FLCAM series flat nesting software operating guide

Shanghai Fangling Computer Software Co., LTD
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Use precautions

Thank you for choosing to use the FLCAM flat nesting software of Shanghai Fangling Computer Software Co., LTD. This manual is specially prepared for users of this software. It introduces all functions of FLCAM in a comprehensive and detailed way, and provides clear installation instructions, aiming to help you quickly get started and efficiently use this software.

We are fully aware that our products need continuous improvement and refinement, which is why FLCAM is constantly being optimized. If you notice any changes in the technical parameters or functional descriptions in this manual, we apologize in advance and hope for your understanding. Should you encounter any issues while using FLCAM, or have any questions, suggestions, or feedback that this manual does not adequately address, we sincerely invite you to contact us. We value every user's opinion and are committed to promptly addressing your concerns and actively considering your valuable suggestions.

Thank you again for your trust and support, choose our FLCAM flat nesting software. We look forward to working with you to create a better future!

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Charpter 1 Software introduction

1、Software introduction

FLCAM2023, a specialized flat nesting software for CNC cutting processes, is designed with a user-friendly interface and a comprehensive feature set. The system integrates core functions such as the creation and editing of 2D processing graphics, multi-process parameter handling, intelligent layout optimization, and processing path sequencing. It can generate standardized processing codes compatible with mainstream CNC equipment, including flame cutting, plasma cutting, laser cutting, and water jet processing. By leveraging advanced algorithm architecture, the system maximizes the utilization of sheet metal and supports the configuration of complex process parameters and dynamic optimization of processing paths, significantly enhancing the precision control and efficiency of CNC cutting operations.

2、Software version classification

Software is divided into [Professional version], [Standard version], [Machine tool version];

Professional version

Standard version

Machine tool version

Special Note: This manual applies to three versions, so the version you are currently using may not contain all of the features mentioned. This manual is intended only as a guide to the use of the software and should not be considered a complete list of software functions.

3、Software installation and uninstallation

1．Software operating environment requirements

（1）Windows 7 64-bit and above;

（2）.NET Running environment for Framework 4.0 and above.

2．Installation procedure

（1）Before installation, please be sure to close all anti-virus software, to prevent anti-virus software from misreporting the installation file as a virus, resulting in the file being deleted or intercepted. This may cause the software to fail to start normally or some functions cannot be used normally.

（2）Double-click the installation package, click to agree the software license statement, according to the software installation prompts click "Next", until the software installation is complete;

（3）Before starting the software, make sure that the purchased USB dongle is correctly inserted into the USB port of the computer running the software. If not, the software will not start or fully use due to lack of authorization.

Special note: The encryption dog is a tool used for software authorization. An encryption dog is only applicable to one set of software. If you need to use multiple sets of software or the encryption dog is lost, you need to buy the software again. Therefore, please take good care of the encryption dog.

Charpter 2 Introduction to the software interface

The software is mainly divided into two interfaces, namely sampling

interface and drawing interface:

1、Sample layout interface

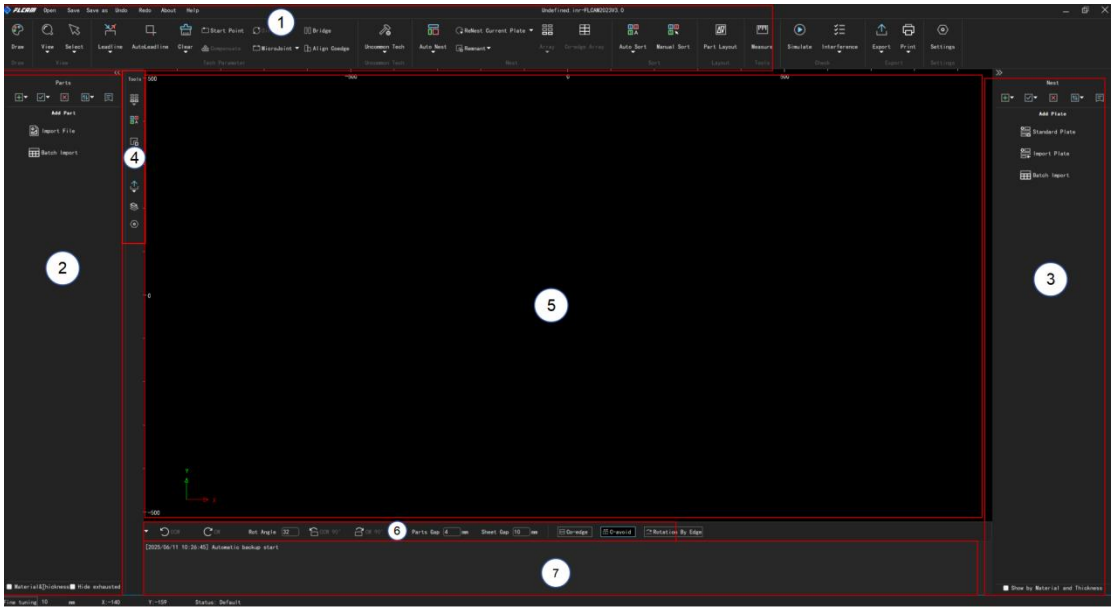


Figure (2-1) shows the software discharge interface

(1) Tool bar: contains a variety of common function buttons;

(2) Part list: Import or draw parts displayed here;

(3) Plate list: The added or imported plates are displayed here;

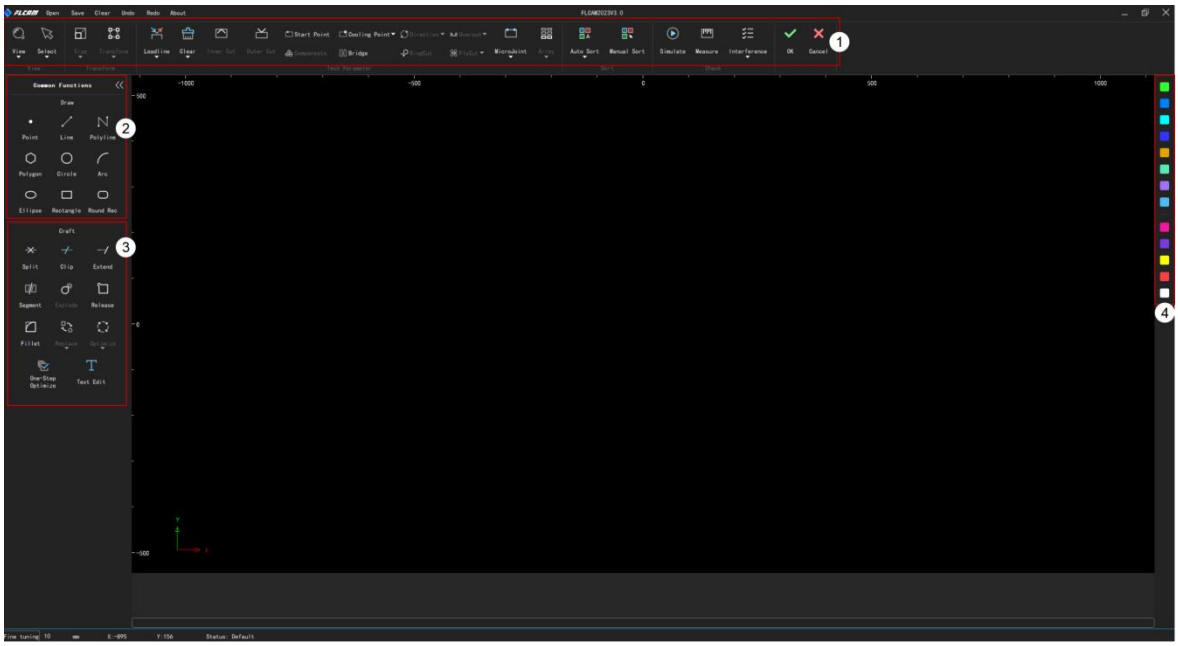
(4) Quick toolbar: some commonly used function buttons, convenient for quick use;

(5) Material layout: Display here when material is discharged automatically or manually;

(6) Bottom toolbar: common function buttons related to parts when manually discharging materials;

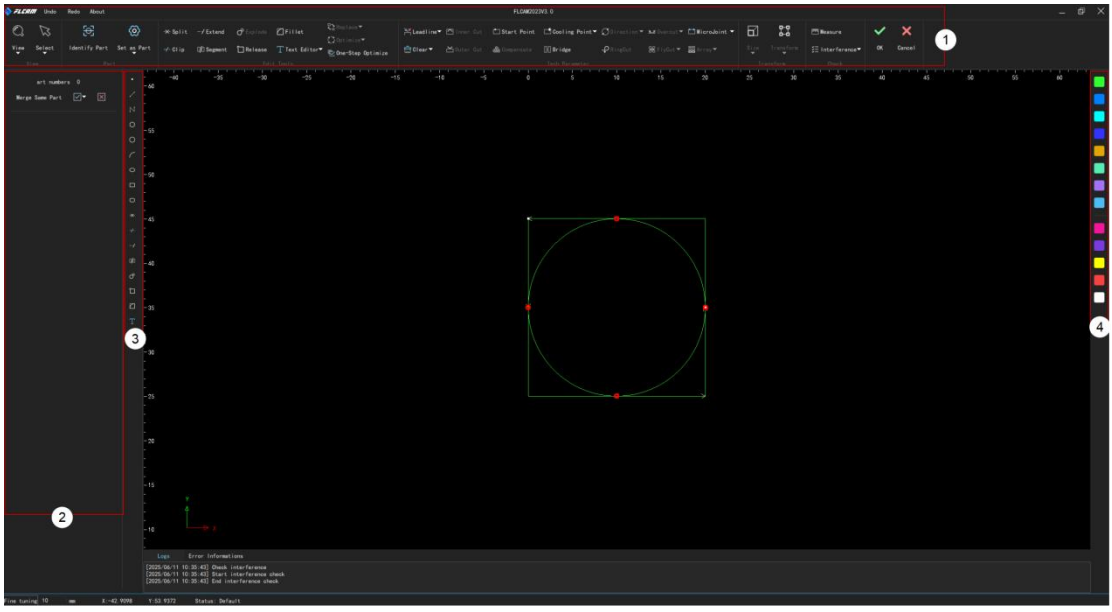
(7) Information output column: Enter the current operation information. If some operations are invalid, you can view the information prompt at this place.

2、Drawing interface



(1) Tool bar: contains a variety of common function buttons;
(2) Common functions: common lines and graphics drawing;
(3) Graphics process: commonly used lines, graphics processing functions;
(4) Layer setting: set the layer as cutting, marking, coding and powder spraying.

3、Drawing processing interface



(1) Tool bar: contains common drawing processing functions;

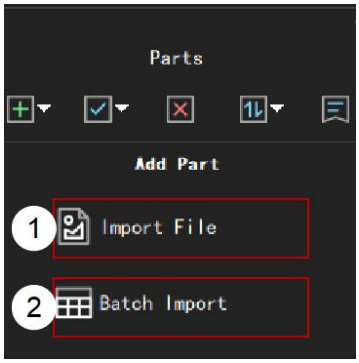
(2) Part list: Shows parts that have been correctly identified;
(3) Quick drawing area: commonly used drawing function buttons;
(4) Layer setting: set the layer as cutting, marking, coding and powder spraying.

Charpter 3 Software function introduction

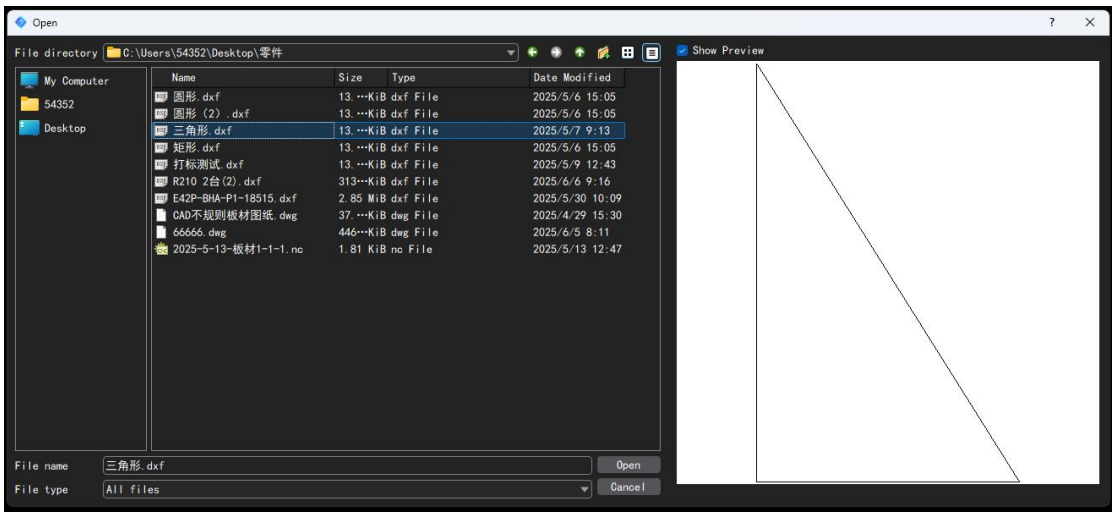
1、Typesetting function

1. Import parts

Support CAD drawing formats, such as DXF, DWG; support NC, CNC, TXT



(1) Import parts from drawings: Click to open the part selection interface, you can select one part, select all parts, hold down Ctrl key + left mouse button to select multiple parts, and the preview of parts can be displayed on the right.



After selecting the parts, click the open button to enter the automatic optimization parameter Settings. Refer to item 2 "Automatic Optimization Parameter Settings".

（2）Import parts in batches from a table (standard edition and above)

The software supports batch import of parts through tables, which is convenient for batch import when parts are stored in different locations. The table template is stored in the default installation path of the software: C:\Fangling\FLCAM\ExcelTemplates

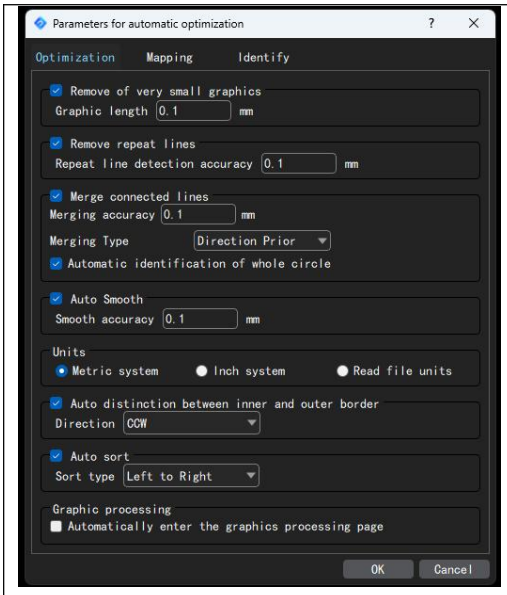
Import by path batch: support setting the absolute path of parts, and can import parts in different positions;

Import by name: support relative path, import parts in batches;

Import standard rectangle: Set the length and width parameters of the rectangle, and the software will automatically identify it as a standard rectangle part import.

