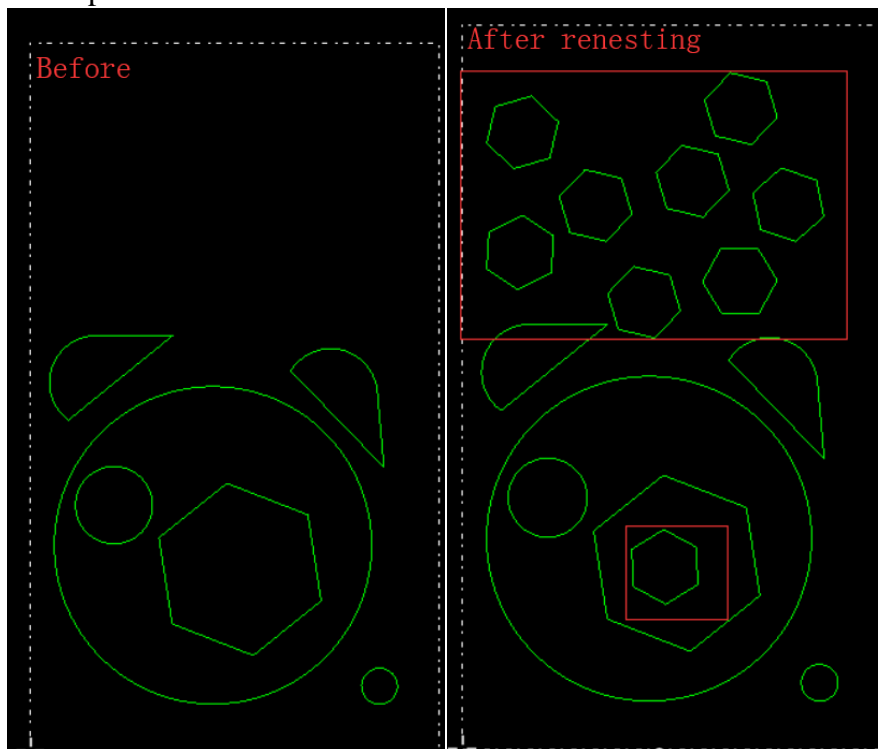
3.2 Irregular plate nesting case

Compared to the standard edition can only nest on rectangular plate, professional edition can nest on plate of all shapes. The professional edition supports to save remnant which can be used next time. Irregular plate nesting can nest on irregular plate or remnant which can improve utilization and reduce production cost.



3.3 Renest

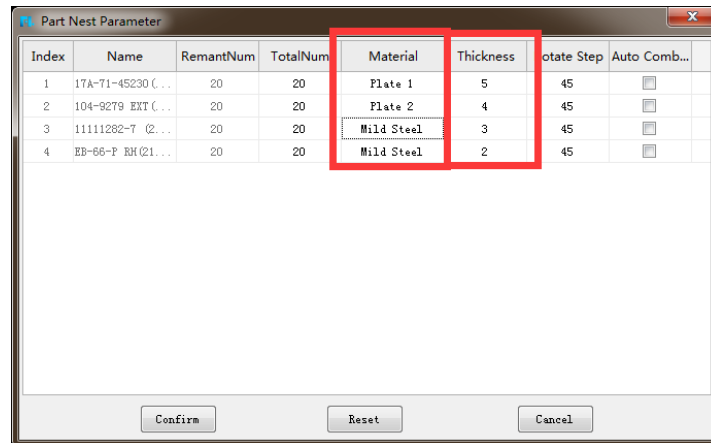
The professional edition supports to renest which means the plate can be nested again if it still has the space can be nested after first nesting. This function can make full use of the plate.



