

**Xingduowei Icut high speed cutting
machine**

User Manual

welcome

Welcome to use Xingduowei Icut flexible material cutting machine software.

[Improve Multi-Dimensional High-Speed Cutting Machine Control Software] (abbreviated as Icut) is a specialized control system designed for multi-industry cutting machines. This software excels in processing flexible materials such as textiles, advertising materials, and carbon fiber, while also supporting milling operations on rigid materials including acrylic, aluminum plates, copper sheets, and wood. Its core functionalities encompass graphic optimization, parameter configuration, customizable cutting pattern editing, intelligent material nesting, path planning optimization, machining simulation, and real-time process control.

The Icut software must be used with the corresponding hardware equipment to achieve processing operation control.

The Icut software supports offline demonstration operations. Without online, it supports non-processing control demonstration operations. You can experience the software without the device.

This manual is written based on version 5.0. Due to the continuous addition and update of software functions, there may be some differences between the Icut software you are using and the description in this manual. We hereby apologize for this.

If you have any questions or problems in the process of use, please contact us in time.

! The operation and cutting effect of the machine tool are directly related to the cutting material, machine configuration, the tool you use and the parameters you set. Please set the process parameters carefully according to your cutting process requirements.

Improper parameter Settings or incorrect operations may lead to reduced cutting performance, head or other parts of the machine tool and even personal injury. The Icut control system has made every effort to provide various protective measures, and equipment manufacturers and end customers should strictly follow the operation procedures to avoid accidents.

catalogue

Xingduowei Icut high speed cutting machine	1
welcome	2
1. Quick Start	7
1.1 Features	7
1.2 Obtain and install software	8
1.3 Start using	8
1.3.1 Desktop shortcut icon opening mode	8
1.3.2 User interface	9
in common use	11
1.3.3 Toolbar	14
1.3.4 File menu	15
1.4 Operation process	16
1.4.1 Import files	17
1.4.2 Optimization treatment	18
1.4.3 Process setup	19
1.4.4 Path optimization	22
1.4.5 Simulation inspection	22
1.4.6 Start processing	23
2. Graphic operation	25
2.1 Graphic display	25
2.2 Figure selection	27
2.3 Graphic editing	30
2.3.1 Size modification	30
2.3.2 Interactive graphical transformation	31
2.3.3 Quick translation, rotation and mirror	32
2.3.4 In-place replication	33
2.4 Capture tools	33
2.5 Draw graphics	34
2.5.1 Drawing basic graphics	34
2.5.2 Input commands to draw graphics	35
2.5.3 Text input	36
2.5.4 Create standard parts	37
2.6 Graphic optimization	38
2.6.1 Remove small graphics	39
2.6.2 Remove duplicate lines	39
2.6.3 Merge the connecting lines	39
2.6.4 smoothing	39
2.6.5 Interrupted merging	40
2.6.6 Detonation	41
3.Process tools and process parameters	43
3.1 Setting the starting point of the figure	43
3.1.1 Manual starting point	43

3.1.2 Automatic batch starting point	44
3.1.3 Longest straight line starting point	45
3.2 Graphic direction setting	46
3.3 Common borders	47
3.4 Graphic tool compensation	48
3.4.2 External contraction and internal expansion	50
3.4.3 Total contraction	51
3.4.4 All external expansion	51
3.4.5 Angle type	51
3.4.6 Compensation, same layer	52
3.5 Regional carving	54
3.5.1 Yang carving and Yin carving	54
3.5.2 Row cutting tool and ring cutting tool	55
3.5.3 Ring cutting and tool removal	56
3.6 Reverse cut compensation	57
3.7 Dispersal and grouping	60
3.7.1 Combined samples	60
3.8 Array	62
3.8.1 Rectangular array	62
3.8.2 Ring array	63
3.8.2 Interactive arrays	64
3.9 Sorting	65
3.9.1 Sequence Preview	65
3.9.2 Manual sorting	66
3.9.3 Automatic sorting	66
3.10 Chamfer	69
3.10.1 Round corners	69
3.10.2 Inverted concave Angle	70
3.10.3 Inverted chamfer	71
3.10.4 Inverted chamfer	72
3.11 Alignment tools	74
3.12 Closeness	75
3.13 Integration function	76
3.14 Circular fusion	77
3.15 Leads	77
3.16 Add the outer frame	78
3.17 Measuring tools	79
4. Processing control	80
4.1 Coordinate system	80
4.1.1 Original zero point	81
4.1.2 Workpiece zero point	82
4.1.2 Find the zero point after anomaly	82
4.2 Alarm	83
4.3 Soft limit	84

4.4 Manual testing	85
4.5 Blade cutting	85
4.5.1 Manual tool setting	86
4.5.2 Automatic tool cutting	86
4.5.3 Fine-tuning the blade depth	87
4.6 Walk the border	87
4.7 Processing, stopping, pausing and continuing	87
4.7.1 Processing	87
4.7.2 Stop	89
4.7.3 Suspension and continuation	89
4.7.4 Advanced Start	89
4.8 Partitioning	90
4.8.2 Application scenarios of partitioned adsorption mode	90
4.9 Pulling material	92
4.9.1 Multiple machining operations for general machining	93
4.9.1.1 Single page processing As shown in the following figure:	93
4.9.1.2 Single page cycle processing	94
4.9.1.3 Page processing	95
4.9.2 Various processing operations of border patrol	96
4.9.2.1 Add templates and visual interface introduction	96
4.9.2.2 Single page patrol processing	97
4.9.2.3 Single page patrol cycle processing	98
4.9.2.4 Page border processing	99
4.9.2.5 Cutting Mark mirror processing	101
4.9.2.6 Scanning code for border processing	103
5. System auxiliary functions	106
5.1 Board upgrade	106
5.2 Parameter export and parameter import	107
5.3 Table test	108
5.3.1 Configure the test IO signal on the console	109
5.3.2 Configuration of desktop data	109
5.3.3 Bench test	111
5.3.4 View the surface data	112
5.3.5 Export/import of console data	113
5.3.6 Enable surface compensation	113
5.4 Language modification	114
5.5 Diagnosis and log viewing	114
5.7 Shortcuts	116
6.Common problems and treatment	117
6.1 Tool debugging	117
6.1.1 Angle offset	117
6.1.2 Blade tip offset	120
6.2 Offset test	124
6.2.1 Tool holder offset	125

6.2.2 Camera offset test	125
6.2.3 Dual head offset test	126
6.3 Tool compensation	127
6.3.1 Blade lifting and blade falling compensation	127
6.3.2 Blade compensation	129
6.3.3 Blade radius compensation	130
6.4 The device is not connected	130

1. Quick Start

1.1 Features

Xing multidimensional cutting machine control software is a comprehensive cutting control software specially developed for clothing, advertising and other flexible material cutting. Its main features are as follows:

- Supports parsing of various formats such as dwg, dxf, txt, nc, ai, eps, pdf, plt, xdw, jpg, tif, bmp, png, etc., providing convenience for users to make files;
- When opening or importing a file, the file will be optimized automatically, including deleting small graphics, removing repeated lines, automatically merging connected lines, smoothing processing, setting starting points automatically, sorting and adjusting cutting direction automatically;
- Optimized functions such as automatic compensation can be manually executed, turned on or turned off;
- Supports common functions of CAD, including size modification, translation, mirror, rotation, alignment, copy, array, etc.;
- In the WYSIWYG mode, parameters such as lead-in and lead-out lines, tool compensation, micro connection, bridge and so on can be easily set;
- Support curve segmentation and merging, curve smoothing processing, as well as part merging and breaking operations;
- It has the function of automatic sampling which saves time and effort, can realize automatic common edge and generate surplus material;
- Through a variety of array methods, it can easily complete the layout of the plate;
- Flexible and diverse automatic sorting and manual sorting functions, support through group lock the processing order of graphics within the group;
- Supports viewing the processing order and previewing the cutting order through simulated processing;
- The cutting depth of the graphic file can be set, and the layered cutting and the adjustment of the amount of each cut can be supported;
- Supports breakpoint processing, which records the line number when the processing stops or pauses, so as to facilitate the subsequent return to that position to complete the remaining processing tasks;
- Support power failure continuation processing. If there is an unexpected power failure during

processing, you can choose the power failure continuation mode after power supply is restored to continue processing from the position before power failure;

- Support CCD camera vision calibration; support printing inkjet, labeling, automatic feeding and pushing, projection, sorting, large vision, layout of materials and many other extended functions.

1.2 Obtain and install software

You can contact your supplier or customer service personnel to obtain the software installation program, or you can download the installation program from Xingduowei's official website. Before installing the software, please check whether your computer meets the following installation requirements:

- Win7 or above operating system
- I4 or higher CPU
- At least 4GB of memory
- 15 VGA display above 1 inch, resolution above 1280*1024, recommended 32-bit true color above
- If you are using a Vista-based computer system, run it as an administrator to avoid errors.

After the check, run the installer directly. For Vista, right-click and run the installer as an administrator.

To prevent program modifications during installation and ensure proper installation, please disable Security Guard and antivirus software before proceeding. Antivirus software cannot guarantee a completely virus-free computer. If your device is already infected with viruses while the antivirus is active, it may mistakenly flag Icut as a virus, potentially causing Icut to be incorrectly identified as malicious.

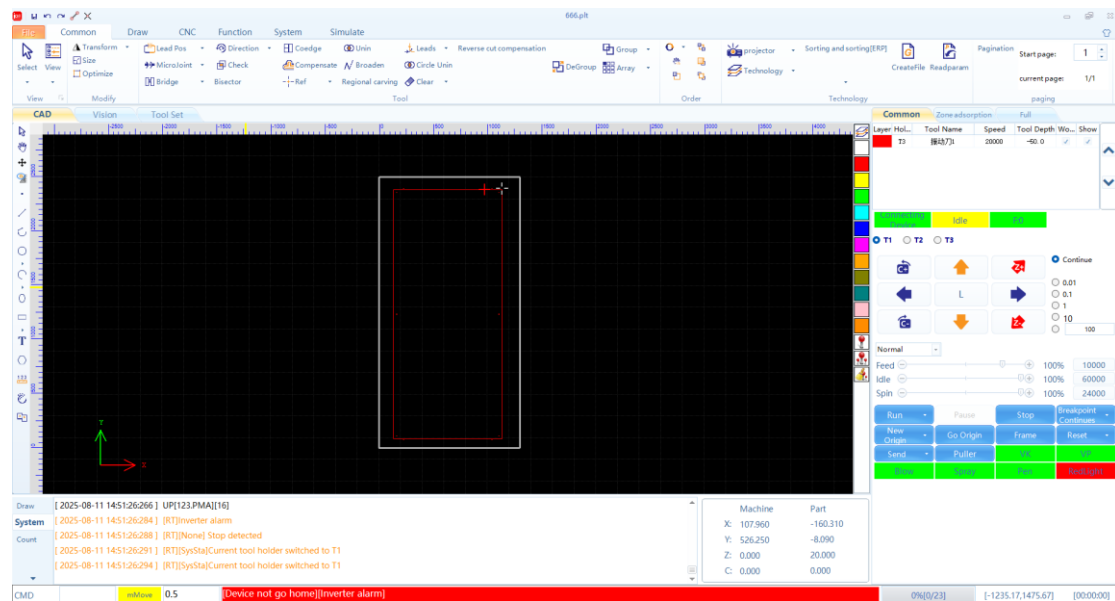
1.3 Start using

1.3.1 Desktop shortcut icon opening mode



After the installation of the software is successful, the icon shown in the figure on the right will appear on the desktop. Double-click to run the Icut cutting machine system.

1.3.2 User interface



In the center of the interface, the black background plate is the drawing board. The white square in the drawing board is the drawing plane, and there are grid displays. The grid and the scale bar on the top and left of the working plane will change with the zooming of the view, which provides convenience for drawing.

At the top of the interface, from top to bottom are the title bar, menu bar, and toolbar. The toolbar features prominently grouped with large icons, where users can access common tools. The menu bar includes a [File] menu and seven toolbar menus: [Common], [Graphics], [CNC], [System], [Simulate], [Large View], and [Functions]. These menu options can be switched between. To the left of the title bar is a [Quick Access Bar] that provides quick access to save , undo , redo , endpoint capture , and intersection capture functions .

The left side of the drawing panel features a shortcut toolbar, which we refer to as the "navigation bar" in subsequent explanations. This section provides quick access to essential drawing functions. From top to bottom, the first four tools are [Select], [Pan], [Main View], and [Quick Hover Toolbar]. Below these are corresponding drawing tool options that can be selected by clicking. At the bottom is the measurement tool.

The right side of the drawing panel features a layer toolbar, arranged from top to bottom: The first button

is [Open Process Settings] , followed by [Layer Selection] (buttons 2 -13 ) – a total of 12 color layer buttons corresponding to each layer. After selecting a graphic, clicking the corresponding layer color will automatically apply that layer's color to the selected shape. Mark points  can be created for selected shapes. A one-click command marks all selected points . Clearing all marked points can be done by clicking the corresponding button .

The interface features three vertically arranged display windows. The top window serves as the drawing information display area, where all drawing command prompts and input data are shown. The middle window displays system information (excluding drawing-related details), including system logs with timestamp markers and color-coded alerts (operation, warning, alarm). The bottom window shows processing statistics. The right side displays coordinate positions (machine coordinates **Machine** and workpiece coordinates **Part**) for real-time monitoring of the machine's current physical location and relative positioning.

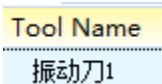
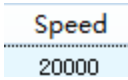
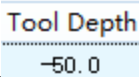
The interface's bottom section contains the [Command Prompt Bar], [Fine-Tuning], [Status Bar], [Progress Bar], [Mouse Position Display], and [Timing Display]. Command Prompt Bar: Displays real-time input information during drawing. Fine-Tuning: Click the fine-tuning button to switch between zooming in/out and rotating tools, allowing users to input adjustment steps, zoom distance, and rotation angle values. Status Bar: Shows real-time device connection status, zero-reset status, and file loading progress. Progress Bar: Displays the current processing progress. Timing Display: Shows the processing time of the current file.

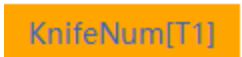
The top panel features a function module navigation bar, including interface switches for CAD, 3D, Visual, Tool Adjustment, and Large View. The CAD interface serves as the drawing board for creating and editing graphics. The 3D interface displays G-code parameters. The Visual interface enables CCD edge detection operations. The Tool Adjustment interface handles tool holder configuration, tool debugging,

parameter modification, and depth settings. The Large View section provides a comprehensive display interface with advanced visualization capabilities.

The upper-right corner of the drawing panel features an interface navigation bar containing four sections: Common, Zone Adsorption, Material Cladding, and Layout. The Common section provides essential display and operational functions, arranged from top to bottom as follows: Layer Display, Status, Tool Holder Switch, Manual Operation, Process Selection Graphics, G-code Programming, Processing/Blanking, Spindle Speed Scaling, and On/off Buttons.

in common use

1) Layer display includes: Layers  (current layers used in the graphic), Blade Holder  (blade holder used for cutting in the graphic), Tool  (tool used for cutting in the graphic), Speed  (cutting speed used in the graphic), Blade Depth  (cutting depth of the blade holder and tool), Processing  (whether processing is active), Display  (whether graphics on the drawing board are visible). Layer order toggle button  (after selecting a layer, click the up/down arrow icon to switch layer order).

2) The status bar includes:  green indicates that the equipment is connected, red indicates that the equipment is not connected.  Display the machine status, standby or processing.  Display the speed, the current moving speed and processing speed.  Display the current spindle tool number.

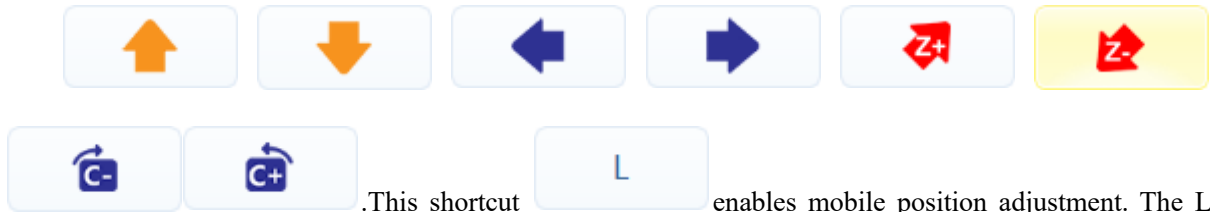
3) Tool holder switching: Click to select the tool holder to switch between different tool holders. When switching the tool holder, if the Z-axis of the previous tool holder is not at the 0 point position,

☒ T1 ☐ T2 ☐ T3 ☐ T4

the Z-axis of the previous tool holder will be moved to the 0 point position.

4) Manual operation: The machine can be rotated forward, backward, left and right by manually moving

the button. Select ☒ Continue and click the following quick button



.This shortcut enables mobile position adjustment. The L and H buttons represent low-speed and high-speed modes respectively. On the right side, you can select the movement step size (customizable ☐ 100). Click the "100" position to open a dialog box where you can input the desired distance. Click "OK" to confirm.

5) Select graphic processing:  | After checking, only the selected graphics in the drawing board will be processed. If the graphics are not selected, a dialog box will pop up to prompt you to check whether the graphics are selected or cancel the check

 Select graphic processing mode: Check if the layer is processed and if the graphic is selected

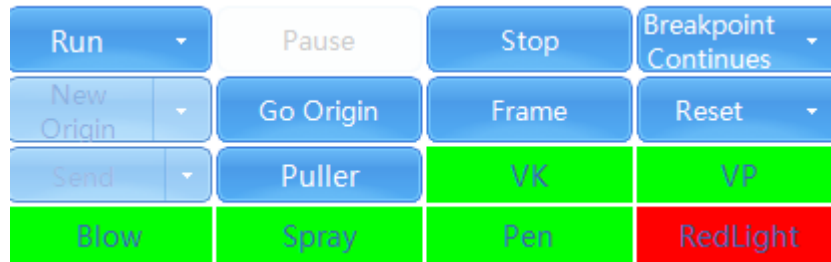
6) Code processing: ☐ G Code Check and execute G code instructions.

7) Ratio adjustment: including feed, empty stroke and spindle adjustment speed. The speed ratio can be adjusted by dragging the progress bar. Click the red box to open the setting speed window, input the correct value and confirm.



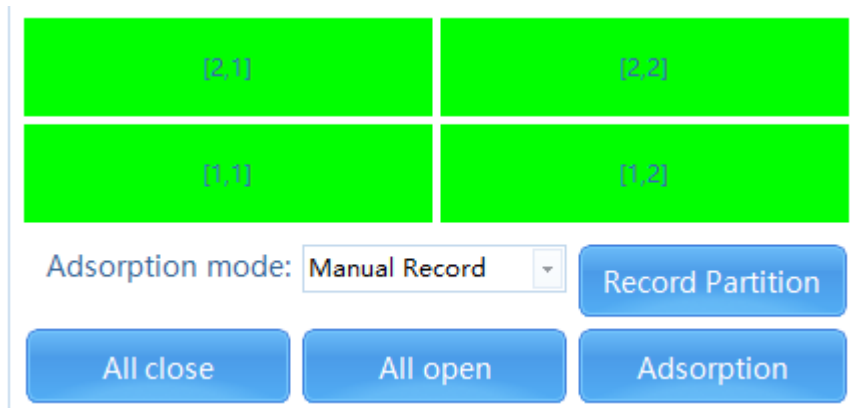
8) Quick button: Blue represents the default button, which is displayed by default after installing new software. Green represents the custom button, which can be selected in the window of system-switch setting-function switch. The required quick button of the device can be selected, and the unnecessary one can be

blocked.

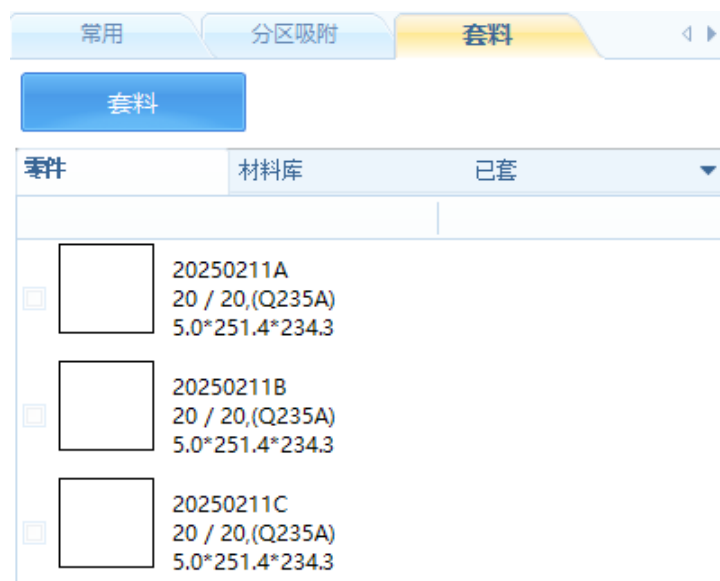


process	Execution of processing, equipment begins processing
suspend	Execution is suspended, the equipment is suspended, and then click Continue, the equipment continues to process
cease	Execution stops and the equipment stops working
The breakpoint continues	Execution of the breakpoint continues, and the equipment is processed at the breakpoint where it stopped
Set a starting point	Set the starting point and determine the XY coordinate of the workpiece origin
Back to the starting point	Execution starts at the XY coordinate position of the workpiece origin
Walk the perimeter	Execution of the border walk, the device performs the border walk function
Back to zero	Zero return is performed, and all shafts of the equipment return to zero point
transmit by radio	Execute the send and download the file to the controller

9) Zone Adsorption: Click each zone to enable or disable adsorption in the current area. Green indicates disabled adsorption, while red signifies active adsorption. The left-side drop-down arrow allows selection of four modes: Manual, Adaptive, Auto-follow, and Manual Memory. Full On/Off options enable complete activation or deactivation of zones. Adsorption refers to activating the vacuum pump.



10) Batching: This process organizes graphics for processing into structured sequences to optimize material usage. (Note: Batching requires a digital signature to activate). Parts: Contains additional graphics with specified quantities. Material Library: Stores approved materials. Completed Batches: Files containing finalized processed graphics.

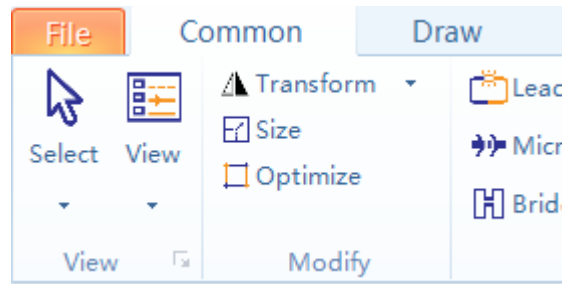


11) Fill: The fill function is used to reasonably fill the specified graphics on the board with the highest utilization rate. Icut supports one-click fill. It also provides a number of parameters for local adjustment, such as part spacing, material edge, rotation, common edge, quantity, etc.

1.3.3 Toolbar

The Icut toolbar uses a style called Ribbon (the ribbon), which places the most commonly used functions in columns and partitions, and uses some large buttons for easy operation. The following figure

shows you:



There are several large ribbon toolbars under each menu bar. You can open the corresponding window through the menu bar, find the corresponding partition toolbar, and select the tools to use.

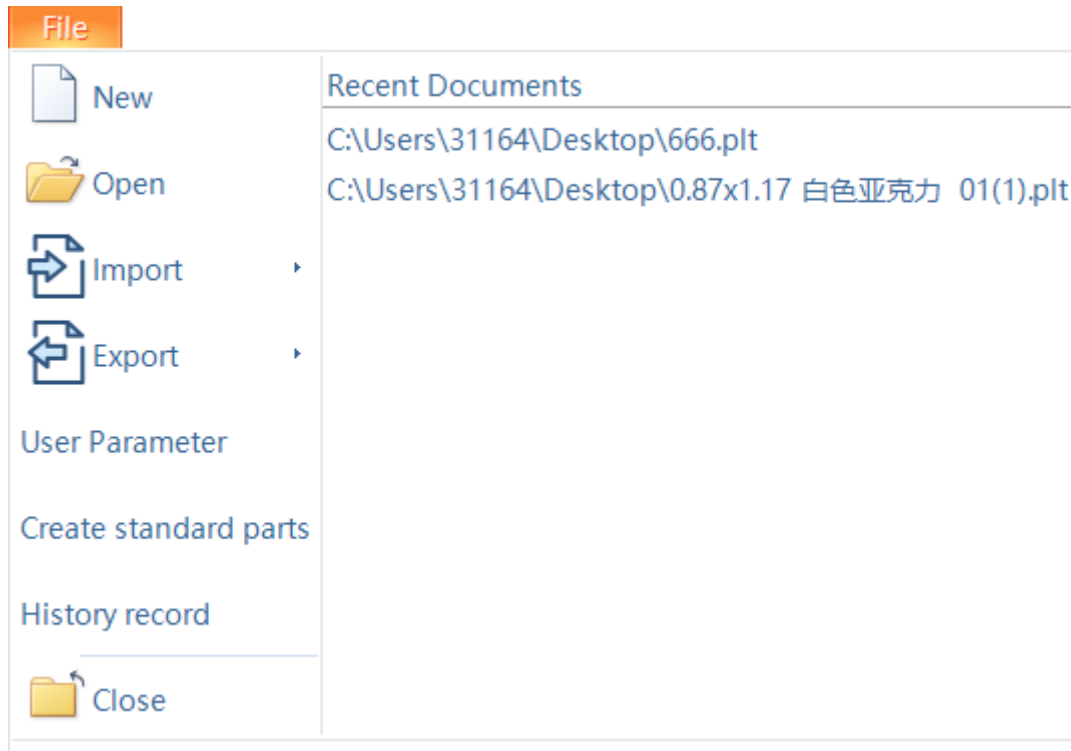
Each page's toolbar organizes functions into multiple "tabbed sections" such as "View", "Edit", and "Tools". Some sections contain "Expand Buttons" (marked with an icon), which open corresponding function dialog boxes. Additionally, some tool buttons feature small triangle icons below them – these are called "Drop-down Buttons". When clicked, they reveal the corresponding "Expand Menu" that provides more detailed operation options.

When the mouse moves to the position of a large size tool (such as the "Select" tool), the tool button changes color and shows as a rectangle. At this time, click to use the tool to perform the corresponding editing operation on the selected graphics; if you click the small triangle below the button, you can open the extended menu of the tool.

Whether you have used software with similar interface or not, you can quickly get familiar with and master the operation of this software

1.3.4 File menu

In the upper left corner of the menu bar, there is a special menu that appears in a drop-down style called the "File Menu". It includes some tools related to files. Click on File  to open the file menu to display the tools, as shown below:



Please note that the right side is the recently opened file, which is to facilitate your finding of the last designed file.

Create: Create a new file in Icut.

Open: Open a new file in Icut.

Import: Import a file to the drawing board without removing existing graphics from the drawing board. If you want to open an external file, use Open instead.

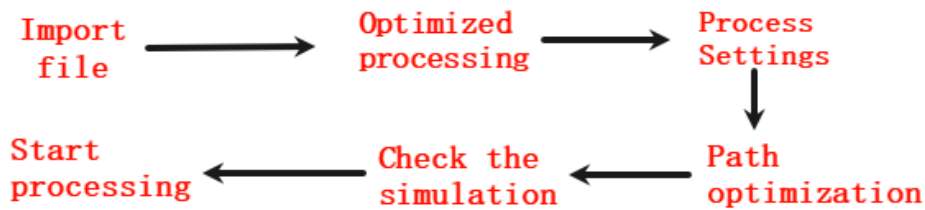
Export: Icut can export "XDW", "XDWL" and "PLT" files.

User parameters: You can set some common parameters, including the automatic optimization parameters for imported graphics.

Create standard parts: Icut contains some libraries for you to choose from. If suitable, you can directly call and open them, and modify the size to cut and use them.

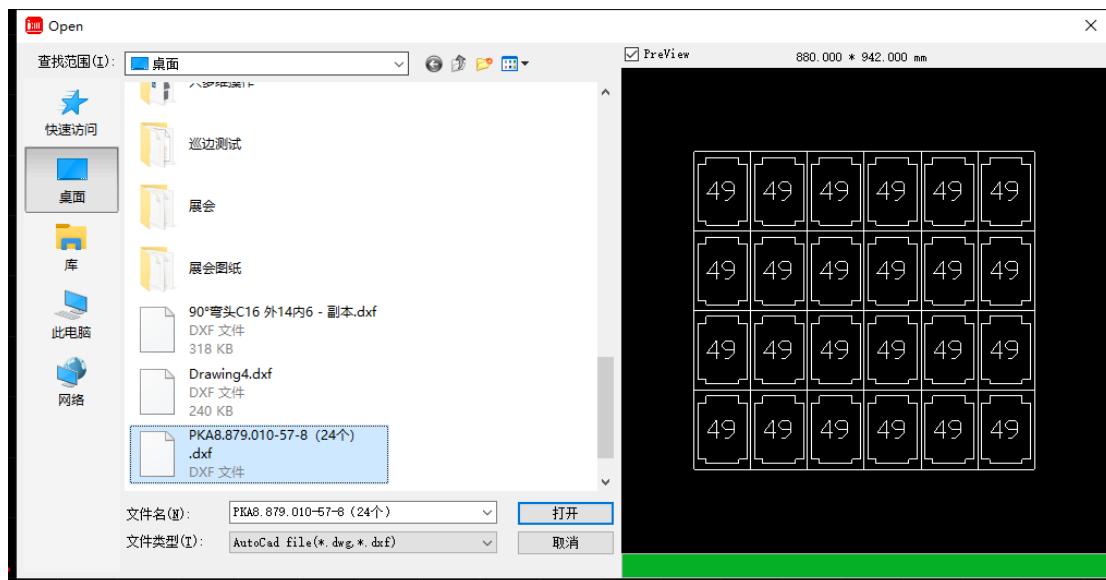
History: You can view recently processed files.

1.4 Operation process



1.4.1 Import files

To open a file, click the "File" button in the "Open" menu of the Quick Start bar at the top-left corner of the interface. Navigate to the target directory and select the desired file. Click "Open" next to the filename. (The "File Explorer" dialog provides a preview window where you can instantly view processed files by clicking on any filename, helping you quickly locate files needing processing.)

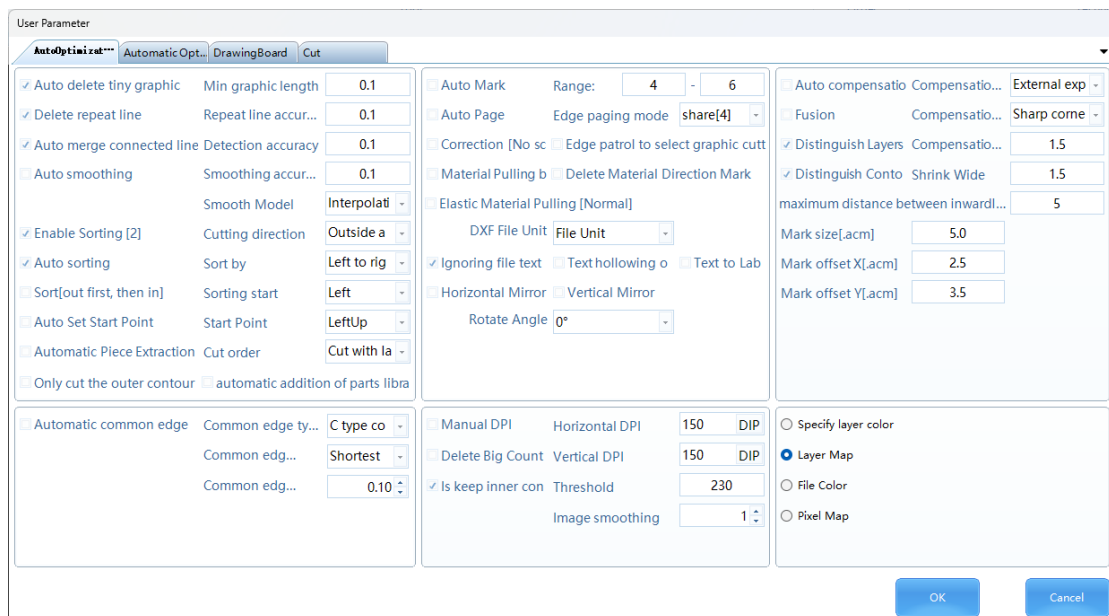


If you want to draw graphics by yourself in the CAD interface, you can draw graphics through the drawing tool under the "Drawing" tool. You can also pick the drawing tool by using the quick navigation bar on the left side of the CAD interface.

The Icut system supports simultaneous import of multiple files. Click the "Open File" button in the top-left corner of the interface's shortcut bar, then select "Import" from the drop-down menu (supporting file formats like DXF, PLT, AI, images, XDW, etc.). Importing other graphics is possible even when CAD has existing graphics in the current session.

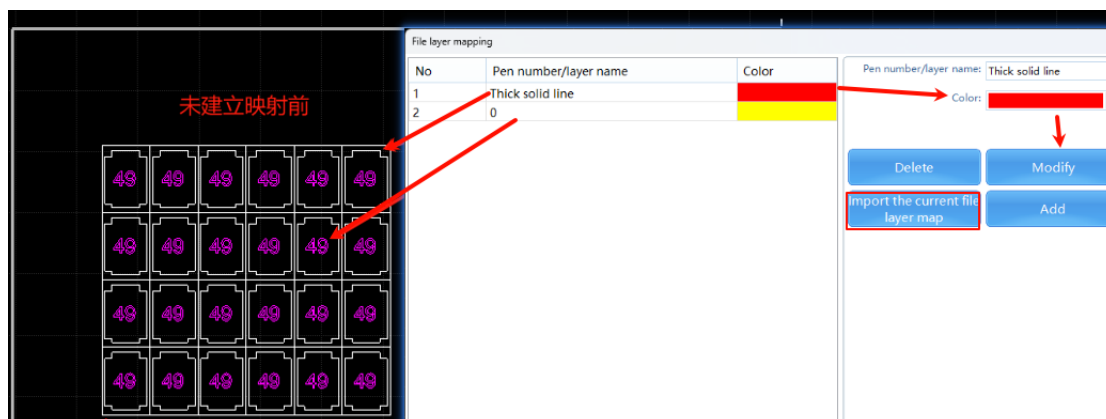
1.4.2 Optimization treatment

When importing graphics, Icut automatically applies a series of optimization processes, including "eliminating minor graphics", "removing duplicate lines", "merging connected lines", "automatic smoothing", "sorting", "setting starting points", "selecting sections", "common edges", "automatic M-point generation", "angle adjustment", "automatic compensation", and "layer mapping". Typically, after automatic optimization, you can proceed directly to the next step of process parameter settings without additional manual adjustments. If the automatically optimized graphics do not meet your requirements, you can manually configure them through two methods: First, click the "File" menu drop-down and adjust optimization settings in "User Parameters"; Second, select the target graphic and find the "Optimize" tool in the toolbar of the "Common Tools" menu to configure specific parameters.

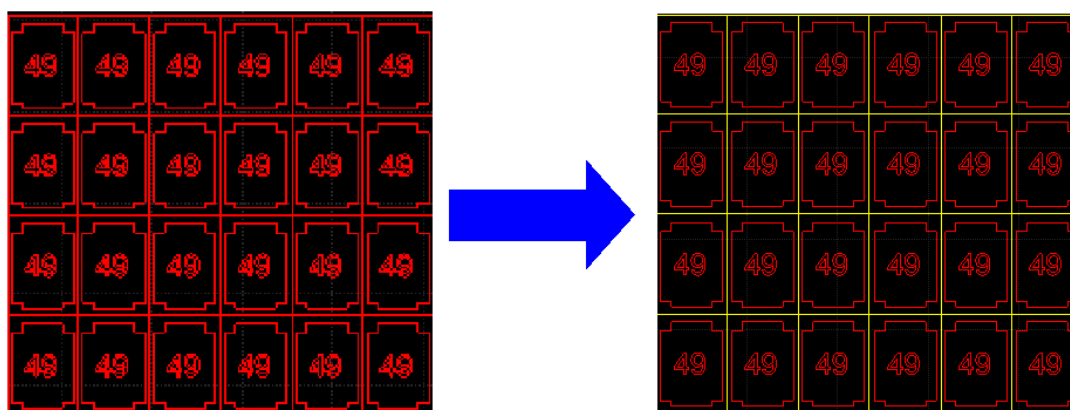


When using the "Layer Mapping" tool for the first time, it's essential to establish a mapping relationship with the processing file beforehand. The process is as follows: After opening the file, select the target document. In the top menu bar, navigate to "Common Tools", then click on "Process" in the drop-down menu and choose "Layer Mapping". Within the pop-up window, click "Import Current File Layer Mapping". Next, select the layer number you want to modify. Through the "Color" drop-down menu, choose the target color

corresponding to the graphic in that layer. Once selected, click "Modify" to complete the configuration.



After the modification is successful, exit the layer mapping dialog. You will find that the current graphic is as shown in the figure below, and different graphics correspond to different colors.



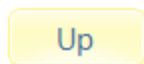
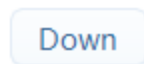
When creating graphics in other software, it's recommended to assign specific colors to each graphic and confirm adjustments before exporting. This way, when importing files into Icut software, simply check the "Layer Mapping" option in the "User Parameters" section beforehand. The imported graphics will automatically retain their original color properties without manual color reassignment. Different colors correspond to various tool holders and tool settings within the software.

Note! Icut mapping supports two modes: PLT and DXF files are supported respectively.