2. Automatically optimize parameter configuration

After selecting the parts to be imported, the software will open "Automatic optimization parameter configuration" and automatically optimize the parameter setting. There are three parameter interfaces, namely drawing optimization, drawing mapping and information identification. The import setting for the current part drawing is as follows:

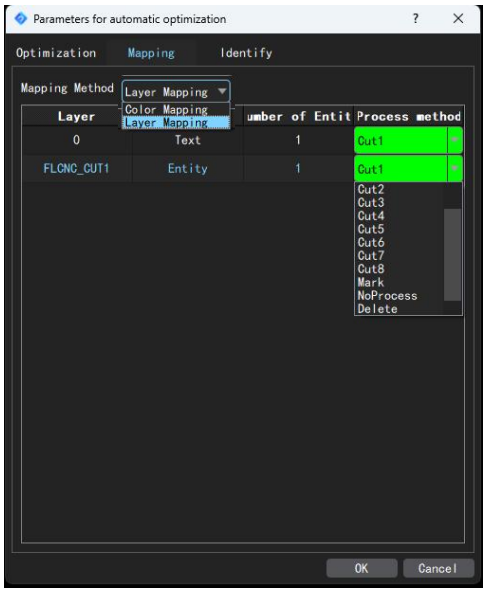


Drawing optimization

The currently selected parameters are usually set by default and do not need to be modified

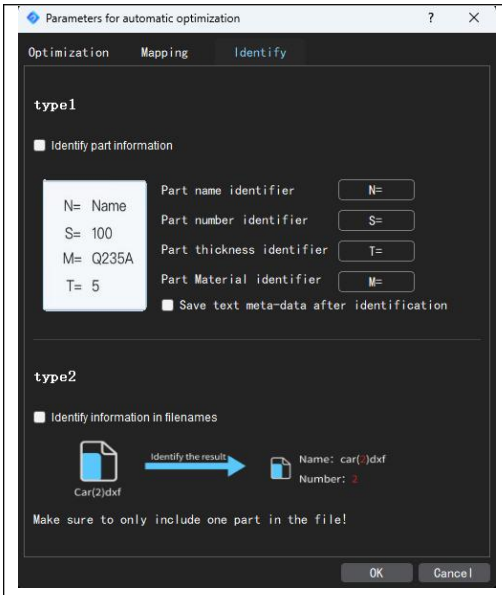
Drawing processing: After selection, the part processing interface will be entered, which is generally used to process parts with import errors. It can also be used to identify and import multiple parts on a CAD drawing.

If the machine tool version encounters part error and cannot be imported, you can select this item. In the standard version and above, a prompt will pop up asking whether to enter the part processing interface. There is no need to manually check (refer to the introduction of "Drawing Processing" for the function usage mode).



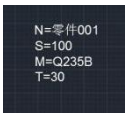
Map the drawings

Mapping mode: layer mapping or color mapping. It can automatically identify the layer information set in CAD drawing and set the corresponding processing mode according to the requirements, such as marking the layer or importing without processing.



information identification

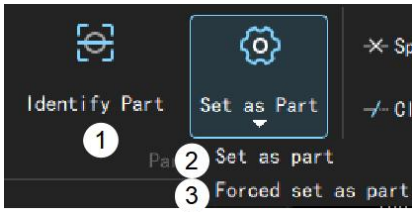
Type 1 is CAD drawing. As shown in the figure below, the part information is edited inside the part. When importing, the software will automatically identify it (N, S, T and M can be customized. For example, if N is changed to P, then P represents the part name)



Type 2, identify the part name and quantity according to the file name of the part. For example, the dxf file of rectangle (2) identifies the part name as rectangle (2) and the quantity as 2 (the quantity in parentheses is English, otherwise the quantity cannot be identified).

3. Drawing of the paper

The drawing processing function can modify and adjust the faulty drawing file according to the error prompt information. It can also identify and import multiple parts on a CAD drawing.

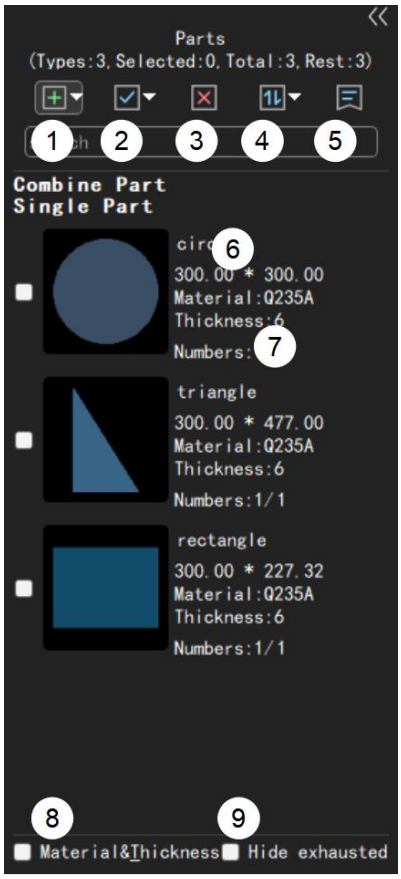


（1）Identification of parts: After clicking, the correct parts in the imported drawings can be automatically identified, and the wrong parts will be prompted with the wrong position.

（2）Set as part: manually set the graphic as a part;

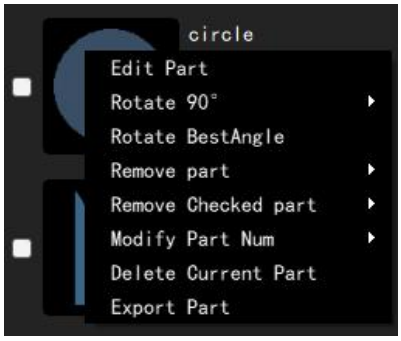
（3）Forcing parts to be set: For unenclosed contour graphics.

4. List of parts



Imported parts will be displayed in the part list, and you can edit the part (the part must not be typeset), modify the part name, modify the part quantity, delete the part, and so on.

（1）Add parts: Click to continue importing parts;
（2）Select parts: you can select all, do not select all, and reverse the selection of parts in the list;
（3）Delete parts: you can delete the parts that have been selected;
（4）Part sorting: Parts can be sorted according to import order, name, and area
（5）Part properties: the quantity, thickness, material, rotation step length and priority of each part can be modified (refer to Figure 3-1);
（6）Part name: the left mouse button can be modified directly;
（7）Number of parts: The number format is: unprinted number of parts / total number of parts. Click the left mouse button on "/" and the number can be directly modified to modify the total number of parts;
（8）Display material thickness: After checking, parts can be grouped and displayed according to material thickness;
（9）Hide used parts: If checked, the parts that have all been typeset will be automatically hidden.



Right-click the component

（1）Edit parts: Open the part editing interface (the part needs to be unprinted), set various parameters for the part, please refer to the specific operation

（2）Rotate 90°: rotate the current part or the selected part;

（3）Rotate to optimal Angle (standard and higher version function): the edge of the part can be rotated to a parallel Angle with the edge of the plate;
（4）Remove parts: Remove the already laid out parts from the board, supporting only the current board or all boards;
（5）Delete selected parts: Remove the already typeset and selected parts from the board, supporting only the current board or all boards;
（6）Modify the number of parts: you can modify

the current number of parts, the number of selected parts, and the total number of parts;

（7）Delete the current part: delete the current mouse selected part;

（8）Export parts: Export the current part, supported export format is NC, DXF.

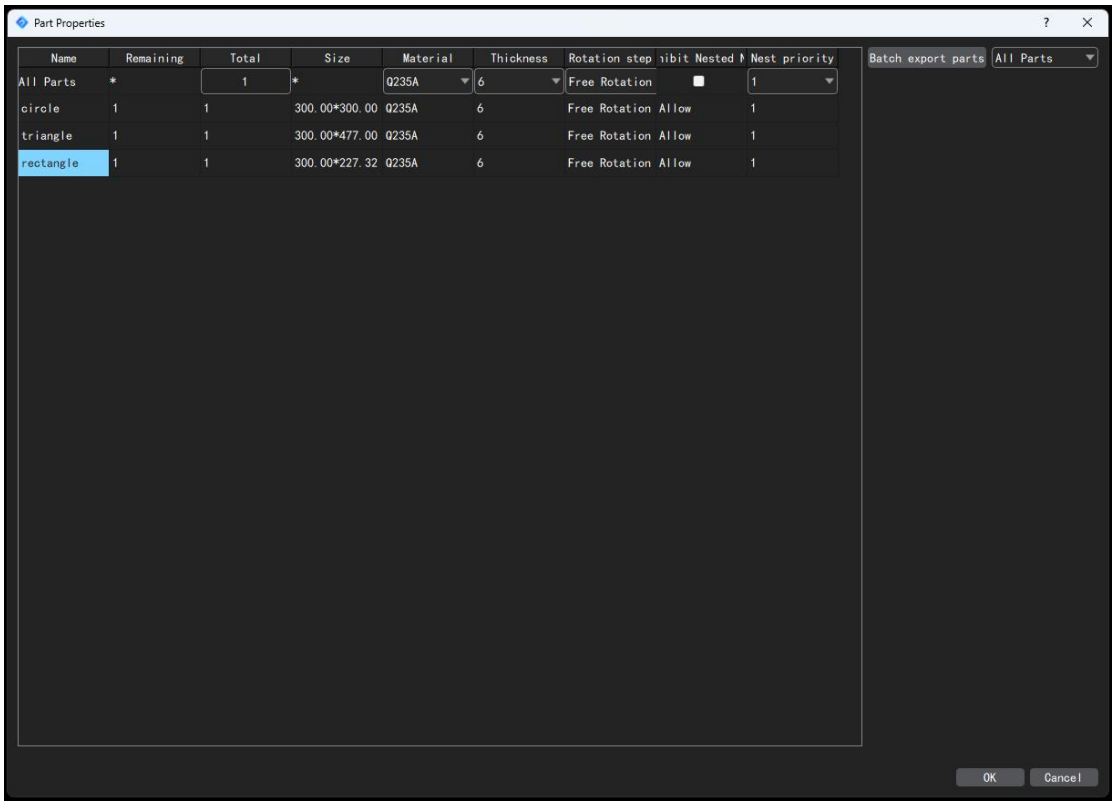


Figure 3-1 Part attribute interface

5. Add panels

Add panels

（1）Add panels: Continue to add panels, the first three items correspond to (6) (7) (8). The fourth item of panel management is shown in Figure 4-1;

（2）Select the board: you can select all, do not select all, reverse selection;

（3）Remove parts: remove the selected plates;

（4）Plate sorting: can be sorted by utilization rate, name and area;

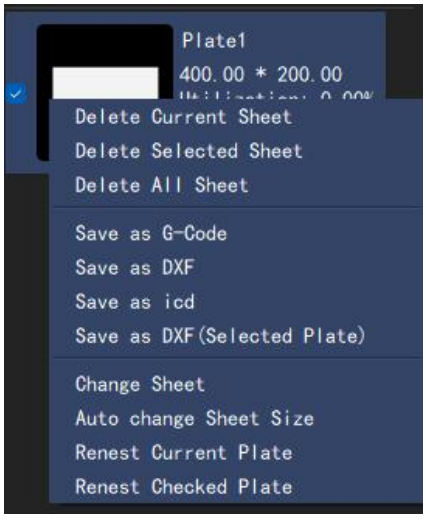
（5）Plate properties: Display the parameter information of the current plate, refer to Figure 4-2

（6）Add standard plate: Click to add rectangular plate, you can set the name of the plate, material, quantity, thickness, length (X), width; refer to Figure 4-3

（7）Add imported plates: you can import plates in dwg and dxf formats. Generally, regular rectangular plates can be achieved through "add standard plates". Imported plates can be used to draw irregular graphics in CAD as plates;

（8）Import plates in batches from the table: Similar to the operation of importing parts in batches, you can import multiple plates in batches. The default storage path of the table template is C:\Fangling\FLCAM\ExcelTemplates

（9）Display by material thickness: different thickness plates can be grouped and displayed.



Right-click the board

（1）Delete the current board: delete the board where the mouse is located;

（2）Delete the selected board: delete the selected board;

（3）Delete all panels: delete all panels in the panel list;

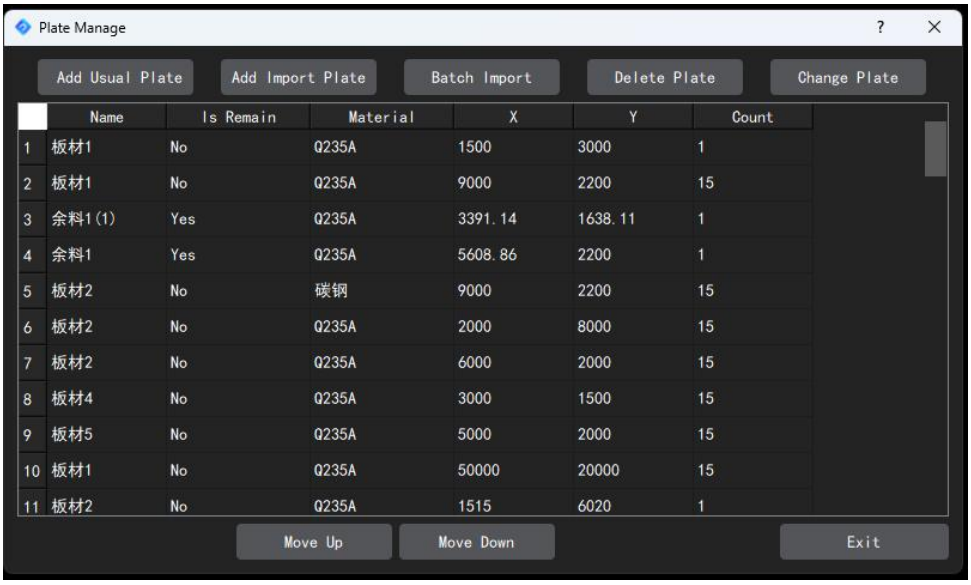
（4）Save as G code: export the current plate to a cutting file;

（5）Save as DXF: Export the current plate to a DXF format file;

（6）Save as iCD: Save the current plate as the special format of square diamond L8200 (iCUT3.0) system;

（7）Save as DXF (check the plate): Save the selected plate as a DXF format file;

	（8）Modify the plate parameters: modify the size, material and thickness of the current plate; （9）Automatic adjustment of plate size: automatically adjust the size of the plate to match the size of the current layout part area; （10）Reorganize the current board: reorganize the current board; （11）Reorganize selected plates: reorganize the selected plates;



	Name	Is Remain	Material	X	Y	Count
1	板材1	No	Q235A	1500	3000	1
2	板材1	No	Q235A	9000	2200	15
3	余料1(1)	Yes	Q235A	3391.14	1638.11	1
4	余料1	Yes	Q235A	5608.86	2200	1
5	板材2	No	碳钢	9000	2200	15
6	板材2	No	Q235A	2000	8000	15
7	板材2	No	Q235A	6000	2000	15
8	板材4	No	Q235A	3000	1500	15
9	板材5	No	Q235A	5000	2000	15
10	板材1	No	Q235A	50000	20000	15
11	板材2	No	Q235A	1515	6020	1