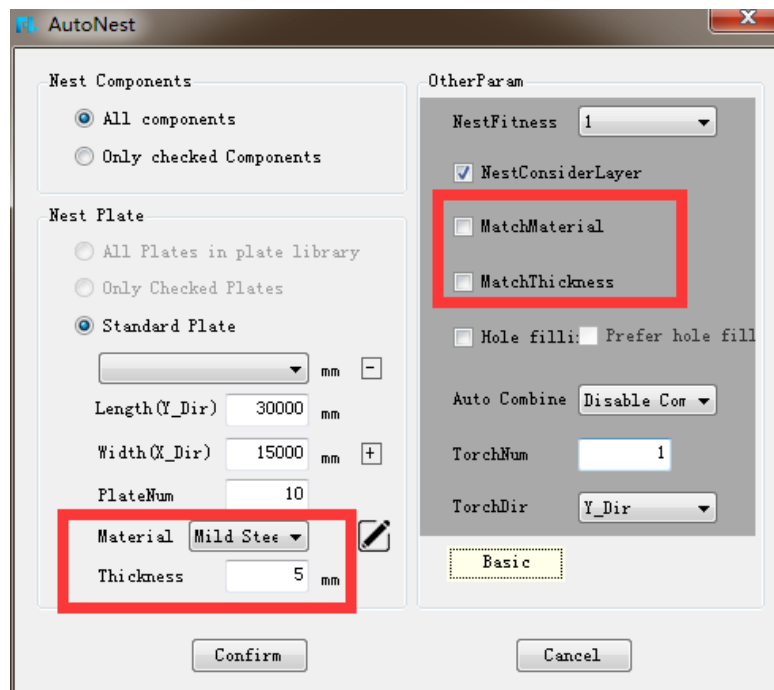
3.4 Match material and thickness

Match material: The parts can be nested on the corresponding plate of the same material during the nesting.

Match thickness: The parts can be nested on the corresponding plate of the same thickness during the nesting.

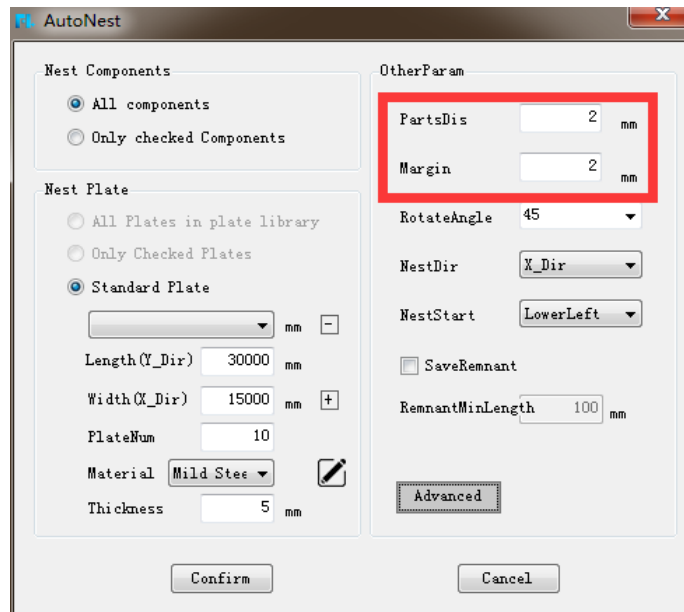


Set the material and thickness parameters of the parts firstly. And it will match material and thickness of the parts automatically during the nesting.