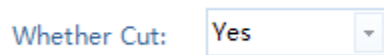
PLT uses layer mapping, and DXF uses element mapping function.

1.4.3 Process setup

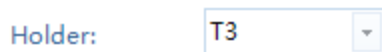
To complete this step, we need to configure the layer parameters in the CAD interface. Click the "Open Layer Process Settings"  panel in the top-right corner of the CAD window. As shown below: The "Layer Process" interface includes parameters such as speed settings, tool lift height, tool lift angle, layering configuration, and tool drop compensation settings. These parameters determine both machining efficiency and cutting quality during production. Please configure them according to the specifications provided in the manufacturer's training materials.



The layer order can be modified by pressing the "up and down" button. Select a layer and click up or down to change the layer order.



The "Is processed" property can be used to modify whether the current layer is processed.



Through the "Knife seat" option, you can choose which knife seat is needed for cutting the current figure.

Processing speed:

Refers to the current tool cutting speed and sets different values according to the actual cutting material.

Knife speed:

Cutting speed:

Refers to the vertical processing speed of Z axis, and different values are set according to the actual cutting material.

Knife height: Refers to the height of the Z+ blade lifting relative to the Z depth when the Z axis is empty. Generally, the lifting height must be greater than the material thickness

Knife Angle: Refers to whether the Z-axis lifts the blade at the clamping angle position during cutting. According to the first quadrant of the four-quadrant coordinate system, determine whether the lifting angle range is within the set range. Generally, a larger value means fewer blade lifts. A value of 0 indicates no

blade lift.



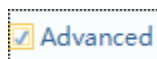
cut supports layered cutting. This feature enables multi-depth material processing, allowing you to meet diverse order requirements. To activate layered cutting, configure three key parameters: "Material Thickness" (the actual thickness of the workpiece), "Cutting Depth" (the depth the tool cuts into the material surface), and "Cutting Layers" (the number of layers to be cut or the number of cuts required to reach the desired depth).

Spindle Number: Change the tool spindle. Which number of tools is needed for cutting at present?

Select the corresponding tool number.

Spindle Speed: Current tool spindle speed

Spindle Diameter: Tool compensation, after opening, the graphics automatically compensate.



Check advanced to select different ways of milling cutter cutting, including: "Carving mode" includes path carving and drilling carving. "Landing mode" includes "slanted downward cutting" and "vertical downward cutting".

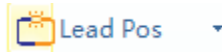
A screenshot of a software window titled "Technology". It contains a "Layer" list on the left with "Layer 1" selected. To the right are fields for "Layer:", "Holder:", "Whether Cut:", and "Tool:". Below these is a "Layered cutting" checkbox. On the right side, there are input fields for "Spindle Number:", "Spindle Speed:", "Spindle Diameter:", "Knife height:", "Processing speed:", "Knife speed:", and "Cutting speed:". At the bottom right, there is an "Advanced" checkbox and a section for "Carving Type:", "Fall Type:", "Fall Angle:", and "SurfaceRe:". "OK" and "Cancel" buttons are at the bottom right.

1.4.4 Path optimization

When importing graphics and encountering paths that don't meet expectations, further optimization is required. You can select the graphics and use quick tools for refinement. Common optimization methods include: shape adjustments, starting point settings, path direction optimization, shared edge handling, group processing, and sorting enhancements. For detailed instructions, refer to Chapters 2 and 3.



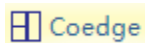
After selecting the graphic, you can zoom, rotate, mirror and other operations on the selected graphic through the drop-down arrow.



After selecting the graphic, you can edit the starting point of the selected graphic through the drop-down shortcut arrow. Manual editing of the starting point is supported, and one-click editing of the starting point is supported.



After selecting the graphic, you can edit the direction of the selected graphic and path by dragging the arrow.



After selecting the figure, the common edge processing of the figure can be realized by modifying the interface parameters of the common edge, so as to improve the processing efficiency.



After selecting the graphics, you can process the selected graphics group, or you can take a sample of the selected graphics through the drop-down shortcut button. The system supports sample order processing.

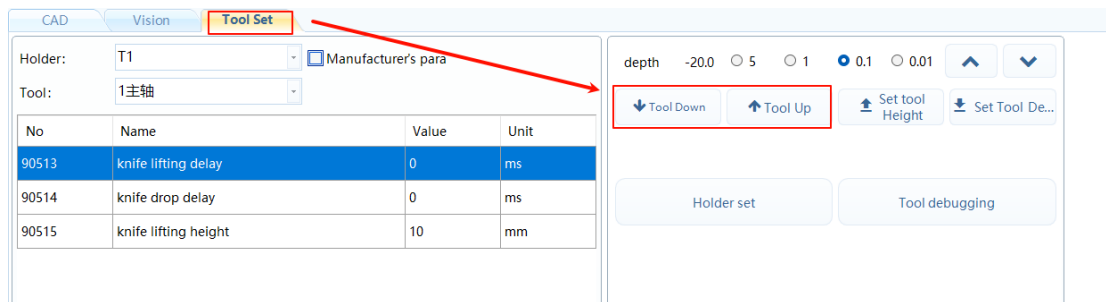


After selecting the graphics, you can optimize the path order of the selected graphics to improve processing efficiency. The system supports a variety of automatic sorting modes. Please select the path order mode suitable for your own materials to optimize.

1.4.5 Simulation inspection

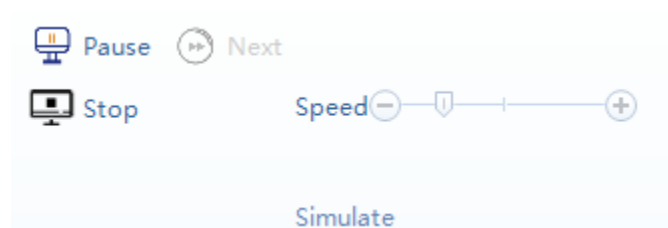
Before actual cutting, the depth of the knife and processing trajectory should be checked.

Knife depth confirmation check: Open the "adjust knife" interface, click the "drop knife" button, the current tool holder tool will automatically drop to the Z set depth position, check whether the tool is in the specified position. If the depth of the tool is not in the cutting position, please reset the depth.



Path Simulation: First switch to the CAD interface . Open the "Simulation" option in the menu bar (as shown below). Adjust the simulation speed by dragging the progress bar next to "Speed".

Click the button  **Simulate** to start simulating the path by cutting shapes in the CAD interface. The simulated path will be displayed in yellow color, allowing you to visually observe its starting point and direction. During simulation, click the pause button  **Pause** to stop. You can then hover over the CAD interface to zoom in/out, resume simulation, or click again to continue  **Next**. To end the simulation, click the button  **Stop** to terminate the process.

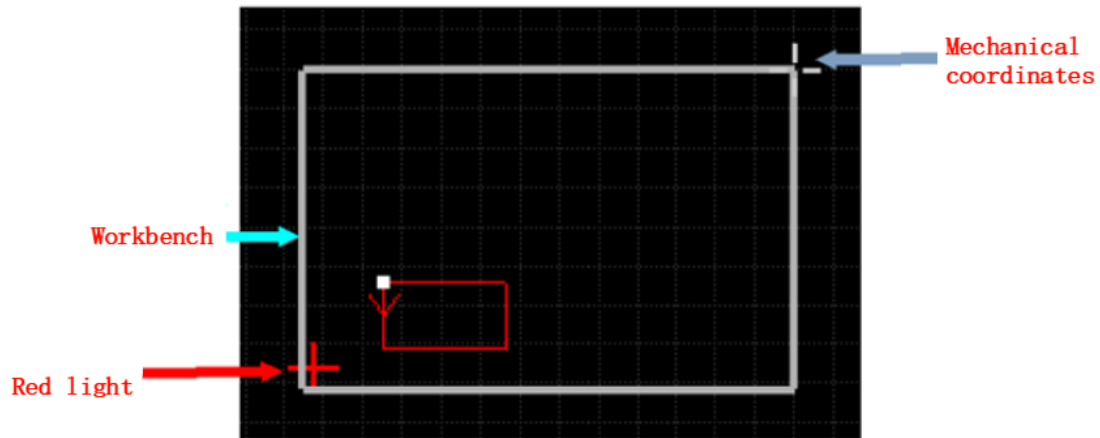


The simulated path trajectory does not meet the cutting requirements. Please select the graphic for further optimization.

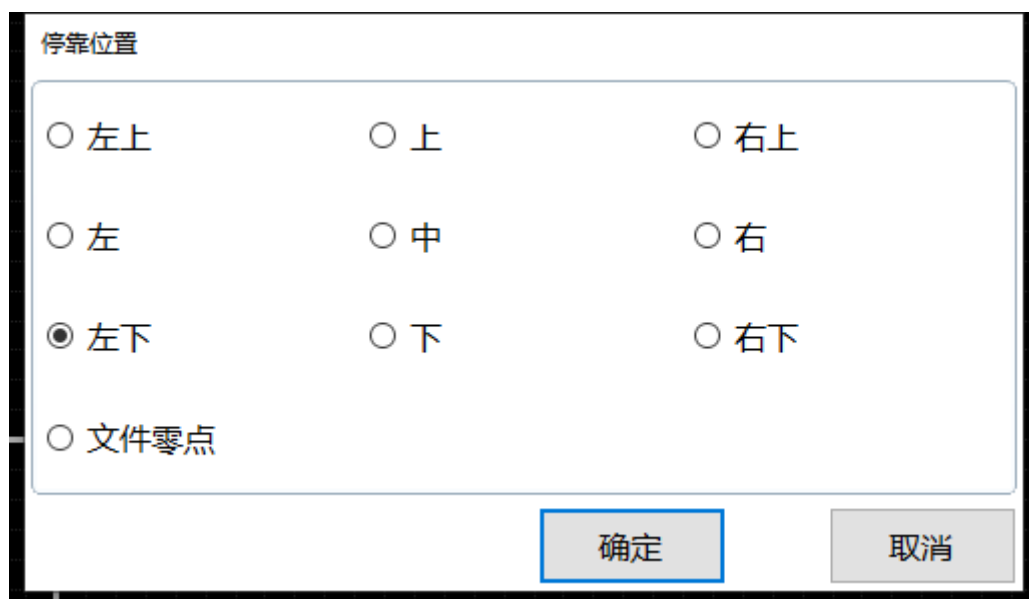
1.4.6 Start processing

The white area represents the workbench, the red light indicates the current position of the machine, and the white cross marks the mechanical zero point. Before processing, we need to check whether the

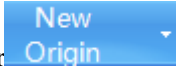
processed graphic exceeds the workbench range. If any graphic oversteps the workbench boundaries, modify it accordingly. Ensure that the processed graphic does not exceed the workbench limits.



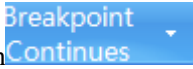
Selecting the starting point: Navigate to Menu> Common> Docking Buttons  , then choose your docking position. Based on the structure of your purchased machine and operational habits, use the docking tool to set the starting point. Typically, this is positioned at either the lower left or lower right corner. For devices with red light positioning functionality, the starting point can be determined by tracking the mechanical position indicated by the red light.

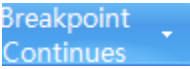


After setting the graphic docking position, move the machine to the material's designated docking

location (e.g., the lower-left corner). Align the red light with the "lower-left corner" of the cutting plate. Click the shortcut button in the lower-left corner  of the Icut interface to set the starting point and confirm the workpiece coordinates. Then execute the border-following command by clicking the button . As the machine begins tracing the border, check if the red light's path stays within the material processing area. If any deviation occurs, reset the starting point or adjust the cutting plate position before repeating the border-following process. Ensure the red light's movement stays within the machine's operational range.

Finally, click  the button to start processing. Click  the button to pause processing, and you can move  the machine during the pause. Click the button to continue processing.

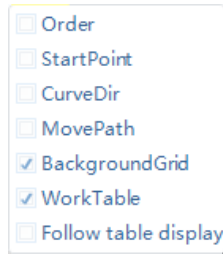
Click  the button to stop the processing. After stopping, the equipment can go back to the starting point, reset the depth of cut, modify the speed and other operations. As long as you do not change the graphics or move the cutting plate, you can click the button  to achieve the continuation of the cut.

If you encounter a sudden power failure during the use, you can re-import the file and click the button  to continue cutting from the last power failure position. Currently, it does not support continuing from the edge of the circuit breaker.

2. Graphic operation

2.1 Graphic display

The first "View" column in the common menu provides a number of quick buttons to help control the display effect, as shown below:



Processing number: After checking, the number is displayed at the starting point of the figure to show the processing order of the figure element

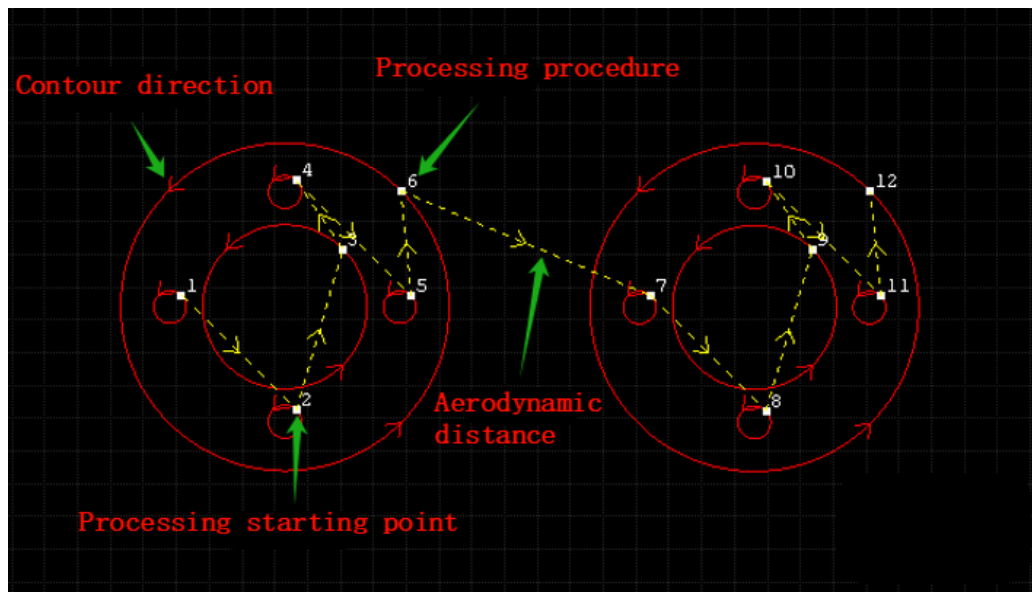
Path start: After checking, the white square center point is the starting point of the figure

Outline direction: After checking, the arrow direction shows the processing direction

Flight path: When checked, the trajectory of the flight path is displayed

Background grid: Check to display the grid in the CAD drawing interface

Workbench: Check to display the workbench, which is open by default.



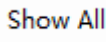
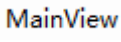
On the right side of the CAD interface, click the mouse right on the color layer navigation bar, as shown in the following figure:

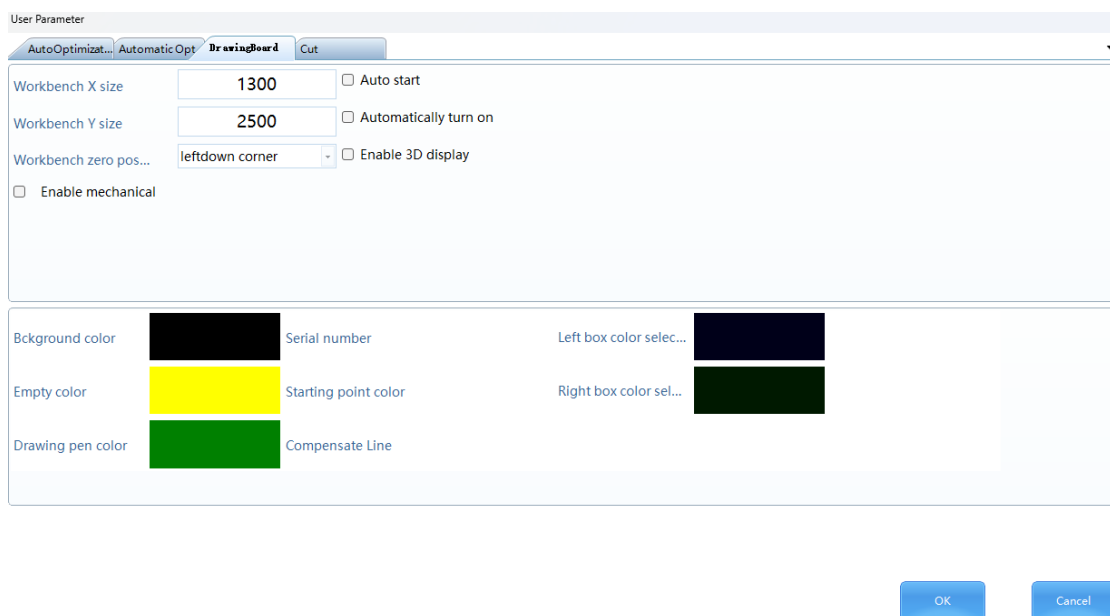


You can select the current color layer, you can hide the selected graphics, and you can display the

currently hidden color graphics.

Click the "View" icon in the lower-right corner of the tab  to open the User Parameters and Drawing Board dialog box. Here you can customize detailed settings for graphics displayed in the CAD interface, as shown below: Modify workspace dimensions including background color, cursor color, drawing pen color, sequence number color, starting point color, compensated original line, left frame selection color, and right frame selection color. All display colors can be customized here.

In the CAD drawing interface, the middle mouse wheel can zoom in and out of the view for easy viewing. Right-click opens a shortcut navigation bar, including hidden graphics  operations. There is also a one-click  switch to the main view for quick viewing of all graphics



2.2 Figure selection

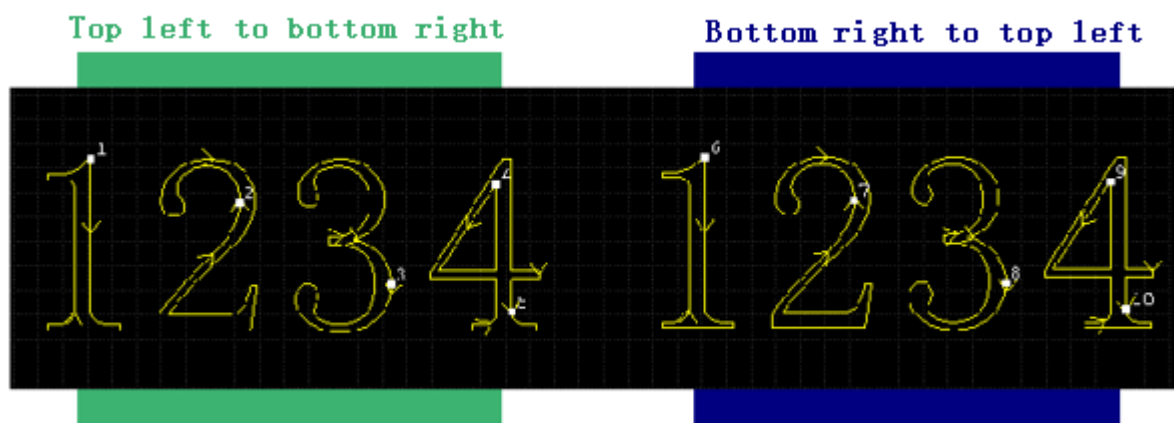
Icut provides a rich selection of graphical options.

The most fundamental selection method is "point-and-click" — simply hover over a graphic and click to select it. Another common approach is "box selection": hold down the left mouse button while moving to create a semi-transparent box around the target shape in the CAD interface. There are two variations: The first method involves dragging from the top-left corner to the bottom-right corner (as shown in the green

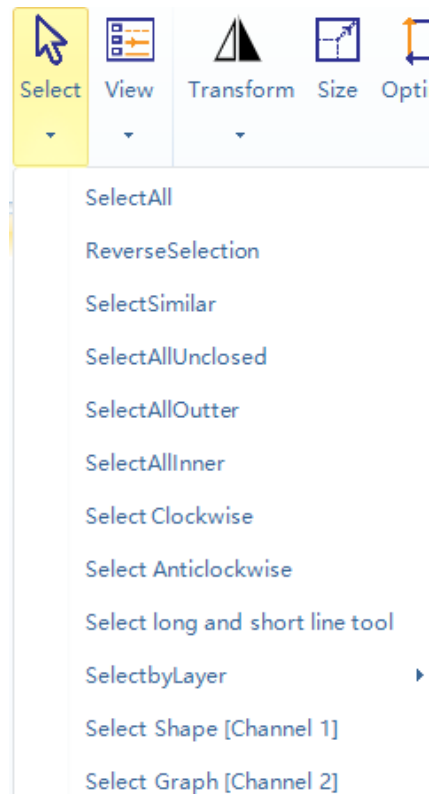
box) — only shapes fully within this green rectangle get selected. The second method works in reverse — drag from the bottom-right corner to the top-left (as shown in the blue box) — any part of the shape inside the blue box gets selected.

The selection diagram is as follows: The green area on the left from top to bottom will select items 2 and 3. The blue area on the right from bottom to top will select items 1, 2, 3, and 4. Flexibly using these two selection methods can help you more easily choose the graphics you need.

Whether it is "click" or "box", if you press the "ctrl" key while selecting, you can select multiple graphics without removing the original selected graphics. Of course, the selected graphics can be removed from the selection status.



The Icut system provides you with a more convenient way to select graphics by selecting the "View" column under the common menu.

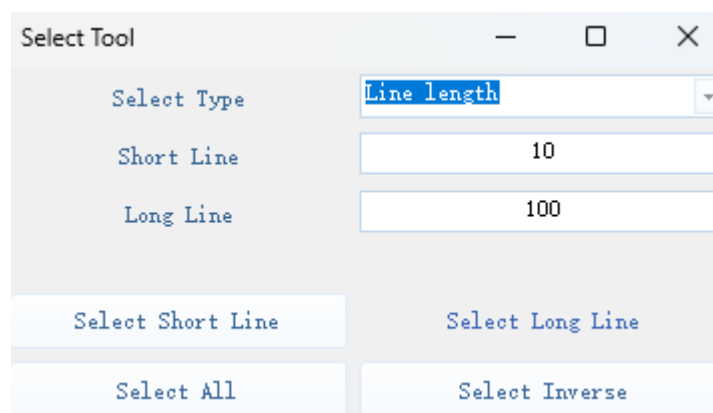


Basic selection: Select all (Ctrl+A), invert.

Shape selection: Select similar contours, select all unclosed ones, select all outer or inner shapes, and select all clockwise or counterclockwise.

Select short or long: The "Selection Type" contains: line length, shape length, and shape width.

The "Short or Long" input size. The "Four Methods" contain: Select short, select long, select all, and inverse.

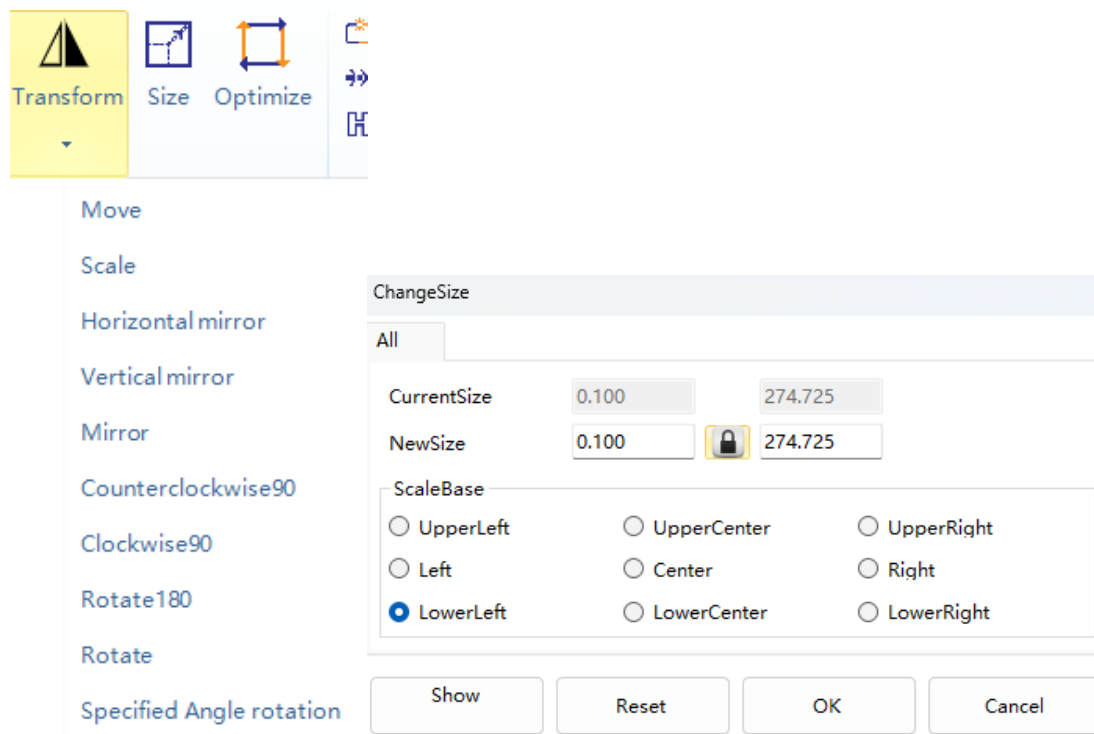


Layer selection: Selects all graphics with the same layer color. You can also select the corresponding color by right-clicking it under the "Process Navigation Bar".

Among them, "Select Similar Shapes" can select shapes of the same size. For example: I first select a 10MM circle, and then click "Select Similar Shapes" to select all circles of the same size of 10MM.

2.3 Graphic editing

The "Modify" tab in the menu bar offers comprehensive graphic editing features. Before using any tools, select the target graphic. Most transformations can be completed by clicking the drop-down shortcut menu under the "Transform" icon (e.g., translation, rotation, mirroring). The tab also includes size modification functions. As shown in the figure below:



2.3.1 Size modification

Icut provides a variety of convenient ways to modify the size. You can enter the modification window through the column size modification tool in the common menu "Modify", or you can right-click anywhere in the CAD interface to quickly access the "Size" column and enter the modification window. As shown in the figure above:

Current size: The default gray cannot be edited. It shows the current selected graphic size for reference.

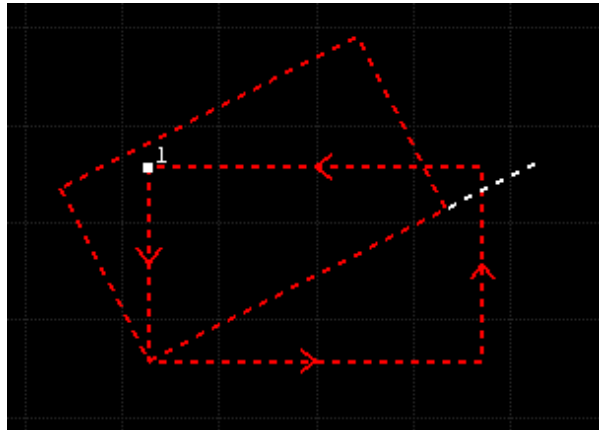
New dimension settings: Enter precise values to modify graphic dimensions. When the interface lock is active , length and width are proportionally locked according to the original drawing scale. Adjusting dimensions in any direction will proportionally adjust the other dimension. When the interface lock is inactive , length and width scales remain unlocked. Modifying dimensions in one direction will not affect the corresponding dimension in the opposite direction.

Zoom center: You can specify the positional relationship between the new shape and the original shape after zooming. For example, select "upper left" to indicate that the new shape and the original shape are transformed based on the upper left corner of the shape after zooming.

2.3.2 Interactive graphical transformation

Icut offers three interactive graphic transformations: zoom, rotate, and mirror at any angle, enabling precise adjustments to graphics. To perform these operations, first select the target graphic, then click the corresponding tool (as shown in the diagram above). Follow these steps: For example, to rotate a rectangle 45 degrees using its lower-left corner as the pivot point, follow these instructions:

- ① First, select the shape to rotate.
- ② Then click the small triangle ▼ below "Graphic Transformation" to open the drop-down menu, and select "Rotate". At this time, the drawing prompt bar below the CAD interface prompts: Please specify the starting point of rotation. **Rotate, please specify the base point position:**
- ③ Move the mouse to the lower left corner of the graph, and the mouse will be automatically adsorbed to the lower left corner to capture the endpoint.



- ④ Click the mouse, and the drawing prompt bar below the CAD interface prompts: Please specify the rotation Angle **Rotate, please specify the angle:** .
- ⑤ At this time, directly enter "45" in the "command bar" below the system, and click the Enter key to complete the rotation.

Interactive zoom and mirror operations are the same as above, so I won't repeat them here!

Note! Interactive zoom, the command bar input instructions indicate the number of times the graph is zoomed!

To retrieve the interactive zoom, interactive rotation, and arbitrary Angle mirror tool, you can pick the tool by right-clicking on the quick access bar in the CAD interface.

2.3.3 Quick translation, rotation and mirror

The Icut system offers a user-friendly graphic transformation tool. Under the "Modify" menu in the common menu, there's a drop-down menu with a small triangle ▼ next to the graphic transformation section, providing options like horizontal mirror, vertical mirror, 90-degree counterclockwise/clockwise rotation, 180-degree rotation, and translation. Simply select the graphic you want to transform and click the grab tool to start editing.

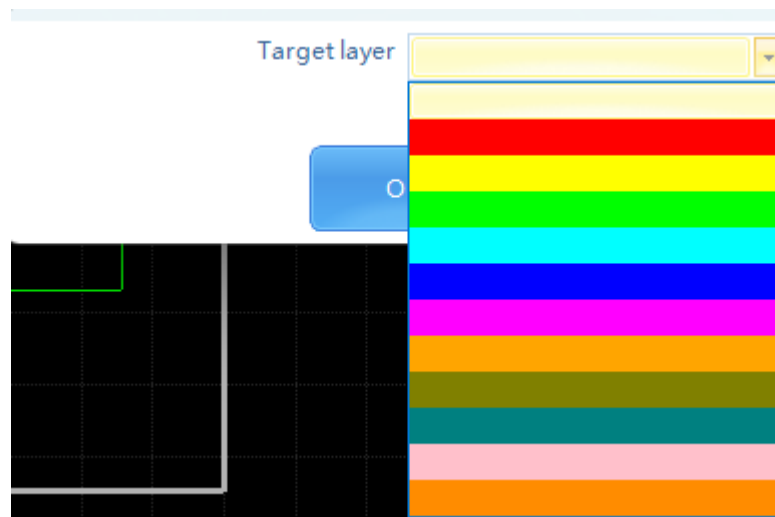
You can also use the function **Rotate** in the shortcut bar at the bottom of the interface to quickly shift and rotate the value input by switching and fine-tuning.

Fine-tuning: Select the graphic and move the keyboard arrow keys to move the graphic according to the set step distance

Rotate: Select the shape and click the arrow key or press the "R" key to rotate the shape

2.3.4 In-place replication

We sometimes need to duplicate shapes at identical positions within a graphic, as shown below: Two identical rectangles exist in the same layer at the same location. First, select the shape and right-click to open the shortcut menu. In the dialog box that appears, choose the target layer (you can select either the original or another layer). Click OK to create two fully overlapping rectangles.

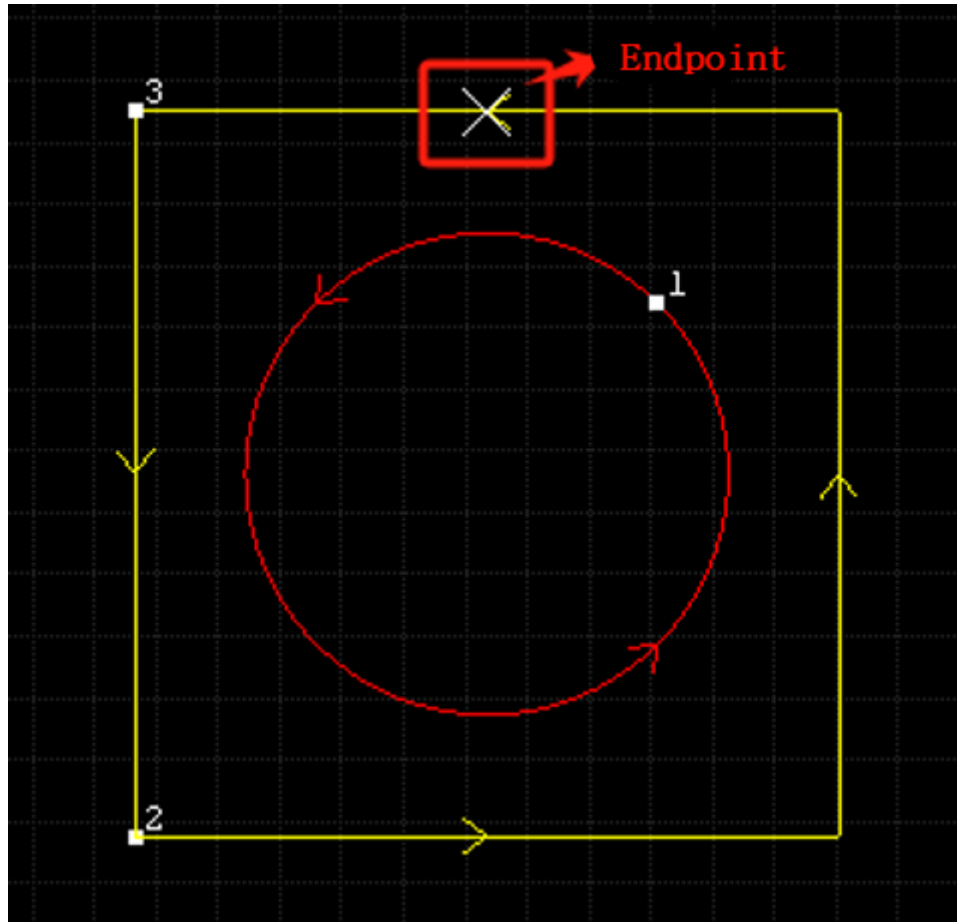


2.4 Capture tools

During graphic drafting, we need tools to precisely capture special feature points like endpoints and intersection points for accurate selection.



The Icut interface provides two feature point capture tools in the top-left corner. As shown in the figure below, when drawing graphics that intersect with existing shapes, simply activate these tools . Move your mouse over the endpoint of the existing shape, and it will automatically hover over the endpoint. Click here to confirm the reference point position for your new drawing.



There are three special shortcuts     in the top left corner of Icut, from left to right: software icon, save, undo (Ctrl+Z), and restore shortcut.

2.5 Draw graphics

Icut provides graphic drawing functions. In the middle section of the left navigation toolbar, from top to bottom are: Isolated Point, Line, Multiline, Circle, Arc, Ellipse, Rectangle, Text, Polygon, and Measurement. This layout is also present in the drawing module of the top menu bar. Except for Text and Measurement, the first seven functions are standard graphic drawing tools similar to those in CAD systems.

2.5.1 Drawing basic graphics

Drawing isolated points, straight lines, polylines, circles, arcs, ellipses, rectangles, text, and polygons is remarkably straightforward. Here's the step-by-step guide: Select the drawing tool in the CAD interface,

click to select the first corner or center point. Release the mouse and drag to set the rectangle's or circle's dimensions. Finally, click again to confirm the end corner position – and there you have it!

During the drawing process, if you want to cancel the current drawing command, right-click and cancel in the shortcut bar. Alternatively, press the ESC key to cancel the drawing command.

In the left navigation bar drawing tools, circles, rectangles, and arcs each feature distinct drawing modes. By clicking the small triangular  icons below these shapes, users can quickly access various drawing methods for their preferred options. For example, the circle dropdown menu includes: center-radius circles, center-diameter circles, two-point circles, and three-point circles.

2.5.2 Input commands to draw graphics

Icut works like a CAD drawing program by typing commands to draw graphics with precise positioning and dimensions. The specific format (X coordinate ***/comma,/Y coordinate ***) is as simple as entering 100,100 and pressing Enter.

Most drawing operations can be performed either by mouse or by inputting coordinates. The following example uses a 100 by 100 rectangle with rounded corners of 10MM:

- ① Select the rounded rectangle tool in the  drawing navigation bar. The drawing log bar prompts you to specify the first corner point
- ② Enter the first corner point position: -2500, -1600. Enter to specify another corner point
- ③ Enter the second corner point position: -2400, -1500. Enter to specify the radius of the circle
- ④ Press Enter 10 times. The operation is complete. As shown in the figure below:

Drawing a rounded rectangle, specify the first corner point:

-2500,-1600

Drawing a rectangle, specify the other corner point (or dimensions (D)):

-2400,-1500

Drawing a rounded rectangle, specify the fillet radius:

10

Drawing completed

2.5.3 Text input

Icut supports text input. Click the tool icon on the left **T** drawing navigation bar and type text directly at the "Text" location.

String

☐ SingleLine extfont2.shx

☒ HollowOut ...

[Font: Name=宋体, Size=100, Units=3, GdiCharSet=1, GdiVerticalFont=False]

Text	ABCD
CharDistance	20
Height	20
DecliningAngle	0

OK Cancel

Select "Luo Kong" **...** on the right to open the font editing interface

Font: Configure the common font. You can select the font you need here

Font: You can choose the form of the font, including regular, italic, bold, and bold skewed.