Figure 4-1, sheet management

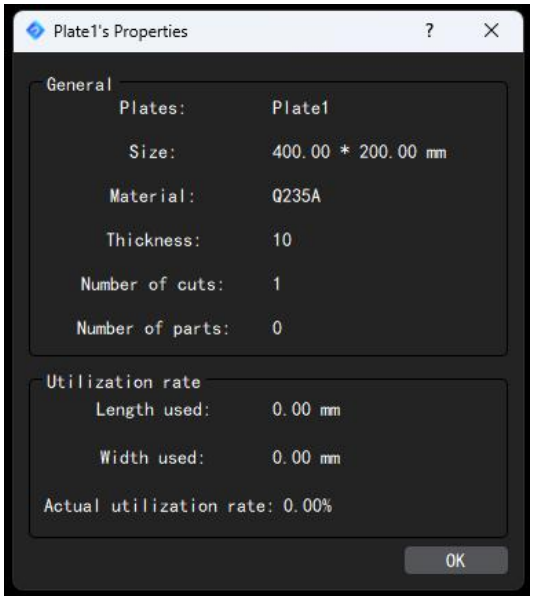


Figure 4-2, sheet properties

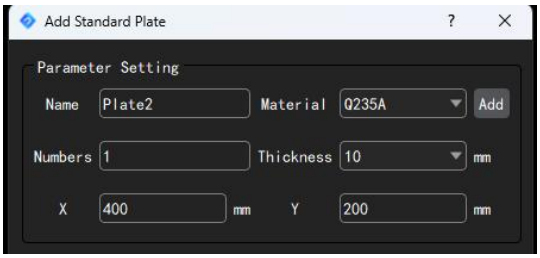
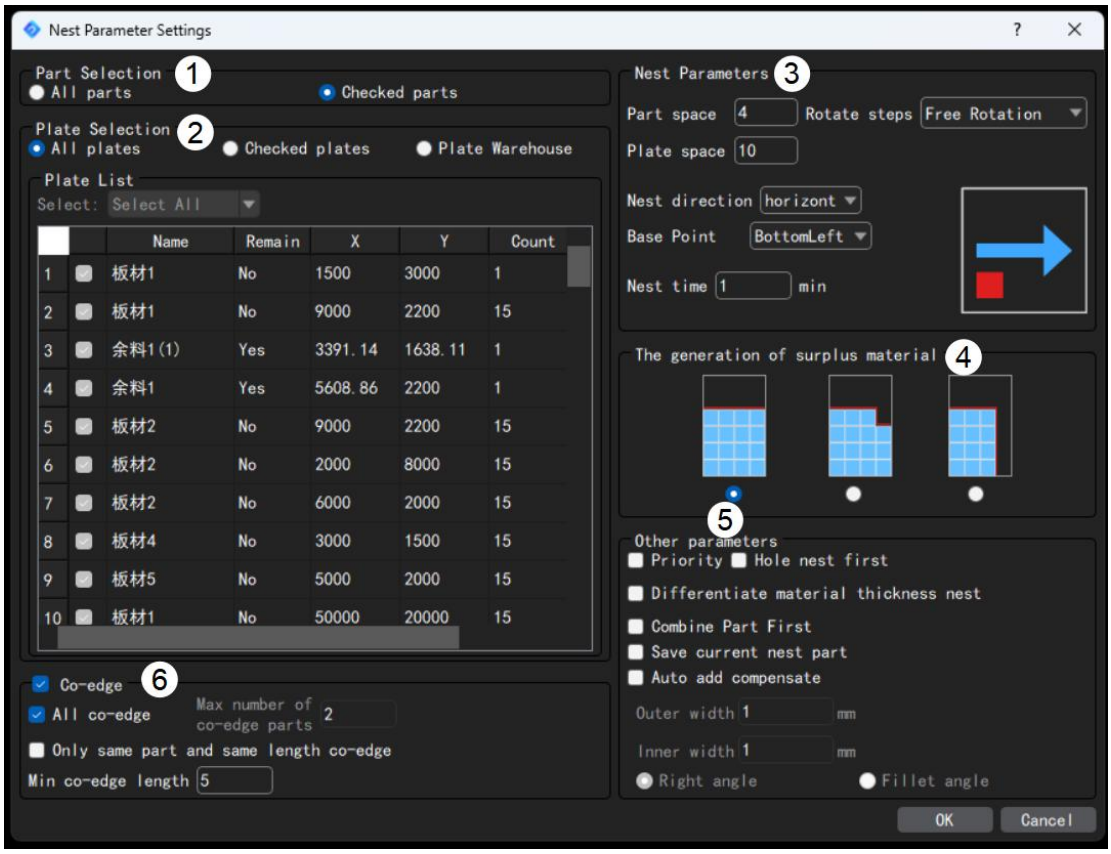


Figure 4-3 Add standard plates

6. Automatic sample sorting



（1）Component selection

All parts: All parts in the list of parts participate in the layout;

Selected parts: The selected parts are included in the layout. If no parts are selected, there is no nesting result.

（2）Plate selection

All panels: All panels in the panel list are involved in the layout;

Check the board: The board has been checked in the board list to participate in the layout. If there is no board check, there will be no nesting result;

Sheet library: Select the sheet types already available in the sheet library to participate in the layout (standard edition and above).

（3）Sampling parameters

Part spacing: set the distance between parts, unit mm;

Rotation step length: When typesetting, the software will automatically calculate the layout mode with higher utilization according to the shape of the part, so the layout Angle of the part may be adjusted. If you want the part to be fixed at a certain Angle (not arbitrary Angle), you can achieve it by modifying the rotation step length;

Plate spacing: set the distance between parts and plate edges;

Assembly axis direction: set whether the part layout is arranged along the X-axis or Y-axis;

Start of nesting: Set the starting position of the layout from which plate, which can be set as lower left, upper left, lower right, upper right.

Assembly time: generally default, theoretically the longer the setting time, the better the layout may be obtained.

（4）Shape of residual material generation

Remaining material generation shape: the generation shape of the unprinted area of the plate after setting the layout.

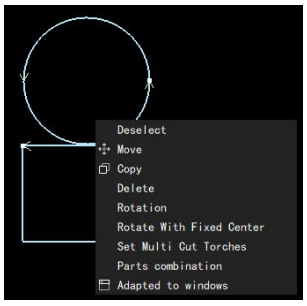
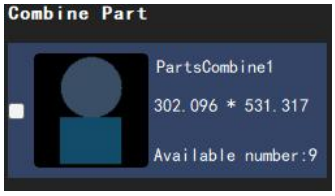
（5）Other parameters

Priority: Determine the layout sequence of parts according to the priority of parts involved in the layout (the priority of parts should be set in the part list);

Priority hole nesting: To enhance the utilization of sheet metal, parts of suitable sizes can be arranged in the 'holes' section of the parts. For example, for a concentric circular part, the inner circle is typically cut off and becomes scrap. If the priority hole nesting option is selected, the system will automatically determine if there are suitable parts that can utilize this part for layout, thereby reducing sheet metal waste;

Sorting material thickness and nesting: If the part and the plate are set with different materials and different thicknesses, check it, and only the parts with the same material and thickness as the plate will be arranged on the plate during layout;

Part combination priority: If there is a part combination, the part combination is prioritized. The part combination is set as follows:

		On the layout board, select the parts you want to combine, right-click the part combination. The combined parts will be displayed in the part list

Keep the current parts in place: If there are already parts in layout, the layout will be performed in other blank areas of the board without changing the current layout;

Automatic increase compensation: set to participate in the automatic increase of compensation for layout parts;

（6）Shared borders

All edges: After checking, all parts involved in the layout will be arranged with common edges;

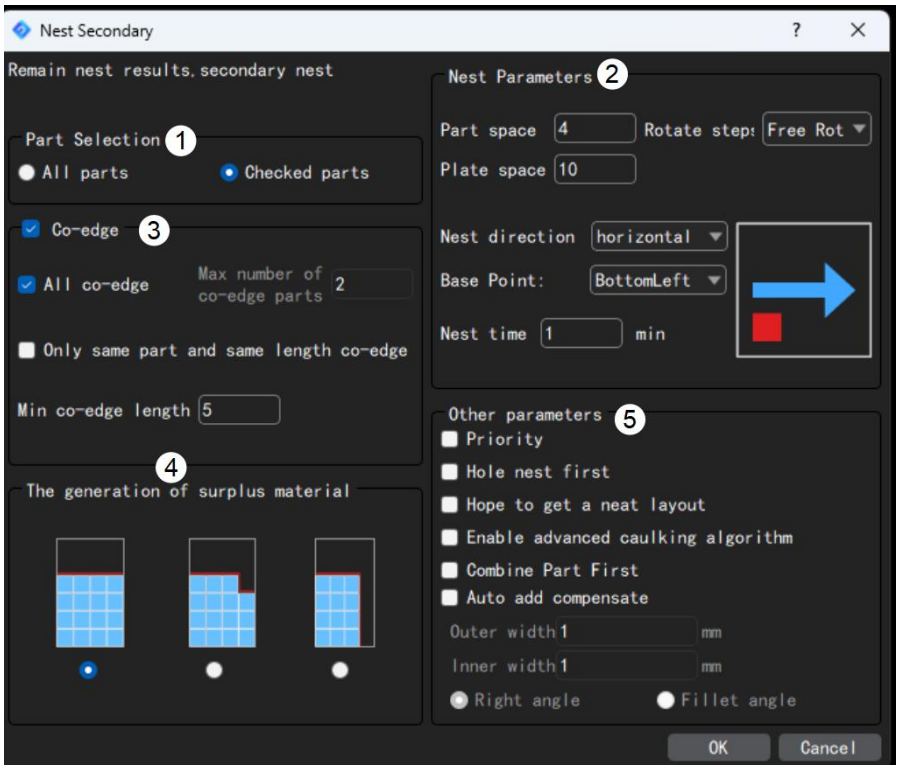
Maximum number of parts sharing a common edge: Set the maximum number of parts participating in a common edge. This function is only valid when "all common edges" is not checked;

Only parts of the same length and common edge are set: only parts of the same shape are set to have a common edge, and the edges of the common edge parts are of the same length;

Minimum number of parts with common edges: The length of the part edge set to be shared is less than the length of the part edge that does not participate in the common edge. This function is only valid when "only parts with the same length share the common edge" is selected.

7. Secondary nesting

The secondary layout can retain the results of the already typeset area and continue to typeset in the untypeset area



(1) (2) (3) (4) (5) For the meaning of parameters, please refer to "Automatic sampling

." Parameter introduction

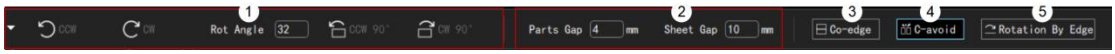
Hope for neat layout: If you select this option, the algorithm will try to optimize and generate a neater layout according to the current layout.

Enable advanced joint filling algorithm: If this option is selected, the system will use a more advanced algorithm to optimize the gaps between existing parts

for part layout, which may take longer to assemble.

8. Manual sampling

The software supports manual layout, allowing users to drag and drop parts from the part list into the layout area. During the dragging process, the parts will remain suspended over the mouse pointer. Users can freely move the parts and place them in suitable positions for layout, while also performing various manual layout commands, such as inserting new parts, deleting parts, rotating parts, mirroring parts, and copying parts.



（1）Manual rotation: you can rotate the typesetting parts as needed, and you can customize the rotation Angle;

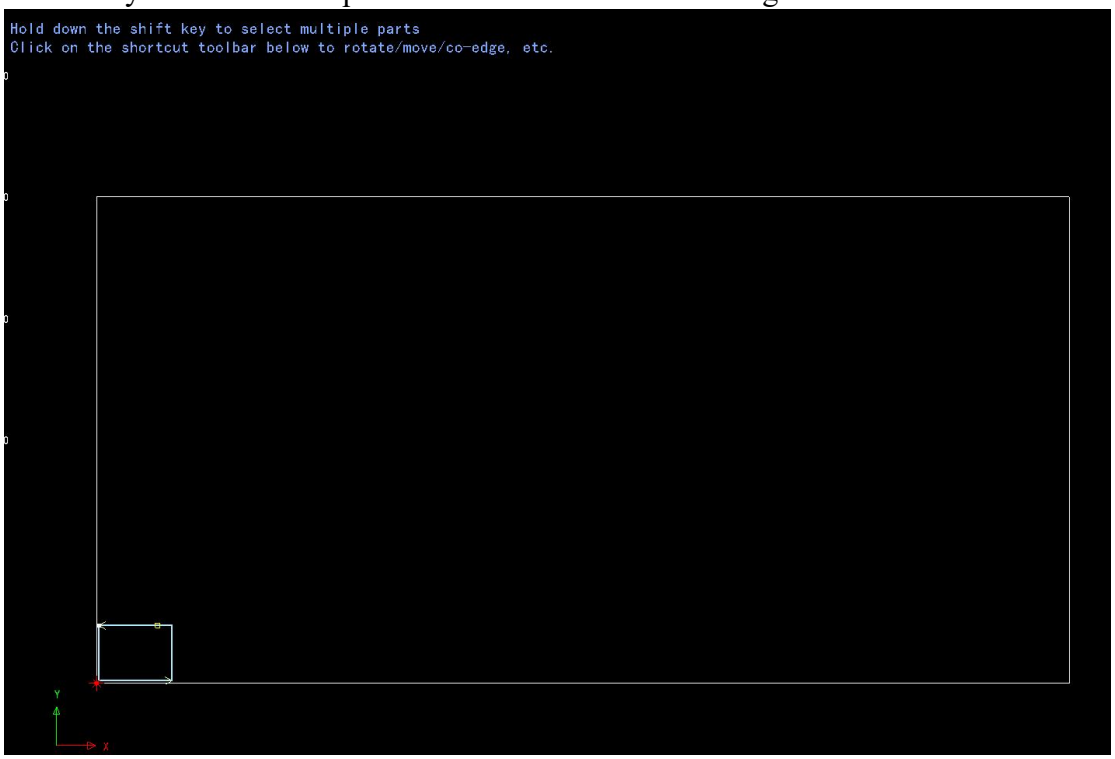
（2）Part and plate spacing: set the spacing between parts, set the spacing between plates and parts, which is consistent with the function in automatic layout;

（3）Common edge: When the software is opened, it can automatically set common edge for parts that can be shared;

（4）Anti-collision: In the off state, the layout function will not restrict parts overlapping or placing outside the plate; but when it is on, the system will automatically limit these operations, thus effectively avoiding layout errors.

（5）Rotate by edge: You can specify the edge of a part as the rotation center to rotate the part.

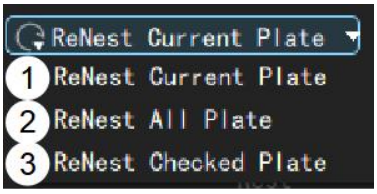
Note: When typesetting manually, the upper left corner of the part can provide various commonly used shortcut operations under the default setting.



9. Stay close to the common edge

In the manual layout process, you can select parts that have not yet been shared to set up shared edges.

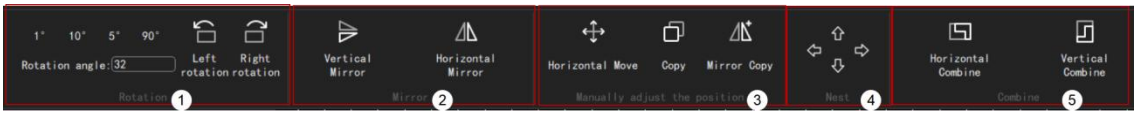
10. Resort to the current one



（1）Reorganize the current: reformat the existing board;
（2）Rearrange all panels: Rearrange all panels in the panel list;
（3）Reorganize selected panels: Reorganizes the selected panels.