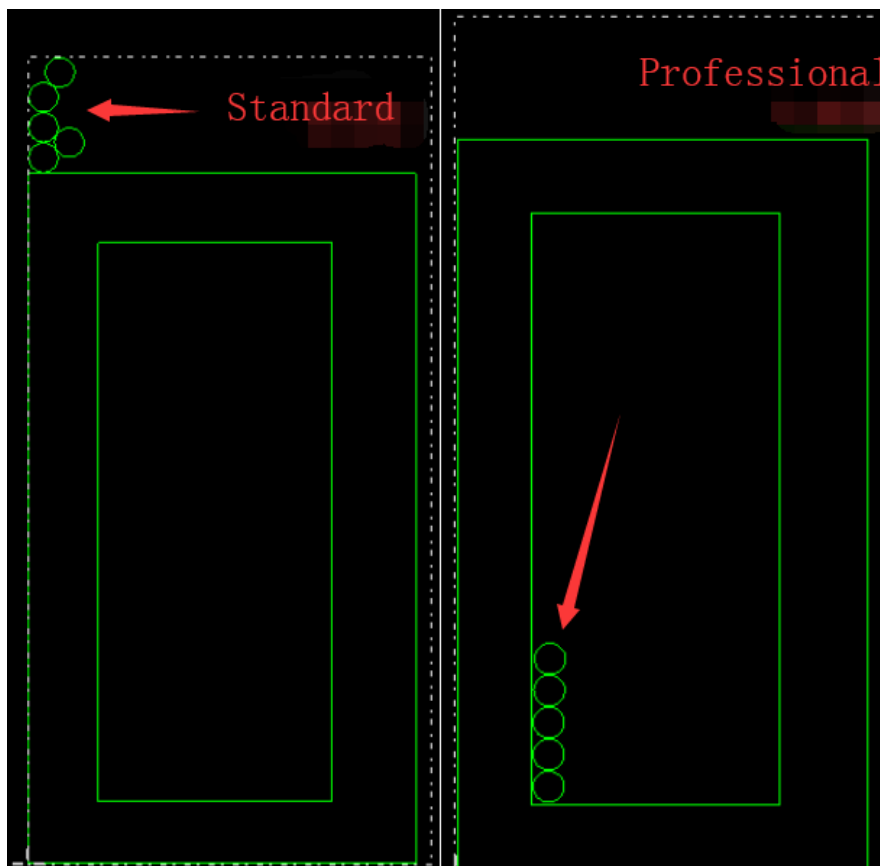
3.5 Margin

The margin in the standard edition is the same of the parts distance which cannot be customized. The margin in the professional edition can be customized as well as parts distance which can make the nesting more flexible.