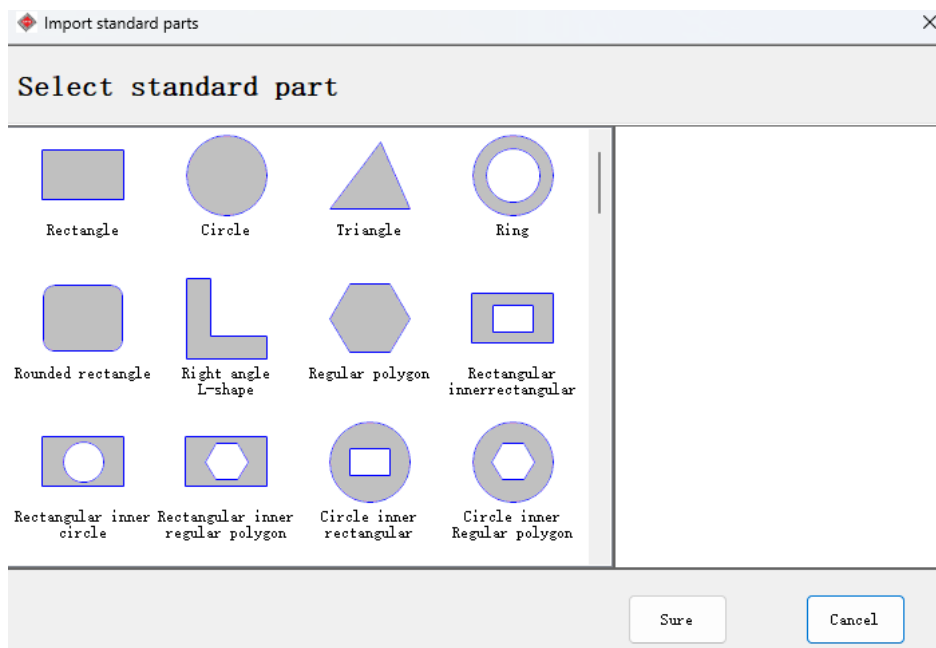
Size: Can set the size of the font

Effect: Whether to delete the line or add an underline.



2.5.4 Create standard parts

Icut provides the drawing of standard parts, menu bar, "File" drop-down menu, open the window to create standard parts: as shown in the figure below: you can open the graphics you need, open it directly, select the parts, and confirm.



After opening the part, a window to modify the size of the part will be opened, as shown in the figure below: Finally click OK and place the part anywhere in the CAD interface.

2.6 Graphic optimization

When importing a external graphic, Icut will automatically optimize the graphic. If you need to manually optimize the graphic, you can open the "Optimize" window in the "Modify" column of the common menu, as shown in the figure below:

Effective between layers: When checked, graphic optimization is effective for graphics on the same layer

Optimize the selected shape: When checked, only the selected shape is optimized

Select the graphics that need optimization, check the options that need optimization, configure the optimization parameters, and confirm.

2.6.1 Remove small graphics

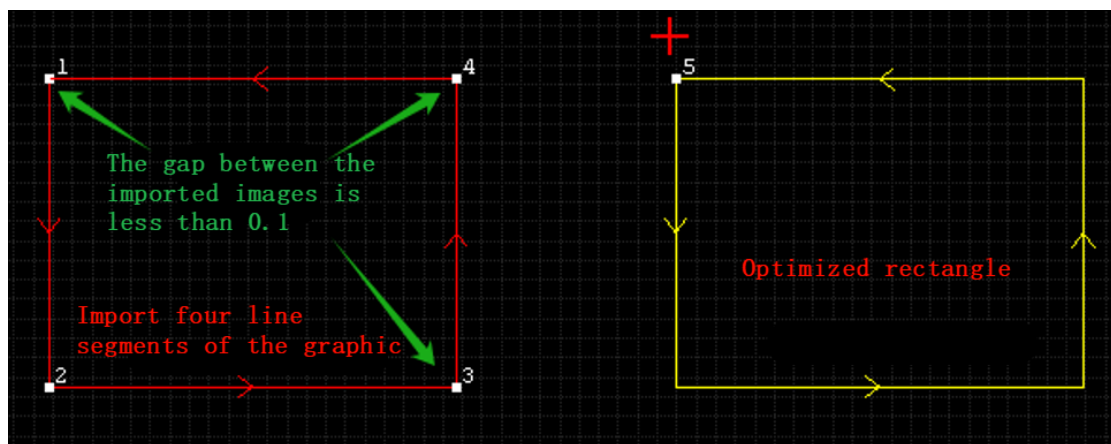
Imported graphics may sometimes contain visually inconspicuous elements that result in small display sizes or unintended positioning during processing. To resolve this, use the "Delete Minor Graphics" feature: Under the optimization tool, select "Delete Minor Graphics", adjust the size range of minor graphics, then confirm. This process will remove graphics smaller than the specified dimensions while preserving others.

2.6.2 Remove duplicate lines

This function is used to remove overlapping graphics until only one remains. Under the optimization tool, check "Delete duplicate lines" and modify the parameter range of duplicate lines, then confirm. It will search and clean all graphics. If two lines are smaller than the parameter range, one line will be automatically deleted.

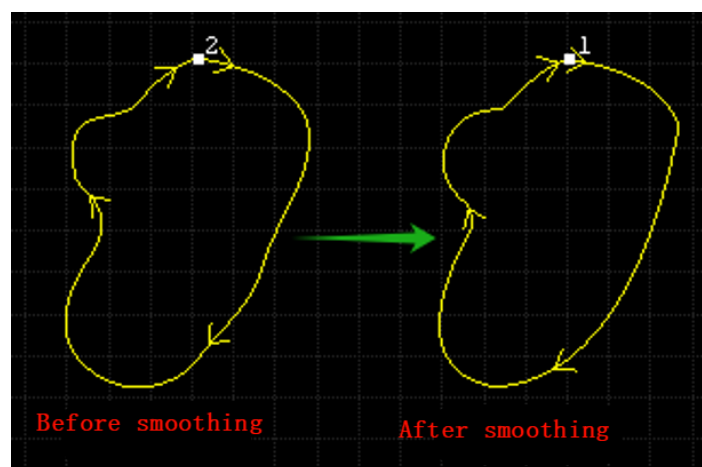
2.6.3 Merge the connecting lines

Graphics created with other software like AutoCAD often contain visually connected but actually separate shapes. These can be merged by selecting the shapes to combine, checking the "Merge Linked Lines" option in the optimization tool, adjusting the parameter range, and confirming the changes.



2.6.4 smoothing

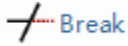
Imported graphics from other drawing software often exhibit irregular curves and excessive nodes, resulting in choppy cutting motions or frequent tool lifting, which significantly reduces processing efficiency. To resolve this, apply smoothing optimization to imported graphics: Select "Smooth" in the tool settings, input precision parameters, then click OK to complete the enhancement. The comparison below shows the original curve versus the smoothed version. For clarity, we've applied a higher smoothing precision here. In practical applications, users should adjust the fitting values according to specific machining requirements.

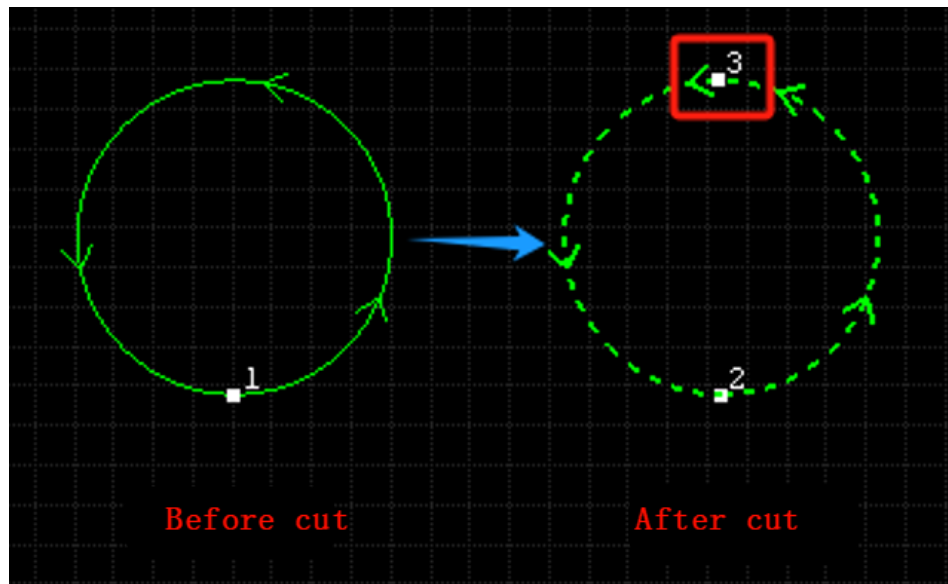


The Icut system offers two smoothing modes: fitting and interpolation. Each mode represents a distinct algorithm, allowing users to select based on their specific requirements. For fitting mode, the precision value should be set between 0.1 and 0.3. The interpolation mode typically requires values between 5 and 6. Please ensure you correctly select the smoothing mode and input appropriate precision values accordingly.

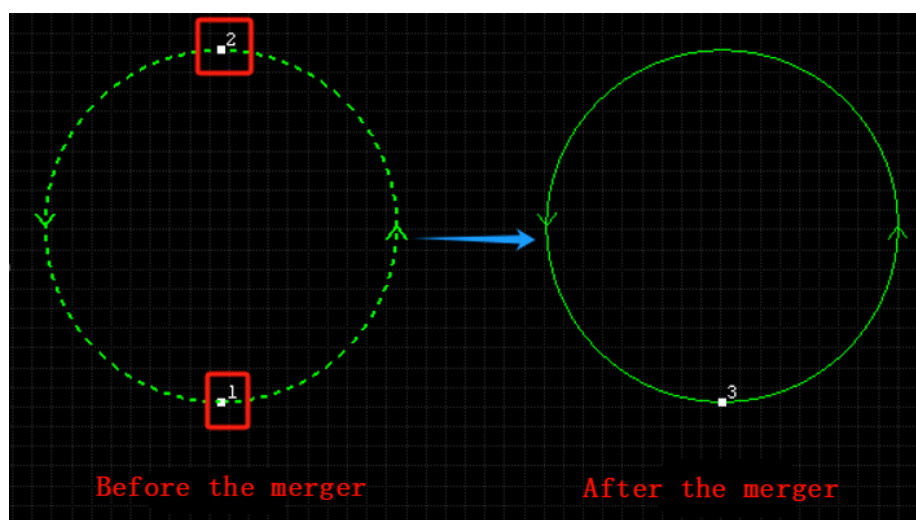
Note! The "User Parameters" section in the menu bar already provides smoothing optimization. Before importing files, check the smoothing option to enable automatic smoothing once during import. If this option is not selected in "User Parameters", manual optimization can be performed by checking the "Modify" tab in the menu and opening the optimization window for manual adjustments.

2.6.5 Interrupted merging

To interrupt a shape, first select the target shape . In the menu, navigate to the "Operation" tab and click the "Break" tool. Position your cursor over the target location (as shown in the red box at position 3). Click to cut the shape. Once interrupted, the shape becomes open and loses access to certain functions.

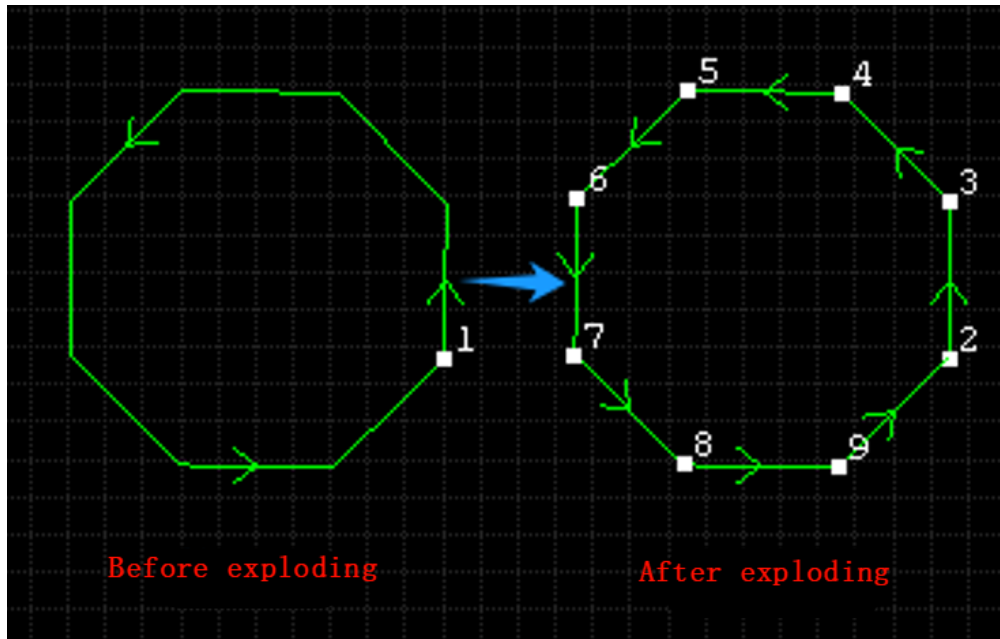


The merge tool is the opposite of the break function. The prerequisite for using the merge tool is that two nodes of two graphics must completely overlap. Select the graphics , click the tool in the "Operation" column of the menu. Both graphics to be merged must be selected.



2.6.6 Detonation

Select the "Operation" column of the graphical menu and click the tool  **Explode**. As shown in the figure below, it will automatically break at the endpoints.



3.Process tools and process parameters

This chapter details the process setup features provided by Icut. As most process parameters are directly linked to the materials being cut, tool holders, and cutting tools, please configure them according to actual production requirements. All parameters mentioned here—including those shown in the images—are for reference purposes only and should not be considered as definitive specifications.

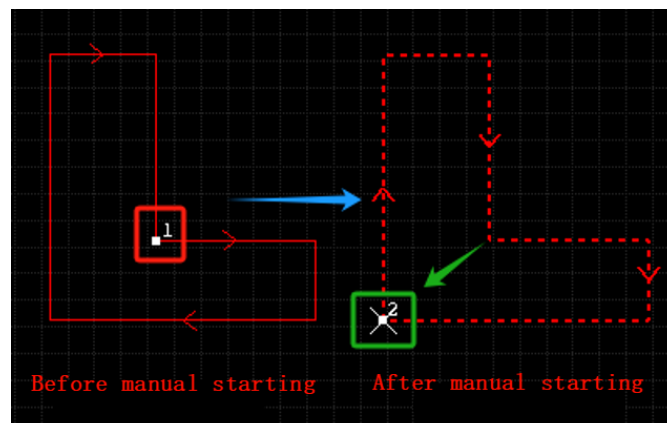
Note! Improper or wrong parameters may lead to poor cutting effect or even damage the machine tool, please set carefully.

3.1 Setting the starting point of the figure

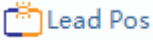
Icut offers three optimized starting point methods: Manual Start, Automatic Batch Start, and Longest Straight Line Start. These intuitive options are detailed below. To configure your starting position, first select the graphic you want to work on, then navigate to the "Tools" menu in the toolbar section where you can choose between these preset settings  **Lead Pos** .

3.1.1 Manual starting point

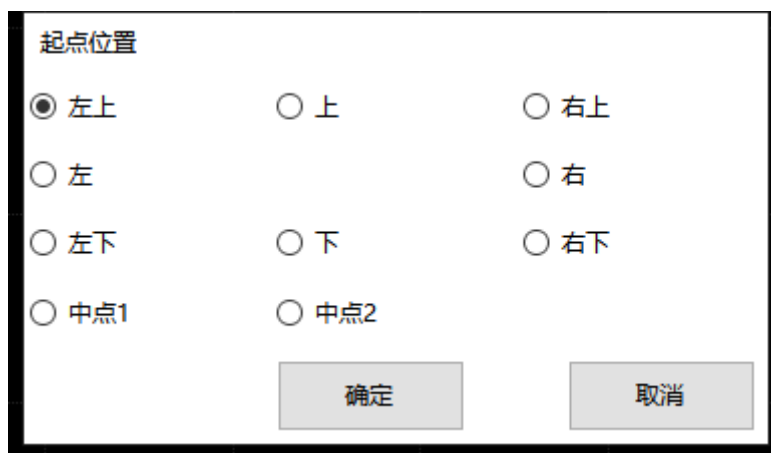
After selecting the figure, click the button  **Lead Pos** , as shown in the following figure: Before modifying the starting point position at "1", move the mouse to "2", the mouse automatically adsorbs a cross shape, and then click the mouse to complete the modification of the starting point position. Starting point position 1 to 2.



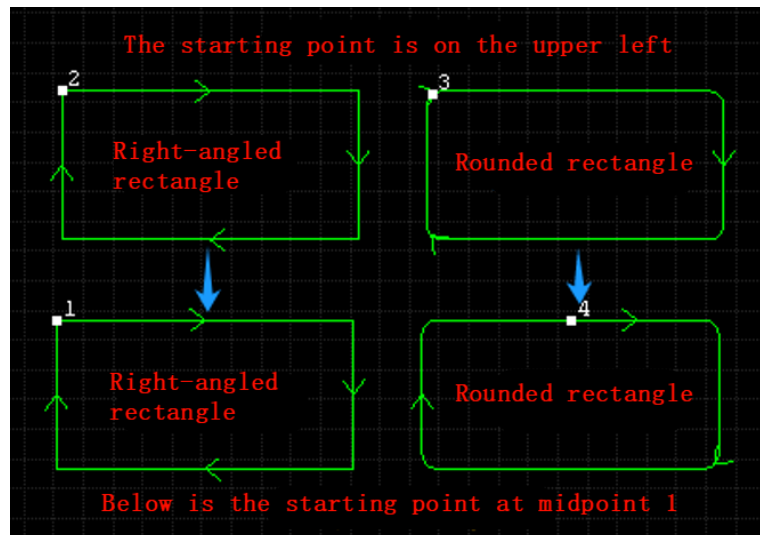
3.1.2 Automatic batch starting point

Icut supports automatic batch starting point configuration. When processing multiple individual graphics in a file, we utilize batch starting points to optimize workflow efficiency. First, select the desired graphics by clicking buttons  under the "Tools" menu section and selecting "Automatic Batch Starting Points" from the drop-down menu. This activates the starting position window (as shown below), offering 10 positioning options: top-left, bottom-left, top-right, bottom-right, left, right, top, bottom, center point 1, and center point 2. The first eight positions are standard starting points, while the last two feature specialized starting point methods.

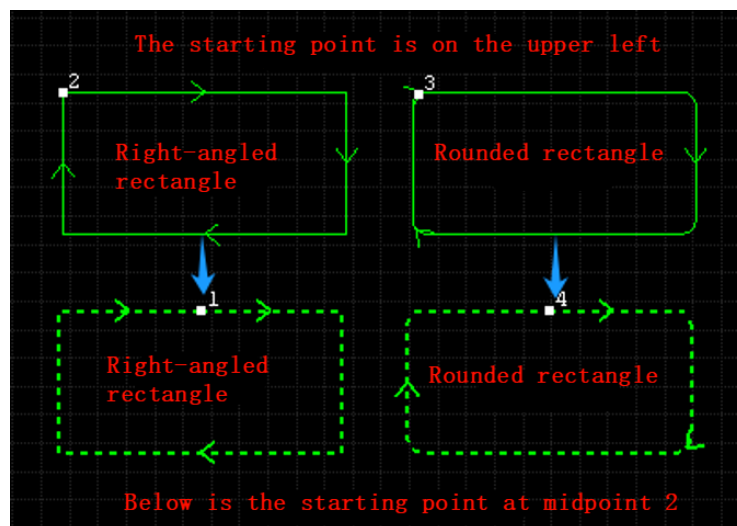
In the "starting point" window, select the desired starting point. For example, select "upper left corner" and click OK. The selected graphic starting point will be set to the upper left corner.



The usage of Point 1 and Point 2: These two methods are respectively applied in environments where a file contains right angles and rounded corners. For Point 1, the starting point of the fingertip angle pattern is located at the angle intersection, while the starting point of the rounded corner pattern is at the midpoint. Point 2 refers to situations where both right-angle and rounded-corner patterns share the same midpoint origin. As shown in the figure below



Point 1 effect



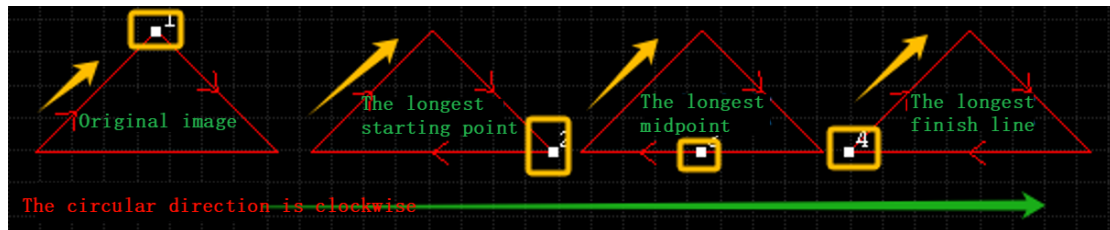
Point 2 effect

3.1.3 Longest straight line starting point

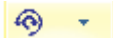
Under the "Tools" tab in the menu bar , the "Longest Line" dropdown menu offers three options: longest starting point, longest center point, and longest endpoint. As shown in the diagram below:

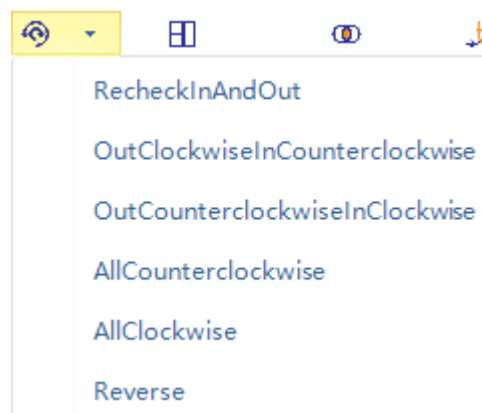
The red area represents the graphic, the yellow arrow indicates the cutting direction, and the yellow box marks the starting position. From left to right, these correspond to the original image, longest line starting point, longest line center point, and longest line endpoint, respectively.

As shown in the diagram below, we first identify the longest side of the triangle. It's evident that the base segment is the longest. Next, we need to determine the cutting direction. Examining this base segment individually, its extension runs from right to left, meaning it starts at the right end and ends at the left end.



3.2 Graphic direction setting

During material cutting processes, precise control of cutting direction is crucial. Icut offers a comprehensive and detailed tool for optimizing cutting orientation: Simply select the target shape, navigate to the "Tools" menu section, click the "Direction" button  to open the drop-down menu, then choose the appropriate function to modify the cutting path direction, achieving optimal cutting results.



Re-distinguish inner and outer contours: The default cutting order of the system is "inner first, then outer". When a closed shape contains other shapes, but the actual cutting order is "outer first, then inner", you need to click the "direction" drop-down menu to re-distinguish inner and outer contours.

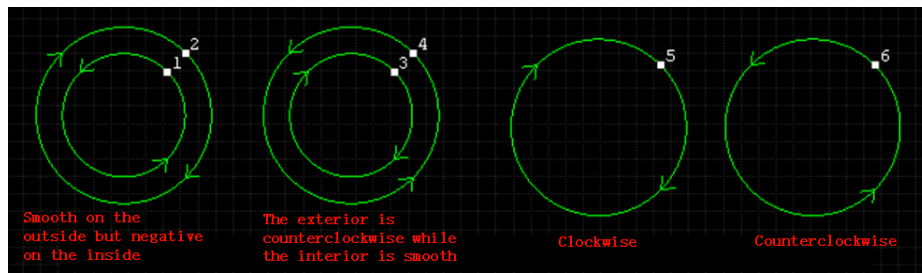
External clockwise and internal counterclockwise: As shown in the figure, Figure 1 represents "external clockwise and internal counterclockwise" (clockwise outside, counterclockwise inside), while

Figure 2 demonstrates "external counterclockwise and internal clockwise" (counterclockwise outside, clockwise inside). To use this function, two prerequisites must be satisfied:

1. The figure must be a closed figure;
2. The internal and external graphics should be two independent graphics. If there is a group state, the graphics should be split first with the scattering tool and then the direction should be modified.

Counterclockwise and clockwise: As shown in the figure, Figure 3 is the counterclockwise cutting direction, and Figure 4 is the counterclockwise cutting direction. You can directly choose the corresponding direction for modification according to actual requirements.

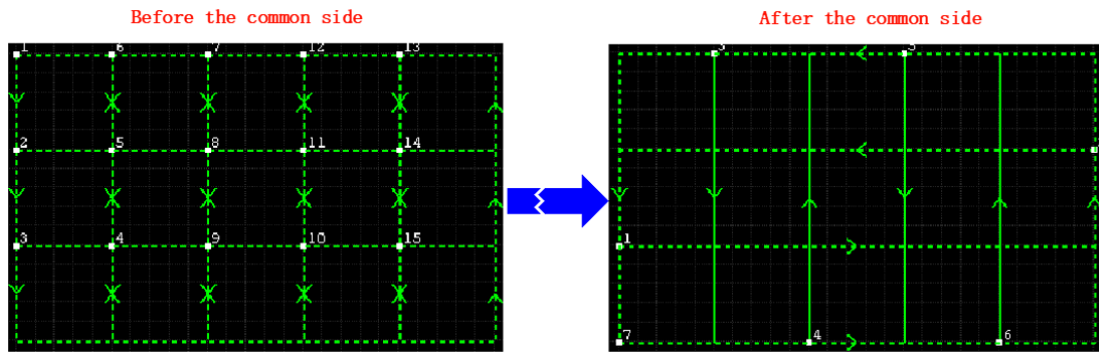
Reverse: This function can directly reverse the cutting direction of the current graphic.



3.3 Common borders

In cutting and processing, we often encounter graphics with the same boundary. In order to save the processing length and improve the processing efficiency, it is necessary to merge these graphics with the same boundary and realize the common use of boundaries.

Icut also supports the optimization of common edge effect by modifying the "common edge spacing" parameter: For graphics that are not completely coincident and have a certain edge spacing, the common edge function can be enabled by adjusting this parameter to automatically merge the graphics, so that the boundary can be shared without manual alignment.



- ① Select the "Tool" column under the menu, select the common edge , and open the common edge window
- ② Select "common edge type" includes regular common edge, C-shaped common edge. The figure above shows the regular common edge
- ③ Select "Common edge sorting" Common edge sorting automatically, including the shortest distance, horizontal U-shaped, horizontal Z-shaped, vertical U-shaped, vertical Z-shaped.
- ④ Modify the precision of "common edge spacing". It refers to the spacing between graphics, and is default 0.1.

Manual co edge setting

Common edge type:

General common edge

Common edge sorting:

Minimum distance

Common edge distance:

0.10

OK

Cancel

3.4 Graphic tool compensation

Icut offers multiple graphic compensation functions. Since standard cutting paths follow the original graphic trajectory, we sometimes need to expand or contract the cut area. This is particularly important when

using spindle milling cutters. For example, with a 3.17mm diameter tool cutting



a 50×50 rectangle without compensation, the actual cut size would be 3.17mm smaller. Therefore, we must expand the rectangle by half the tool's diameter (1.58mm), ensuring the final material meets the 50×50 dimensions. This method significantly improves cutting accuracy. However, when using G code files for machining, no external expansion or contraction is required, as these paths are automatically processed during creation.

Under the "Tools" column in the menu bar, open the window as shown below  :

Input of compensation precision, including external expansion distance and internal contraction distance

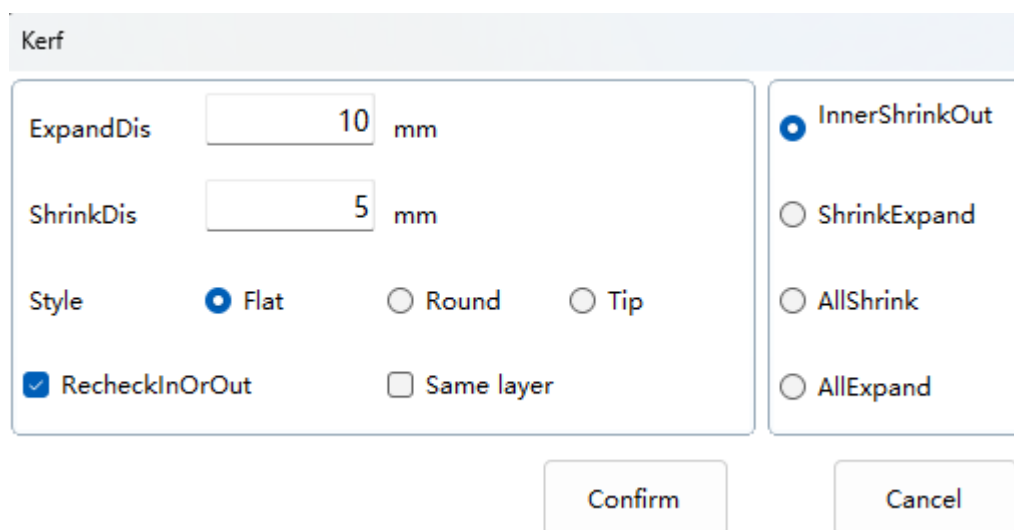
The compensation methods include external expansion and internal contraction, external contraction and internal expansion, full internal contraction and full external expansion

The corner types include flat corner, rounded corner and sharp corner selection

Reoptimize the function of separating inside and outside contours

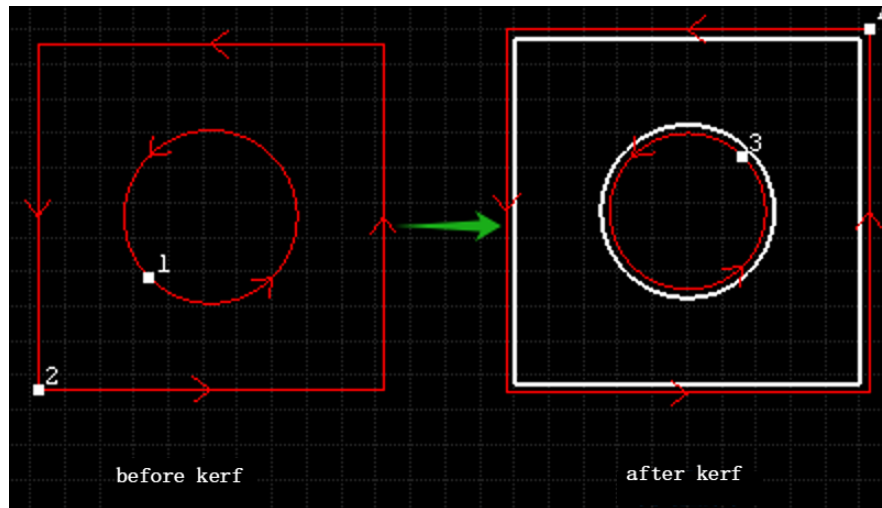
Use expand and shrink on the same layer to determine the layer when expanding and shrinking.

The above features will be introduced below in text and pictures.



3.4.1 Expanding and contracting

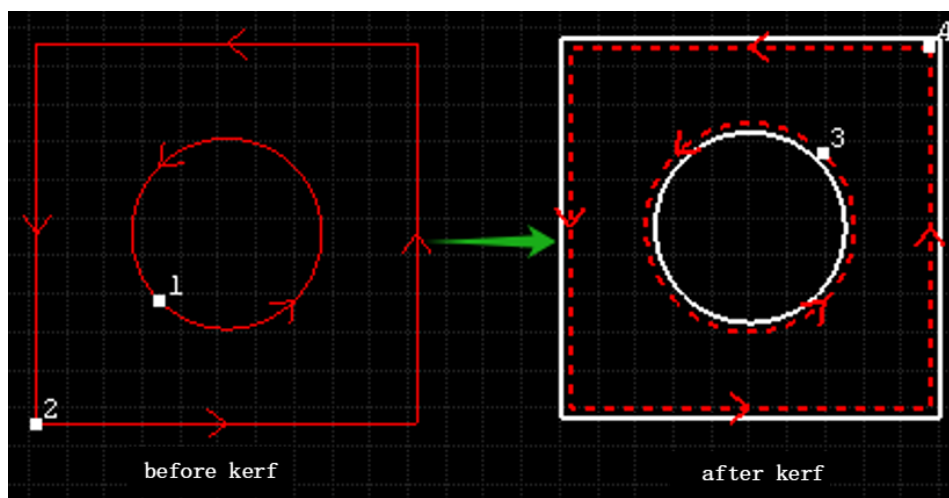
The figure below shows: the original figure on the left and the compensated figure on the right. Red represents the cutting trajectory and white represents the original line. The distance between expansion and contraction is half of the tool diameter.



The demonstration is a closed shape. If it is a non-closed shape, both the outer and inner shapes will be expanded.

3.4.2 External contraction and internal expansion

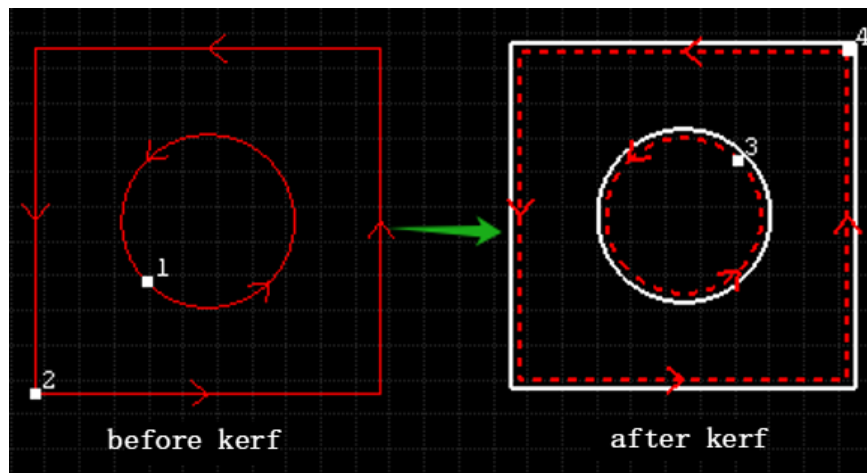
The figure below shows: the original figure on the left and the compensated figure on the right. Red represents the cutting trajectory, and color change represents the original line. The distance between external contraction and internal expansion is half of the tool diameter.



The demonstration is a closed shape. If it is an open shape, both the outer and inner shapes will be contracted.

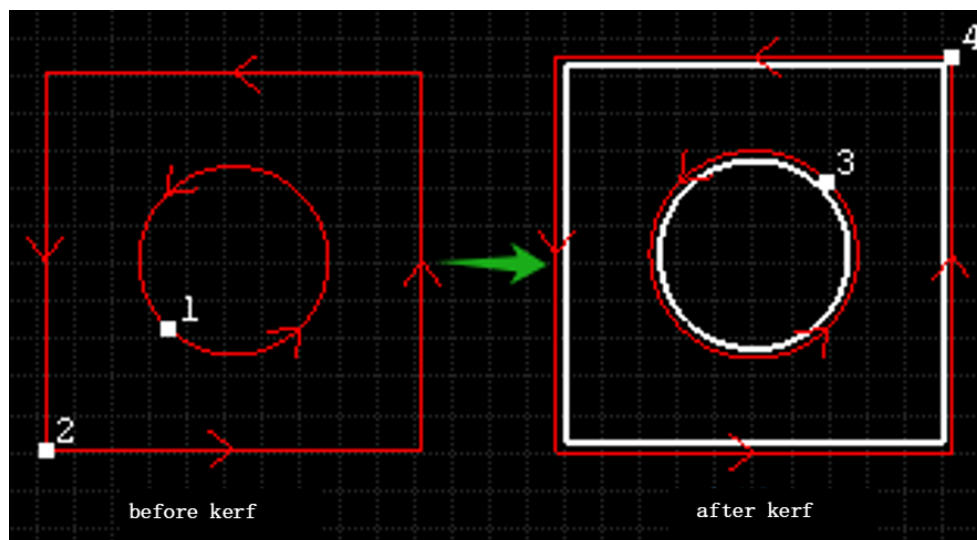
3.4.3 Total contraction

The figure below shows: the original figure on the left and the compensated figure on the right. Red represents the cutting trajectory, and color change represents the original line. The total retraction distance is half of the tool diameter.



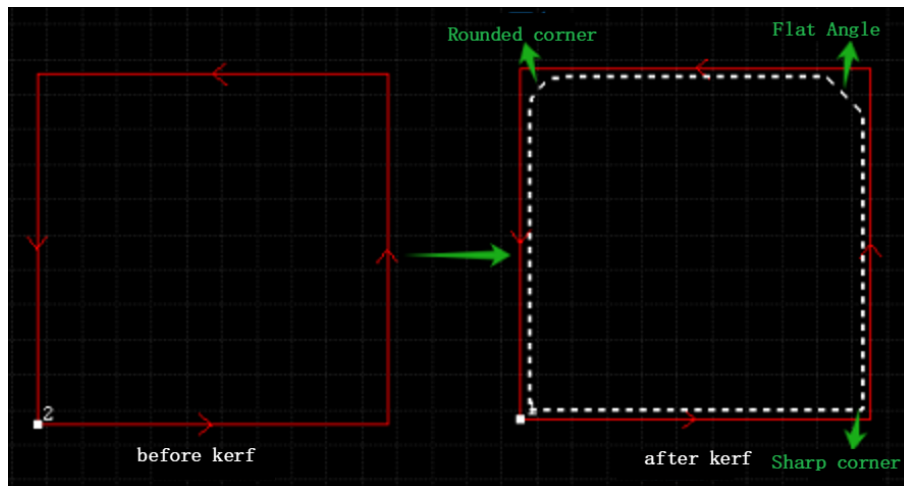
3.4.4 All external expansion

The figure below shows: the original figure on the left and the compensated figure on the right. Red represents the cutting trajectory, and color change represents the original line. The entire external expansion distance is half of the tool diameter.