11. Component layout

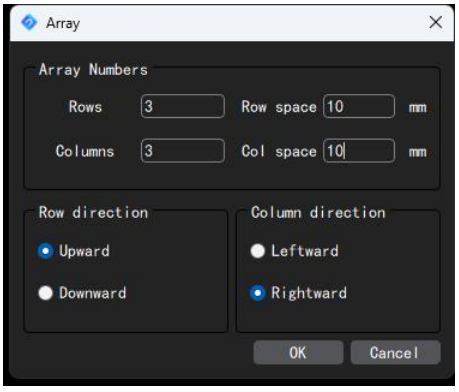
The layout function supports rotating, mirroring, copying, moving, and repeating the layout of a part that has already been laid out.



Rotation: Set the value of rotation Angle to accurately control the rotation Angle of one or more selected parts;
Mirror: Perform vertical and horizontal mirror reversal on one or more selected parts;
Manual position adjustment: Perform move, copy, and mirror copy operations on one or more selected parts;
Sampling: repeat the arrangement of one or more parts currently selected in the specified direction until the plate area in that direction is filled;
Combination: copy one or more selected parts horizontally or vertically for layout;

12. array

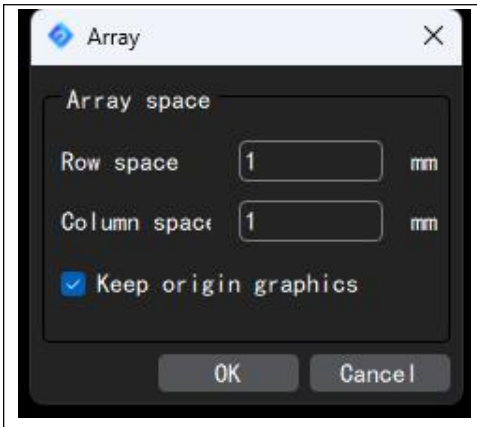
Array graphics is a type of layout that replicates a specified number of graphic objects in a specific direction from a specified part as the starting point.



rectangular array

Starting from the currently selected and formatted part, the layout of the current part is automatically arranged by setting the number of rows, columns and array direction.

Note: The product of the number of rows and columns is the number of layout parts generated. Ensure that the number of available parts in the part list is equal to or greater than this number, otherwise the array will fail.



The interaction array

Select the already typeset parts. You can select the starting point of the layout by clicking with the mouse, and then drag the mouse to achieve array layout. During the layout process, the system will automatically adjust the number of parts according to the total number of available parts.

Keep original graphics: If this option is selected, the selected part will be retained; if not, it will be deleted automatically.

13. Setting of surplus material

（1）Automatic surplus material: automatically set the surplus material range according to the current layout and blank area of the plate;

（2）Clear the leftover line: Clear the set leftover range:

（3）Save the surplus line: save the set surplus as DXF file;

（4）Draw the waste line: manually draw the waste range.

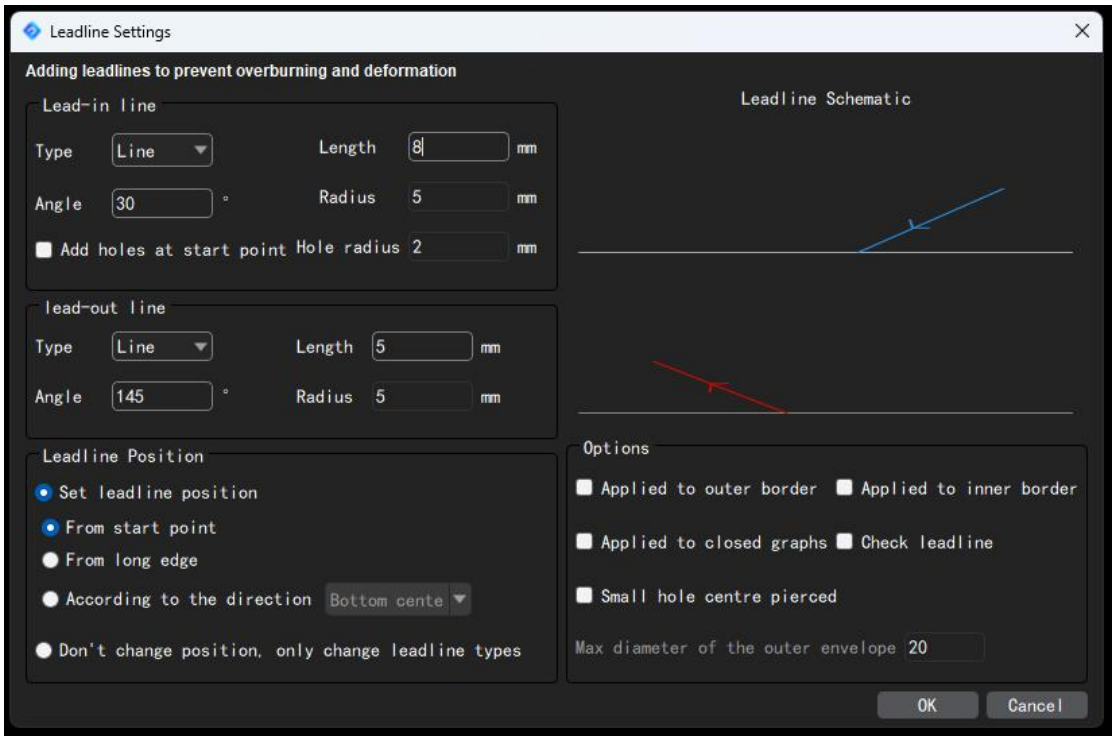
14. imitate

The software supports cutting simulation for layout boards, and the simulation speed can be adjusted.

2、Graphics craft

1. lead wire

Lead function supports automatic and manual lead addition.



（1）Supports line types including straight lines, arcs, and combinations of straight lines and arcs. When setting a straight line, its length can be specified; when setting an arc, the radius of the arc can be specified; for combinations of straight lines and arcs, both the diameter and the arc radius must be specified. Additionally, users can set the angle of the introduction and exit lines and choose whether to introduce from the starting point.

（2）Lead position

From the starting point: from the cutting starting point of the part to introduce the lead-out. From the factory lead-out;

From the long side: If there are different side lengths in the part, the introduction line can be set to introduce the part from the long side;

Select the introduction position according to the direction: you can set which part is the main introduction line, the options are: upper left, middle left, lower left, upper middle, lower middle point, upper right, middle right, lower right;

Do not change the position of the lead, only change the type: after selection, you can change the starting point of the lead by modifying the software to specify any position.

（3） option

Only acts on the outer model: only adds leads to the outer contour of the part;

Only acts on the inner mold: only adds leads to the inner contour of the part;

Applied to closed graphics: If there are parts with common edges, the conventional way of adding leads may cause interference errors. After checking, the

parts with common edges can be added as a whole;

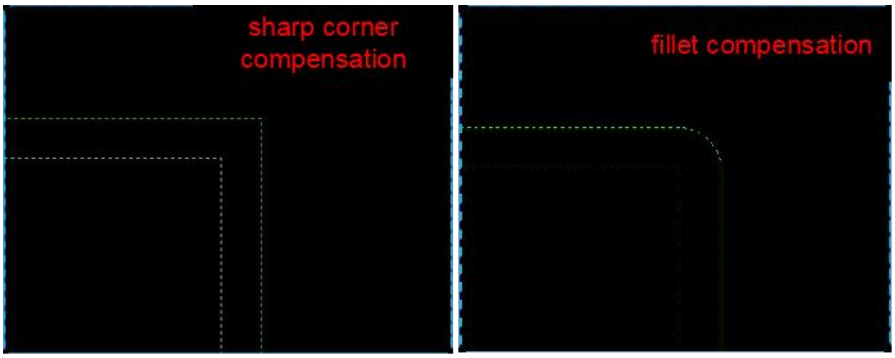
Lead check: automatically check whether there is an error in the addition of lead, and can correct the error;

Punching in the center of the hole: the center of the hole is punched and cut;

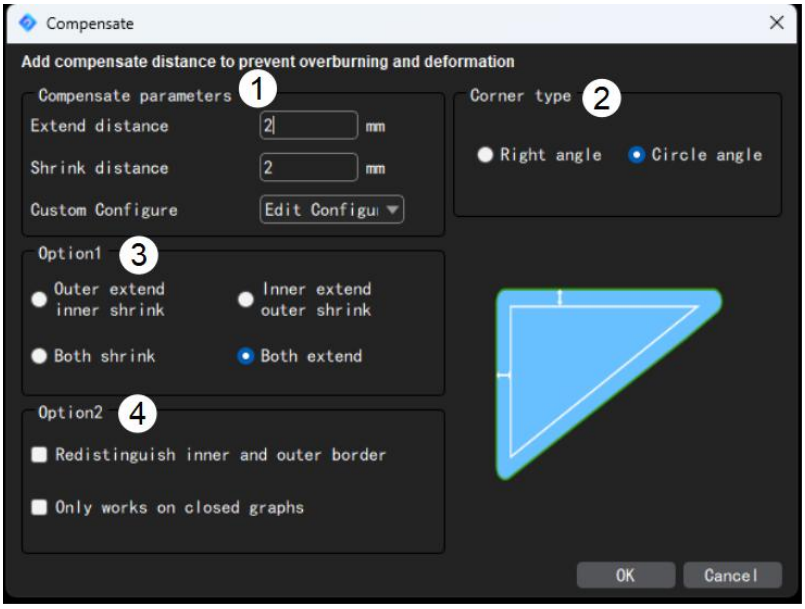
Maximum outer circle diameter: set the outer circle diameter less than or equal to how many is suitable for small hole center perforation.

2. compensate

Compensation is implemented to prevent cutting defects caused by laser or flame during the cutting process. The width of these defects should be measured based on the actual cutting results. The compensated cutting path is displayed in green on the drawing board, while the original outline is shown in white. During processing, the system will follow the compensated path. It is important to note that the original graphic (white line) after compensation will not be processed; it is only displayed on the drawing board for operational convenience.



(The white figure is the original figure, and the green figure is the compensated trajectory)

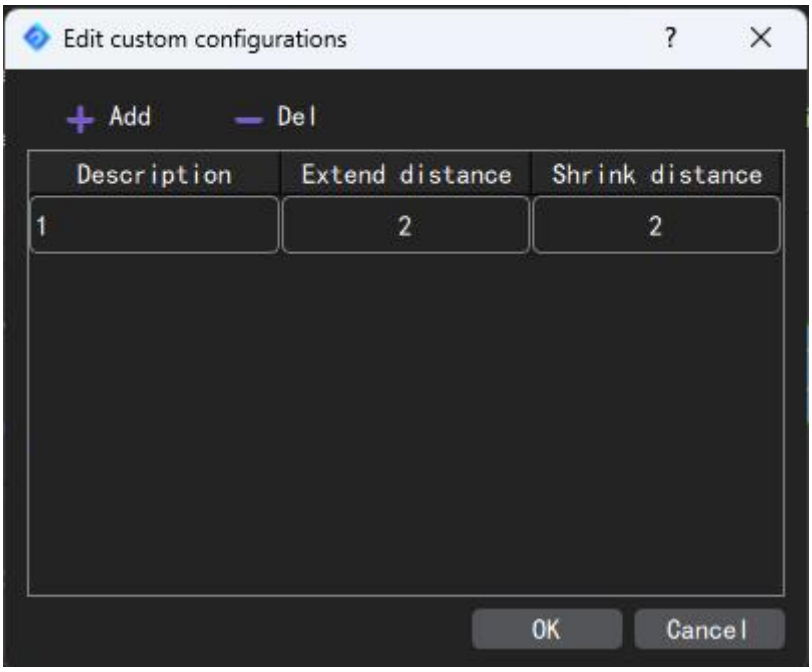


（1） offset parameter

Expansion distance: the part adds compensation distance outward;

Shrinkage distance: the part adds compensation distance inward;

Common configuration: Compensation parameters can be preset for different specifications of parts.



Note: If the compensation value for the smaller contour is set too large, unexpected results will occur.

（2）Corner type

Right-angle compensation: the compensated Angle is a sharp Angle;

Rounded corner compensation: The corner to be compensated is rounded.

（3）Option 1

Compensation method: four ways are expanded and contracted, contracted and expanded, all contracted, all expanded, and all contracted. "Outer" refers to the outer contour of the part, "expanded" refers to the expansion distance, "inner" refers to the inner contour of the part, and "contracted" refers to the contraction distance.

（4）Option 2

Redistinct internal and external contours: If you need to re-distinguish internal and external contours, please check. After checking, the previously set Yin and Yang cutting information will be lost;

It only works on closed shapes: if checked, compensation cannot be added to unenclosed shapes.

3. bridge connection

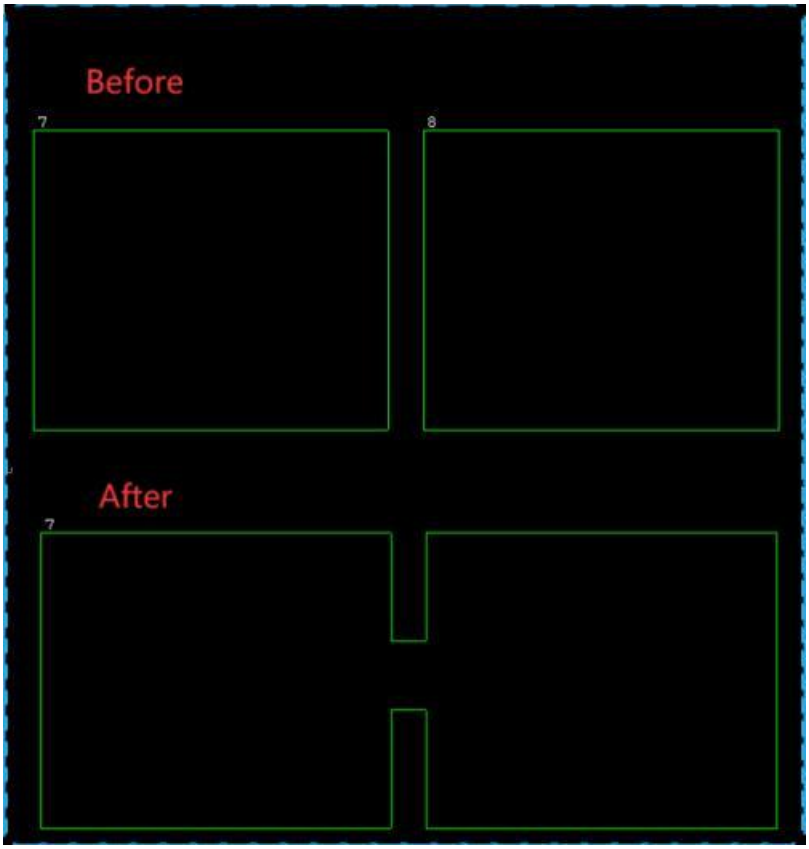
It is primarily used in the process of part cutting to achieve integrated processing

of multiple part profiles. By adding bridging lines between parts, it effectively prevents steel plate deformation and reduces the number of piercing operations required by the cutting machine. The 'bridging' method connects each part, ensuring that the parts do not scatter after cutting. When multiple shapes have bridging points, it can create a single-line effect for all shapes, which is particularly common in connecting text strokes.

The parts that the user draws with the mouse between the two graphics that need to be bridged will automatically bridge.

① The distance between the parts should not be too long, otherwise it is easy to cause material waste;

② Bridge operations are usually performed between the user-selected location and its adjacent parts, and the bridge body must be kept vertical.