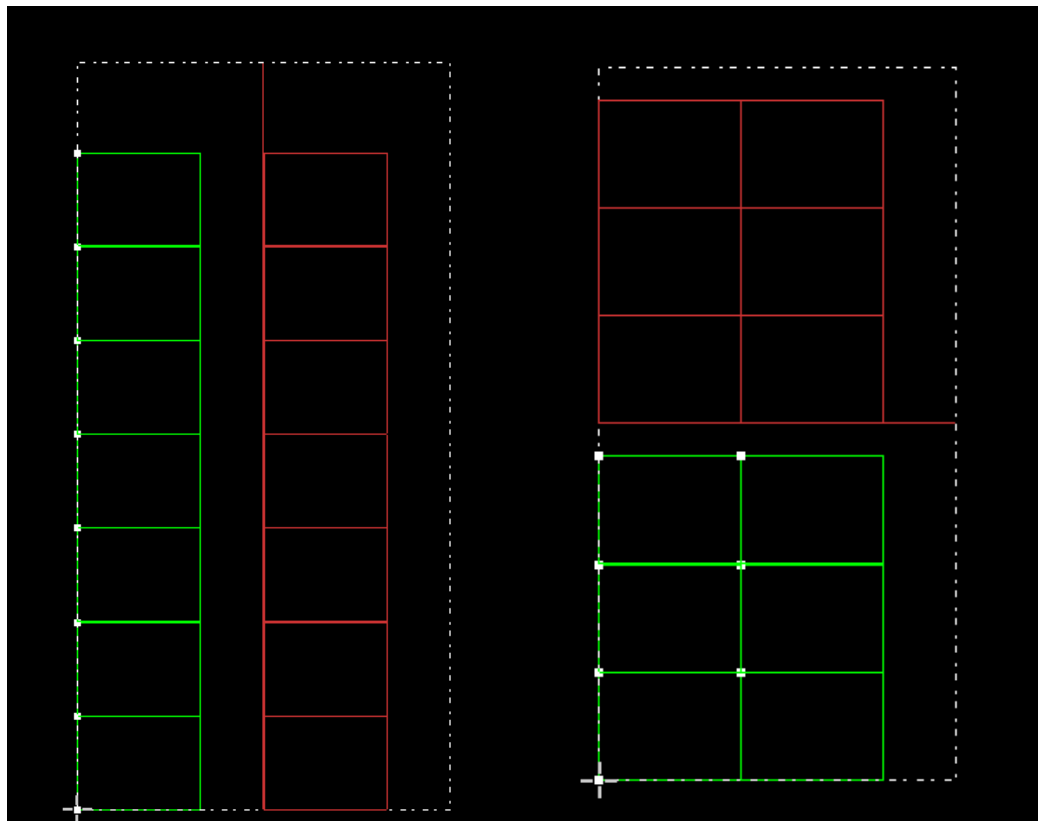
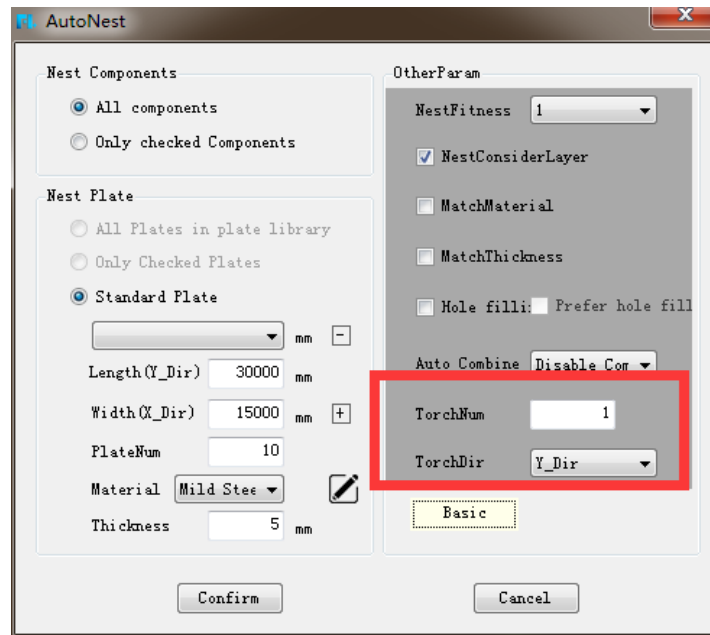
3.6 Hole filling

The professional edition supports the function of hole filling which means small parts can be nested on the hollowed out parts of bigger parts. It can save plate and improve utilization.



3.7 Rectangular plate multi torch nesting

Professional edition supports to multi torch cutting nesting on rectangular plate. It can cutting with multiple torches at the same time after setting the torch number and torch direction.



Y Direction cutting

X Direction cutting

VIII FAQ

Q1: In WIN7 and above system, the software crashes when opening it.

A: When installing software in WIN7 and above system, select “run as administrator”, after successful installation, you can use it normally when you “run as administrator”.

Q2: The question of common edge.

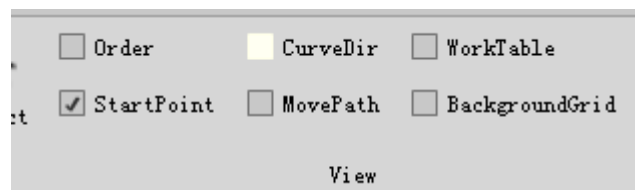
A: Close firstly and then common edge. Select the close function in the lower right corner of the software interface, set parameter: 0.01, then press the keyboard up, down, left, right keys, and then select the common edge function.

Q3: Why some buttons displayed in red?

A: The button displayed in red represents that the function of the button is not opened. Please contact the software supplier to open.

Q4: Why the imported parts did not display the curve direction?

A: Check if the curve direction is ticked in the file menu. Please tick the function you needed, such as “order、start point、curve direction、move path、work table、background”.



Q5: Why the parts miss on the interface suddenly?

A: It may be due to careless miniaturization of the part drawing. Please choose “Main view” to find the parts.