3.4.5 Angle type

As shown in the figure below, three types of corners are displayed here together, instead of being separated. According to the needs, different corner types are selected, and the compensated sharp corner position will optimize different corner features.

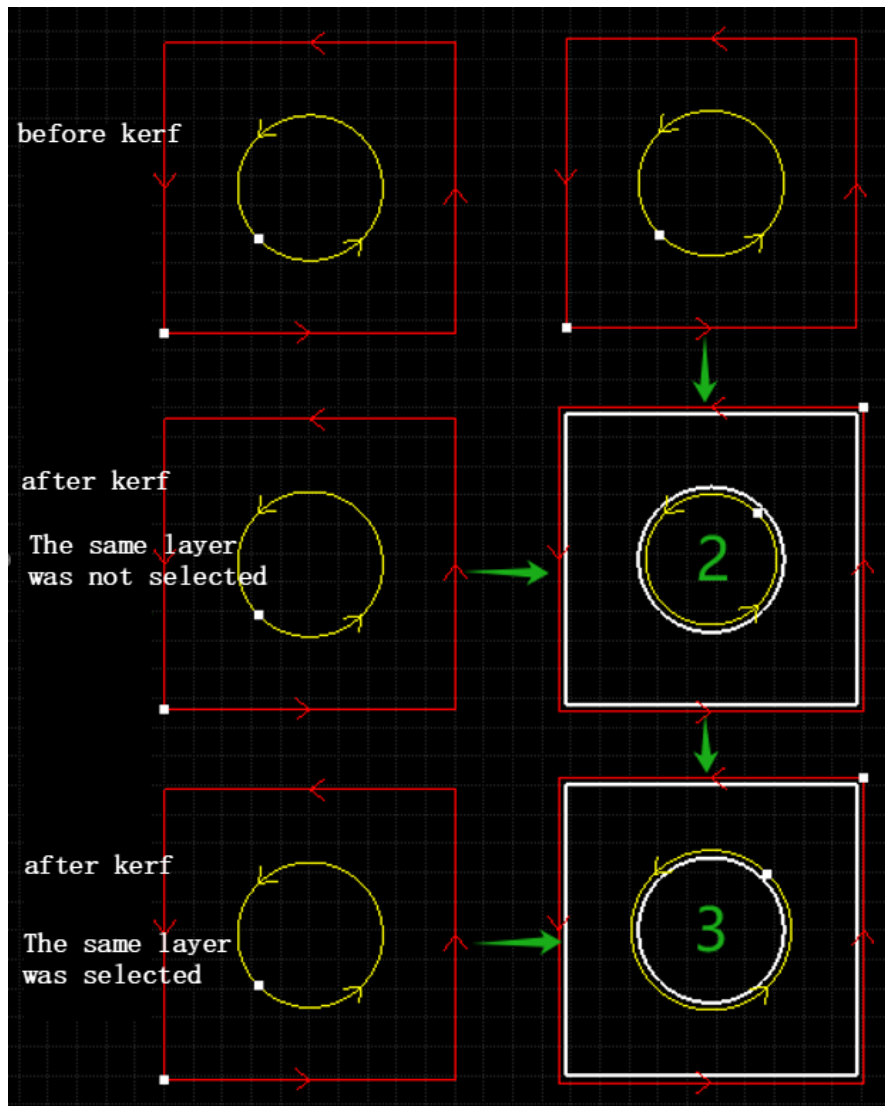


The corner precision after compensation can be modified in the chamfer parameter window under the drop-down menu

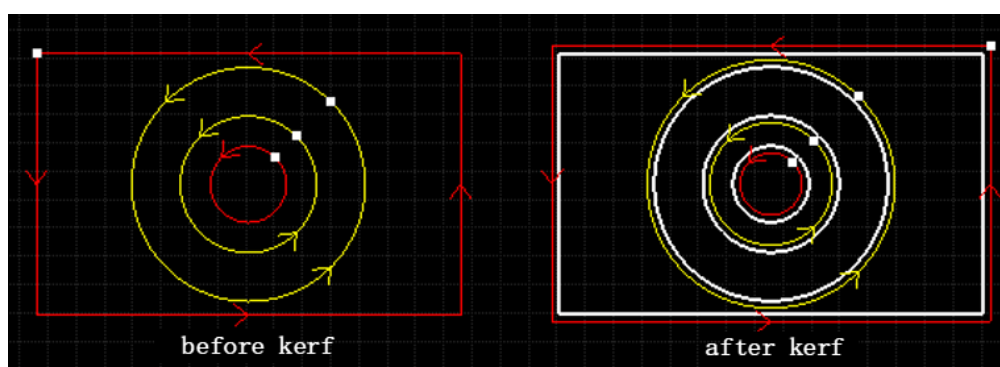
of "Operation" column in the menu bar 

3.4.6 Compensation, same layer

The following figure shows: No.2 is compensated without selecting "same layer", and the compensation is expanded and contracted according to the same layer. No.3 is compensated by selecting "same layer", and the compensation is made independently for the outer and inner layers, and all layers are expanded.



As shown in the figure below: Sometimes we encounter the following graphics, there are multiple graphics in the closed graphics, separated into different layers, and want to use the expand or contract function, you can check the same layer for compensation. The inner and outer contours of the same layer are distinguished.



3.5 Regional carving

Icut supports the "area engraving" function, which refers to the process of local engraving within a specific area. It can directly generate concave and convex milling effects through vector graphics. This is widely used for engraving planes, EVA foam, and other irregular slotting. It saves the time we spend writing G code.

In the common menu, go to the "Tools" section, open the [Regional carving](#) Window and parameters can be set as shown in the figure below:

Tool radius: refers to half of the diameter of the milling tool used, r

Path spacing: Refers to the distance between regional engraving paths, also known as overlap distance. Generally, the value should be set smaller than the tool radius. A smaller value increases the overlap rate, prolongs processing time, but improves engraving and milling quality. Conversely, a larger value reduces overlap rate, shortens processing time, but decreases engraving and milling effectiveness

Target layer: Select which layer color is used to generate the area carving path.

Cutting methods: including row cutting and ring cutting

Whether to delete the original image: Check to delete the original outer contour graphics, only retaining the generated area carving path

Regional Carving

Tool Radius: 1.5

Space: 1.5

Layer: ☐ Is Delete Orange

Feed Type:
Row
Ring

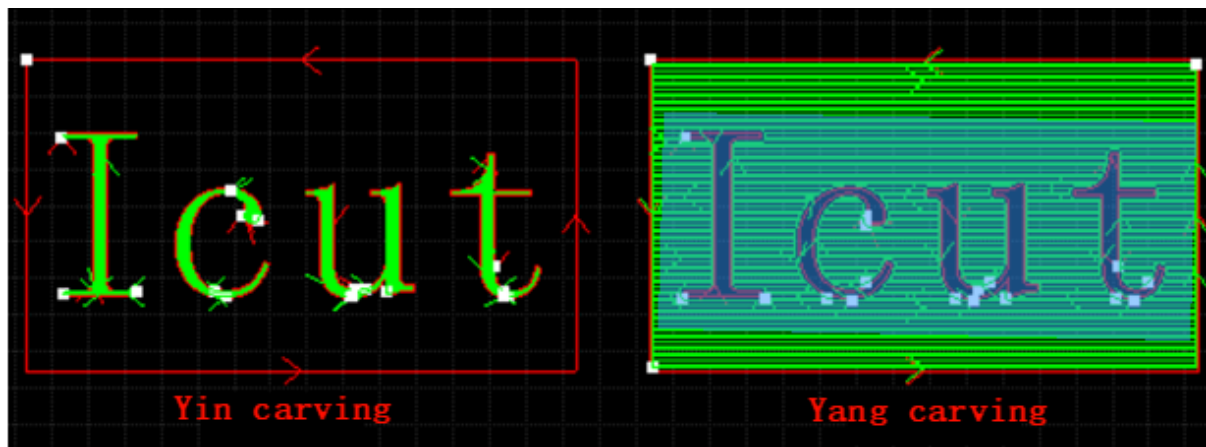
OK Cancel

3.5.1 Yang carving and Yin carving

Icut supports milling operations for positive and negative relief effects, as shown in the figure below:

Ingot carving: Select the text Icut, click the "Tool" column in the common menu, click the "Area carving" button, open the area carving parameter window, set the parameters, and click OK.

Yang carving: Select the text Icut and the outer contour rectangle. Click the "Area carving" button in the column of the common menu, open the area carving parameter window, set the parameters and click OK.



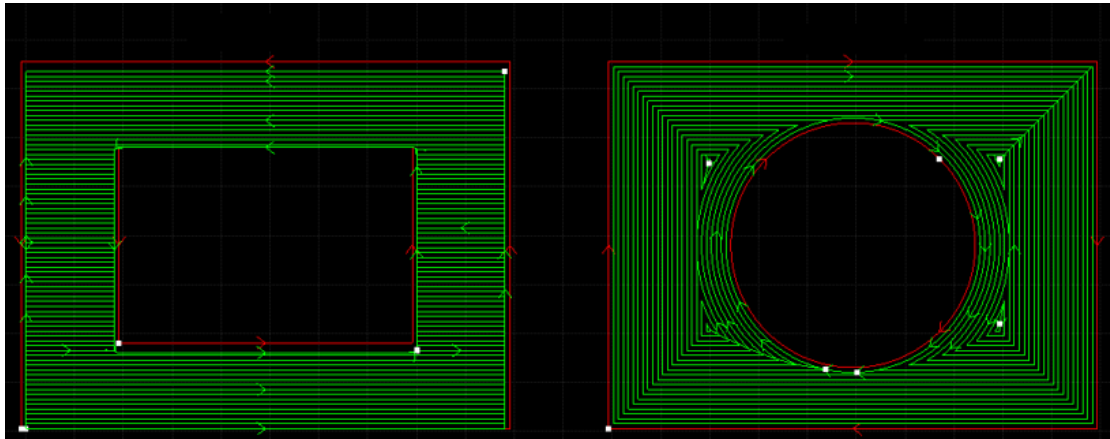
Important: When carving areas, select the tool based on your design's minimum dimensions.

Using oversized tools may result in insufficient path spacing, potentially leaving narrow sections without complete paths. Conversely, choosing undersized tools could reduce processing efficiency.

Always measure the design's minimum dimensions beforehand to choose an appropriate tool size.

3.5.2 Row cutting tool and ring cutting tool

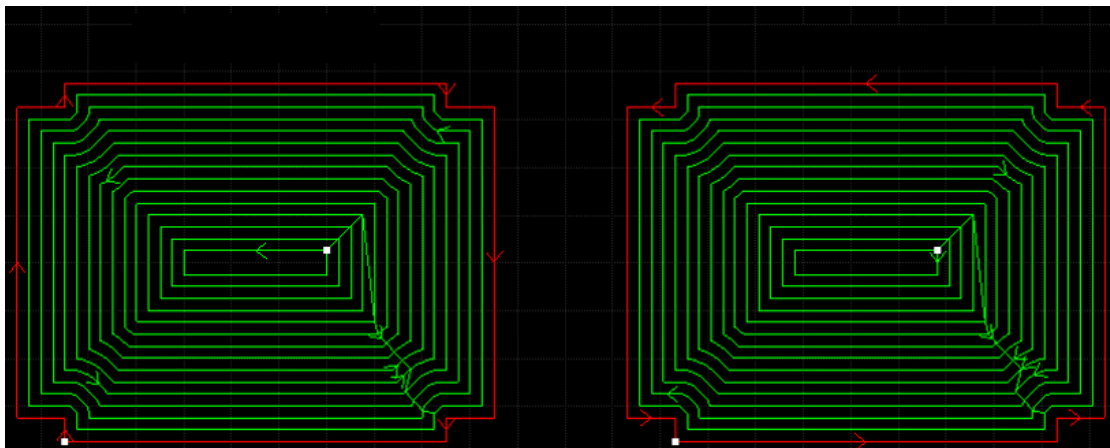
The diagram below illustrates two milling approaches: the left image shows linear cutting with tool removal, while the right demonstrates circular cutting with tool removal. Linear cutting involves horizontal X-axis reciprocation with tool insertion starting from a specific corner point and lifting at the same position. Circular cutting follows the contour path, typically initiating cuts either within the graphic pattern or at intersections between straight lines and arcs. You can select appropriate cutting methods based on material characteristics, tool specifications, and design features. Choosing the optimal cutting method significantly enhances milling efficiency.



Suggestion! Hard materials are selected for ring walking.

3.5.3 Ring cutting and tool removal

When performing circular cutting operations in area engraving, we offer two rotation options: clockwise and counterclockwise. Since certain materials have strict requirements for cutting direction, incorrect orientation may cause burrs during milling, leading to time-consuming manual polishing. Icut effectively resolves these issues by allowing users to customize rotation parameters for both clockwise and counterclockwise operations.



Most importantly, Icut can also modify the tool starting point without changing the milling direction of the path by using the "direction" tool. Some flexible materials need to be milled from outside to inside.

The default system setting is to cut from inside to outside. To modify the starting point of the cutting tool, please refer to the following steps: For example, for milling from outside to inside, the path direction is clockwise

① To select the graphic, open the "Area Carving" window under "Tools" in the common menu and modify the parameters

② Feed Type: Ring ☐ anticlockwise ☒ clockwise

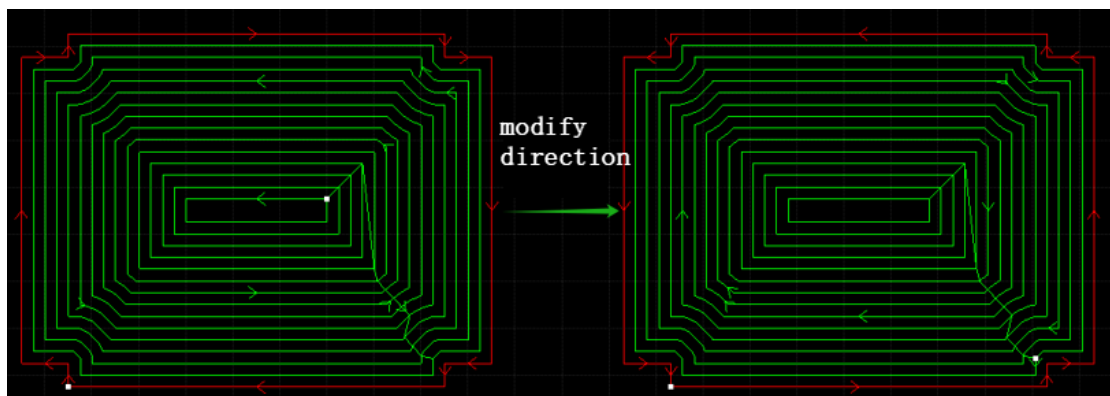
Select "counterclockwise" for the loop

cut tool. OK

③ As shown in the figure below, the left side is the carving path of the current area, with the starting point inside.

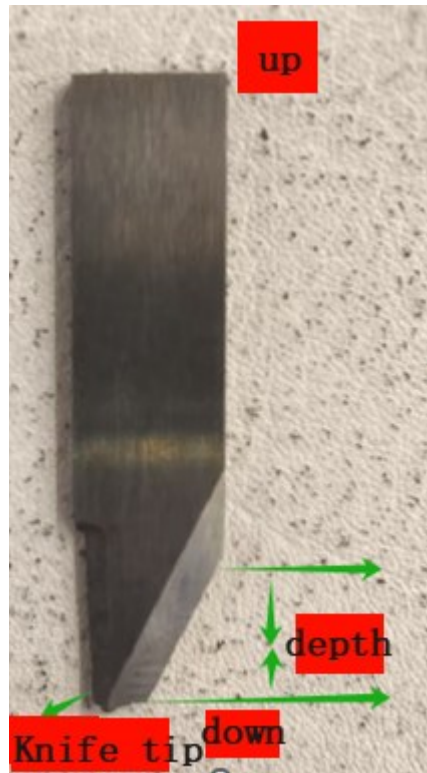
④ Select the area of the carving path. Click the "Tool" column, click the "Direction" tool button, and click "Reverse" in the drop-down menu

⑤ As shown in the figure below, the final effect is on the right. The starting point is outside and milled clockwise.



3.6 Reverse cut compensation

The tools used in the cutting machine are angled tools, unlike the milling tool which is completely vertical and wide at the top and narrow at the bottom. Cutting thick materials will produce "overcut", that is, the bottom is cut and part of the material is cut into the upper part.



Therefore, we added the parameter "anti-cut compensation". When cutting along the processing trajectory direction, the cutting is reversed near the lifting position. The end point of cutting is consistent with the starting point of reverse cutting, and the tip of the blade and the rod are on a vertical line.

The menu is usually located in the "Tools" column. Open the [Reverse cut compensation](#) window as shown below:

Overcut length: refers to the length of the material surface cut after the bottom surface is cut

Knife lifting Angle: refers to the exterior angle of two straight lines at the cutting point of the figure.

If the exterior angle is less than the knife lifting Angle, the current line segment will open reverse cut.

Select shape: When checked, the selected shape is cut off

Anti-cut layer: When checked, you can specify which layer to use for anti-cut. Anti-cut can be used with different layers and different tools.

Reverse Cut Compensation

OverCut length 3.0

Lifting angle 35.0

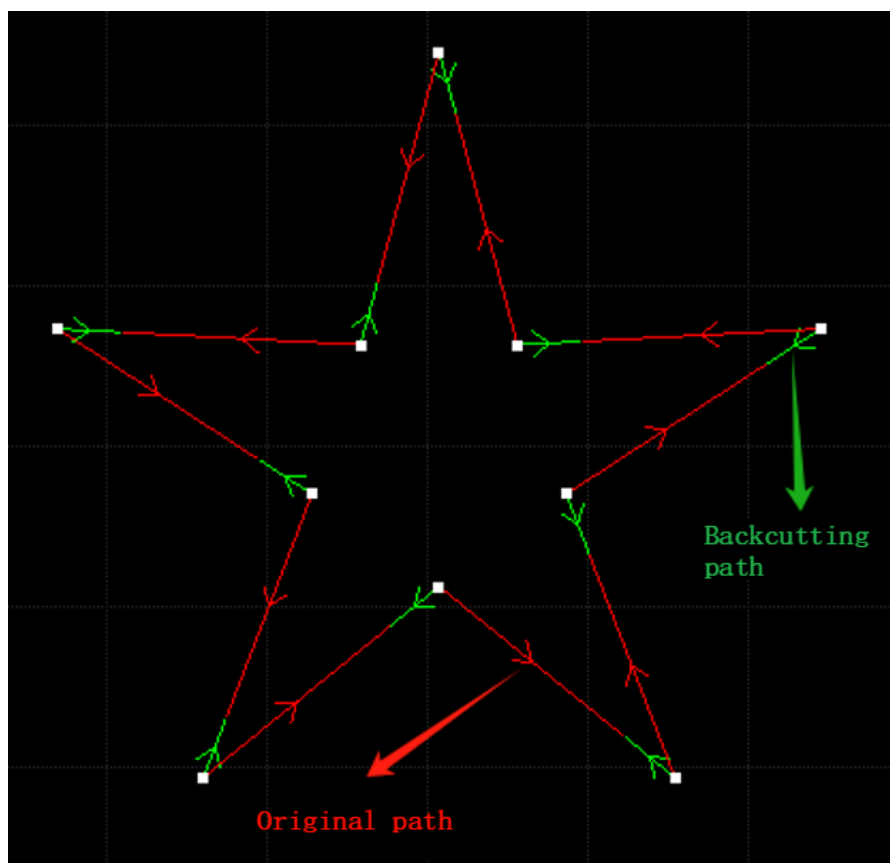
selected graphic

Anti tangent cutting layer

OK

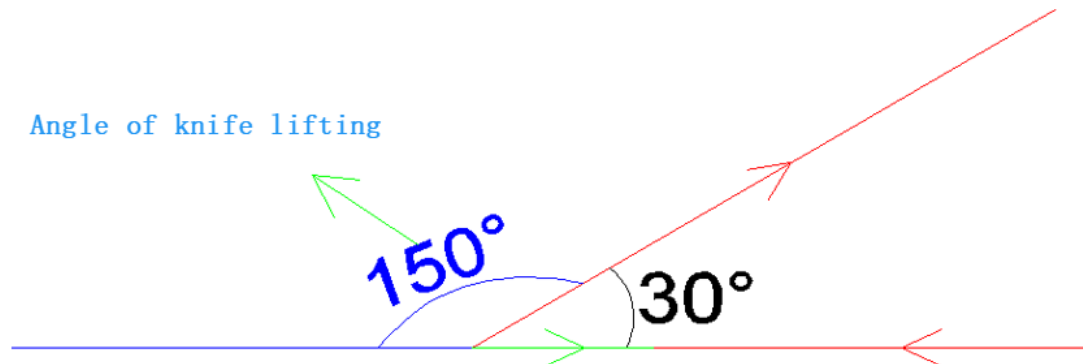
Cancel

Operation steps: Select the graphic, click the "Tool" column in the menu bar, click the "Anti-cut compensation" button, and modify the parameters. Click OK to confirm, as shown in the figure below: Red is the source path, green is the anti-cut path.



Knife lifting angle: As shown in the figure below: Red represents the cutting path, green represents the reverse cutting path. The two red cutting paths have an angle of 30° and an outer

angle of 150 degrees. When the knife lifting angle is $\geq 150^\circ$, there is no reverse cutting. When the knife lifting angle $< 150^\circ$, there is reverse cutting



3.7 Dispersal and grouping

In Icut, a "group" refers to the combination of multiple graphics, even multiple "groups", forming a "group". The entire "group" will be viewed as a whole. The order within the "group", the positional relationship between graphics, and the layers are fixed. The internal order will not be affected when sorting, dragging, etc.

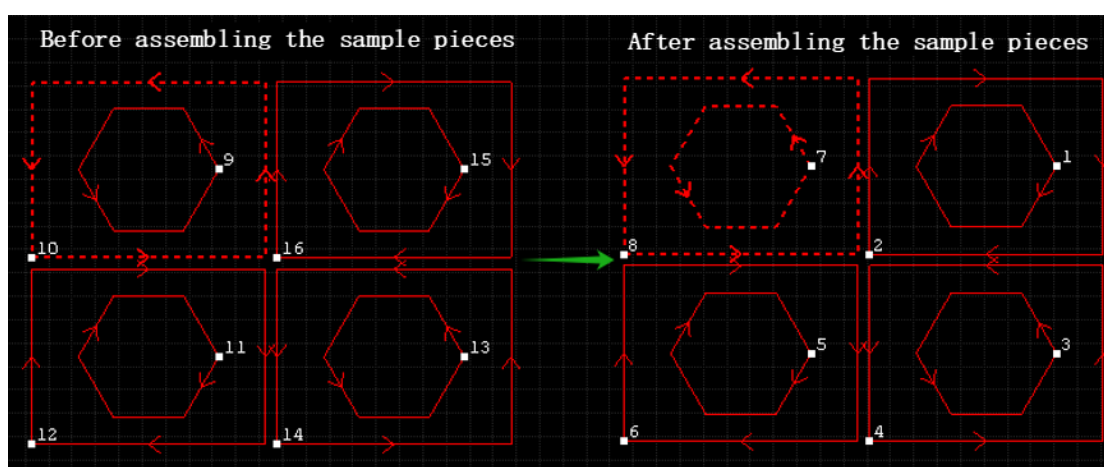
To create a group of graphics, click the "Tools" tab in the menu bar. Select the desired graphics and click the button  Group to combine them into a group. To "break up" graphics, select the grouped graphics in the menu bar and click the button  DeGroup. Note that "breaking up" doesn't split individual curves but only breaks the group itself, whereas "splitting" will break the graphics into separate line segments.

3.7.1 Combined samples

A composite sample refers to automatically grouping individual page samples that share common features, including both internal and external graphics. As shown in the diagram: The left side illustrates the pre-selection state where rectangles and hexagons remain independent graphics that can be individually

selected and edited. The right side demonstrates the post-selection effect where these shapes merge into a unified group, allowing simultaneous selection and editing.

Specific operation: Select the graphics that need to be taken (as shown in the figure below, select the rectangle and hexagon). Click the small triangle on the right side of the "Group" column under the "Tool" menu, and click the button **Combined sample piece**. At this time, the rectangle and hexagon become a whole, and other identical graphics are grouped together.

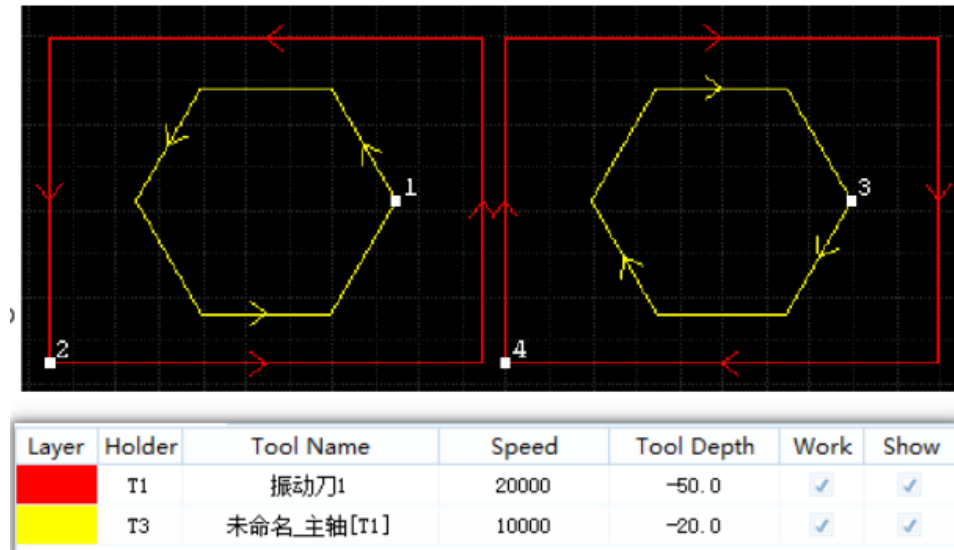


After using the photo-taking function, Icut has two cutting modes for you to choose from: "Cut by sample" and "Cut by layer order". The "User Parameters" window can be opened in the drop-down menu of "File" in the upper left corner of the menu bar.



Check "Automatic photo retrieval" to select the cutting order. Click the button, and select the cutting order mode from the drop-down menu **Cut with la**, **Cut with sa**, or **Cut with laye**.

Cut by layer order: as shown in the figure below, the yellow layer is in front and the red layer is behind. First process two yellow hexagons, then process two red rectangles. The layer in front is processed first.



Process according to the order of sample pieces: As shown in the figure above, take a single sample piece as the benchmark, process the No.1 hexagonal figure first, switch the tool holder, then process the No.2 rectangular figure, and so on. Process the next sample piece after processing one sample piece.

3.8 Array

Using arrays can quickly and accurately obtain multiple objects. Icut provides three array modes, including rectangular array, circular array, and interactive array.

3.8.1 Rectangular array

To select the graphics that need the array, click the button  Array in the "Tools" column of the common menu, and select "Rectangular Array" in the drop-down menu. Open the rectangular array setting parameter window, as shown in the following figure:

Rectangular Array

☒ Offset
☐ Spacing
☐ Odd-Even Array

Rows:

10

Column count:

10

Row offset

10

Column offset

10

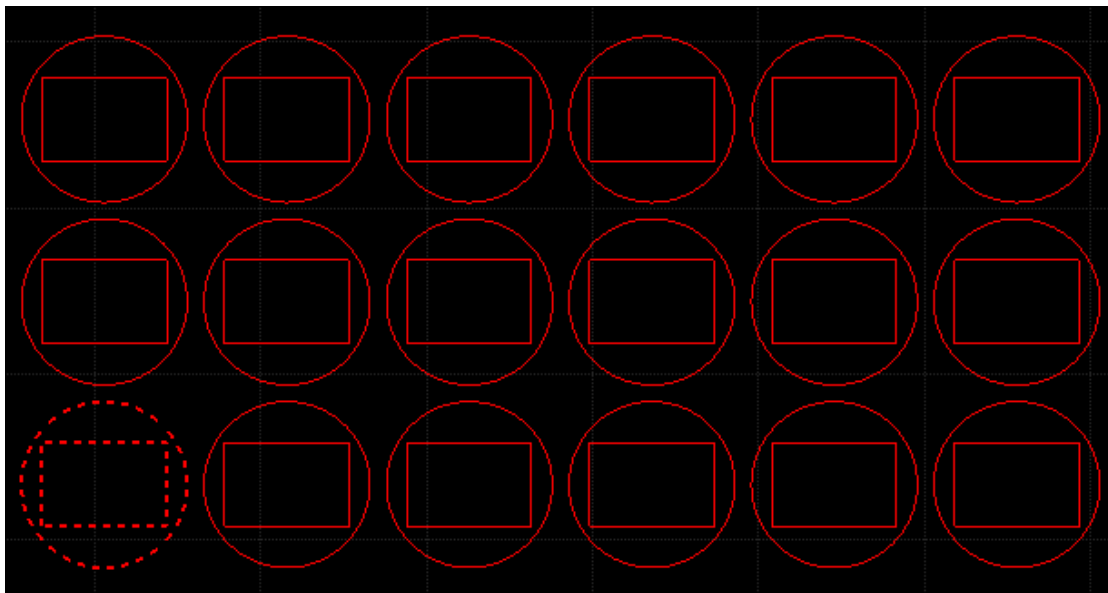
☒ Upward
☐ Down

☐ Left
☒ Right

OK

Cancel

Set the number of rows and columns, spacing distance, array direction, click OK, you can complete the rapid array of graphics, as shown in the figure below:



3.8.2 Ring array

To select the graphics that need the array, click the button  Array in the "Tools" column under the common menu, and select "Ring Array" in the drop-down menu. Select the center position of the array points, and open the ring array setting parameter window, as shown in the figure below:

RingArray

Type

☒ ByNum

☐ ByAngle

Parameter

CenterPoint

134.189,2264.802

TotalNum

5

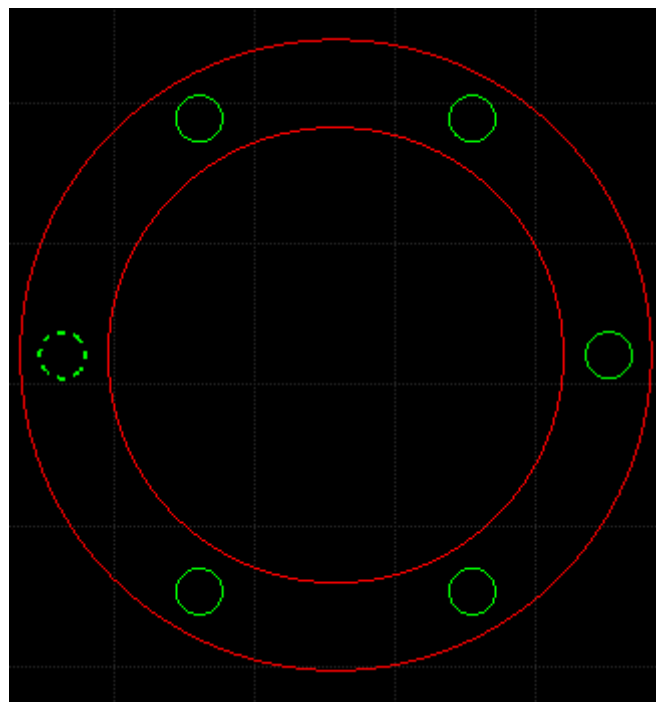
TotalAngle

30 °

OK

Cancel

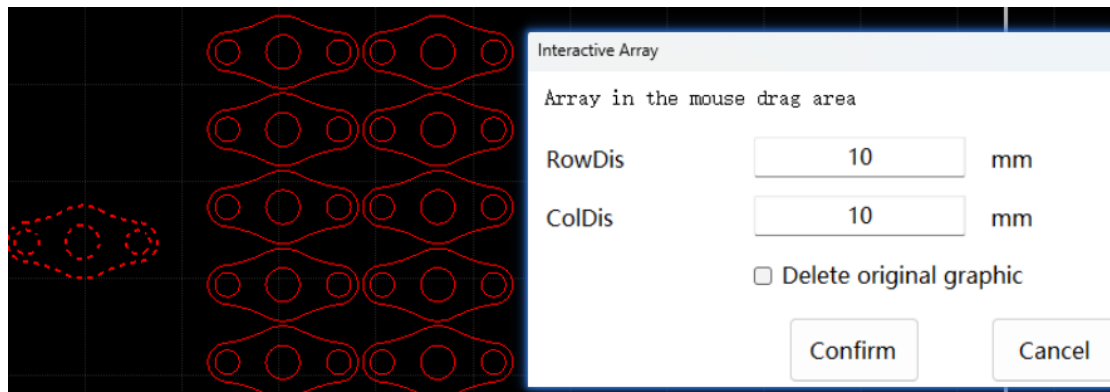
Set the array mode (by quantity, by interval), array, center point position, interval Angle, array Angle, click OK to complete the ring quick array, as shown below:



3.8.2 Interactive arrays

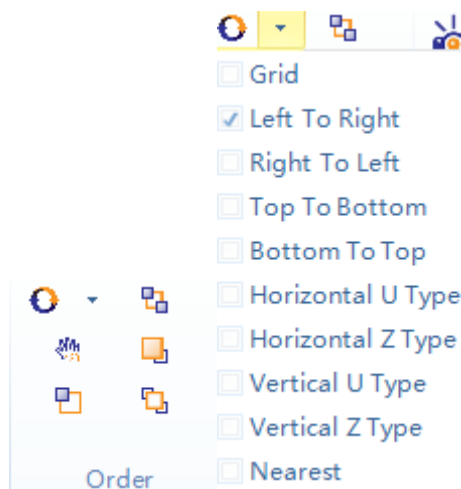
To select the graphics that need the array, click the button  Array in the "Tools" column under the common menu, and select "Interactive Array" in the drop-down menu to open the interactive array setting parameter window, as shown in the figure below:

Set the parameters, row and column spacing, click OK, in the CAD drawing interface, hold down the left mouse button, drag the mouse, drag a region, it will be quickly array completed.



3.9 Sorting

You can use the "Order" column under the common menu, which lists all the functions in order, as shown below:



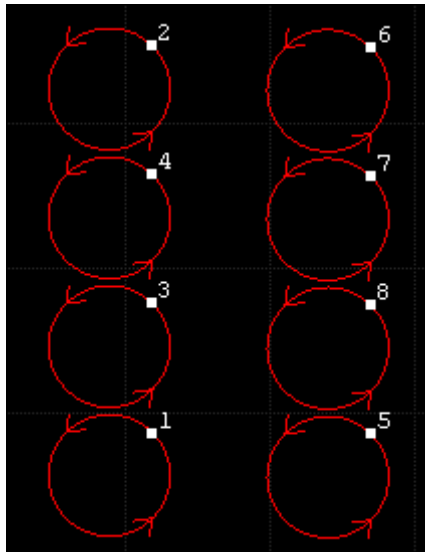
3.9.1 Sequence Preview



View

You can access the "View" tab in the menu bar to enable the "Processing Sequence" display by selecting the button  **Order** drop-down menu, which makes it easier to track production stages. As shown in the diagram below: From bottom to top and left to right, the processing sequence is: 1, 3, 4, 2, 5, 8, 7, 6.

Alternatively, you can preview simulations using the "Simulate" tool in the menu bar.



3.9.2 Manual sorting

If you want to fine-tune the results of auto-sort, you can use manual sorting. First, select the graph you want to adjust, and then click the button  ,  ,  ,  . The function buttons work as follows:

	Move the selected graphic processing order one step back
	Move the selected graphic processing order to the last processing
	Move the selected graphic one position forward in the processing order
	Move the selected graphic processing order to the previous one
	Select the "Manual Sort" button and click the graphics you want to sort in order, starting with the first one by default

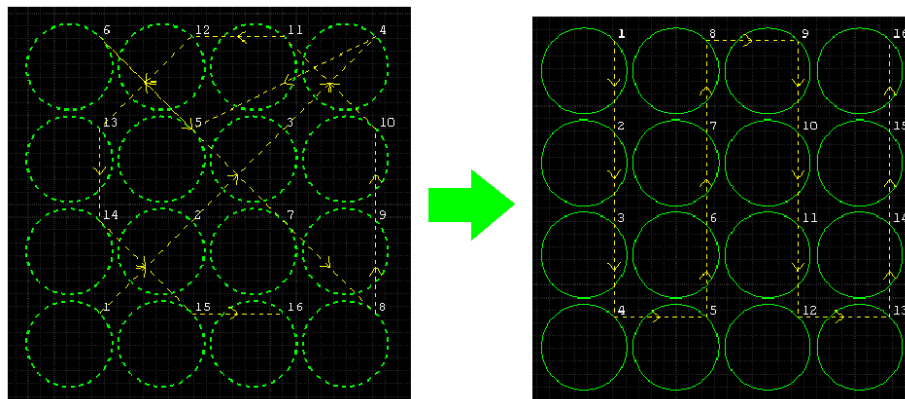
Note! The "layer cut" is cut in the order. The order does not affect the layer cut. The layer order is the cut.