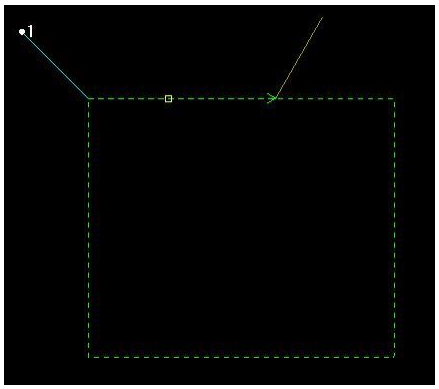
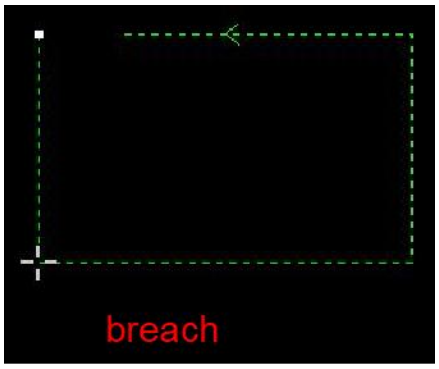
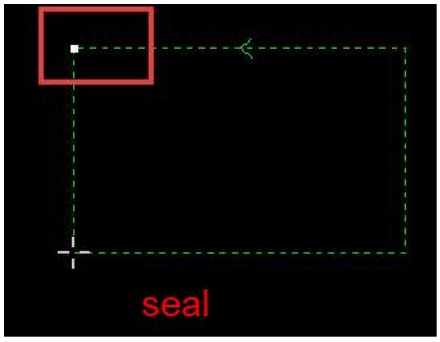
matters need attention ：

① When selecting the bridge function, please note that the bridge operation will close some unenclosed contours to generate new inner contours.

② The effect of thermal deformation on the cut piece should be considered when choosing the bridge path.

4. Cut through the notch. Seal the opening

This function can set the graphics to turn off the fire or light in advance or delay the fire or light, and users can customize the length of the transition\gap.

	**Cut off** Generally, the offset operation is mainly applied to the outer contour and is performed on the original lead line. As shown in the figure, the starting point of the original lead line coincides with the introduction line, and by offsetting outward by 20 mm, the position of the lead line has been moved to the right, as shown on the right side of the figure.
	**breach** The length of the notch can be flexibly adjusted according to specific cutting requirements.
	**seal** For the gap that has been set, click "Seal" to adjust the gap to be closed. It is equal to cancel the seal setting

5. origin

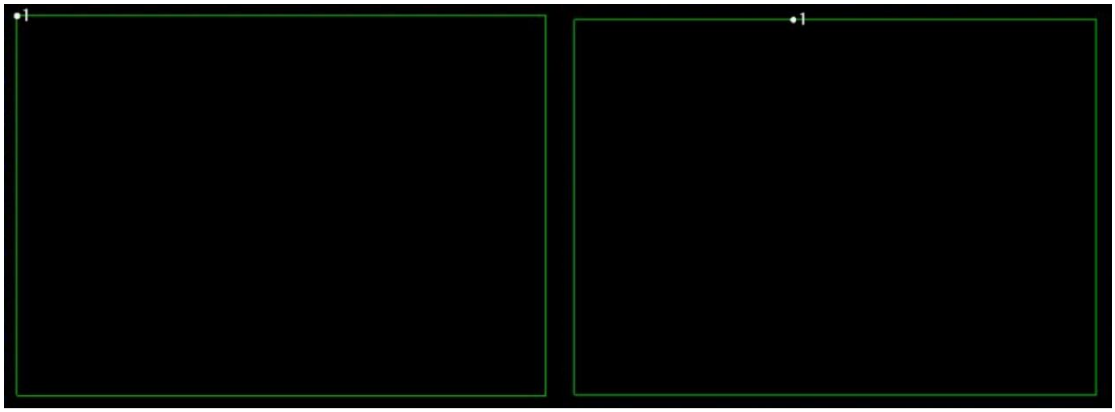
Each part has and only one starting point, which can be set to facilitate the addition of processes and cutting paths

Planning for the perimeter.

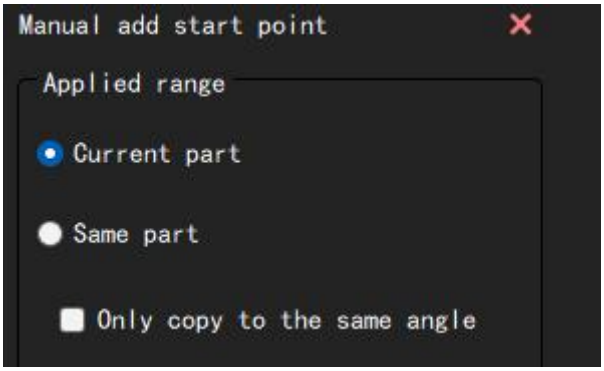
In the layout or drawing interface, click the "Start point" button, and then click a position on the part outline to specify that position as the cutting starting point.

As shown in the figure below, the starting point is placed in the middle of the

outline from the end point position.



When modifying a part that has already been typeset in the layout area, you can set whether to modify only the current part or all identical parts.



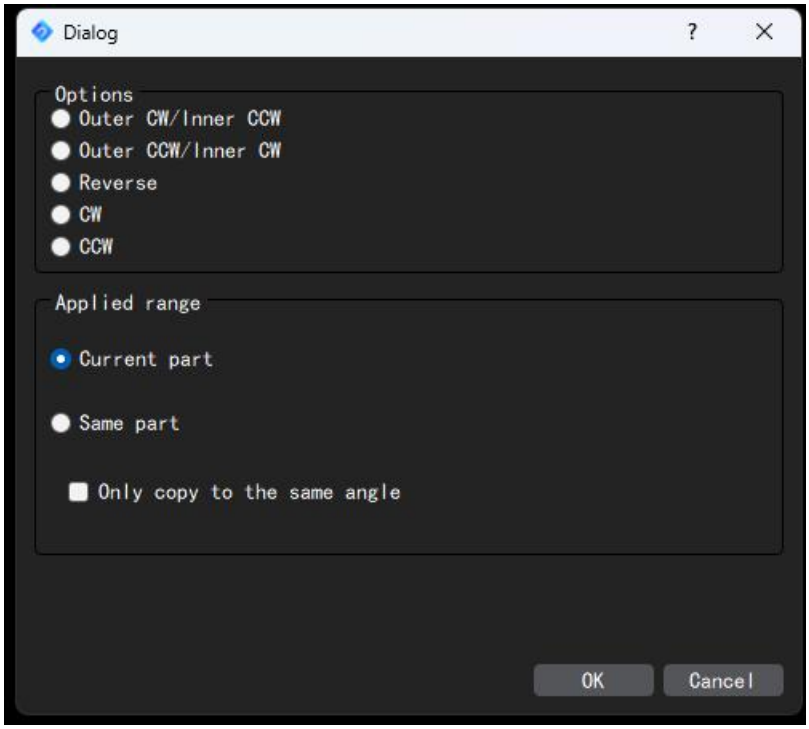
6. direction

According to the machining direction of the selected parts that meet the conditions, a reasonable machining direction can improve the cutting quality 。

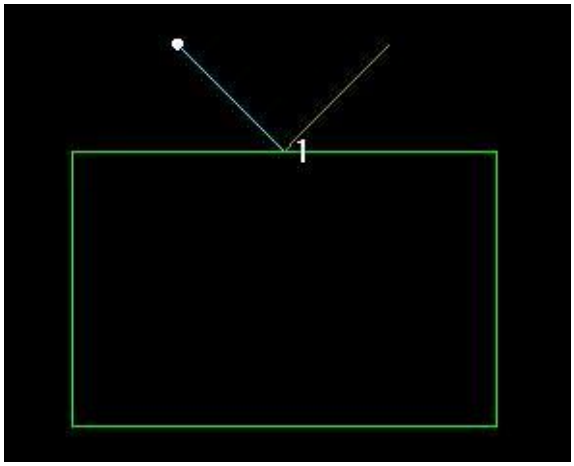
Set direction parameters	function declaration
Distinguish between inner and outer contours	After clicking, the inner and outer contours of the part graphics will be distinguished. This operation will cause the previously set Yin and Yang cutting information to be lost.
External obedience and internal rebellion	The outer contour is displayed clockwise and the inner contour is displayed counterclockwise.
Outward and inward	The outer contour is displayed counterclockwise and the inner contour is displayed clockwise.
opposite direction	Change the cutting direction of the piece to the opposite direction.

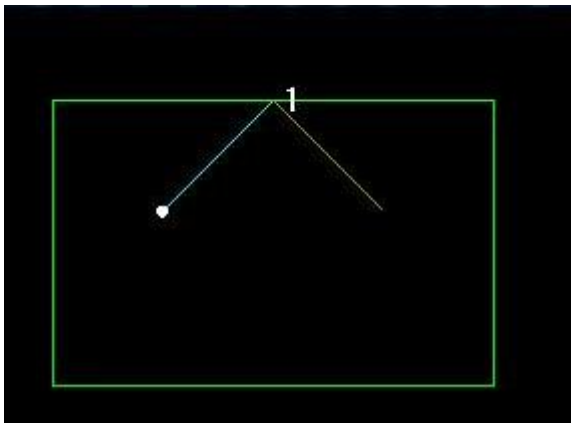
anticlockwise	Change the cutting direction of the piece to clockwise.
clockwise	Change the direction of part cutting to clockwise.

When modifying a part that has already been typeset in the layout area, you can set whether to modify only the current part or all identical parts.



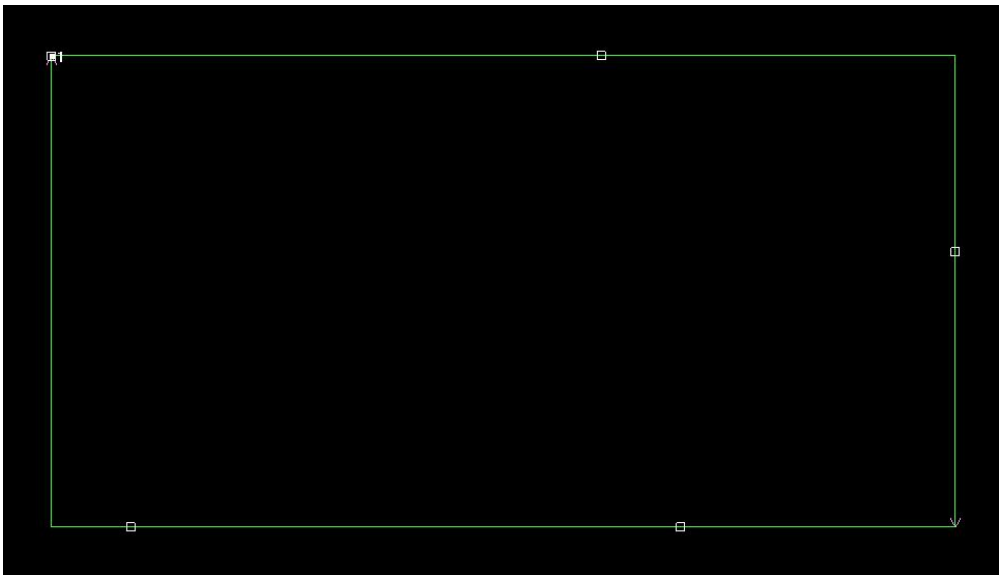
7. Vaginal/cutaneous

	**The sun is setting** Move the lead outside the outline.

	Vulva: Move the lead to inside the outline. When adding the lead, the outer mold is a positive cut, introduced from the outside and into the inner mold For undercut, it is introduced from the inside. Users can manually set the undercut and yang cut for the selected parts

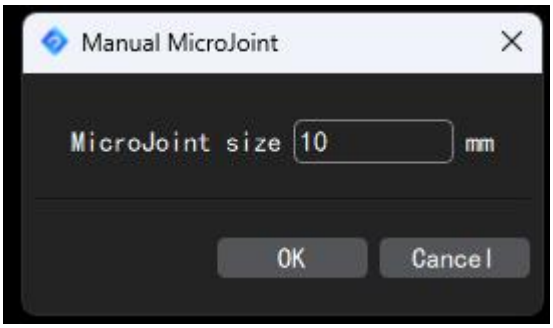
8. Micro-link

To insert several small segments without cutting in the contour path, this method prevents the part from lifting after cutting, ensuring it does not fall off after processing. When cutting reaches this point, the power and light are turned off; whether to turn off the gas and follow-up is determined by the parameters related to the short-distance air movement during cutting. In the nesting software, micro-connections are displayed as white rectangular boxes, as shown in the figure below

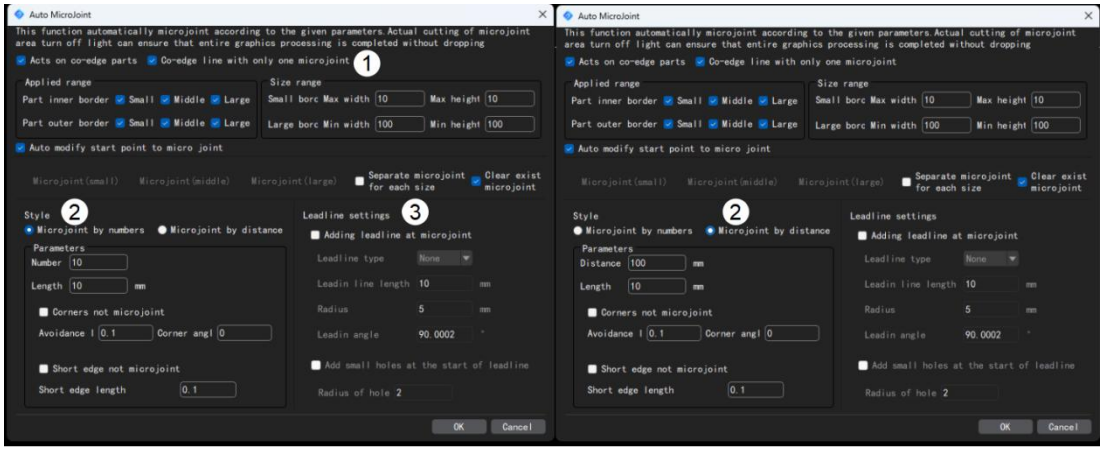


The operation of "micro-link" supports "manual micro-link", "automatic micro-link", "drawing line micro-link" and "exploding micro-link".

Manual micro-link: Set the size of the micro-link and whether to apply similar contours, and then manually specify the location of the micro-link.



Automatic microconnection: automatically add microconnection to parts according to the set parameters.



（1） applied range

Part inner profile: set the part inner profile micro connection, and set parameters according to the size range

Add micro-link to the outline type of dynamic check;

Part outer contour: Set part outer contour micro connection, and set parameters according to the size range

Add micro-link to the outline type of the motion check box.

（2） pattern

Add micro connection according to quantity: automatically add micro connection to parts according to the number and length of micro connection;

Add micro-link and micro-link length according to the set distance interval;

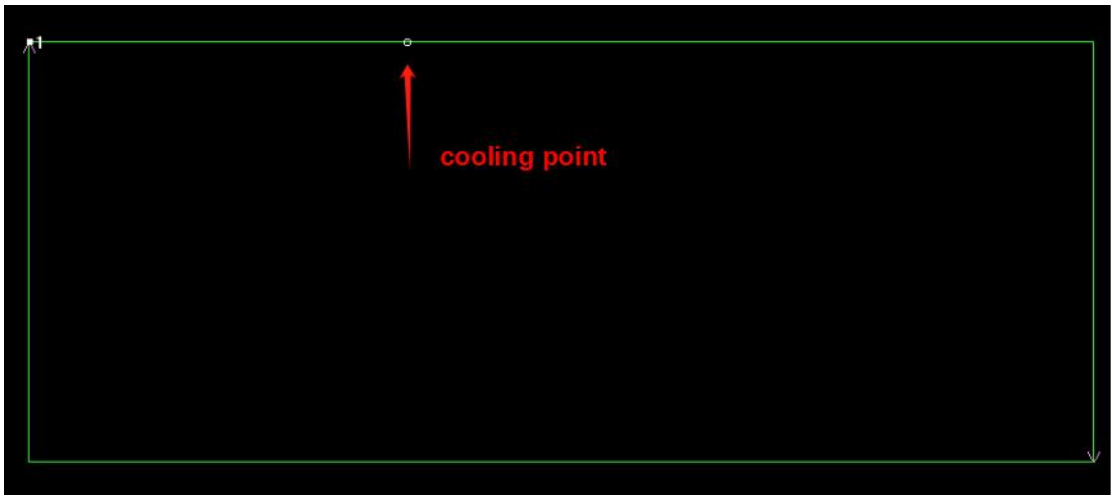
No micro connection at the corner: set the corner Angle and length, no micro connection is added;

Shortcomings are not micro-connections: if the length value is less than the set value, no micro-connections are added.

（3）Lead setting

Add lead at micro connection: Set add lead at micro connection. Refer to the function description of "Lead" for the meaning of lead parameters.

9. Cooling point

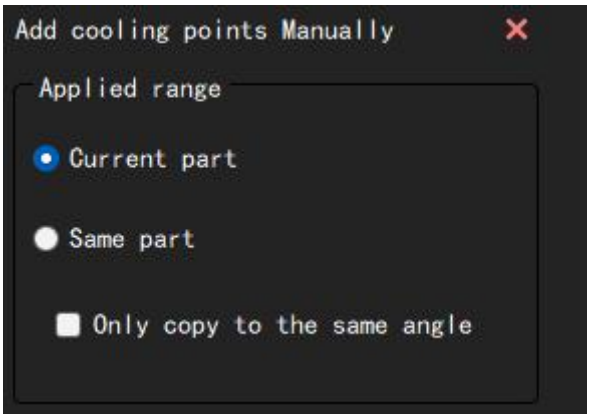


The "cooling point" function refers to the process of cutting, when the cooling point is executed, the laser will be turned off, and the delay blowing will be carried out according to the relevant setting of the cooling point in the global parameters, and then the laser will be turned on to continue normal cutting.
Cooling points are usually used in corner processes, where a pause is made at the corner, the laser is turned off and blown to prevent the material from burning.

Similar to the micro-link function, multiple cooling points can also be inserted by clicking continuously. Cooling points can still be added after performing processes such as micro-link and compensation.
When cutting thick plates with oxygen, the reasonable setting of cooling point can effectively reduce the overheating phenomenon of sharp corners.

Automatic cooling point: Add parts that need to be added to the cooling point in batches according to the set parameter value. Yes
Add at the starting point and the corner.

Manual cooling point: Select the position where you want to add a cooling point on the part graphic and click to set a cooling point at this position.



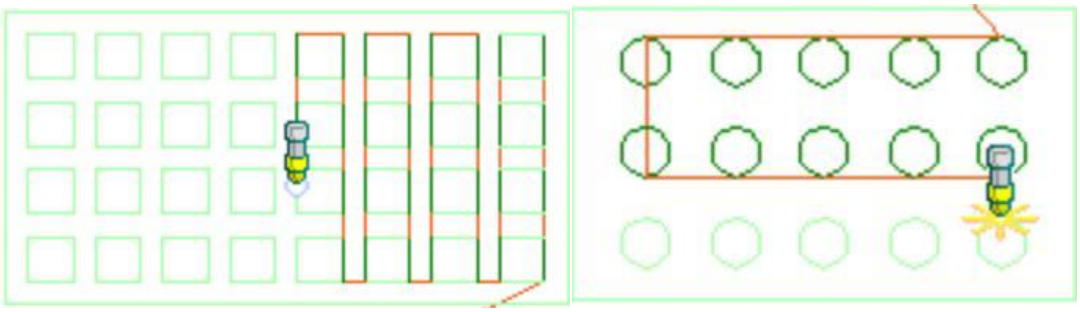
Note: When setting the starting point in the discharge area, you can set the cooling points for all identical parts that have been laid out in batches.

10. Flick

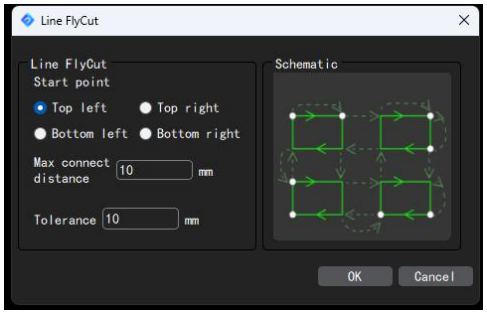
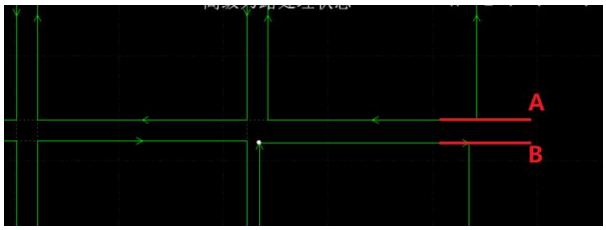
"Flight cutting" is applied to the processing of regular graphics (circle, square) array, using the optimal processing path specification
It can greatly improve the processing efficiency and reduce the processing time. The

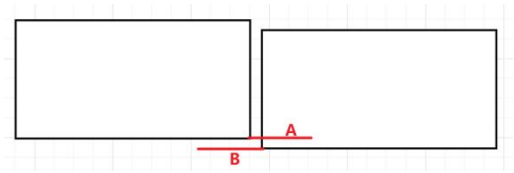
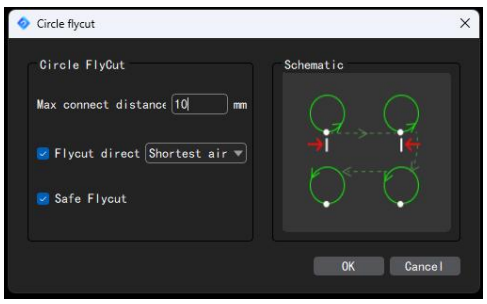
frame selection needs to carry out the flight cutting of the graphics (matrix), click the "flight cutting" button to complete the flight cutting path planning, and click the simulation to view the actual running trajectory.

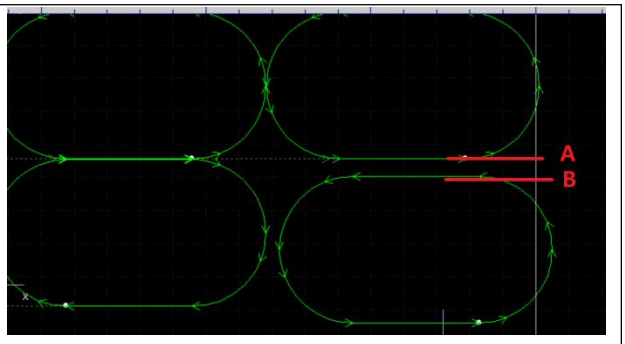
If the selected graphic does not meet the flight cutting conditions, the flight cutting path planning cannot be completed, and the message bar will
Prompt "The current graphic cannot be cut!



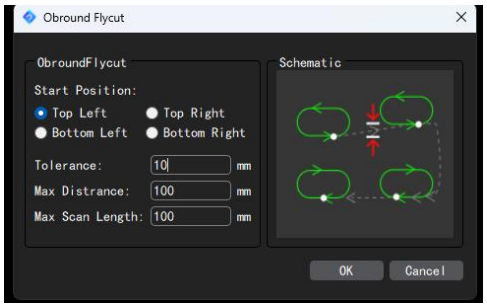
Fly cut parameters

<table>
<tr>
<td> 
</td>
<td>Straight cut
Start: Set the starting position of the contour fly cutting;
Maximum connection distance: the spacing between horizontal straight segments A and B, as shown in the figure below:
 

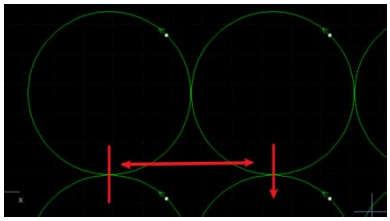
Maximum distance deviation allowed: the maximum vertical distance between horizontal segments A and B, as shown in the figure below:
 
</td>
</tr>
<tr>
<td> 
</td>
<td>Circular flying cuts
Maximum connection distance: the distance between straight sections A and B;</td>
</tr>
</table>



Fly cut direction: set the fly cut direction;
Safe flycut: Check whether the current flycut intersects with the generated flycut path. If there is an intersection, give up this connection.

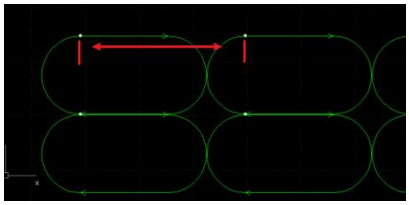


Runway flying cut
Start: Set the starting position of the contour fly cutting;
Error: In the process of path splicing, it is used to judge whether the starting point or endpoint of two graphs are "close enough" to determine whether they can be directly connected;
Maximum smooth connection distance: the distance between the centers of two circles, which is used to determine whether different lines can be connected by Bezier scan lines, as shown in the figure below:



Note: If the parameter setting is not appropriate, different lines may not be connected.

Maximum flight length: This parameter determines whether two adjacent trajectories in the same dimension can be connected by a scan line, meaning they can be grouped together. The maximum allowable distance between shapes is set; if the spacing between processed shapes exceeds this value, flight cutting cannot be performed. This distance refers to the spacing between the starting

	points in the original shape array, and even if the starting point positions are modified later, this distance will not be affected;  Note: If the parameters are not set properly, such as less than the spacing between adjacent trajectories (the distance between start points), these two trajectories cannot be connected by a straight scan line.

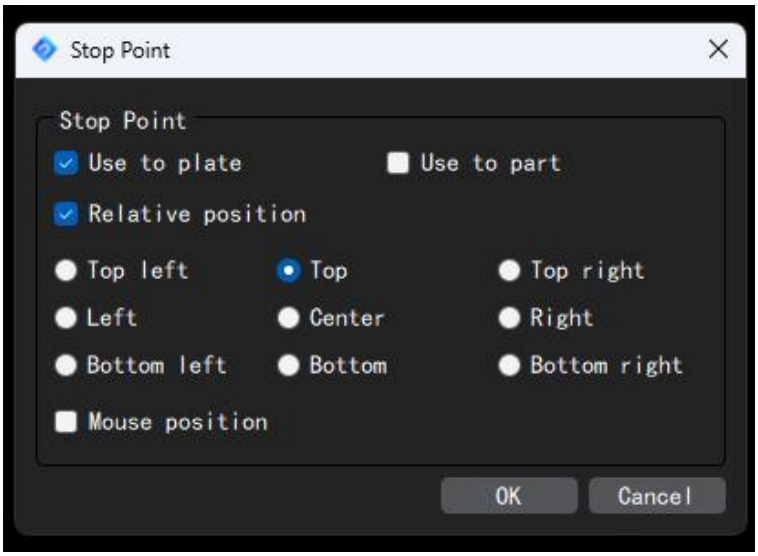
11. ring cutting

Because the corner of the part is easy to damage, which will affect the quality of the whole part, in order to effectively avoid the damage of the part, you can define the size of "surrounding cutting corner" in the cutting parameters, and add the corresponding surrounding structure outside the contour corner.

After selecting the figure, click the "ring cutting" button in the process column to obtain a better sharp corner cutting effect.

When performing the circular cutting process, the software first checks the conditions to determine whether corner processing is required,
Then the corresponding processing operation is performed according to the judgment result.

12. A docking point



The "stop point" function can set the stop position as the zero point of the machining object for a plate or a single part. When the user completes the setting of the stop position and starts the machining, the program will automatically align the stop point with the position of the cutting head, and the graphic position in the view area will be updated synchronously.

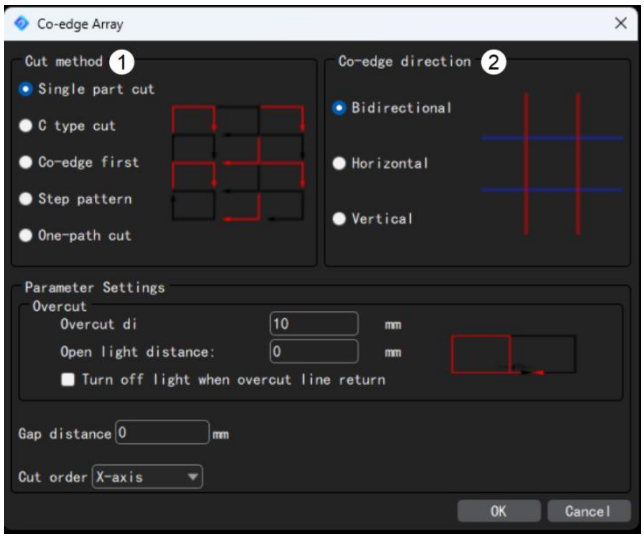
① Relative position: set the docking point in the relative position of the plate or part;

② Dock at the mouse specified position: you can manually specify the docking position inside the plate or part.

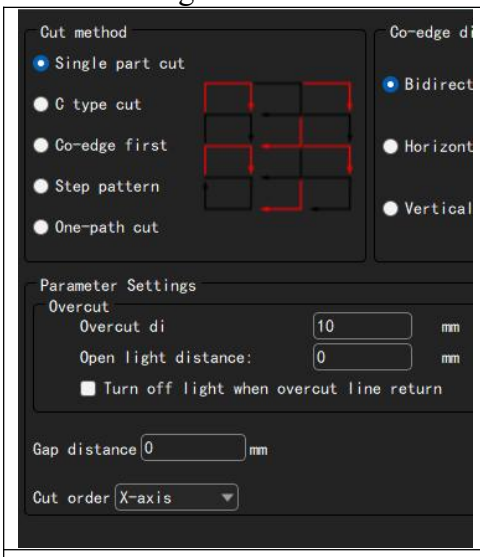
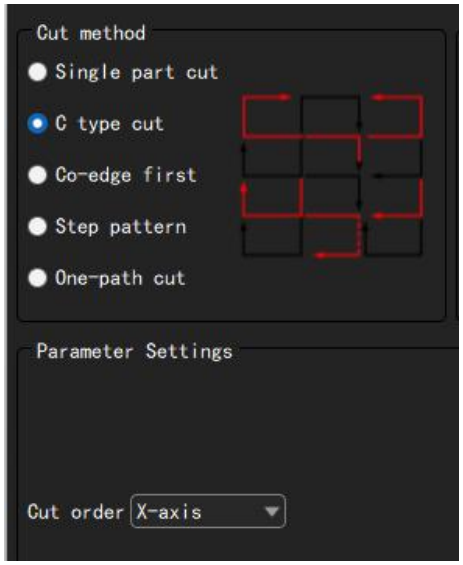
Note: After completing the manual setup of the stop points, it is recommended that users conduct a simulation run to verify if the machining pattern is within the machine tool's effective processing range, ensuring operational safety. Additionally, the setting of stop points should take into account the constraints of the plates or parts, and they should only be placed at the edges or internal areas of the plates or parts.