3.9.3 Automatic sorting

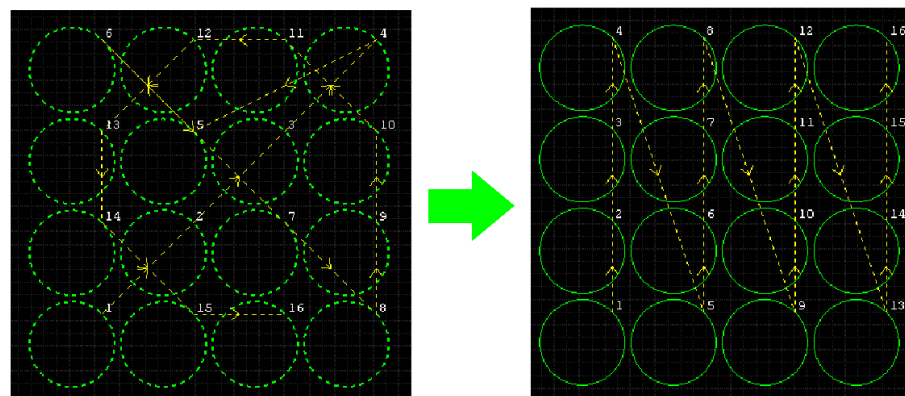
You can click the small triangle  button on the left side under "Order" in the common menu, and select the appropriate sorting method through the drop-down menu. See the following effects of various

sorting methods: Yellow dotted line indicates the empty path, and white numbers indicate the processing sequence number.

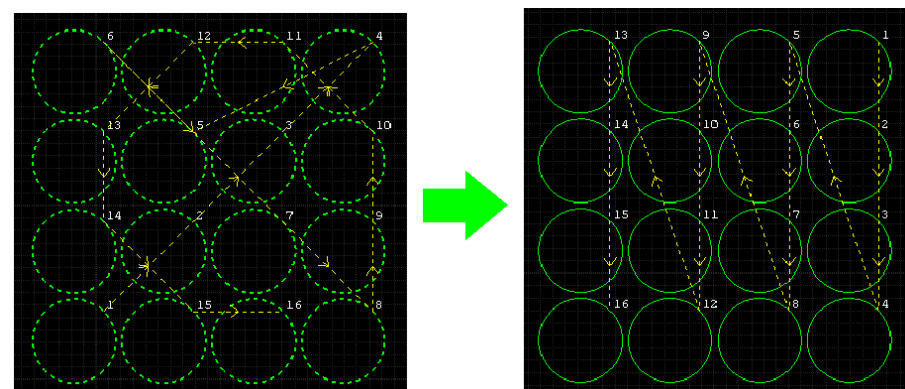
Grid sorting



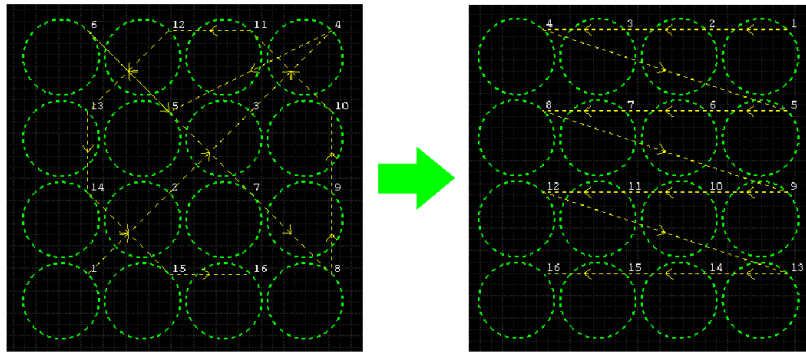
from left to right



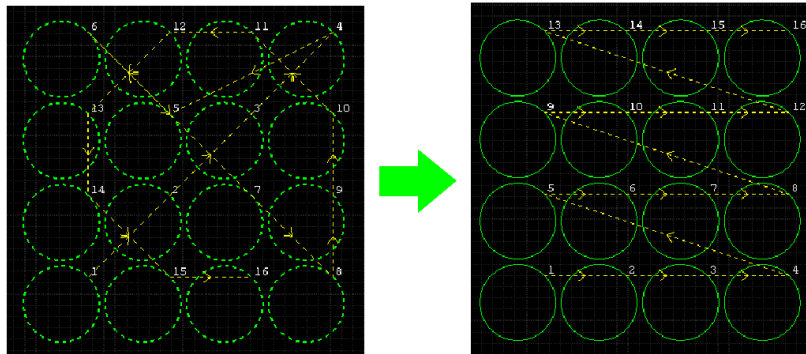
R-L



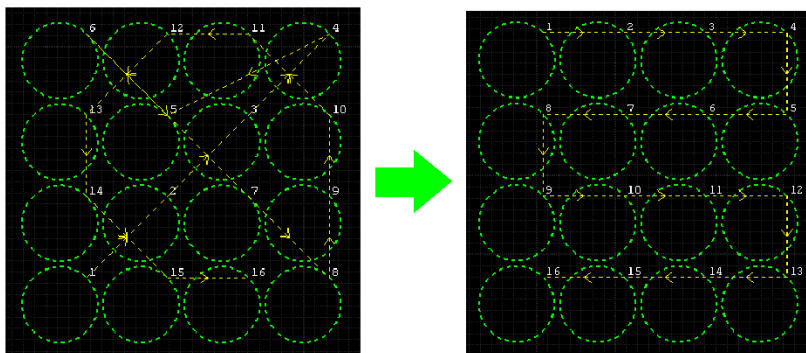
from top to bottom



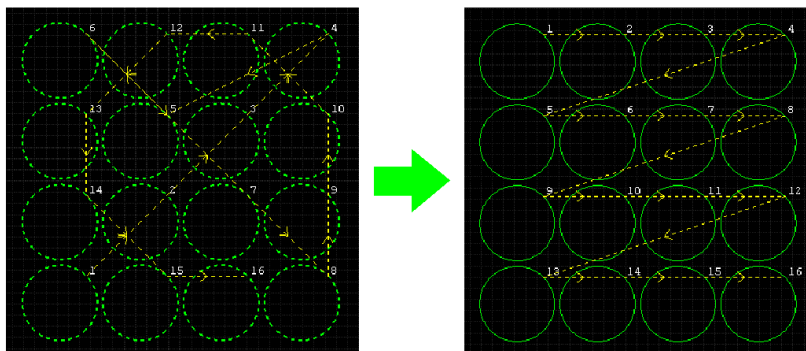
from the bottom up



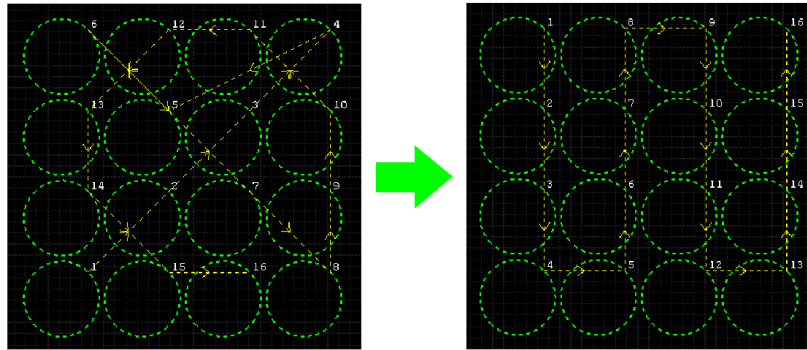
Horizontal U-shaped



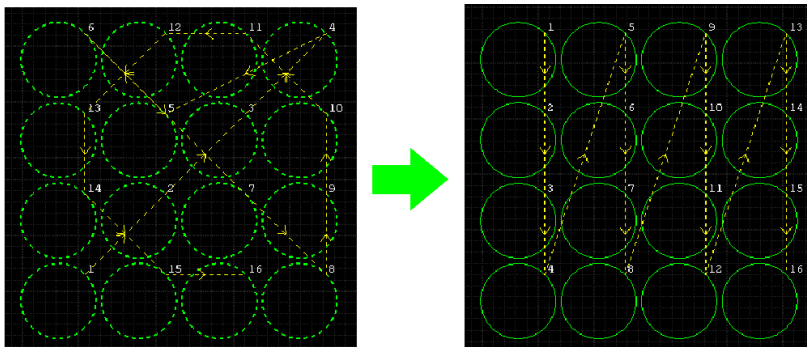
Horizontal Z-type



Vertical U-shaped



Vertical Z type



3.10 Chamfer

Under the drawing "operations" column in the menu bar, open the "bevel" drop-down menu



and select the bevel mode. You can convert sharp corners at the corner of the graphic into various types of bevels, including rounded bevel, concave bevel, and chamfered bevel.

3.10.1 Round corners

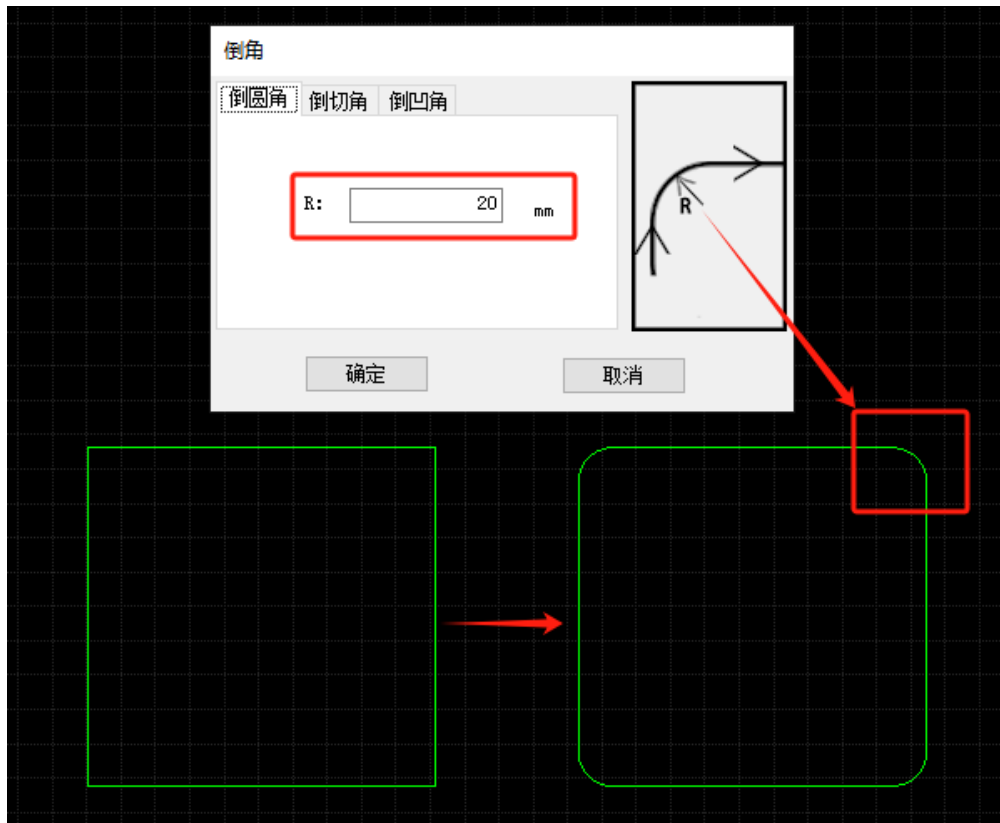
Select the graphic, click the button , and open a window with a drop-down menu

Param

. Select the fillet tool, modify the R value, and click the mouse over the sharp corner you want to fillet.

Select the shape and use the pickup tool  to achieve one-click rounded

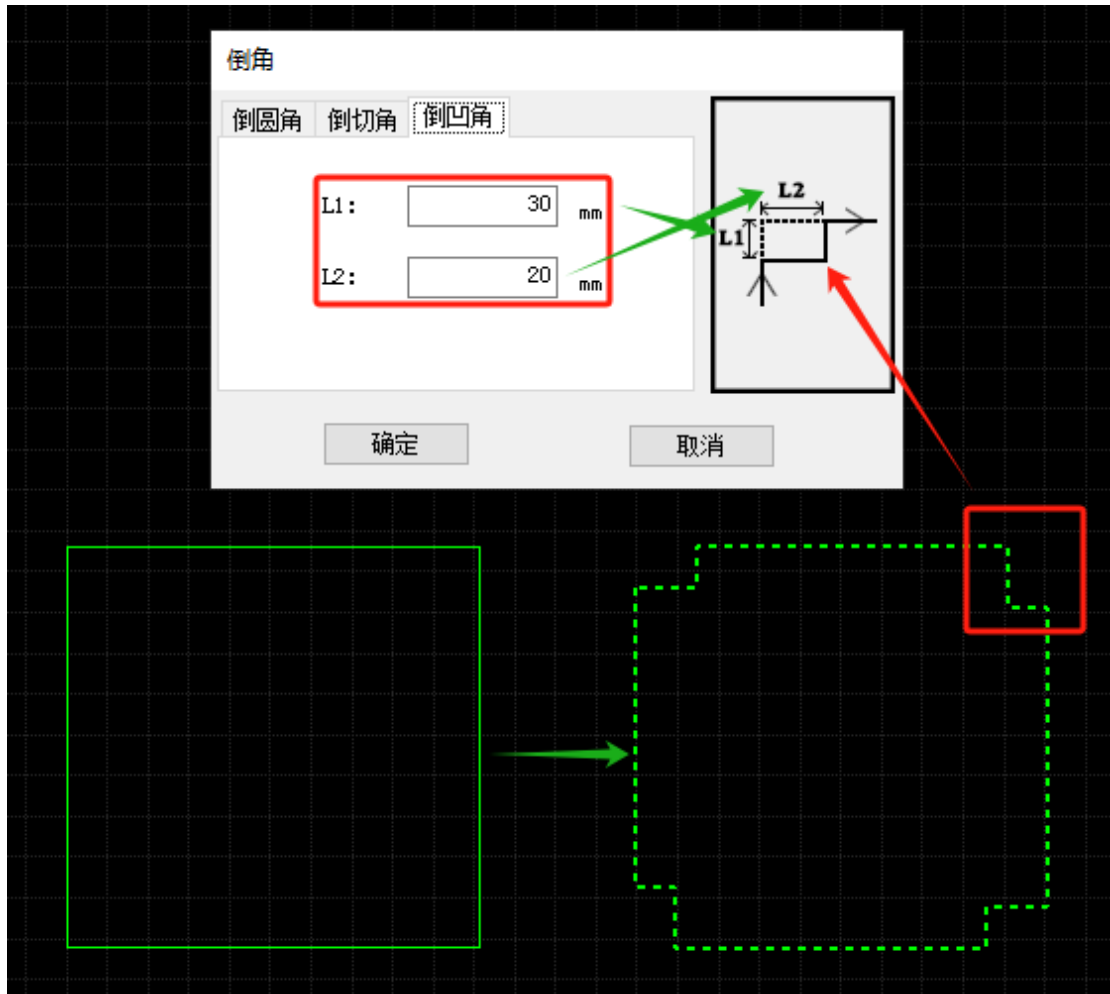
corners. Select the shape and round off all the sharp corners.



To flip the corner, you need to open the capture tool  . In the upper left corner of the system, click endpoint capture and intersection point capture.

3.10.2 Inverted concave Angle

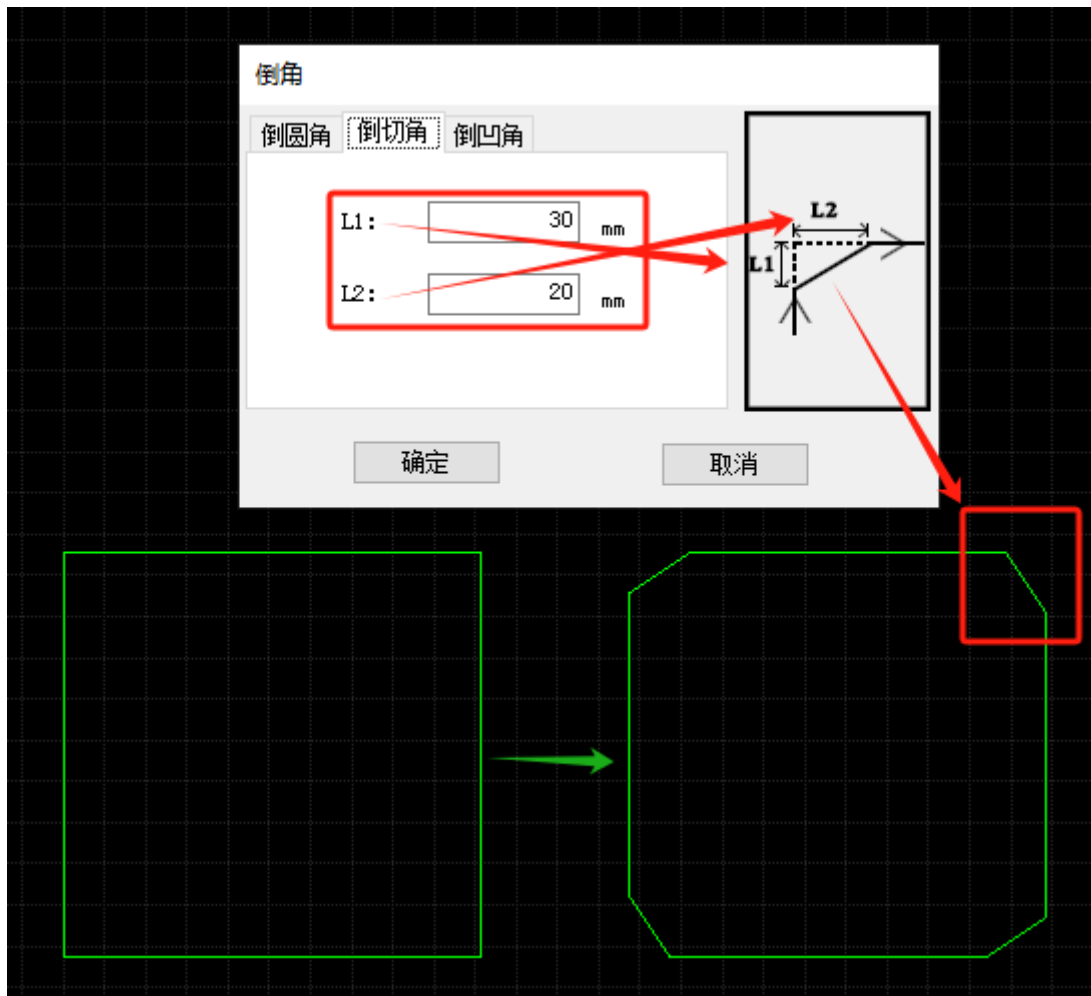
Select the shape, click the button  **Chamfer**, and the drop-down menu will open a window **Param**. Select the chamfer, modify the L1/L2 values. Pick up the chamfer tool. Move the mouse to the sharp corner position that needs chamfer, and click it.



To flip the corner, you need to open the capture tool  . In the upper left corner of the system, click endpoint capture and intersection point capture.

3.10.3 Inverted chamfer

Select the shape, click the button  **Chamfer**, and the drop-down menu will open a window **Param**. Select the chamfer tool, modify the L1/L2 values. Move the mouse to the sharp corner position that needs chamfering, and click it.



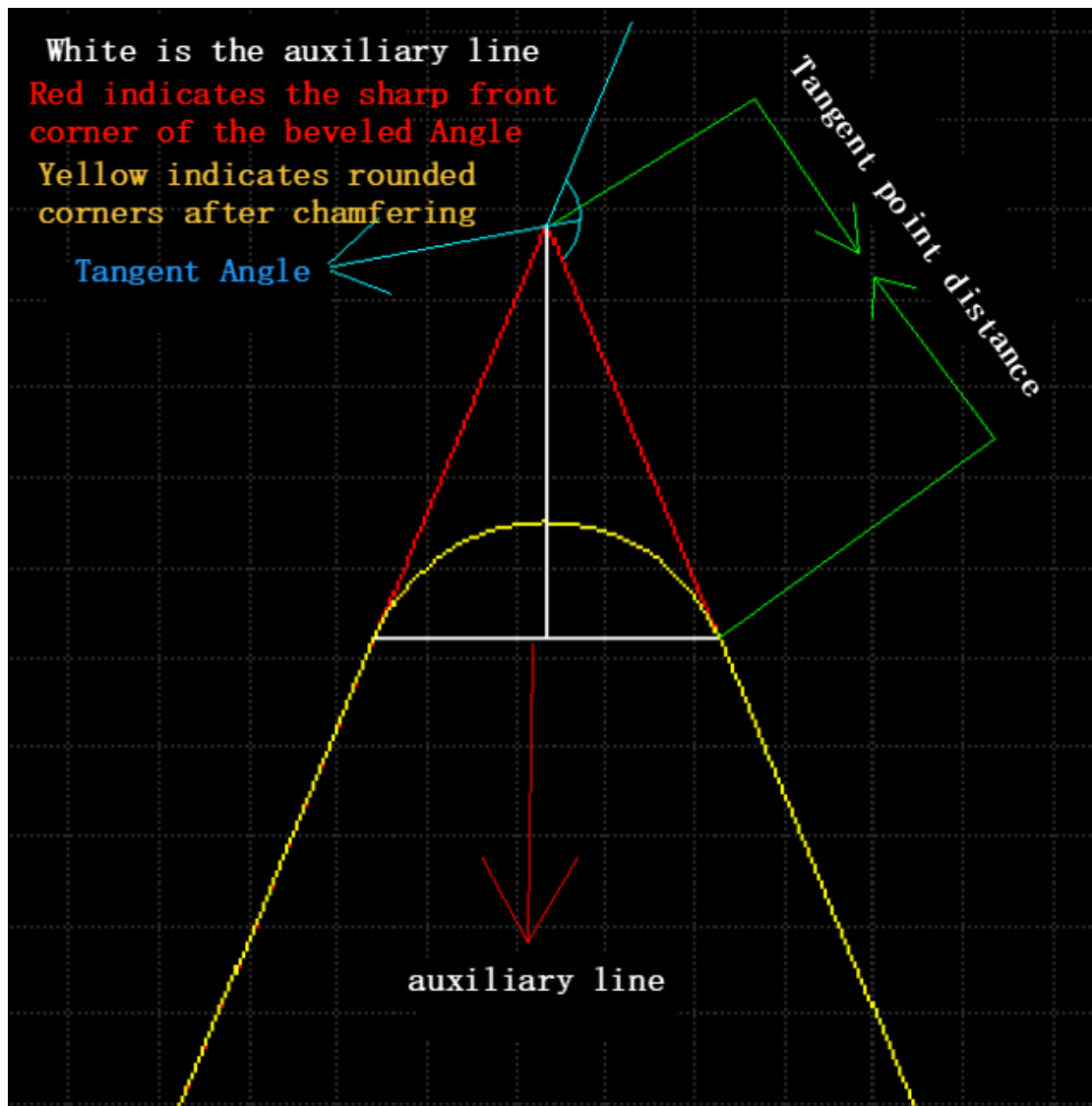
To flip the corner, you need to open the capture tool  . In the upper left corner of the system, click endpoint capture and intersection point capture.

3.10.4 Inverted chamfer

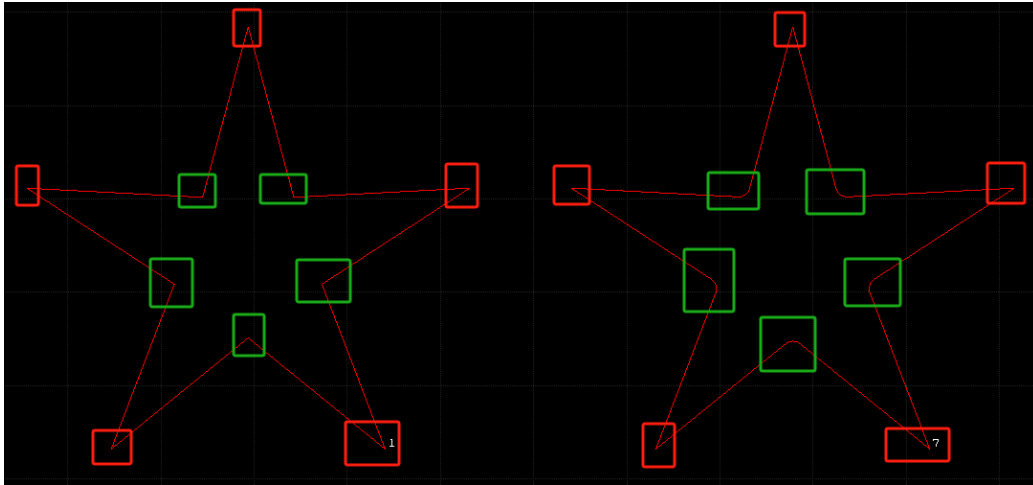
Icut has specifically enhanced its chamfering capabilities for the garment industry. Designed for patterns with "cut edges", this tool allows seamless V-groove processing through chamfering, eliminating the need to lift the cutting blade and boosting production efficiency. Before using this tool, it's essential to understand two critical parameters: "cut point distance" and "chamfer angle". As illustrated in the diagram below:

Cut point distance: The distance between the red figure's Angle position and the yellow figure's arc cut point is the cut point distance.

Apex Angle: The outer angle of the red figure's apex. The blue auxiliary line in the figure below is marked as the outer angle.



To distinguish between the inside and outside angles, as shown in the figure below, the red box is selected for the outside angle and the green box is selected for the inside angle. If the "Distinguish inside and outside angles" parameter is checked, the inside and outside angles are inverted by default. If not checked, the inside and outside angles are inverted.



In the drawing menu, click the "Operation **倒切角** " column to open the "reverse corner cutting"

Angle of cut window as shown in the figure below:

In the parameter window, modify the Angle range, cut point distance, and selected graphics. After modifying the parameters, click OK.

Inverted angle

Minimum chamfe... 0.0
Maximum Chamf... 0.0

Cutting Point Dist... 1.0

☒ Process selected graphics
☐ Distinguish inner/outer corn

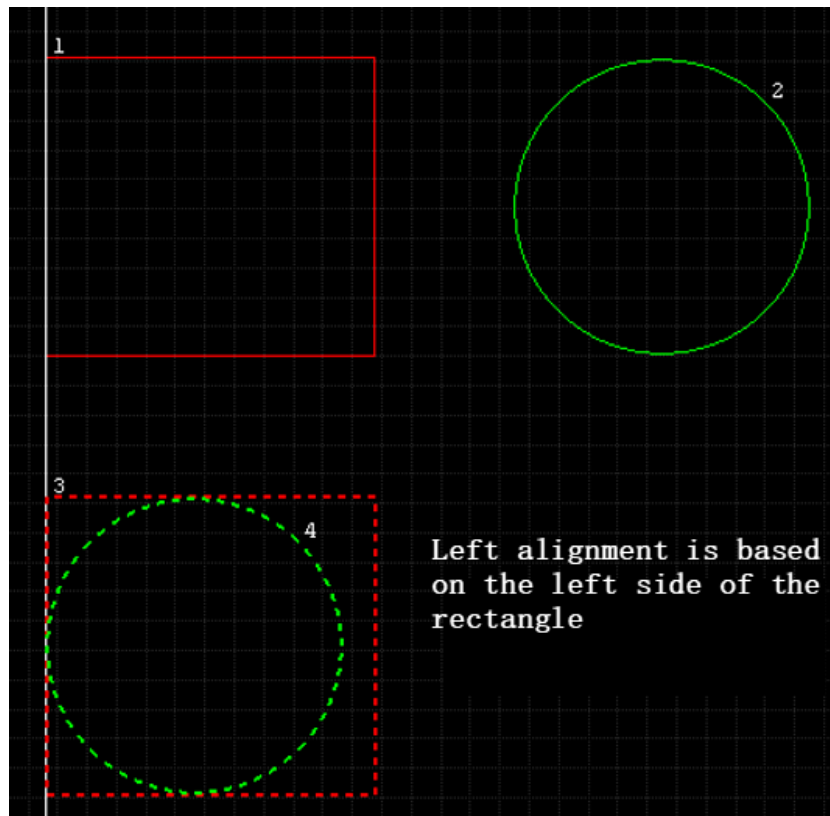
OK
Cancel

3.11 Alignment tools

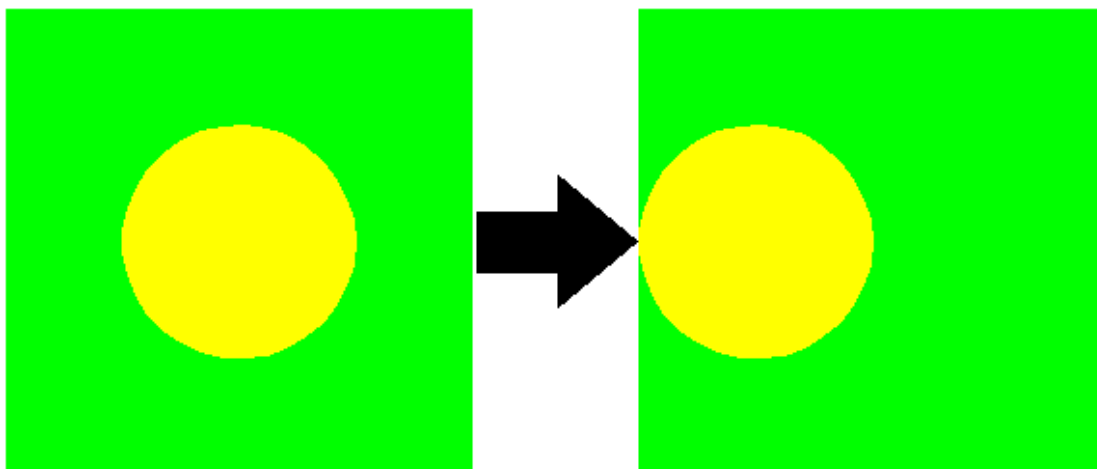
Under the "Operation" section of the drawing menu bar, you can find our alignment tools. First, select the graphic you want to align and use the grab tool. The alignment tools include left align, right align, bottom align, top align, vertical align, horizontal align, and center align.

The alignment tool determines graphic positioning by using the nearest shape along the alignment direction as a reference. As shown in the diagram: When using the left align tool, select a rectangle on the left and a circle on the right.

When selecting the left align tool, it aligns with the left side of the rectangle as the reference point.



Left aligned, as shown below:



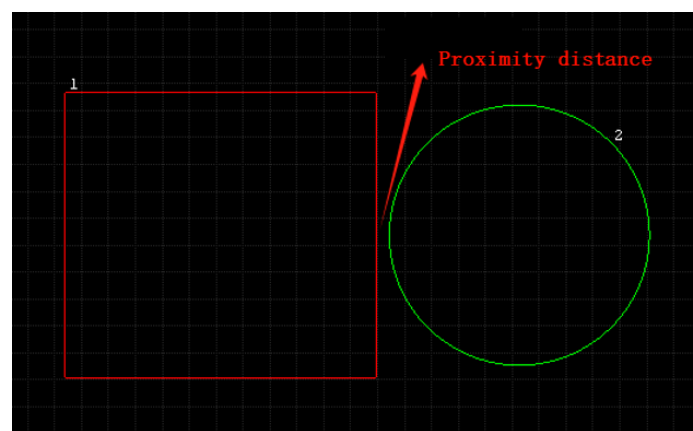
3.12 Closeness

Under the "Operation" column of the drawing toolbar, we can use the close function, including: left

close , right close , top close , bottom close .

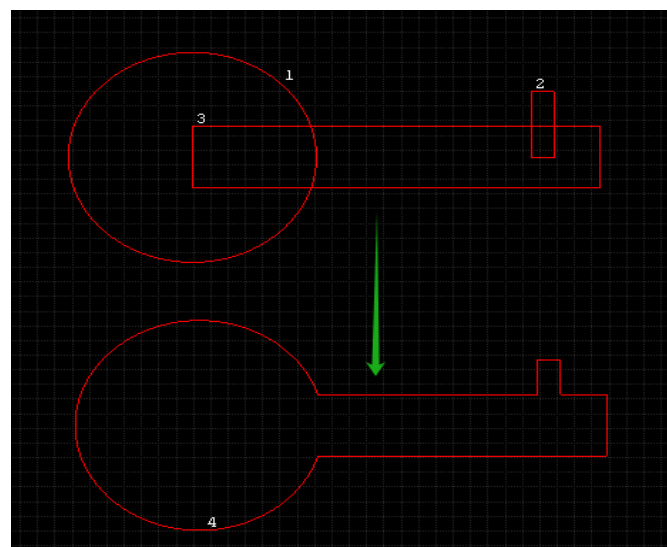
Left-right tightness refers to graphics that are on the same horizontal level, while top-bottom tightness refers to graphics in the vertical direction. Tightness is based on the graphics in the tightness direction. The tightness distance can be modified below the CAD interface  0.5.

as illustrated in following figure :



3.13 Integration function

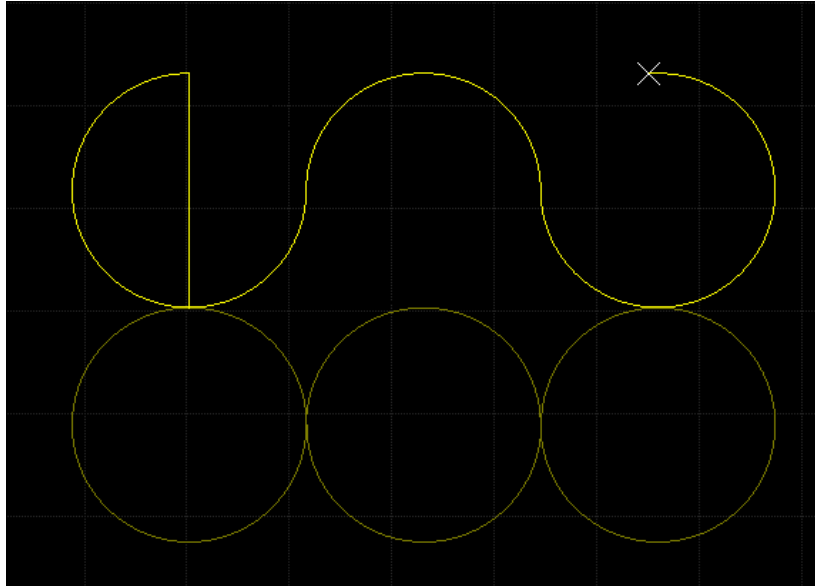
In the common menu, the "Tool" column can be selected to pick up the fusion function . Select the two graphics that need to be fused and click "Fusion" as shown in the figure below: The fusion function takes the union area of the two graphics and retains it



3.14 Circular fusion

Under the "Tools" section in the menu bar, you can select the "Circular Fusion" tool

 Circle Union .Circular fusion refers to connecting adjacent circular shapes to create



S-shaped trajectories, as shown in the figure below: This significantly improves cutting efficiency. The default spacing between circles is $\leq 1\text{MM}$.

Circular fusion includes bidirectional, horizontal and vertical circular fusion.



3.15 Leads

Open the lead function  Leads from the "Tools" column in the common menu. Add leads to selected graphics by modifying the import and export parameters.

Type of lead: straight line, arc

Length: The length of the lead

Radius: Modify the radius of an arc lead when using an arc lead

Angle: lead Angle

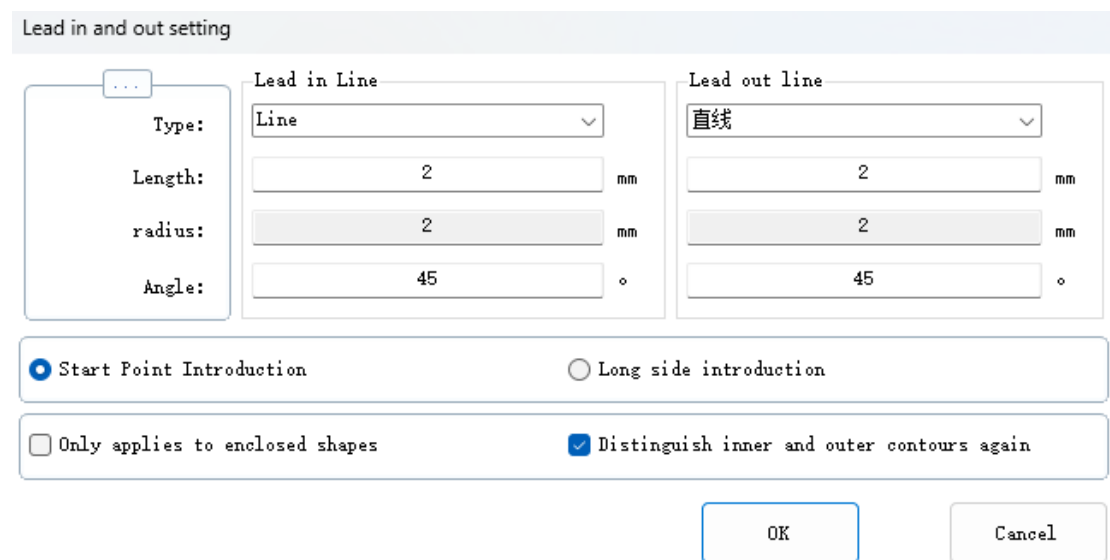
Starting point introduction: Add a lead to the starting point

Long line introduction: Add a lead to the long line break

Only applies to closed shapes: Selected only adds leads to closed shapes

Redefine the inner and outer contours: Selected to make the outer lead of the outer mold and the inner

lead of the inner membrane.



The dialog box titled "Lead in and out setting" contains the following elements:

- A left sidebar with a "..." button and labels for "Type:", "Length:", "radius:", and "Angle:".
- Two main columns: "Lead in Line" and "Lead out line". Each column has a dropdown menu (set to "Line" and "直线" respectively), and three input fields for "Length:", "radius:", and "Angle:" with values of 2, 2, and 45. Units are "mm" for length and radius, and "°" for angle.
- Two radio buttons: "Start Point Introduction" (selected) and "Long side introduction".
- Two checkboxes: "Only applies to enclosed shapes" (unchecked) and "Distinguish inner and outer contours again" (checked).
- "OK" and "Cancel" buttons at the bottom right.

3.16 Add the outer frame

Icut supports adding an outer frame to the current graphic, which can add M points to the current graphic.

In the "Operation" column of the drawing menu, click the button [Add outer frame](#) as shown in the figure below: After modifying the parameters, confirm to complete the function of adding outer frame and M points to the edited graphic.

Add a border: When checked, all graphics are given a border

Select a shape and add a border: When checked, the selected shape is added to the border

Add mark: Check to add M point

X/Y offset: The maximum range of the edited graphics and the offset value

Circular Angle: Circular Angle at point M

Radius: the size of the radius at point M

Add outer frame

☐ Add outer frame

☒ Add outer frame to

☐ Add mark

X-offset: 0.0

Y-offset: 0.0

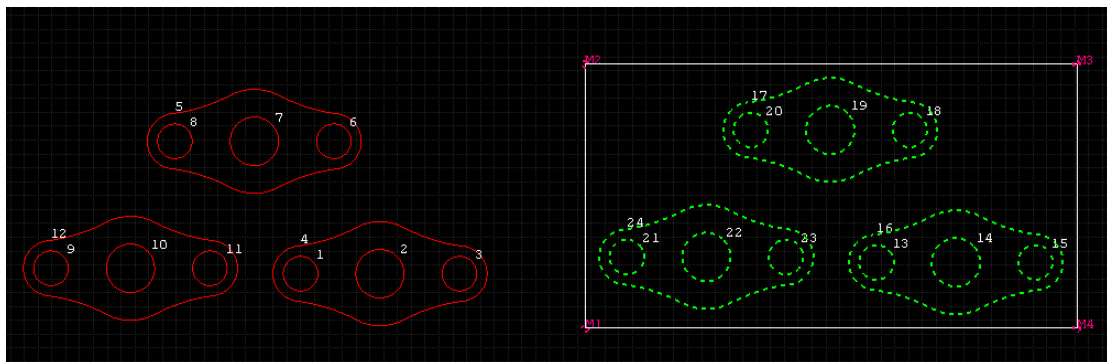
Circle angle: 0.0

Radius: 3.0

OK

Cancel

The figure below shows: white is the added outer frame, M1-M4 is the added M point.

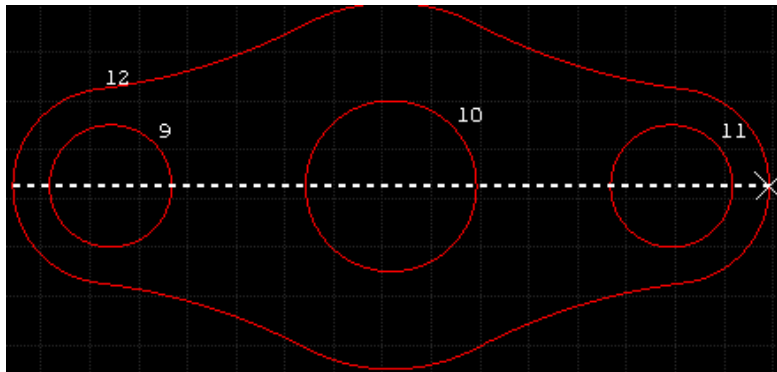


3.17 Measuring tools

Under the drawing menu, select the "123 Measure Operation" column to pick up the tool, which can measure the size of the graphics. The measurement data is viewed in the drawing display column below the software.

Measure result, distance:264.444,X distance:264.444,Y distance:0.

The figure below shows: The white dotted line is the measurement trajectory. Select the "measurement" tool, click the starting point of the measurement, move the mouse to the end point of the measurement, and click to confirm to complete the measurement

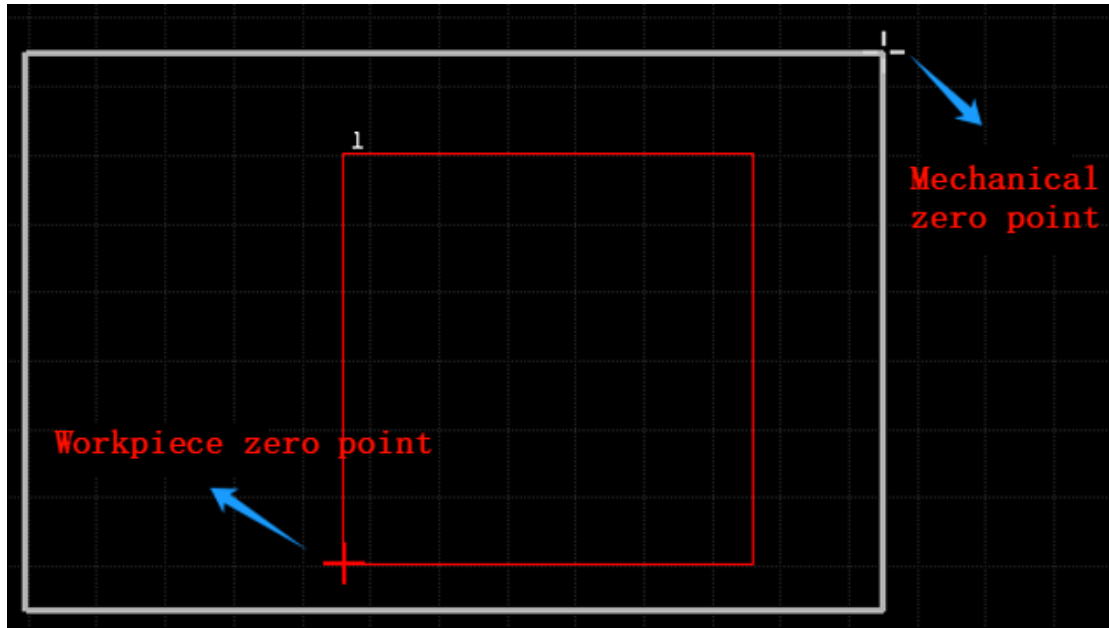


4. Processing control

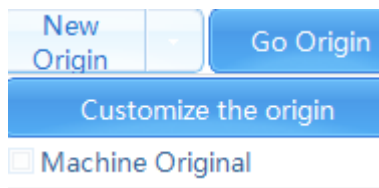
Icut is a set of design and processing control software. All the graphics and parameters mentioned above can be prepared off the machine tool. After all the design is completed, the file can be saved and then opened on the machine tool for processing.

4.1 Coordinate system

Coordinates include zero point and origin. The zero point refers to the mechanical zero point, the machine's reset position. The origin represents the workpiece coordinate, existing relative to the mechanical coordinate, marking the starting position of machining. Using the red light as the starting point as the reference, the red light indicates the origin coordinate position. The white cross marks the mechanical coordinate position.



4.1.1 Original zero point



The original starting point is fixed mechanically and does not move with the workpiece's starting position. This represents the coordinate of the graphic relative to the mechanical zero point within the worktable. When using functions like "Projection" or "Large View", select "Original Starting Point" from the drop-down menu to temporarily activate calibration files. There are two methods for setting the original starting point: custom origin or machine current position. Selecting "Machine Current Position" allows entering X/Y coordinates, after which clicking "Set Point" will automatically align the graphic with the coordinates. Choosing "Machine Current Position" makes the machine's current location the starting point, and clicking "Set Point" will automatically align the graphic with the machine's current position.

Customize Origin Point

Custom origin type: Current location

x coordinate: 10.0

y coordinate: 10.0

OK

Cancel

Imported graphics can be automatically parked at the custom position or the current position of the machine. This can be achieved by checking **Customize the origin** "User Parameters" under "File".

4.1.2 Workpiece zero point

☐ **Machine Original** Select the original zero point and remove it. Use the workpiece zero point, and the white cross follows the movement, relative to the coordinate of the mechanical zero point. The workpiece zero point can be used to select the docking position. In the "Tools" column of the common menu, click docking to select the docking position.

停靠位置

☐ 左上
 ☐ 上
 ☐ 右上

☐ 左
 ☐ 中
 ☐ 右

☒ 左下
 ☐ 下
 ☐ 右下

☐ 文件零点

确定

取消

4.1.2 Find the zero point after anomaly

The machining operation can only be performed after the machine returns to zero . The zeroing state is shown in the following figure: The coordinate position shows a black and white icon, that is, the equipment

returns to zero successfully. If there is no such icon, no zeroing or zeroing fails, the machining cannot be performed.

	Machine	Part
X:	107.960	-160.310
Y:	526.250	-8.090
Z:	32.200	52.200
C:	0.000	0.000

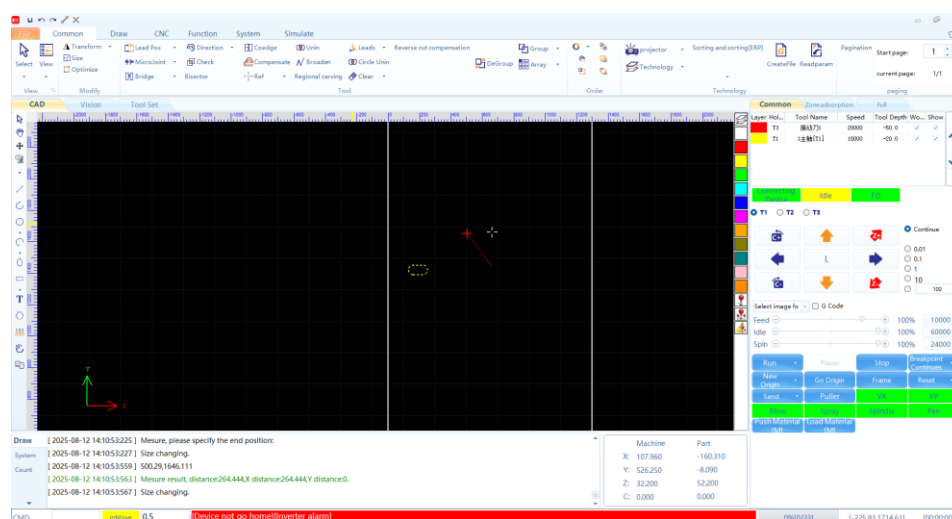
In case of emergency such as triggering the emergency stop, power failure and restart, or driver alarm, the zero return state will be cancelled. At this time, we need to click the operation interface and button **Go Origin**, and wait for the machine to return to zero successfully before operating the processing.

When the collision is triggered during processing, the machine is in pause state. You can click the "Continue" button to continue processing and cutting.

! Note the spindle tool changer system. During the tool change process, pause, stop and continue operation are not supported.

4.2 Alarm

Alarm information can be seen in the status display bar and log bar at the bottom of the software. If the machine suddenly does not work, alarm information can be viewed below to troubleshoot the problem.



Urgent stop alarm: Check whether the emergency stop switch is open

Alarm: Check whether there are obstacles on the machine platform and around the machine

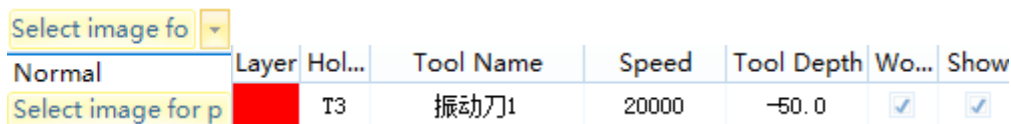
Driver alarm: open the control box, check the driver code and contact the manufacturer

Overdue alarm: Check the starting position and check whether the file is too large

Zero not returned alarm: Please operate after zero return

No connection alarm: Check the network cable connection, check the IP address. Check the status of the touch screen, contact the manufacturer

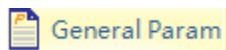
File generation failure: Check the following figure to see if the processing mode is checked and the layer parameters are processed.



Layer	Hol...	Tool Name	Speed	Tool Depth	Wo...	Show
T3		振动刀1	20000	-50.0	☒	☒

4.3 Soft limit

After the equipment resets to zero, it provides soft limit protection based on the preset mechanical stroke settings. In the system menu, under the "Parameters" section, select "General Parameters"



. Check the "Vendor Parameters" option in the top-left corner and search for the keyword "soft limit" as shown below: "1" enables soft limit functionality while "0" disables it. The rotation axis C is disabled by default.

10401	X axis soft limit enable	1		Immediately	soft limit enable status,1 enable,0 disable
10402	Y axis soft limit enable	1		Immediately	soft limit enable status,1 enable,0 disable
10403	Z axis soft limit enable	1		Immediately	soft limit enable status,1 enable,0 disable
10404	C axis soft limit enable	0		Immediately	soft limit enable status,1 enable,0 disable
10405	Z1 axis soft limit enable	1		Immediately	soft limit enable status,1 enable,0 disable
10406	C1 axis soft limit enable	0		Immediately	soft limit enable status,1 enable,0 disable

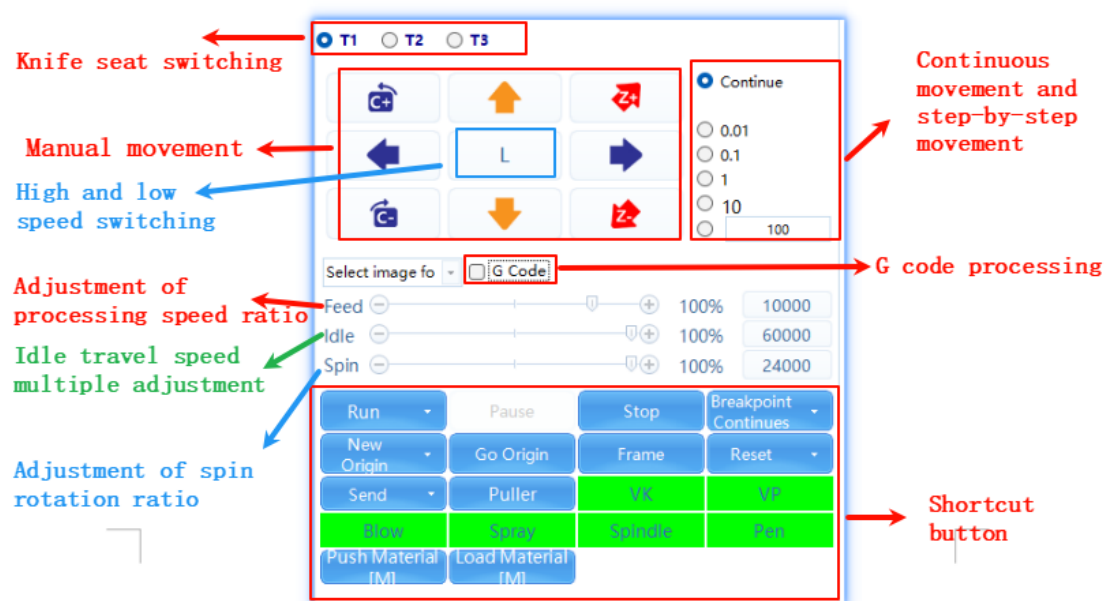
After the machine returns to zero, the equipment can only work and move within the effective maximum mechanical stroke. The manufacturer's parameters are modified by default, so please do not modify them

arbitrarily. During the movement of the equipment, if it exceeds the range, the log will report a soft limit alarm, and it needs to move in the opposite direction.

Axis: [0] Reached the soft limit position in the negative direction of the axis, unable to continue to move in the negative direction

4.4 Manual testing

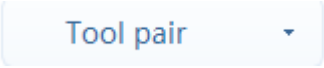
The manual control part of the console is shown in the figure below: The following function buttons can be used to quickly manually operate the equipment



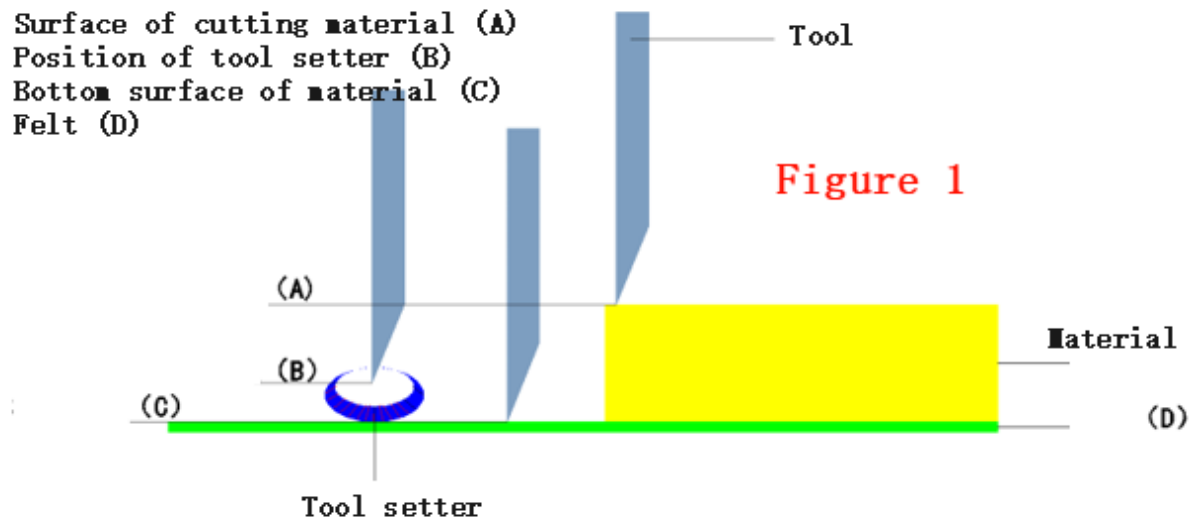
4.5 Blade cutting

Before starting machining or after tool change, reconfigure the tool depth as follows: For non-G code files: As these files lack built-in tool depth parameters, first move the tool tip to the workpiece surface, then click "Set Tool Depth" to complete configuration. For G code files: Although these files already contain built-in tool depth parameters, you must still move the tool tip to the material surface and click "Set Tool Depth" to confirm the settings take effect.

If the equipment supports tool setting, please select the tool to be set in the "tool setting" interface and

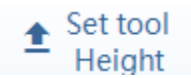
click "tool setting" . The equipment will automatically perform the tool setting.

After the tool setting is successful, the processing can be started directly.



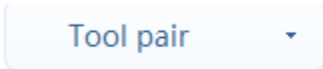
4.5.1 Manual tool setting

Select the tool that needs to set the depth of the tool. Move the tool to the surface of the felt (D) by

moving   the Z-axis. In the tool adjustment interface, click the button , and the Z-axis will be automatically raised to the zero point. The setting of the depth of the tool is complete.

4.5.2 Automatic tool cutting

Select the tool that needs to set the depth of the blade. In the tool adjustment interface, click the button

, and the equipment will automatically perform the blade alignment. After the blade alignment is completed, lift Z to the zero point.

At present, the automatic tool cutting function only supports the following types of tools: vibration tool, circular tool, drag tool and spindle.

4.5.3 Fine-tuning the blade depth

Under the knife adjustment interface, as shown in the figure below: The depth of the knife can be fine-tuned. If there are problems such as cutting depth or not cutting through after processing, it is because the depth of the knife is not set properly. You can fine-tune the depth of the knife by clicking the button below



You can choose the step distance and click the up and down arrows to fine-tune the depth of the knife. For example, if the current depth of the knife is "-23.21" and you want to adjust it to "-23.31", select the step "0.1", then click the button , a prompt dialog box will pop up, and click OK.



4.6 Walk the border

After setting the starting position, click the console button . The red light will move a rectangle along the outer frame of the entire graphic to be processed, so that you can see the maximum processing size range and the size of the required material. If you need to modify the speed of walking along the frame, contact the manufacturer.

4.7 Processing, stopping, pausing and continuing

4.7.1 Processing

After the parameters are set and the border can be moved, you can directly click the processing button  on the PC interface, and the equipment will start automatic processing operation. Alternatively, you can click the button  to send the program to the panel, and then click the processing button on the panel to execute the processing operation.

Check the G code shortcut button when using the G code file  G Code .

G code machining supports spindle, vibration tool, and press wheel processing. Spindle machining is supported by default in G code machining. For vibration tool and press wheel G code machining, add the G code instruction to the first line of the G code file as shown in the figure below:

T501: The spindle is processed on the left

T502: The spindle has two heads for simultaneous processing

T503: Right spindle head machining

T601: Vibration knife left machine head processing

T602: The vibration knife is processed by two heads at the same time

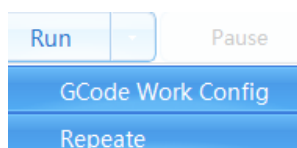
T603: Vibration knife right machine head processing

T701: Processing of left machine head of pressure wheel

T702: The press wheel has two heads for simultaneous processing

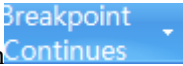
T703: Processing of right machine head of pressure wheel

The above is the machining code instruction for double head model, which is also applicable to single head G code machining.



Click the triangle arrow on the left side of the processing button to perform the ordinary graphic processing operation in a loop. Enter the number of cycles and the interval between each cycle, and click OK to start the processing. If you need to pull the material, check "Pull the material after each processing".

4.7.2 Stop

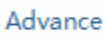
To stop processing, click the console button . After stopping, the program will terminate processing. At this time, click processing to start processing again. To continue processing at the stopped position, click the button . After stopping processing, the equipment is in standby mode and other functions can be operated.

Note: If you click stop during the patrol, the program will terminate the patrol action and you need to restart the patrol.

4.7.3 Suspension and continuation

If you want to pause the processing, please click the console button . After pausing, you can modify the depth of cut, processing speed, lifting height and other operations. If you want to continue the processing, please click the console button , and the machine will continue processing from the paused position.

4.7.4 Advanced Start

The G code machining supports advanced starting, which allows users to input any line number as the starting point. In standby mode, navigate to the "Advanced Start"  tab in the menu bar and click the button (as shown in the figure below). Select "Current File" and enter the "starting line number". Click OK to initiate machining from the specified line number.

Line number processing

Maximum line number

0

start line number

0

☐ current file

OK

Cancel

4.8 Partitioning

Before processing, you can open the partition adsorption interface to set the partition adsorption mode before processing

4.8.1 Partition adsorption mode

The partition adsorption system operates in four modes: Manual Mode, Adaptive Mode, Automatic Tracking Mode, and Manual Memory Mode. Users can switch between these modes based on the size of the cutting element and material type to achieve optimal vacuum adsorption performance. In the ICUT system, green indicates disabled partition function while red denotes enabled partition function.

Common

Zone adsorp...

Full

[2,1]

[2,2]

[2,3]

[1,1]

[1,2]

[1,3]

Adsorption mode:

Manual Record

Manual

Self-adaptation

Auto Follow

Manual Record

Record Partition

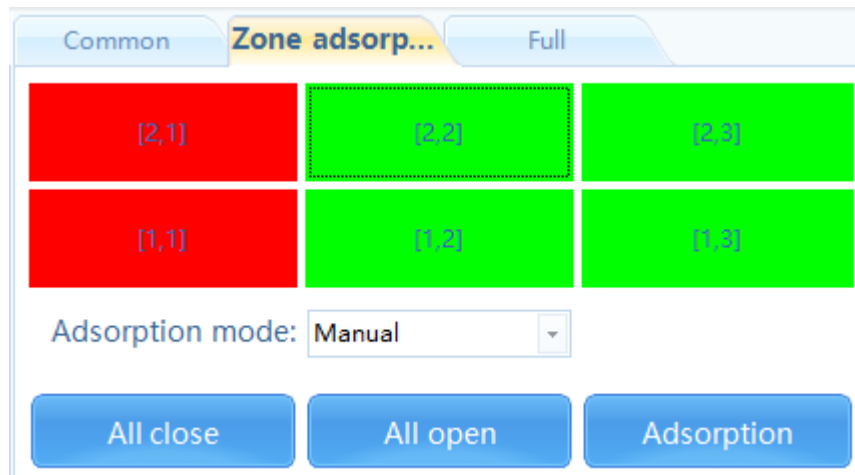
Adsorption

All close

4.8.2 Application scenarios of partitioned adsorption mode

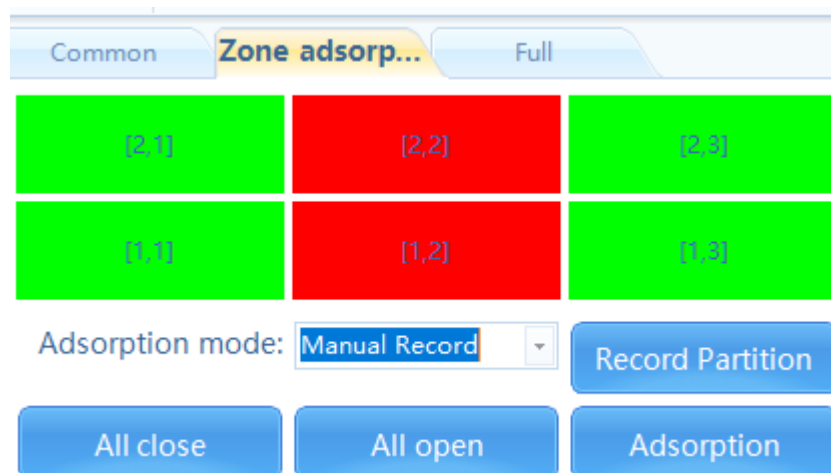
Manual mode refers to manually selecting specific zones to activate during processing. For example, you might select zones [1,1] and [2,1]. These zones will be automatically activated during operation. This

mode is commonly used in machines with fixed worktables that don't pull materials, or when cutting graphic elements at predetermined positions.

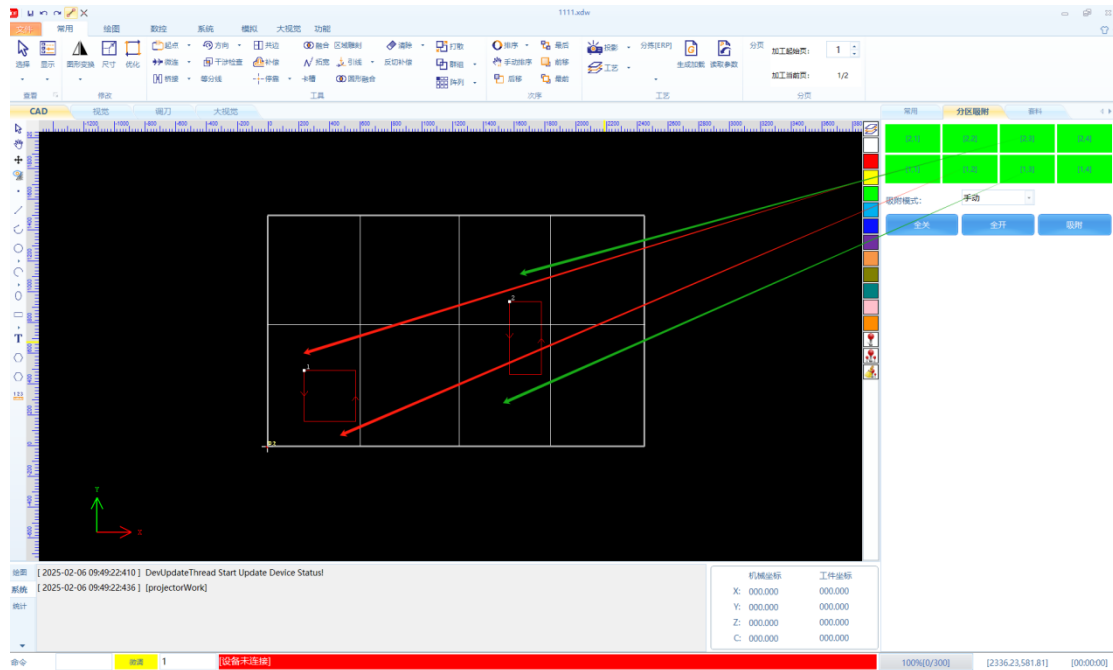


Manual memory refers to: Select the memory mode and select the partition area we want to open. For example, after selecting [1,2] or [2,2], click the memory partition. The device will open these two partitions every time it processes

It is often used to cut the same material in batches at fixed locations

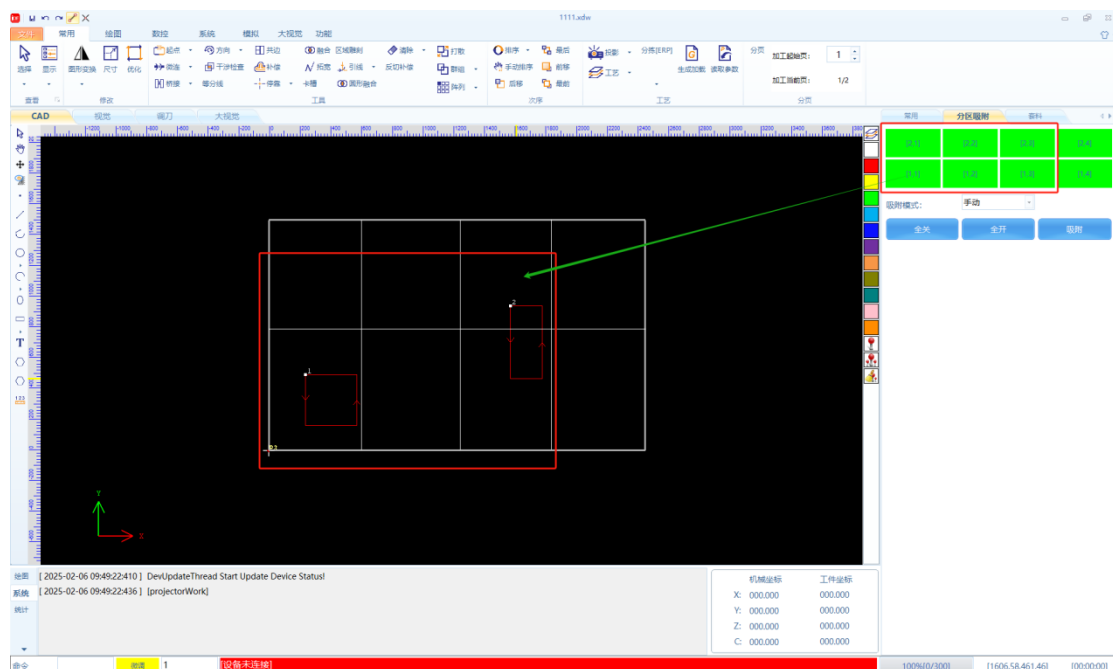


Automatic follow mode: Based on the machine's current moving cutting trajectory and the corresponding CAD worktable element position, the machine sequentially opens the adsorption areas in zones as shown in the figure below. The default worktable has 8 zones. As shown by the elements and processing trajectories, the zones [1,1], [1,2], [2,3], and [1,3] are opened sequentially.



Adaptive partition refers to: as shown in the figure, the two rectangles processed by default are a whole, and all partitions in the range where the two rectangles are located are opened

[2,1]	[2,2]	[2,3]	[2,4]
[1,1]	[1,2]	[1,3]	[1,4]



4.9 Pulling material

For graphics exceeding the working area, segmented cutting can be performed to divide large-sized

patterns into smaller sections. Repeated processing of identical documents across multiple versions can be automated through material pulling. Automation in roll cutting processes can also be achieved via automatic material pulling functions. Please follow manufacturer configuration parameters and training procedures to properly utilize these features. Incorrect parameters or operations may result in failed material pulling or improper execution. Common scenarios include: material pulling after single-sheet processing, repeated processing material pulling, long-section processing material pulling, and roll processing material pulling.

There is no need to elaborate on the material pulling here. After the manufacturer has adjusted it, please do not modify the parameters easily. The following are several processing operations:

4.9.1 Multiple machining operations for general machining

There are three kinds of general processing: "single page processing", "single page circular processing" and "page processing"

4.9.1.1 Single page processing As shown in the following figure:

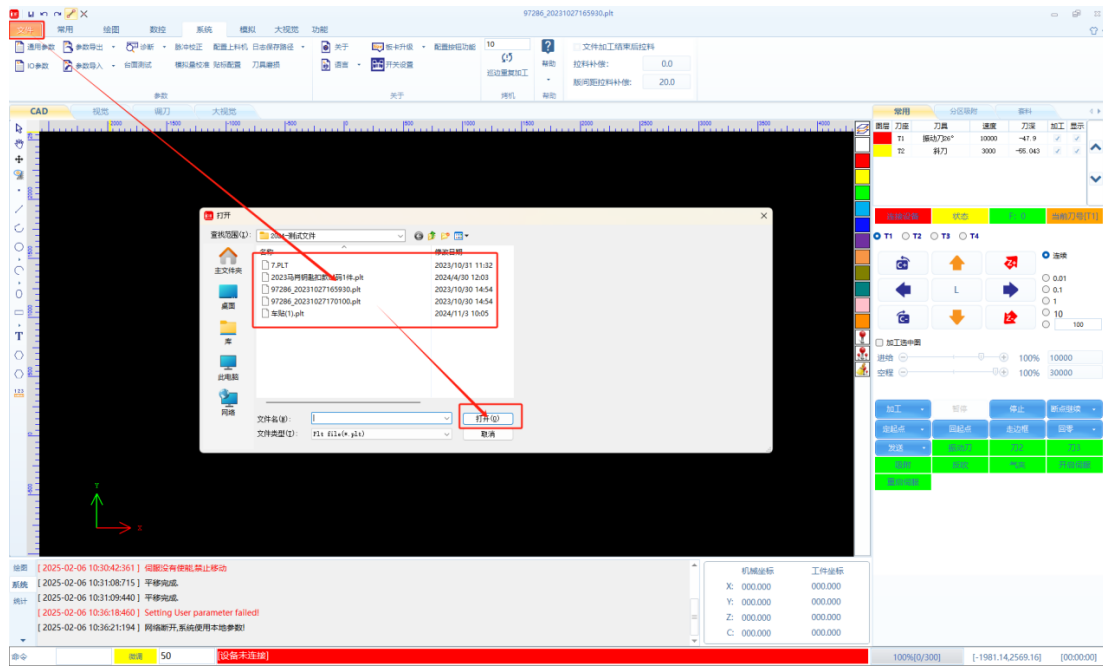
Open the software-open the machine-reset the system-open the file-optimize the figure

Set the color of the graphic-set the layer parameters

Set the depth of the knife-set the starting point-process

If the material needs to be pulled after processing, check and pull the material after processing

 **Pulled End NoCCD**



4.9.1.2 Single page cycle processing

Open the software-open the machine-reset the system-open the file-optimize the figure

Set the color of the graphic-set the layer parameters

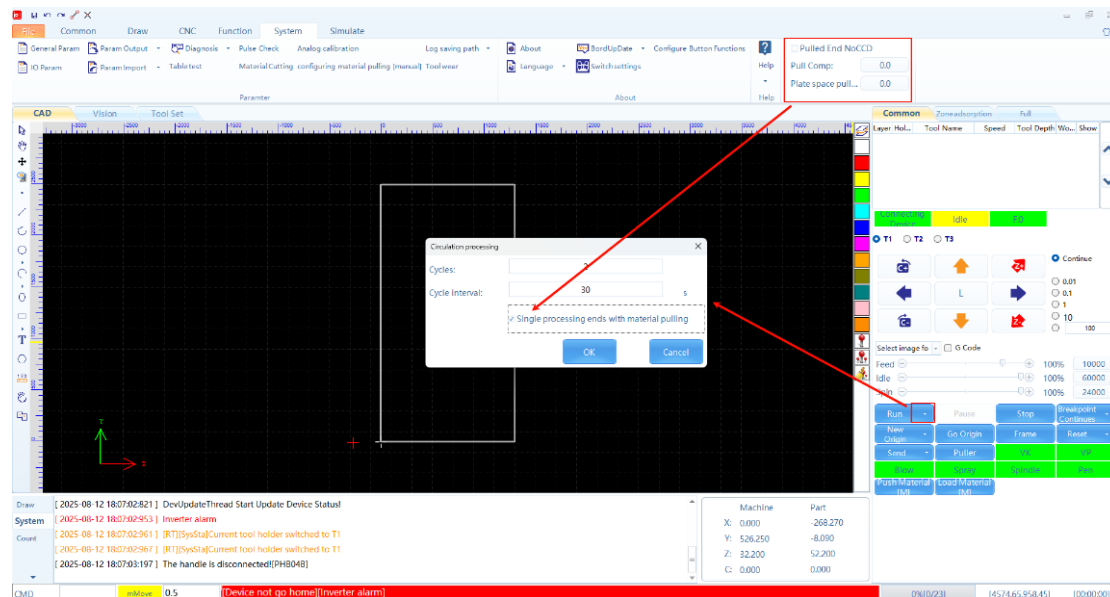
Set knife depth-set starting point

Page down-check pull material after processing-process pull menu-cycle processing (as shown below):

[Cycle number]: The number of times the process is repeated.

[Interval time]: The interval between each processing and the next processing.

After the single processing is finished, check the pull material, click OK, and start the cycle processing.