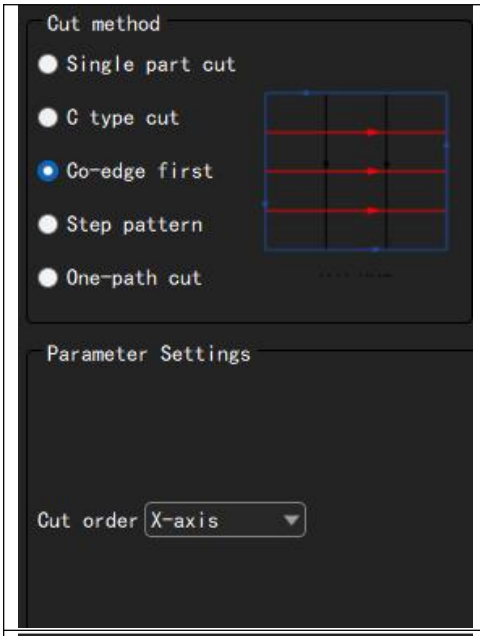
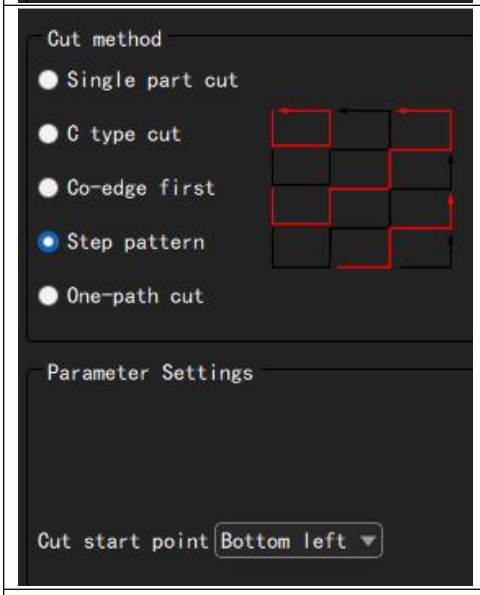
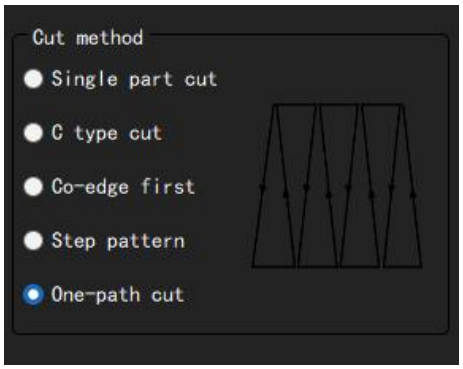
13. Shared border arrays

"Array of adjacent edges" is an array of adjacent edges for a single part. After the part array is completed, it is directly processed
In the state of common edge.



（1）Cutting method

	**Single part cutting** Cut off one part and then cut the next, cutting the common edge only once
	**Type C shares the same side** Similar to the cutting path of a single part, the difference is that the three sides of the C-shaped parts are cut together. The common side will be cut when cutting the next part, and so on. In this way, the first part will be dropped only when cutting the second part, so as to avoid the lifting and shaking of the parts.

	**Shared borders take precedence** First, cut the common edge of the part, and then cut the outer frame. This common edge method is usually suitable for the processing of more regular rectangular parts, which can quickly process straight strips and reduce the number of perforations. In the common edge type with common edge priority, a notch process can be introduced to reduce the collision phenomenon caused by thermal deformation.
	**The trapezoids share a side** The cutting path adopts trapezoidal trajectory, which is mainly suitable for the machining of thick plate rectangular parts. This method can effectively prevent edge lifting, reduce the number of empty walking and perforation, and improve the machining efficiency.
	**One stroke of cutting** For some graphics, a "one size fits all" path planning can be implemented to reduce empty walking and perforation.

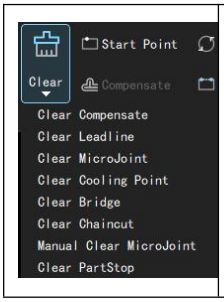
For thicker plates, it is usually necessary to add a cut compensation. After the compensation of parts that need to be shared, the shared operation is performed. If the shared graphics already contain compensation, the trajectory after compensation will be retained after the "shared" operation is completed.

Note: Common edge material is only suitable for parts with more right angles for

common edge processing, for complex structure,
For parts with more curves, it is not recommended to use the common side layout processing method.

14. clean up

Remove the set part process.



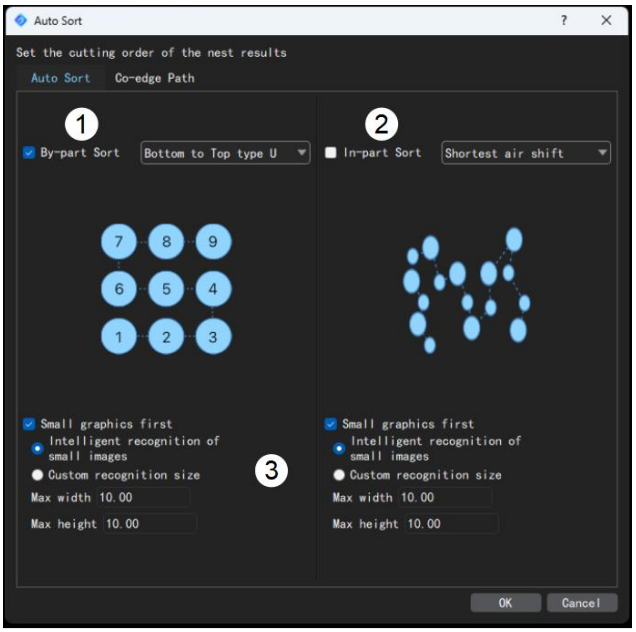
For more details about the cleanup function, see the corresponding introduction.
You can choose to clear the process settings for the selected parts or all parts.

3、 sort

The software provides a variety of sorting strategies, and users can choose the appropriate strategy according to the actual cutting pattern to reduce the length of empty movement and improve the processing efficiency. All automatic sorting strategies distinguish between inner and outer molds, and inner mold graphics are always prioritized.

If the outer shape is a non-closed shape, this function may not work. The software distinguishes between parts and supports sorting the outer contour and inner contour separately.

1. Auto-sort



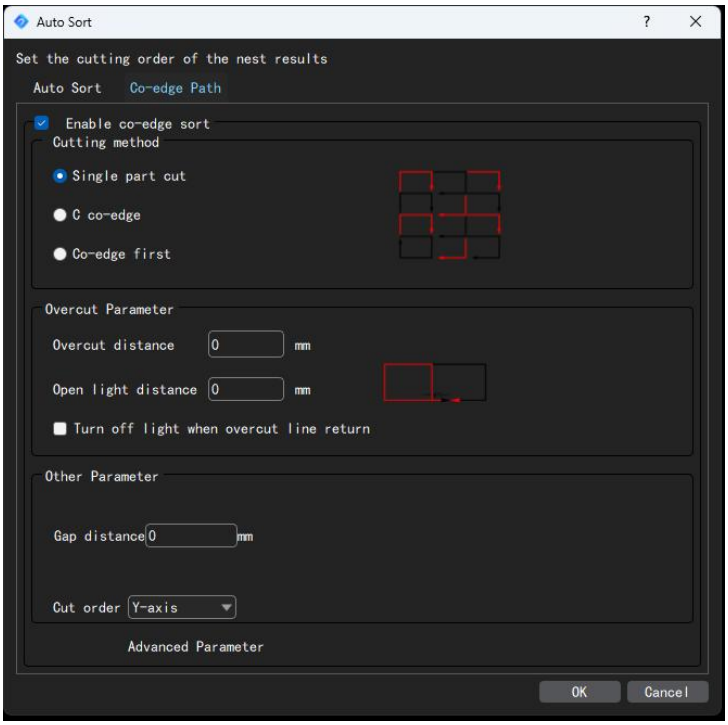
（1）Part sorting: set the cutting order between parts according to the preset order;
（2）Part sorting: set the cutting order of multiple inner contours in a single part;
（3）Small graphics priority: For small parts, users may prefer to prioritize cutting them to prevent the deformation of smaller parts after larger ones have been cut, which could affect processing accuracy. To achieve this, users can select the 'small graphics priority' function, which prioritizes the processing of smaller graphics based

on the layout results. The small graphics can be processed in two modes: 'intelligent recognition of small graphics' and 'custom size.'

In the mode of intelligent recognition of small graphics, the software will take graphics with a size less than or equal to 10x10mm as small graphics by default; while in the mode of custom recognition of size, users can set their own size standards to determine small graphics according to their own needs, so as to meet different processing requirements.

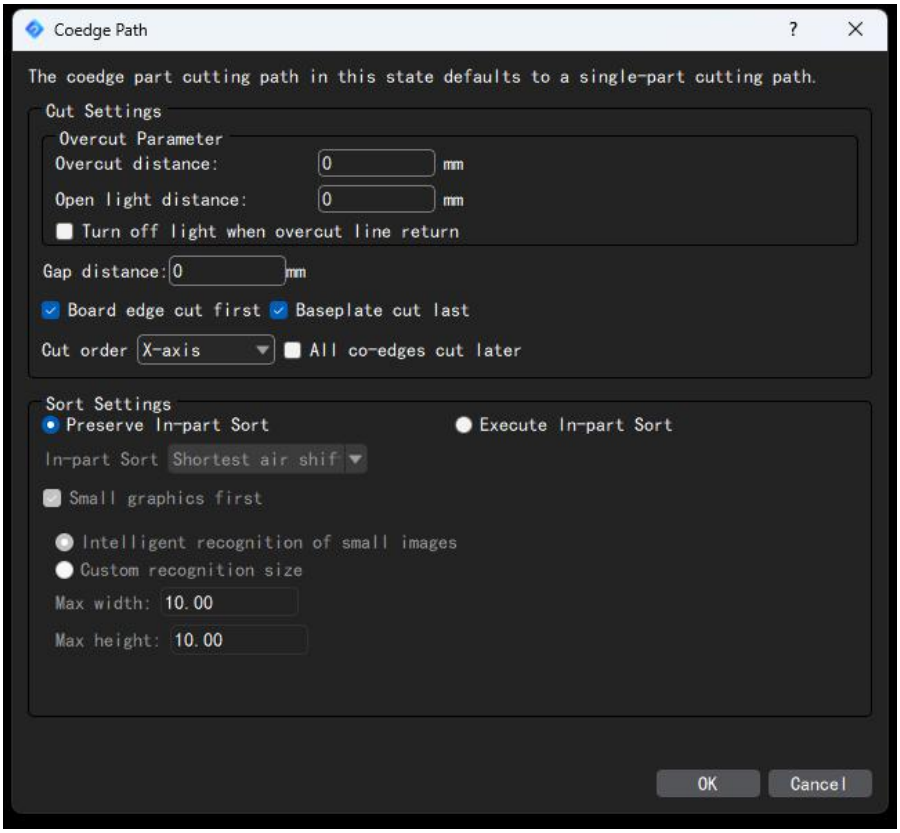
Note: The drawing area is sorted according to the graphic outline information, and does not distinguish between internal or external sorting methods.

2. Shared border route



Enable common edge sorting: set the cutting order for parts that have common edges, such as single part cutting and C-type common edge
Common edge is preferred. Please refer to the introduction of "common edge array" for parameters.

3. Deep sequencing



When parts have been implemented as common edges, all common edge parts will be considered as a whole, so the regular sorting Settings may not work. In this case, you need to enable the "deep sorting" function so that common edge parts can be sorted Settings like ordinary parts.

4. Sort manually

If automatic sorting does not meet the requirements, you can choose to use manual sorting.

（1）Part-to-part sorting and part-to-part sorting:

Part sorting: set the cutting order between parts according to the preset order;

Part sorting: set the cutting order of multiple inner contours in a single part;

（2）Start sorting: Enter the manual sorting mode, you can click the parts in the order of the parts to specify the cutting order between parts.

（3）Complete the rest: Click "Start sorting" and then click "Complete the rest" if the user thinks that the subsequent sorting effect can meet the cutting requirements. The software will automatically complete the sorting of the remaining parts.

（4）From this order: Click "Start sorting", and then click "From this order". At this time, the sequence of parts whose serial numbers are not changed will be continued from the current part for subsequent manual sorting operations;

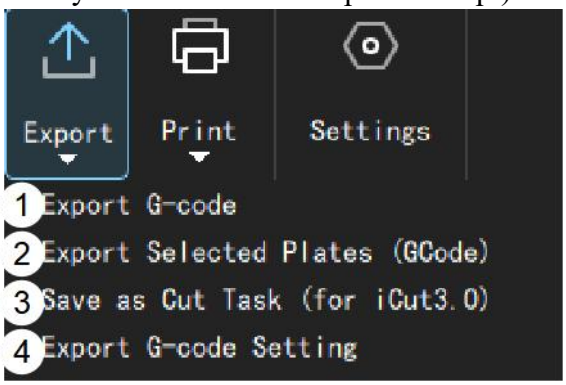
（5）Back: If you accidentally make a mistake, you need to reorder from the wrong place. You can undo the operation steps of the current part;

（6）First: move the selected graphic to the first processing;

（7）Finally, move the selected figure to the last processing;
（8）Forward: Move the selected graphic processing order forward by one;
（9）Move back: Move the selected graphic processing order one step back.

4、Export the cut file

After the layout work is completed, it is necessary to generate the CNC cutting program and hand it over to the CNC system for processing. At this time, the following operations are required:
First, set the corresponding parameters. After setting, select the layout content to be output in the sidebar of the layout result, and then save the file to the local folder through the "Export NC" function.
Secondly, the software supports front and rear functions, and can be compatible with the code format of third-party systems (currently supports Baichu, Weihong and Jiaqiang, and other brand systems can be developed to adapt).



1. Export G code

Click the "Export" button to export all the layout cutting files of the panels in the panel list in batch.