4.9.1.3 Page processing

Open the software-open the machine-reset the system-open the file-optimize the figure

Set the color of the graphic-set the layer parameters

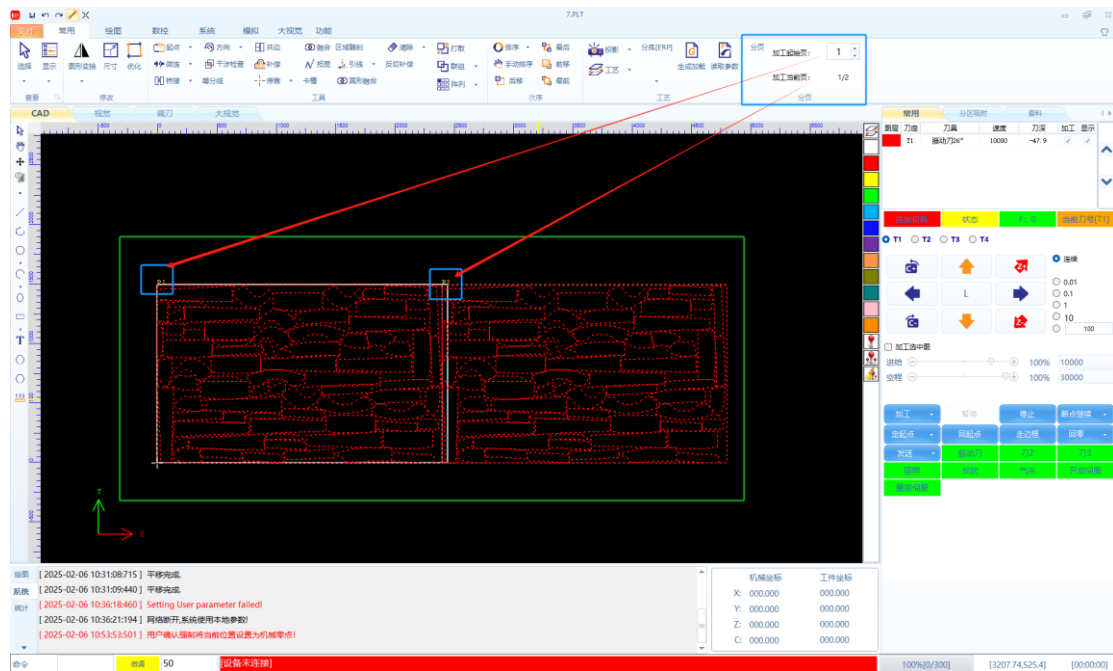
Set knife depth-set starting point

Automatic page division processing beyond the drawing element of the workbench. As shown in the

figure below: The current page number is on the first page **Start page:** . Click process, and a prompt dialog box will pop up. [Yes] starts processing from the current page, [No] starts processing from the first page, and [Cancel] cancels processing.

If the material needs to be pulled after processing, check and pull the material after processing

☐ **Pulled End NoCCD**



4.9.2 Various processing operations of border patrol

The edge processing supports a variety of processing methods: "single page edge processing", "single page edge processing", "page edge processing", "cutting Mark point mirror processing", and "scanning code edge processing"

4.9.2.1 Add templates and visual interface introduction

[Visual Interface]: Open the floating menu bar in the visual interface: you can add templates, set the camera, test the camera offset, select the camera list, and select the Mark point coordinate list. As shown in the figure below:

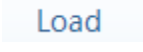
【**Open**】: Turn the camera on and off

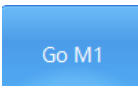
【**CCD Work**】: The border patrol begins processing

【**Stop**】: Add M point, and search whether M point is recognized at the position of M point.

【**Camera offset calibration**】: After adding M point, the camera can see the position of M point and recalibrate the pixel of M point

【  】 : Stop processing the patrol

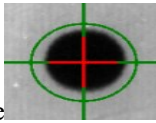
【  】 : Load the position coordinates of M1

【  】 Click back to M1 position

Add template:

Visual interface-Add template- (as shown below)

Select the circular template  Circle template , visual interface, and scroll the mouse wheel to zoom in

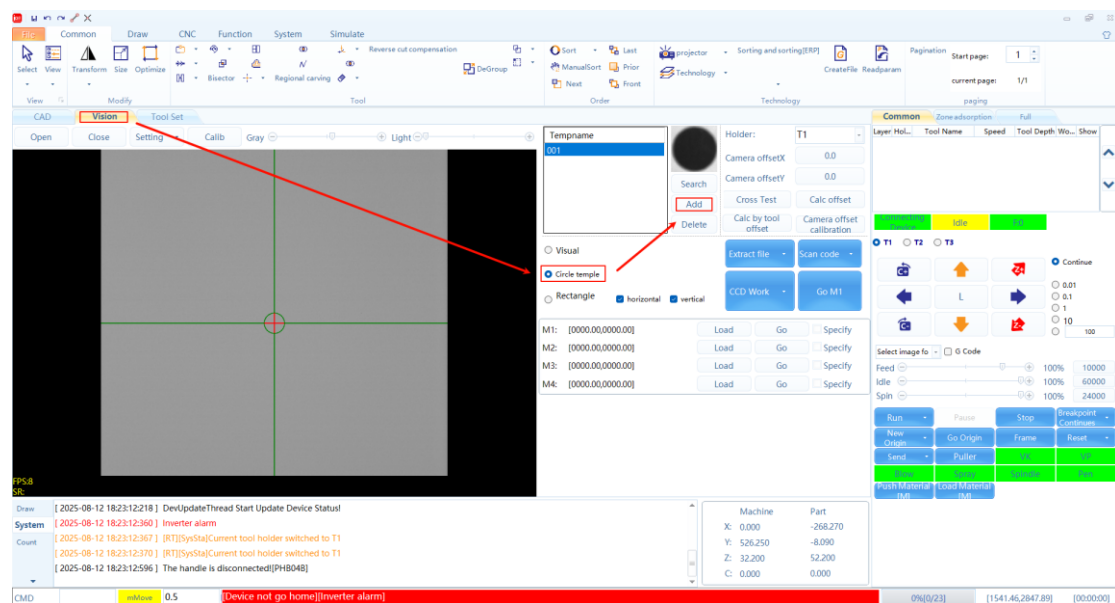
and out of the green reference circle  . After the green reference circle completely covers M point  .

Name Input ×

Name

Add M point and set the name to confirm. Add M point successfully.

Then click "Calibrate" to check whether the calibration is successful.



4.9.2.2 Single page patrol processing

Open the file, and the M point can be automatically marked under user parameters

 Auto Mark Range: -

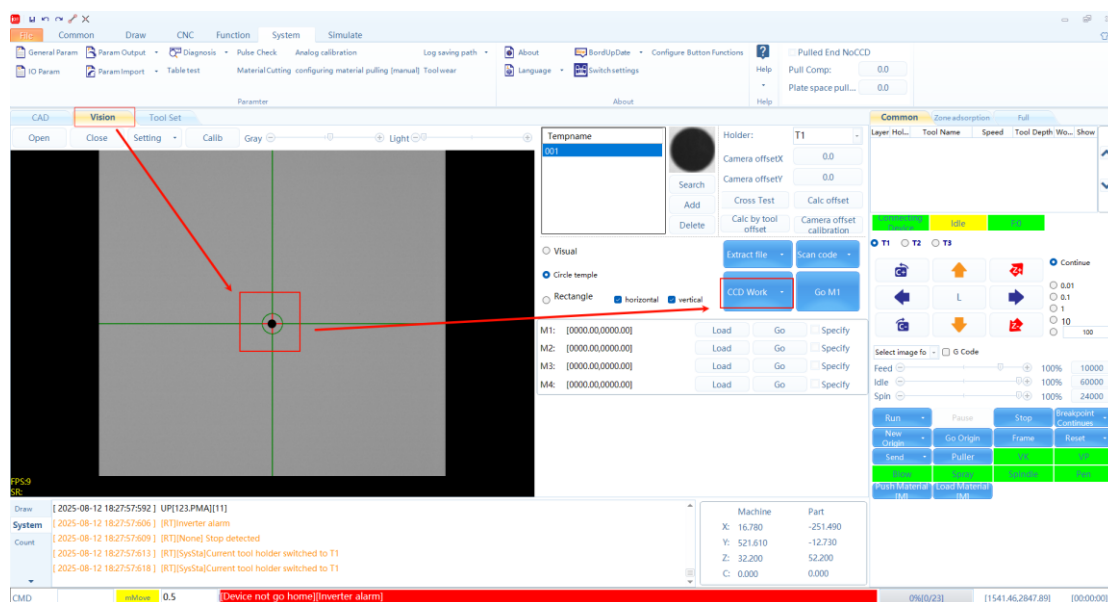
Mark point M1-M4 automatically when importing the file. If the point is not automatically marked, mark it manually after importing the file.



Enter the visual interface **Vision** and open the camera. Move the machine to the first M-point position of the material.

Add template. After the template is added successfully, you can click search to check whether the template is added successfully

The camera is at the first M point. Click the edge processing **CCD Work**. The equipment will automatically start the edge processing. After the edge processing is completed, the machine will automatically download the file for processing.



4.9.2.3 Single page patrol cycle processing

Open the file, and the M point can be automatically marked under user parameters



Mark point M1-M4 automatically when importing the file.

If M point is not automatically marked, you can manually mark it after importing the file



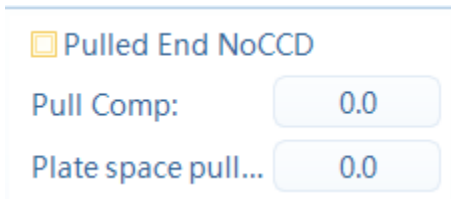
Mark M point alone.



Mark all M points.

Enter the visual interface **Vision** and open the camera. Move the machine to the first M-point position of the material.

Add template. After the template is added successfully, you can click search to check whether the template is added successfully



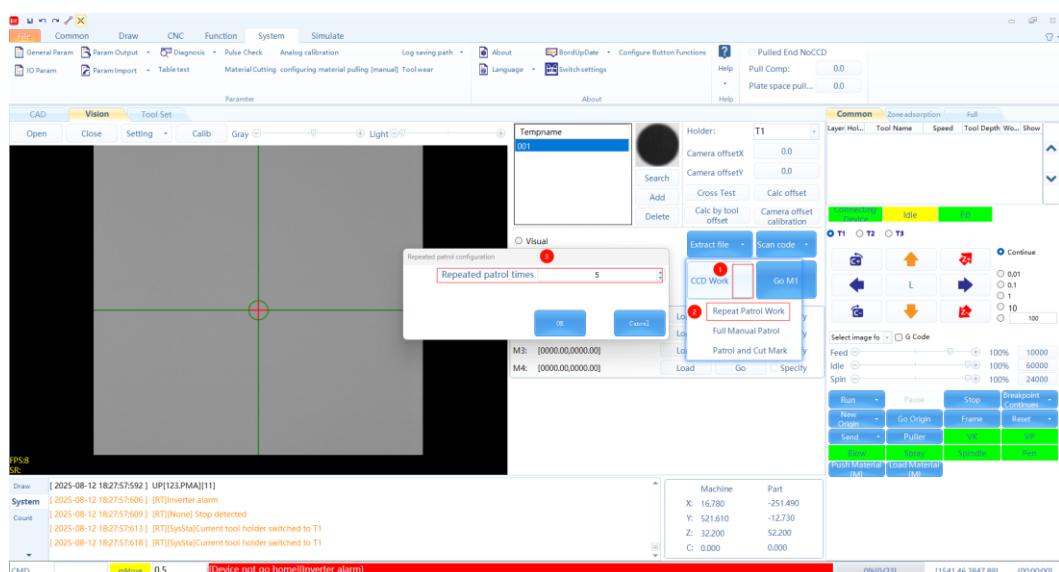
Menu bar-System-After file processing, check the pull material. After the first processing, the system needs to pull material by default, and then cut for the second processing after pulling material.



The camera is at the first M point. Click "tour the edge" Repeat Patrol Work to repeat processing.

Enter the processing times **Repeated patrol times** 5.

After the equipment completes a round of edge processing, pull the material and return the camera position to the first M point to repeat the edge processing.



4.9.2.4 Page border processing

Page-by-page edge processing is suitable for different graphic elements in coil processing. Each page uses 4*M points. Page breaks are automatically generated at the M-point position. As shown in the figure below: The distance between the M-point and the M-point in the pulling direction should not exceed the set worktable size.

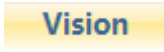
Open the file, and the M point can be automatically marked under user parameters



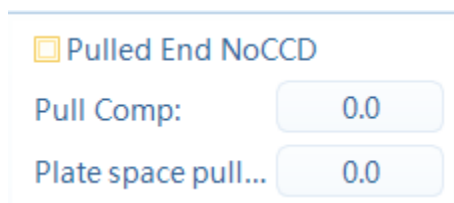
Mark point M1-M4 automatically when importing the file.

If M point is not automatically marked, you can manually mark it after importing the file



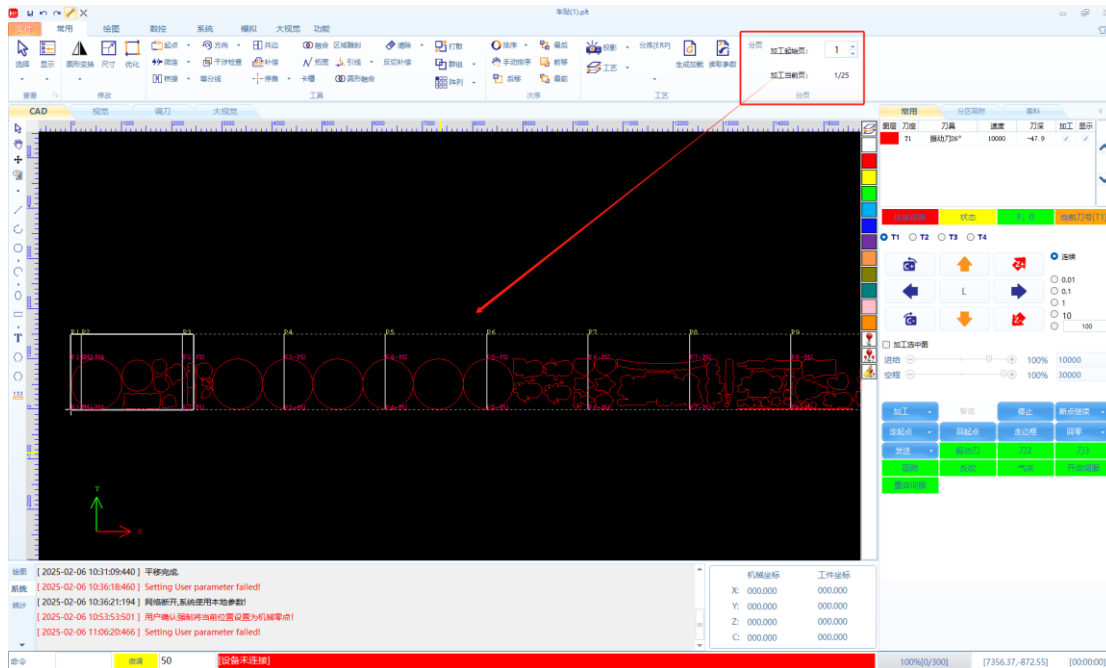
Enter the visual interface  and open the camera. Move the machine to the first M-point position of the material.

Add template. After the template is added successfully, you can click search to check whether the template is added successfully.



Menu bar-System-Check the material pulling after file processing. After the first page is processed, the system needs to pull the material by default. After pulling the material, the second page is processed by edge patrol.

Move the camera to the first M point position, click the edge processing , the equipment will automatically start the edge processing. After the edge processing, the file is automatically downloaded and the cutting element is cut. The first page is processed, and the material is automatically pulled to start the edge processing of the second page



4.9.2.5 Cutting Mark mirror processing

Cut Mark mirror processing is often used in packaging, gift box processing, card paper and other processing industries.

Open the file, and the M point can be automatically marked under user parameters



Mark point M1-M4 automatically when importing files.

If M point is not automatically marked, you can manually mark it after importing the file



Mark M point alone.



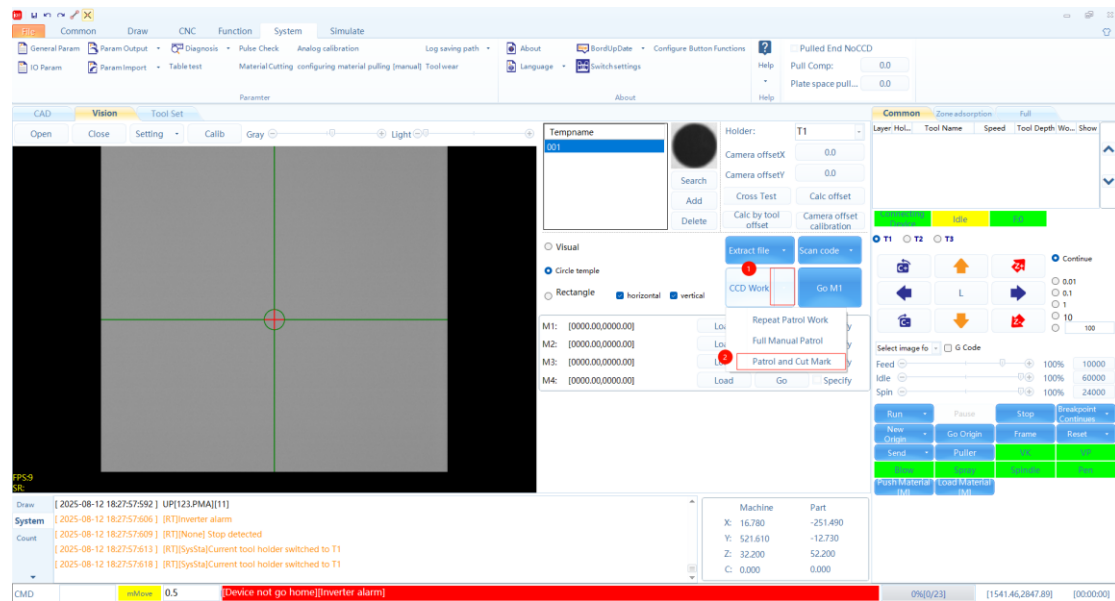
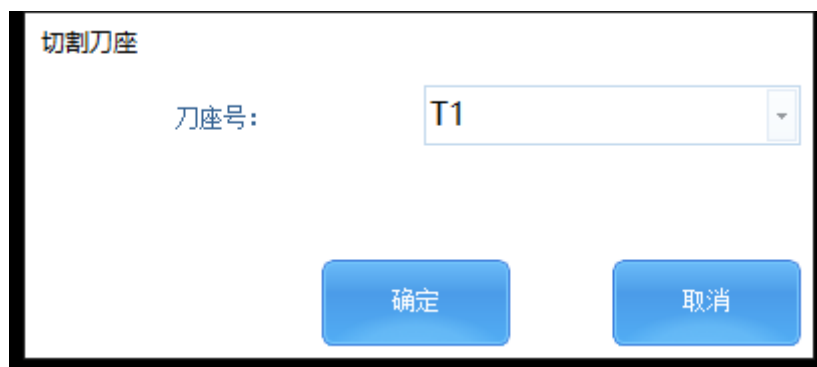
Mark all M points.

Enter the visual interface **Vision** and open the camera. Move the machine to the first M-point position of the material.

Add template. After the template is added successfully, you can click search to check whether the template is added successfully.

Move the camera to the first M point position, click "tour the edge and cut Mark" to pop up a dialog

box, you can select the specified knife seat to cut the M point (the default size of cutting the M point is 8MM)



The equipment starts to patrol automatically. After the patrol is completed, the equipment starts to cut M point automatically.

After cutting point M is completed, a dialog box will pop up automatically to prompt material flipping. Here we need to manually flip the material processed on the platform. As shown in the figure below: The flipping direction must be consistent with the system selection direction, X/Y mirror.

After flipping, the edge checking starts automatically. Click OK, and the processing file is automatically mirrored according to the flipping direction. The equipment automatically processes the edge.



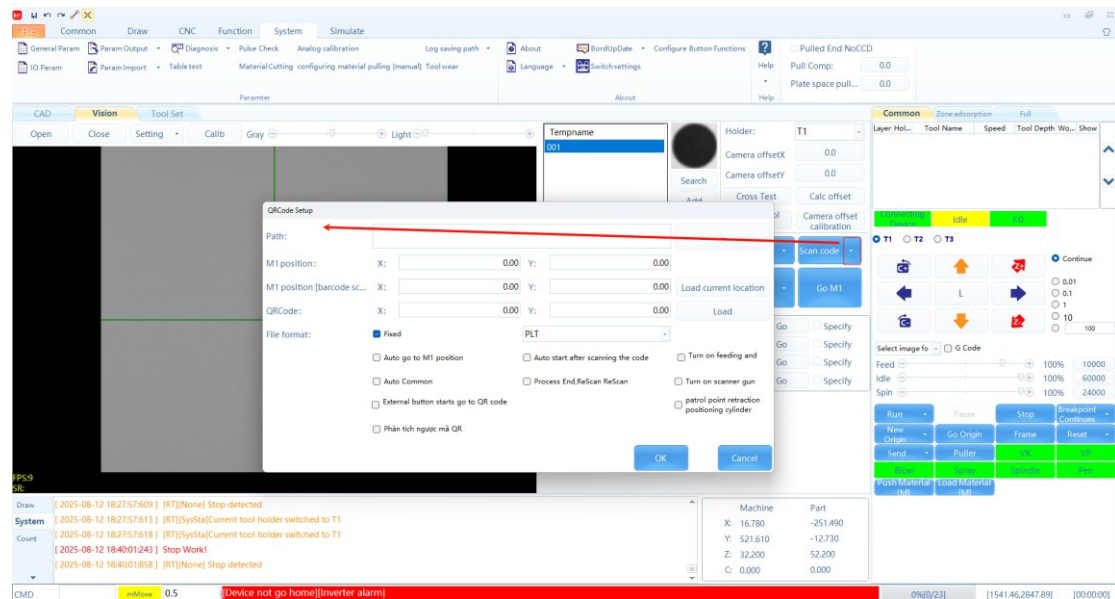
4.9.2.6 Scanning code for border processing

The ICUT scanning and processing system supports small cameras, where the scanner can load files by scanning QR codes. This significantly improves operational efficiency and saves time. The ICUT system features an "external scanning activation button" for edge inspection, enabling one-click scanning and processing.

Scan and process refers to the process of scanning the text information of the QR code on the printed material through a small camera or a scanner, so as to directly load the file under the file directory. It saves the step of manually opening the file.

Note: When printing the material, the QR code should be printed near the first M point. For the edge processing of the roll material QR code, the position of the QR code in each individual file must be consistent with the X/Y position of the first page.

Scan code setup



[Scan path]: The location where the scanned file is saved

[M1 position]: The offset between the QR code and the M1 position

[File format]: Supports PLT and DXF files

[Automatic return to M1 position]: Check to enable. Scan code processing will automatically return to M1 position. Page scan processing must be checked.

[Start automatically after scanning]: Check to enable. Whether to start edge processing automatically after scanning

[Scan code again after document processing]: Check to enable. After the current document processing is completed, the equipment returns to the M1 axis. Do you want to scan the next page automatically? Page scanning must be checked.

[Open the code scanner]: Check to enable. Whether to use the external code scanner to scan the code

Set parameters before scanning and processing

1: Under the user parameter, the automatic Mark is checked. The range size is modified accurately

2: Open the file in advance to check whether the direction of the file is consistent with the direction of the printing material on the machine? If not, you can modify the "rotation Angle" under "User Parameters".

Open the file several times to confirm whether the M point is calibrated successfully and whether the direction is consistent with the direction of the material.

3: open the file in advance, set the layer, and set the processing parameters under the layer.

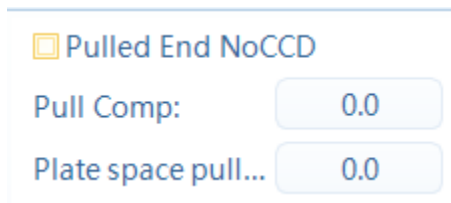
4: Set the scanning code processing parameters, file path, automatically return to M1 position, scan code and start automatically... and other parameters

Scan and process

After the parameters are set, open the camera and move the camera position to the QR code position.

Ensure that the camera view can see the QR code completely. Click scan and process.

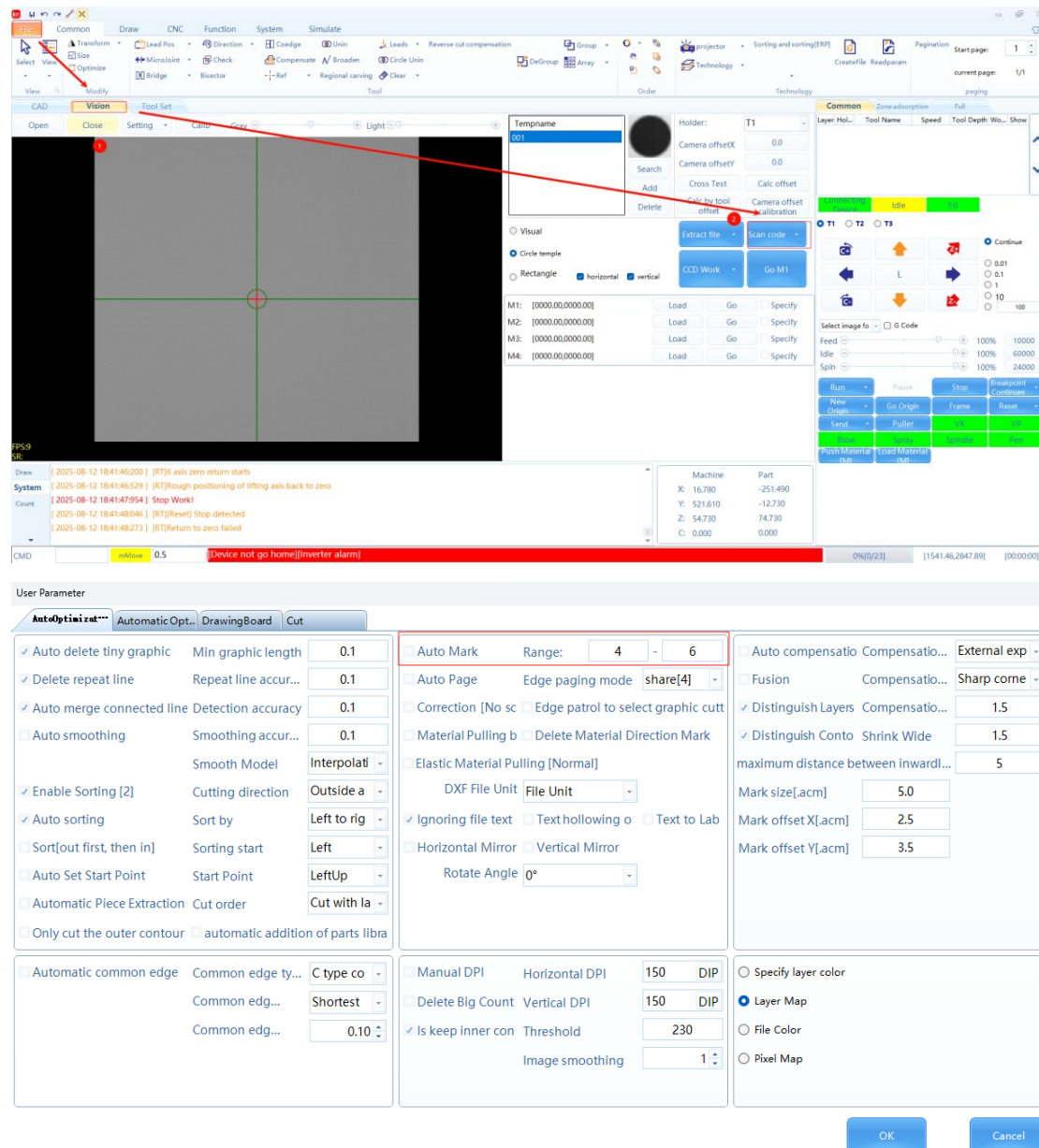
Scan the code to process the edge. Check "Pull material after file processing"



, and fill in the offset of M-point position between each version according to the printed material under "Pull material compensation for plate spacing".

The processing of the external QR code scanning button switch is shown in the following figure:
System-IO Parameters-Input-Parameter No.730. Corresponding to the wiring port number, fill in the corresponding parameter to port No.730. When the machine moves to the QR code position, the "external button" can be directly scanned and processed.

730	External patrol scanning code processing start button	Disable	N
-----	---	---------	---

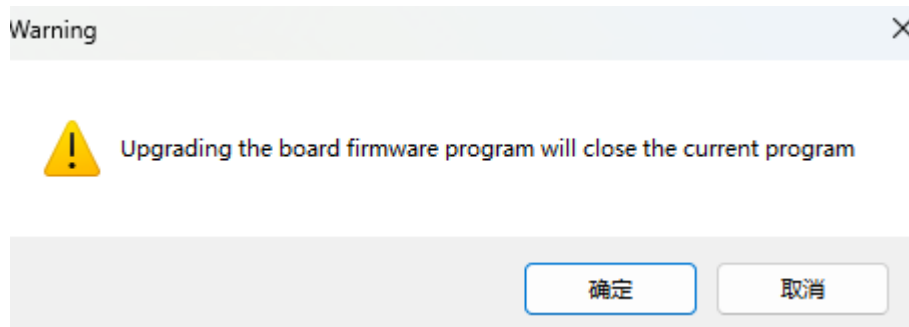


5. System auxiliary functions

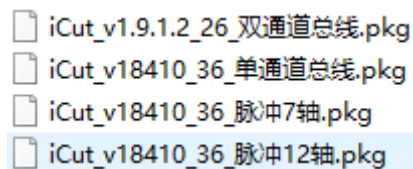
5.1 Board upgrade

After installing the latest software, Icut requires a board upgrade. The controller upgrade file should be synchronized with the PC software. Simply installing new software without upgrading the controller may result in some functions being unavailable. Under the "About" section of the menu bar system, click the

button . A dialog box appears. Click OK:

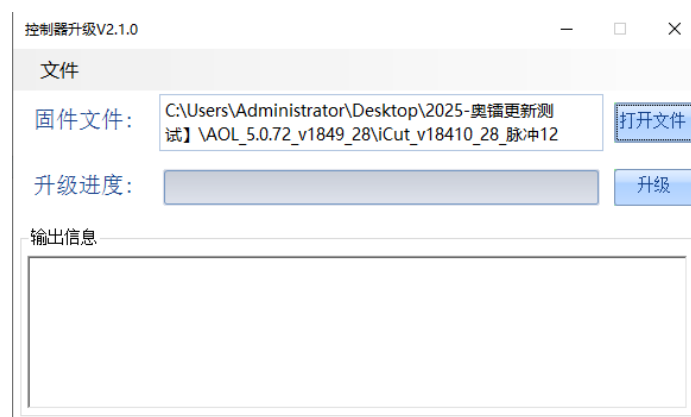


The following is shown: The controller upgrade interface is displayed. In this interface, click: Open the file, find and open the software package **iCut_5.0.106_v18410_36**, and select and open the "PKG" file that matches your machine.



If you are not sure which file to upgrade, please contact us

After opening the file, click the "Upgrade" button, and the system starts to upgrade. After the "Output message" indicates that the upgrade is successful, the upgrade is complete. Power off the device and restart it



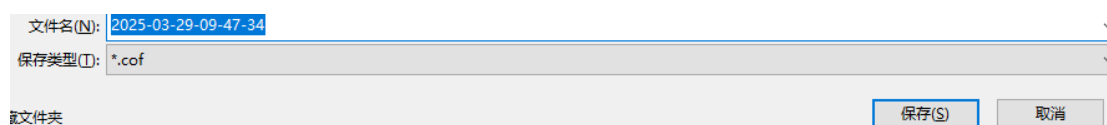
5.2 Parameter export and parameter import

Icut supports real-time synchronization of any parameters. Normally, any parameters modified by us will be automatically synchronized to the controller. Changing the computer does not affect the parameters.

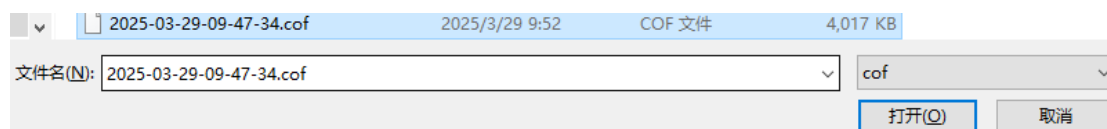
After installing new software and connecting to the controller, the parameters will be automatically synchronized to the PC software.

If a new controller is replaced, we need to export the parameters to the computer in advance, and then import the parameters from the computer after replacing the new controller.

Parameter export: Click the button  Param Output in the "Parameter" column of the menu bar, a dialog box will pop up. Enter the "file name" and save the type as ".cof", then click save. A dialog box will pop up, indicating that "parameter saved successfully", click OK to complete.



Parameter import: Click the button  Param Import in the "parameter" column of the menu bar, a dialog box will pop up. Find and select the previously saved parameters, click open, and prompt "input password". After entering the password, it will prompt "import parameter successfully", and click OK to complete the process.



Note: Do not import parameters lightly. Only after replacing the controller or completely losing parameter data should you import previously saved parameters. After importing new parameters, first check through the control console to ensure normal movement. The tool depth needs to be reset after importing new parameters!

5.3 Table test

The ICU system supports a table compensation function, which can better ensure the cutting precision of the Z-axis depth at different positions during processing. Long-term use can better protect the felt from damage. Before the test platform, you need to prepare the "leveling instrument" as shown in the

figure below:



5.3.1 Configure the test IO signal on the console

System-IO parameter-input-606 bench tester

Fill the corresponding port number of the board connector into the corresponding port under the IO parameter. Trigger the test bench signal to detect whether there is a signal trigger.

IO Param					
Search keyword... 606 <input type="button" value="search"/>					
Input	Number	Name	Port	Level	Description
Output	606	tabletop tester	Disable	N	Desktop tester
Partition adsorption					

5.3.2 Configuration of desktop data

System-Console Test-Open the console calibration interface, as shown in the figure below:

Open the configuration panel data and enter the panel data calibration parameter interface

[Enable Table Compensation]: Check to enable. Turn off "Table Compensation" when measuring table data. After measuring and saving the table data successfully, turn on "Table Compensation". Check to enable.

[XY Direction Distance]: The distance between test points during table test.

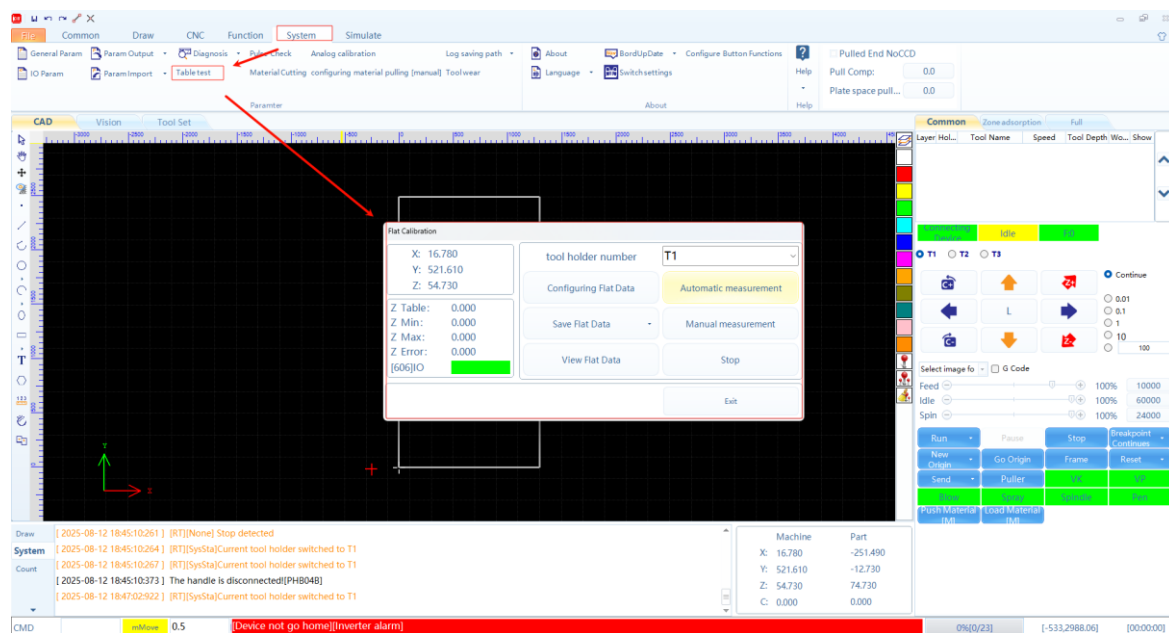
[X/Y calibration starting point/end point]: The default starting point of the Icut system calibration is at the lower left corner, and the upper right corner is the end point.

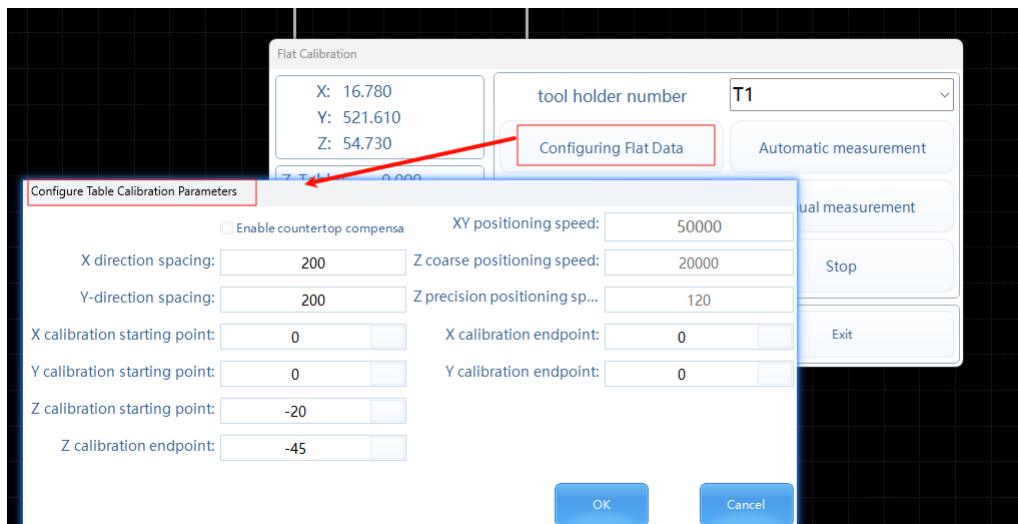
After moving the machine to the lower left corner of the platform, click to load the X/Y starting point. Then move the machine to the upper right corner of the platform and click to load the X/Y end point.