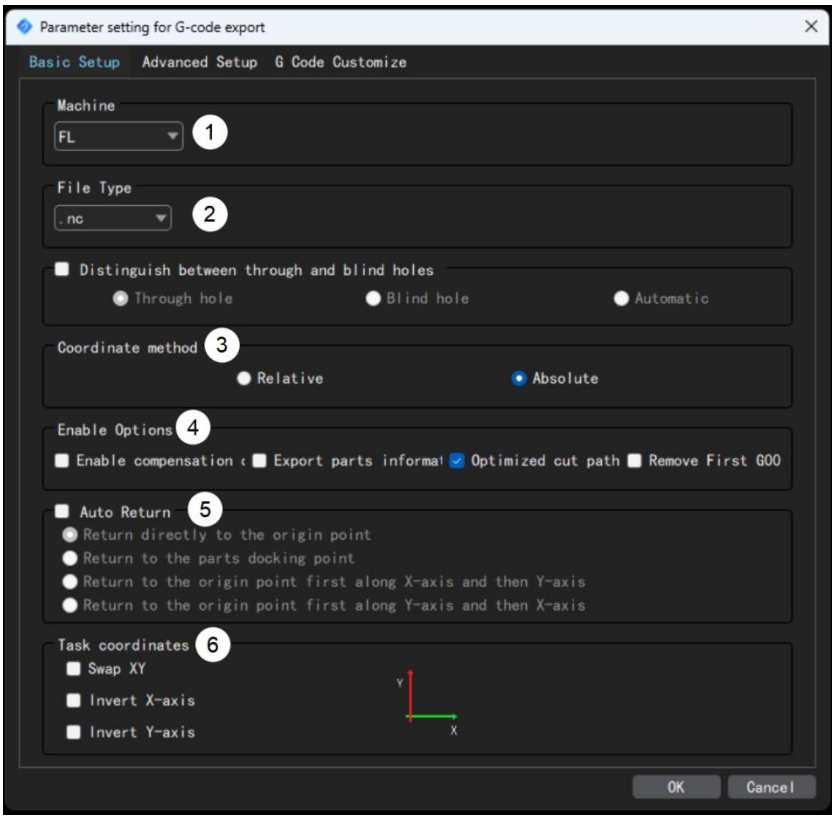
2. Export the selected sheet

Export the cutting file for the selected and formatted sheet.

3. Export processing task package (iCUT3.0)

It is only applicable to Shanghai Fangling L8200 CNC system, which can generate multiple layout files into batch cutting task files and import them into the CNC system for processing operation at one time.

4. G code export Settings



（1）Machine: you can choose some export code formats preset by the software, such as FL=standard G code format, CpyNest=Bochu system format, etc.;

（2）File format: support nc, cnc, txt file format export;

（3）Coordinate mode: select relative coordinate or absolute coordinate according to user requirements;

（4）Enable options:

Enable compensation code: After checking, the generated cutting code will contain the tool compensation command (G41, G42) and the tool compensation command (G40).

Carry part information:

Optimize continuous cutting path:

Remove the first G00:

（5）Automatic return: After all parts are cut, the machine tool cutting gun will return to the starting point of the steel plate. The return path can be selected

① Go back to the origin;

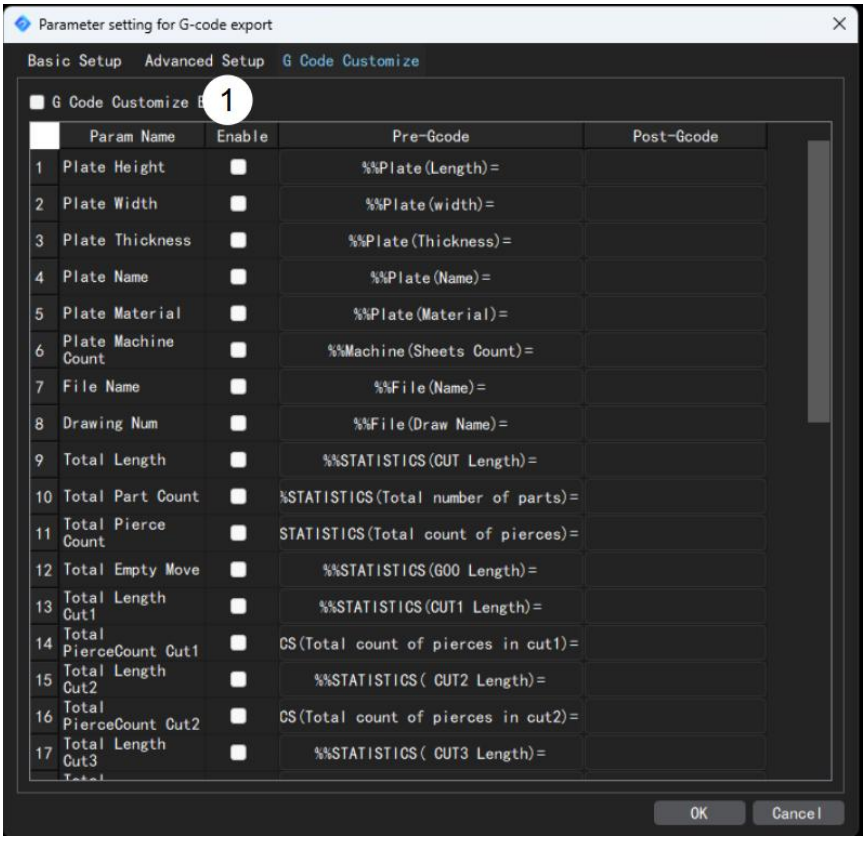
② Return the part docking point (the part docking point needs to be set in advance);

③ First go along the X axis and then back to the origin along the Y axis;

④ First go along the Y axis and then back to the origin along the X axis.

（6）Task coordinates: Based on the actual coordinate system of the machine tool, changing the X value means reversing the direction of the X-axis; a positive value will become negative. Similarly, changing the Y value means reversing the direction of the Y-axis; a positive value will also become negative. Swapping XY means

swapping the X and Y coordinates.



（1）Custom G code

If the required G code format is not preset in the "machine" option, such as Weihong, Jiakang and other systems, you can enable the custom code function to set the code according to the requirements of each system's G code format. You can contact our technical staff for guidance on this function.

5、Print the report

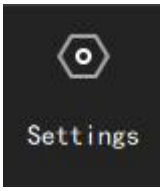
（1）Print: Print all typeset boards;

（2）Print selected plates: only print the selected and typeset plates;

（3）Print cost accounting sheet: print cost table according to the budget plate parameters;

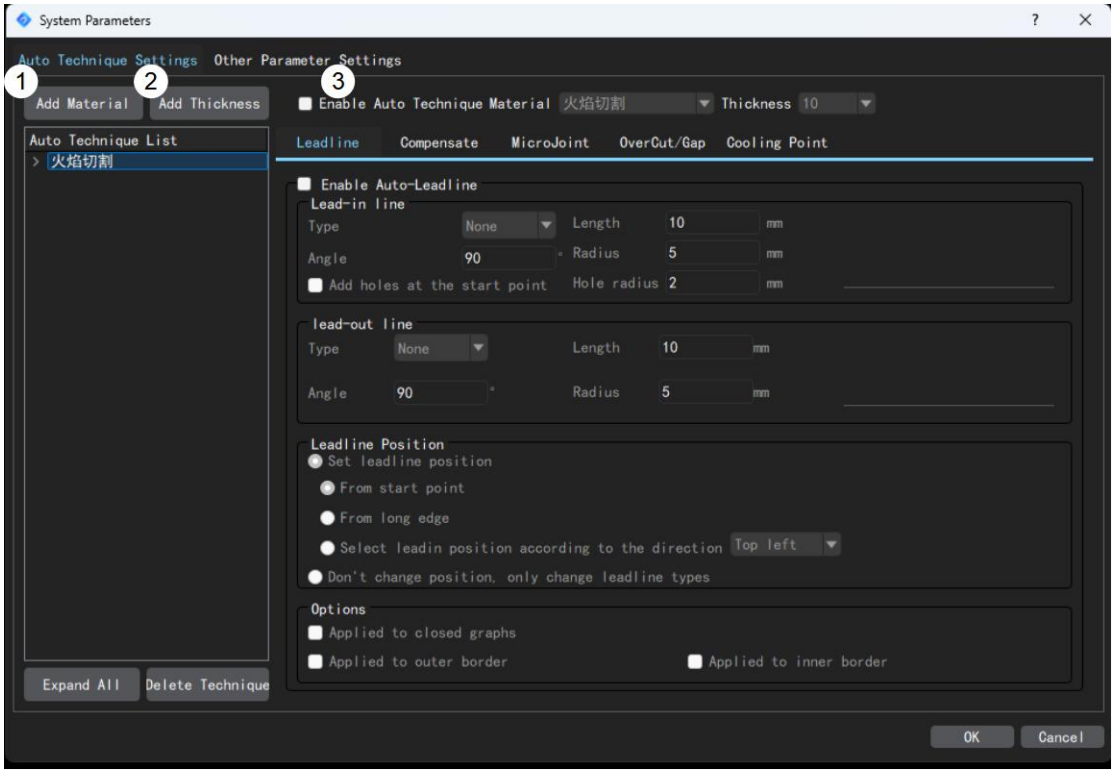
（4）Export to EXCEL: Export the current layout of part information and sheet information to Excel table.

6、Software Settings



1. Automatic process setup

The software can preset commonly used process parameters and automatically apply them to imported or drawn parts, reducing the process setting operation.

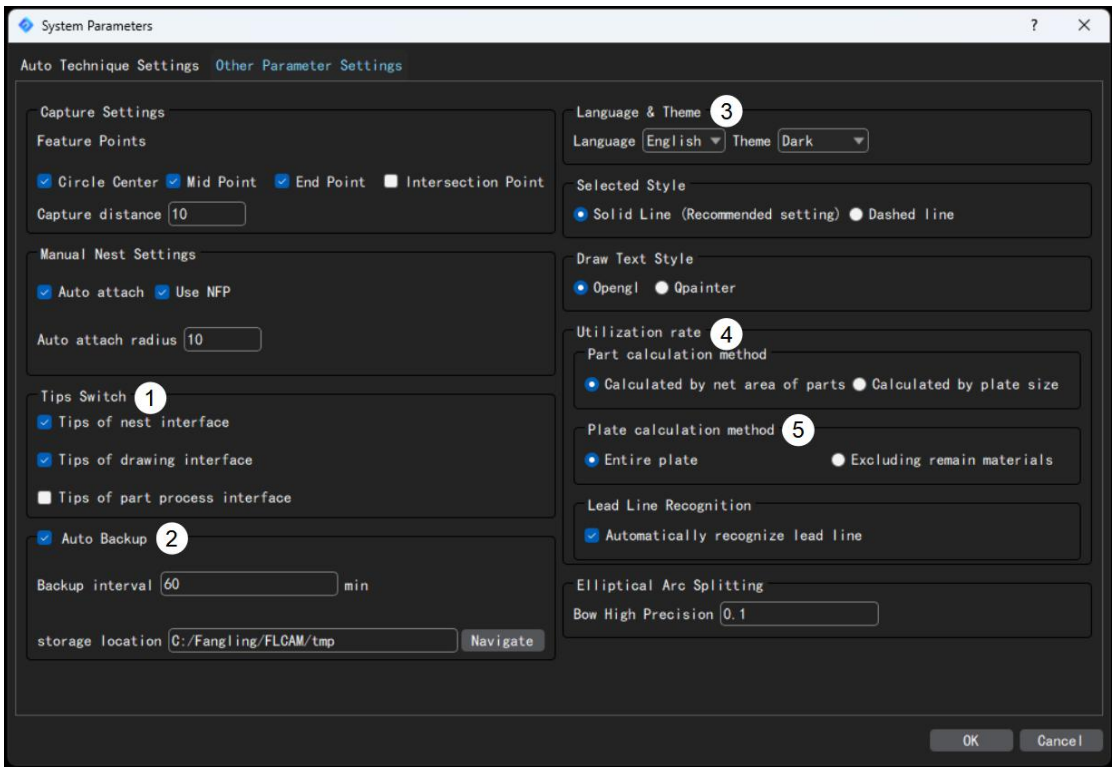


（1）Add process material: customize the name of process material according to the requirements, such as "flame cutting", "thick plate cutting", etc.; multiple can be added;

（2）Add process thickness: different plate thickness can be added under the process material, and preset parameters can be set for different plates;

（3）Enable automatic process parameters: Check "Enable automatic process", select preset process parameters, and check "lead", "compensation", "micro connection" and other related parameters to automatically apply preset parameters to parts.

2. Other parameter Settings



（1）Prompt switch: Check this function, the software will automatically display the relevant operation guidance information in the process of operation;

（2）Automatic backup: set the interval and path of automatic backup;

（3）Language and theme: Modify the display language of the software (currently supports Chinese and English, other languages can be developed to support);

（4）Utilization rate: set the calculation method of plate utilization rate;

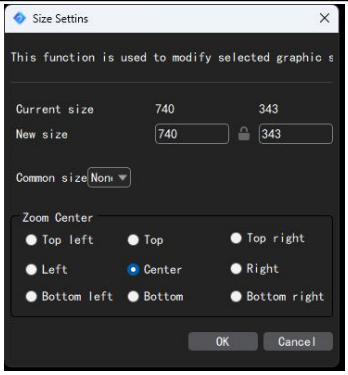
（5）Plate calculation method: set the calculation of whole plate or exclude surplus material;

（6）Other Settings: Generally default, no need to modify.

7、Drawing function

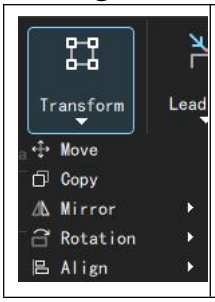
The software supports editing imported part graphics, drawing graphic parts directly, modifying part layer properties, opening CAD drawing files directly and cutting files exported by the software.

1. Size setting

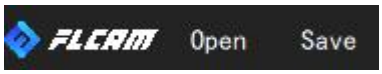


Modify the dimensions of the current part and specify the center of scaling.
The system will provide an intuitive interface that allows users to easily select and set the zoom center point for precise size adjustment.

2. geometric transformation

	You can perform copy, mirror, rotate Angle adjustment, and alignment operations on the current part (these functions are especially useful for typesetting multiple inner contours). In addition, the software provides a size measurement tool that allows you to manually measure the size of the software.

3. Open and save

	Open: directly open the CAD drawing file, or cut the file for easy view of layout; Save: Save the current part as nc, dxf, icd (special format for square diamond L8200 system) file.

8、Other features

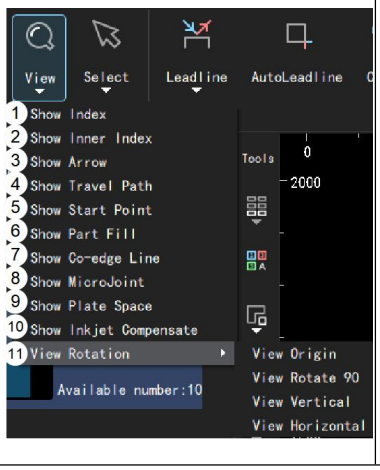
1. construction document

Under the layout interface, the software supports saving the current incomplete layout as an inr file and can open the file again to continue the previous layout work.

（1）Open: Open the saved project file;
（2）Save: Save the current project file;
（3）Save as: Save the current layout progress to a project file.

2. look over

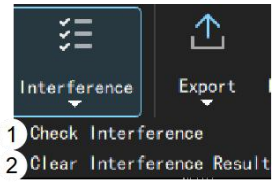
The software can set the various parameters of part display when setting up the layout;

	Display number: display part number; Display the inner contour: display the sequence number of the inner contour of the part; Direction arrow: indicates the cutting direction of the part; Display the empty move path: display the empty move part in the current cutting path; Display starting point: display the cutting starting point of the part;

	Display part filling: display the filling color according to the shape of the part; Display common edge line: the display line represents that the edge of the part is common; Display of micro-linking marks: display of micro-linking, refer to the introduction of "micro-linking"; Display board spacing profile: display board spacing range; Display the compensation of the inkjet code: display the compensation information of the inkjet code content; View rotation: Rotate the current layout view Angle.

3. interference checking

The software will automatically check for cutting path conflicts in parts or typesetting and alert the user to deal with them.

	（1）Interference check: manually perform interference check; （2）Clear interference check results: Clear the interference check information currently displayed.