[Z-axis calibration starting point]: The starting position of the Z-axis measurement during platform test, and the position of the empty travel after the Z-axis is lifted.

[Z-axis calibration endpoint]: The lowest point of the Z-axis during the calibration table process. Move the Z-axis downward [606]IO  until the platform tester signal is triggered. Then lower it by approximately 1-2MM. Load the Z-axis calibration endpoint coordinates.

After the configuration of the surface data parameters is modified, click OK to exit the current window.





5.3.3 Bench test

The default knife holder for the table test is T1

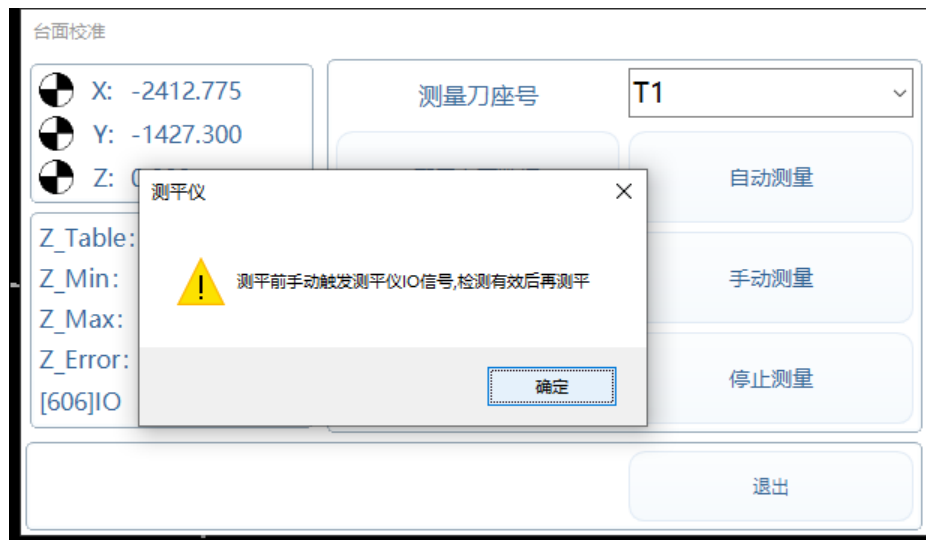
Click "Manual Measurement", and a prompt will appear: "Before leveling, manually trigger the IO signal of the measurement instrument, and check if it is valid before leveling". Click "OK" to manually trigger the signal of the measurement instrument. If the signal exists, automatic measurement can be performed.

Click "Automatically measure" to start leveling the device

After the leveling is successful, the equipment stops lifting the Z-axis. The system prompts "The measurement table is successful" and clicks OK

Save Flat Data

Click "Save desktop data" to confirm and save the desktop data successfully.



5.3.4 View the surface data



Click "View the table data" to view the measured table data, as shown in the figure below: you can view the "highest point", "lowest point" and "maximum error value".

[Return measurement position]: You can manually select a measurement point and click the "Return measurement position" point

[Manual measurement]: If there is a foreign object or the measurement is not accurate at a certain point during measurement, you can click the "manual measurement" function by clicking "return to measurement position". Then measure the current position.

[Save Desktop Data]: In the current desktop data interface, after "manual measurement" of some points, you can save the "manual measurement" desktop data here.

-52.925	-52.865	-52.99	-53	-53.095	-53.115	-53.205	-53.26	-53.275	-53.3	-53.39	-53.38
-52.87	-52.665	-52.89	-52.98	-53.065	-53.115	-53.18	-53.215	-53.255	-53.275	-53.315	-53.38
-52.865	-52.865	-52.945	-52.965	-53.025	-53.08	-53.15	-53.195	-53.22	-53.22	-53.3	-53.34
-52.865	-52.91	-52.975	-52.97	-53.015	-53.03	-53.1	-53.15	-53.175	-53.185	-53.235	-53.28
-52.855	-52.925	-52.975	-52.965	-53.02	-53	-53.065	-53.135	-53.16	-53.19	-53.195	-53.27
-52.835	-52.94	-52.965	-52.935	-53	-53	-53.04	-53.08	-53.115	-53.125	-53.17	-53.215
-52.86	-52.89	-52.895	-52.9	-52.955	-52.96	-53.02	-52.61	-53.095	-53.11	-53.165	-53.175
-52.92	-52.9	-52.915	-52.91	-52.945	-52.97	-52.98	-53.045	-53.06	-53.06	-53.12	-53.135
-52.895	-52.82	-52.9	-52.895	-52.93	-52.9	-52.975	-53.01	-53.04	-53.05	-53.095	-53.135
-52.915	-52.86	-52.87	-52.89	-52.935	-52.935	-52.975	-53.005	-53.02	-53.075	-53.12	-53.115

X: 0.000
Y: 0.000
Z: 0.000

Row: 0.0
Column: 0.0
[0.0,0.0,0.0]

Min Z: -53.73
Max Z: -52.61
Max Error: 1.12

手动测量
保存台面数据

回测量位置
停止

5.3.5 Export/import of console data

Desktop calibration interface-Save desktop data drop-down menu-Export desktop data / Import desktop

data

PlateCalibPos.dat
(*.dat) Desktop data by default. DAT format file

Note: To import the desktop data, you need to restart the touch. The imported desktop data corresponds to the parameters configured for the desktop data.

Flat Calibration

X: 16.780
Y: 521.610
Z: 54.730

Z Table: 0.000
Z Min: 0.000
Z Max: 0.000
Z Error: 0.000
[606]IO

tool holder number
T1

Configuring Flat Data

Save Flat Data

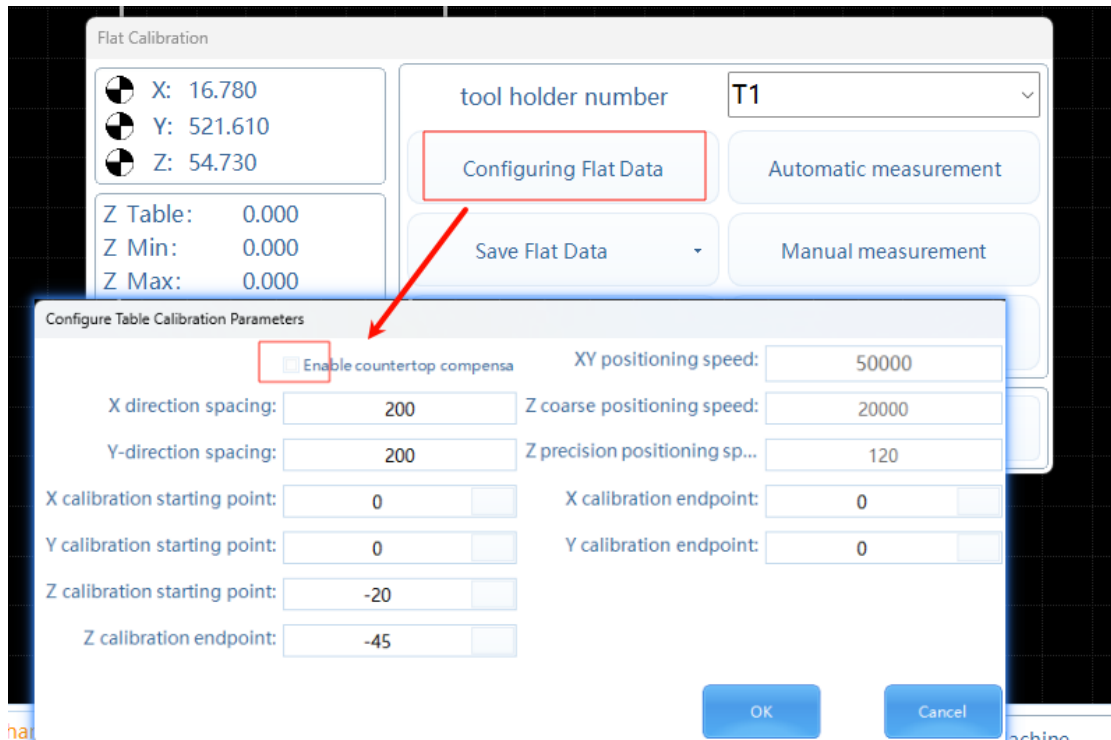
Export flat data
Import flat data

Automatic measurement
Manual measurement
Stop

Exit

5.3.6 Enable surface compensation

Table calibration-configure table data-check to enable table compensation

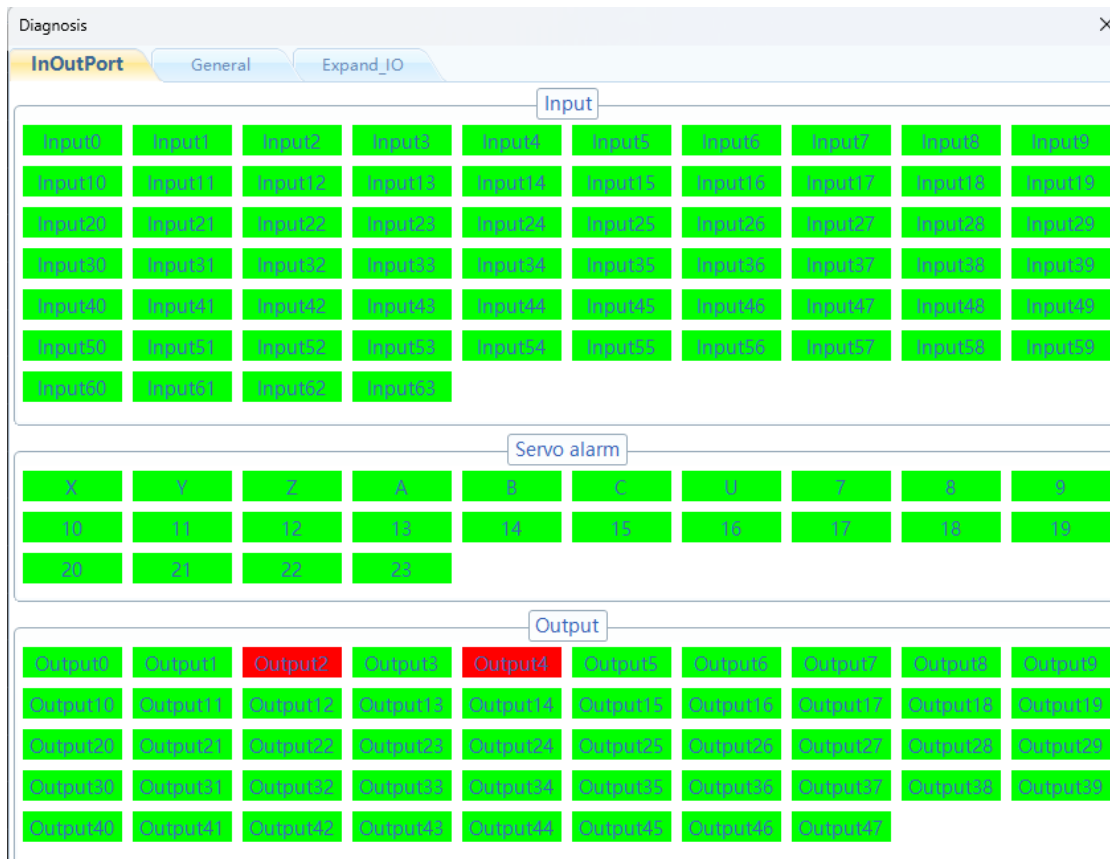


5.4 Language modification

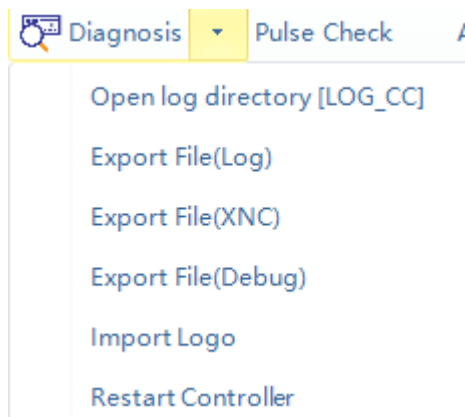
In the "About" column of the menu bar system, click the triangle arrow button  Language and select the language to be modified in the drop-down menu. The controller will restart and switch the language successfully after this connected machine is connected.

5.5 Diagnosis and log viewing

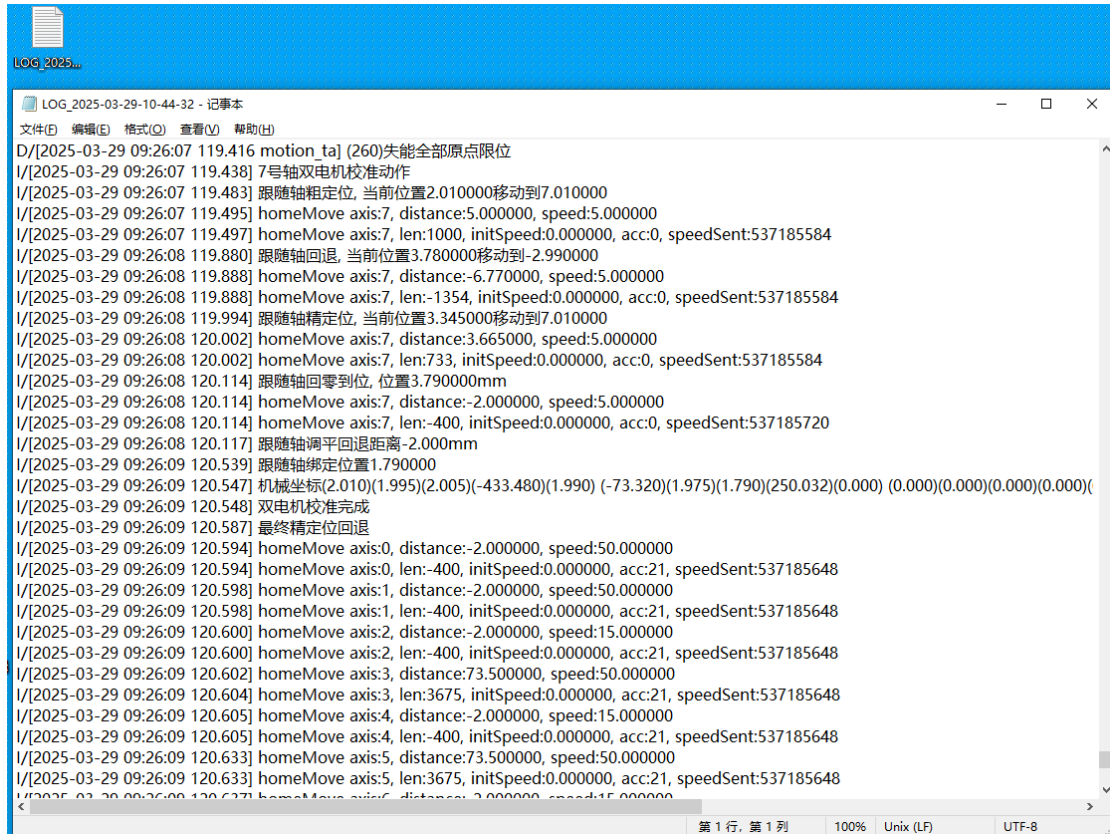
If some signals of the device are faulty, you can open the diagnosis interface by clicking the button  Diagnosis in the "parameter" column of the menu bar system, as shown in the figure below: In this interface, you can view the status of input and output signals.



Click the small arrow triangle on the right side of the diagnosis. In the diagnosis drop-down menu, you can export logs (log), export XNC files, and export processing trajectory ((Debug). If there is a problem, exporting these three files can help you find the problem more quickly and solve it in time.



View the log file, double-click the exported log file, select "notepad" to open, you can view the recent operation records and alarm information.



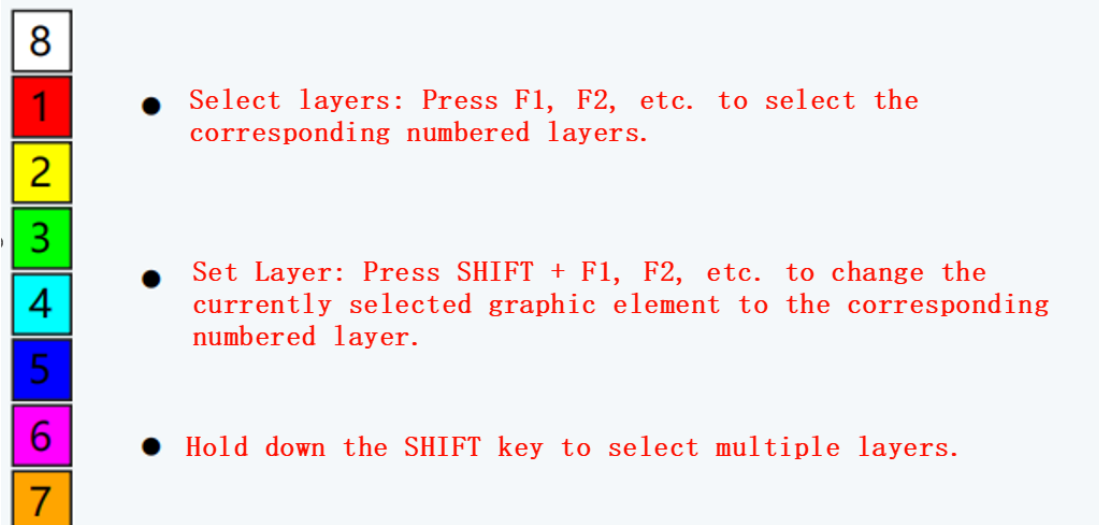
5.7 Shortcuts

Ctrl + F1	The drawing interface gets bigger and smaller
Ctrl + B	Return to the main view, which is the final appropriate size
Enter	In the CAD interface, press Enter to automatically focus the command input bar
Middle mouse button	Drag the graphics by holding down the middle mouse button
Alt + Q	Draw a circle quickly
Alt + W	Draw rounded rectangle quickly
Alt + F	Quickly draw a rectangle
Alt + S	Change the size of the selected shape
Alt + G	Park in the lower left corner

Esc	Interrupts the current operation
Ctrl+ direction key	Move X/Y manually
R	Select shape rotation
space bar	The processing was suspended

There are other shortcuts, as shown in the figure below: different layers correspond to numeric keys

图层对应数字键



6.Common problems and treatment

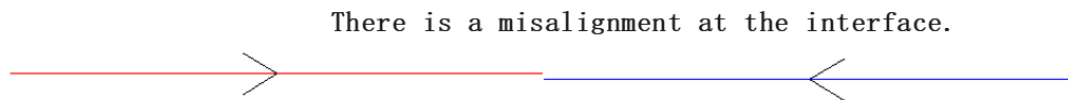
6.1 Tool debugging

During operation, we may encounter issues such as suboptimal cutting performance, incomplete interface separation, abnormal overcutting, corner deformation, interface misalignment, or offsetting during edge trimming. These problems may stem from incorrect tool angle settings, tool eccentricity, or improperly adjusted tool holder offsets. Below are troubleshooting guidelines for various tool adjustments:

6.1.1 Angle offset

As shown in the figure below: The upper figure shows the normal processing effect, and the lower figure shows the displacement caused by the processing effect. This is likely due to the deviation of the

tool Angle. The cutting at 0 degrees of rotation axis and 180 degrees of rotation axis are not on the same straight line.



First, check if the installed tool is properly mounted. Ensure the tool is correctly positioned. After installation, when returning to position C, the tool's blade should face X+ direction. If the blade orientation is reversed, verify the tool's installation or check the tool holder's alignment. For most tool holders, the blade should align with the direction of the fixed screw. As shown in the diagram below:



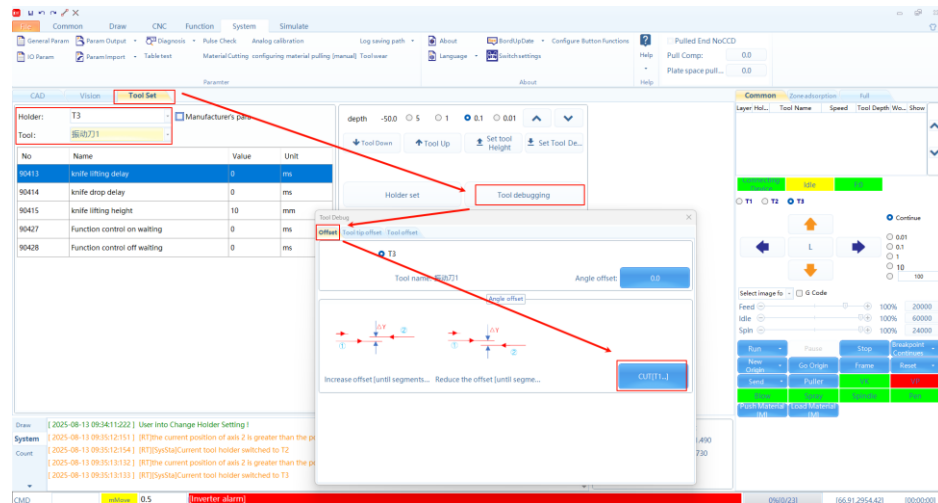
Blade Angle adjustment: as shown in the figure below:

Select the tool that needs to be tested at an Angle, set the depth of the tool on the surface of the material (the depth should be about 0.2MM below the surface of the material, not too deep). Finally, use a harder material to ensure that the cutting does not deform.

In the "tool" interface, select the tool to be tested at the required Angle, open the "tool debugging" window, and select "angle offset".

CUT[T1...]

Move the tool above the material and click the button **CUT[T1...]**. The machine will cut three line segments on the surface of the material, among which the shortest line segment is the cutting direction prompt line segment, which is convenient for you to better determine the cutting direction of the two outer line segments.



After cutting, check the cutting effect:

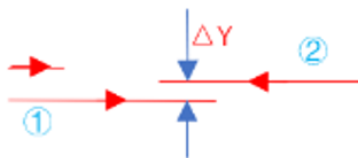
Effect 1: As shown in Figure 1 below, this effect requires an increase in the offset. Here

Angle offset: **0.0**, click open and enter the value to be offset.

Effect 2: As shown in Figure 2 below: This effect requires a reduction in the offset. Here

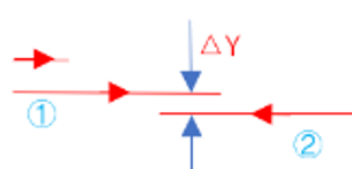
Angle offset: **0.0**, click open and enter the value to be offset.

Figure 1



Increase the offset until line segment 1 coincides with line segment 2.

Figure 2



Reduce the offset until line segment 1 coincides with line segment 2.

If the cutting is ineffective after adjusting the Angle offset, it may be that the tool has an eccentricity in the Y direction. The tool eccentricity needs to be adjusted

6.1.2 Blade tip offset

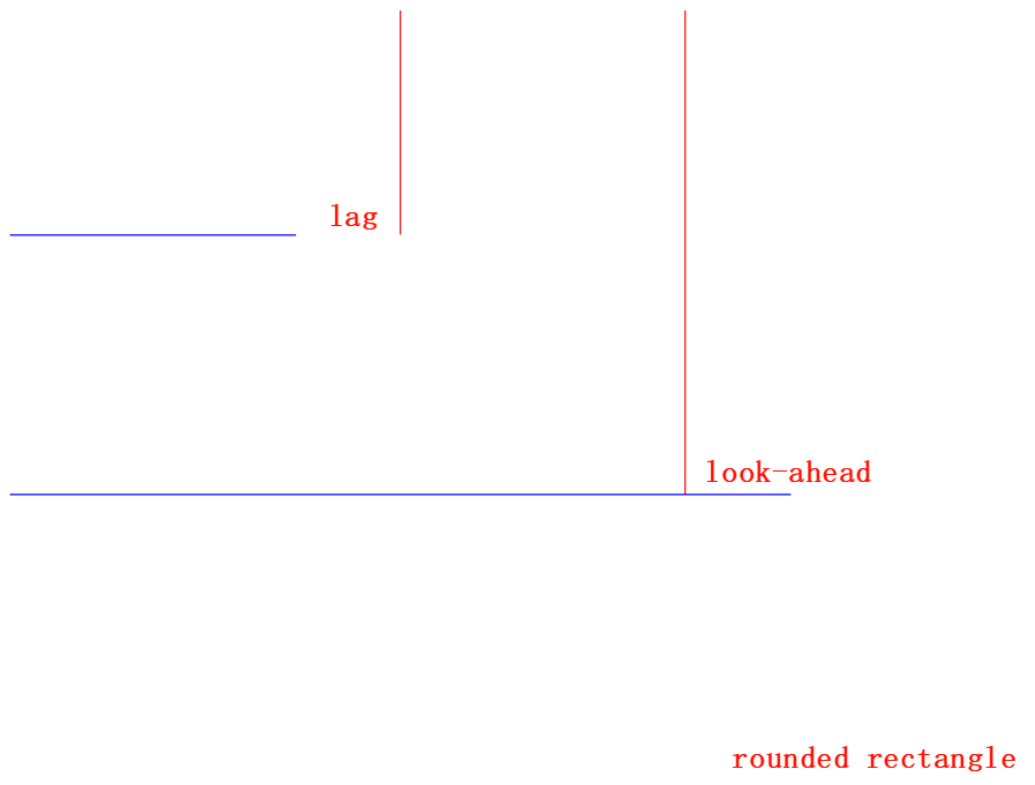
Tool eccentricity means that the installed tool is tilted! It is not parallel or perpendicular to the X/Y axis.

To measure tool eccentricity, you need to fine-tune the depth of the tool first.

When the blade tip contacts the material surface, set the Z-axis depth of 0.1-0.2 to leave a slight mark on the material surface. At this point, adjust the tool depth. Cut a "square" or "cross" to better observe whether the cutting effect shows tool eccentricity.

Y-axis eccentricity of the tool will lead to inaccurate cutting size, either too large or too small

X-eccentricity of the tool will cause the tip position to lift the knife or fall in front or behind, and also lead to irregular rounded corners and rectangles. As shown in the figure below:



If the above situation occurs, first check whether the blade is installed correctly, whether the blade is

installed in place, and whether all the fixing screws are locked. If the blade is installed correctly, we can test the tool eccentricity so that compensation can be made during machining.

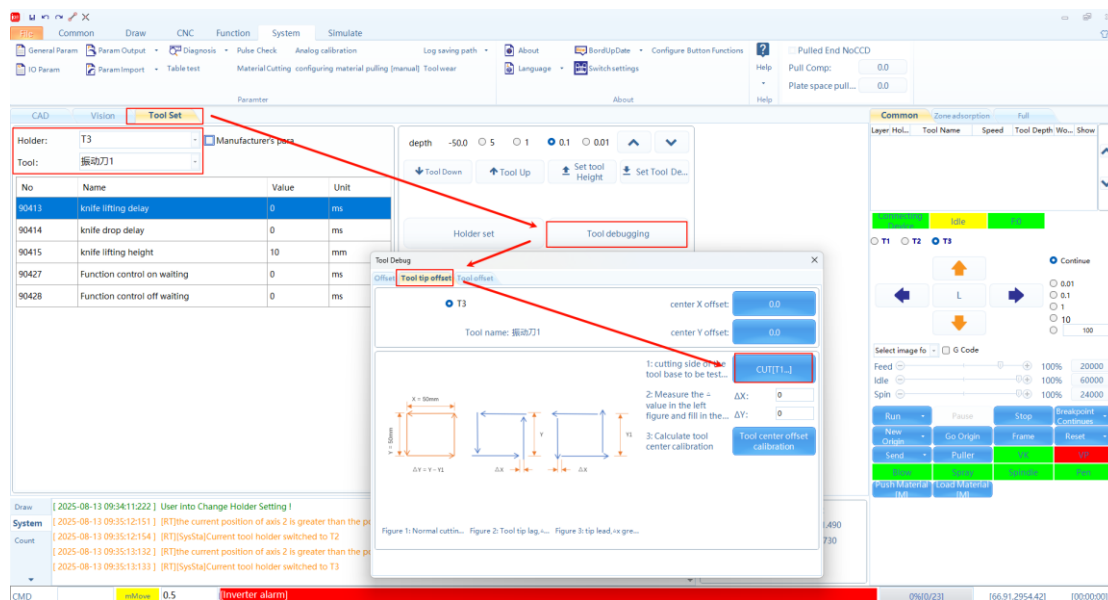
The blade offset debugging is as follows:

Select the tool that needs to be tested at an Angle, set the depth of the tool on the surface of the material (the depth should be about 0.2MM below the surface of the material, not too deep). Finally, choose a harder material to ensure that the cutting does not deform.

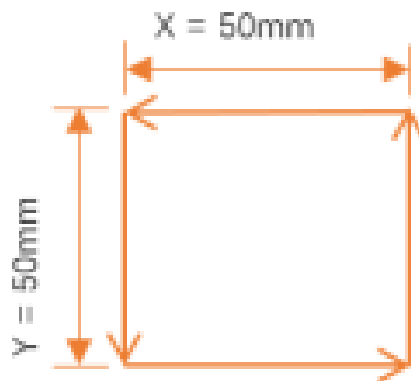
In the "tool" interface, select the tool to be tested at the required Angle, open the "tool debugging" window, and select "tool tip offset".



Please move the tool above the material, click the button, the equipment will cut a rectangle on the surface of the material. After cutting, please carefully measure the size of the cut rectangle and observe the interface between the lifting and dropping of the knife.

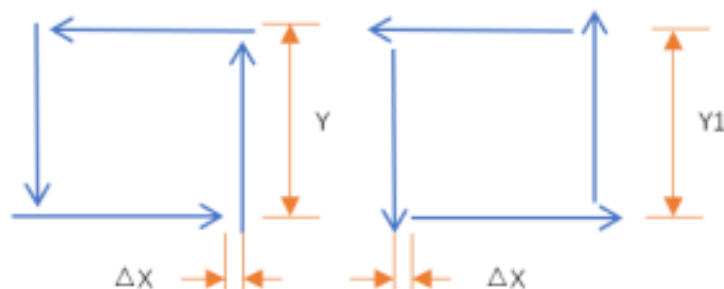


Y to eccentricity: As shown in the figure below: ΔY is the measured and calculated offset value. Y is the target size, and Y1 is the actual cutting size. The calculated error offset value is filled into the right ΔY .



$$\Delta Y = Y - Y1$$

X eccentricity: As shown in the figure below: If the left figure occurs, it means that the tip of the blade lags behind, and ΔX is filled with a negative value. If the right figure occurs, it means that the tip of the blade is ahead, and ΔX is filled with a positive number.



2: Measure the Δ value in the left figure and fill in the...

ΔX :

0

ΔY :

0

After filling in the error value below, click the

button
3: Calculate tool center calibration

Tool center offset calibration

. The system will automatically calculate the

center X offset:

0.0

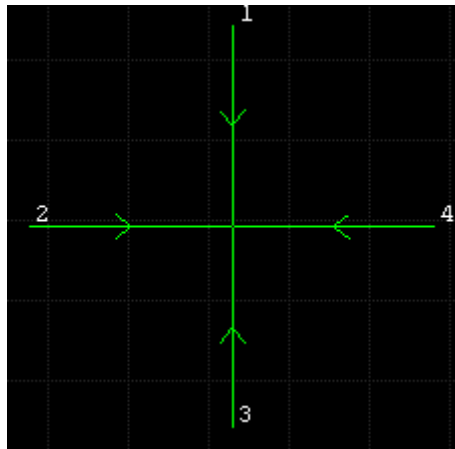
center Y offset:

0.0

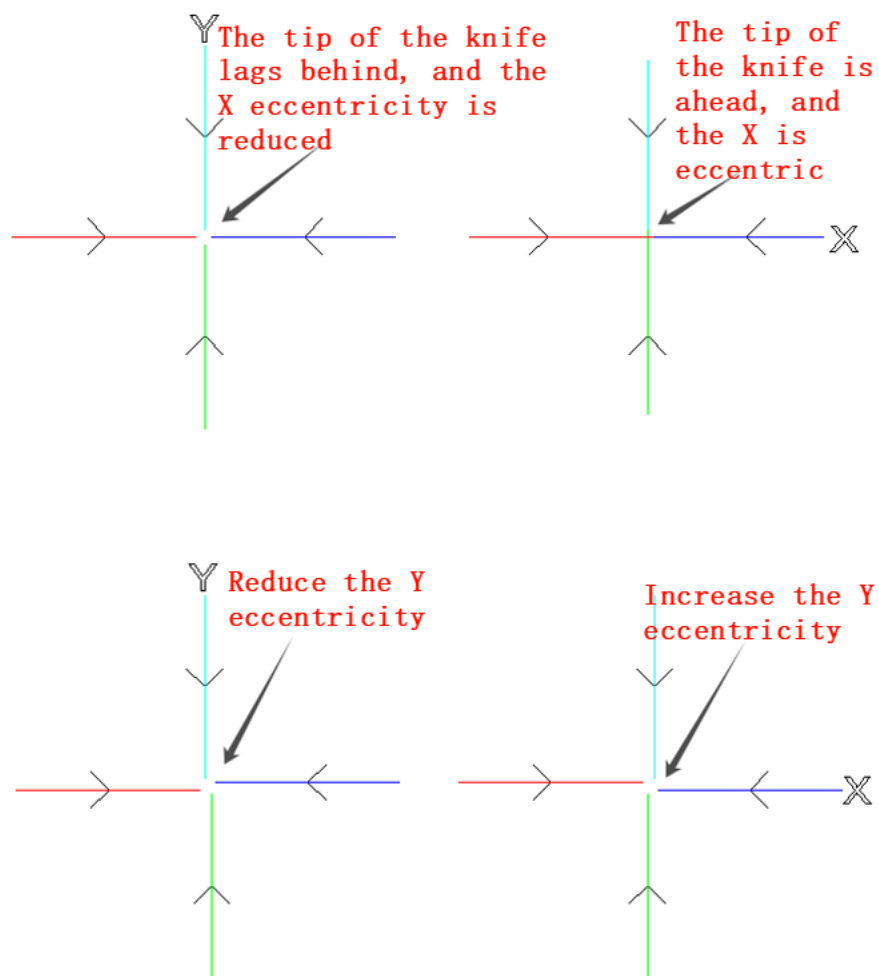
tool tip offset value and fill it into the tool center offset

There is no need to manually fill in.

Method 2: Test the blade eccentricity by cutting the cross test. The drawing of the cross test must be cut in the direction shown in the following figure:



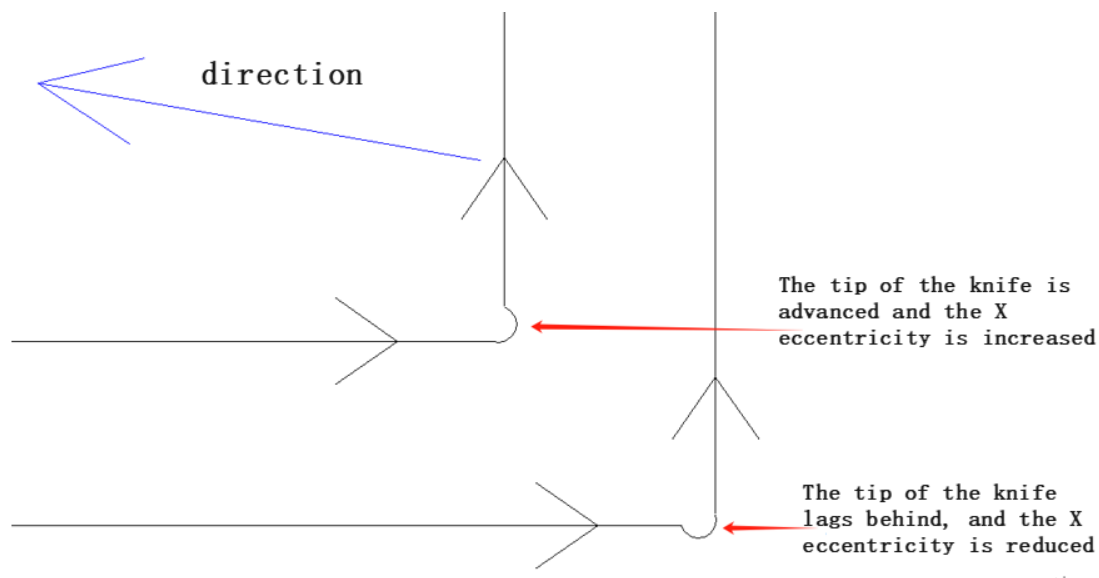
Below are several types of tool eccentricity, adjust the tool eccentricity parameters according to the actual cutting effect:



Eccentricity of fillet rectangle cutting tool: If the effect of fillet rectangle is not good, the following

situation may be caused by X eccentricity problem. Please adjust the X eccentricity parameter test according to the cutting effect shown in the figure below.

This is for thin materials, as shown in the figure below. For thicker materials, you may need to add some "blade compensation". The following questions will be discussed.



6.2 Offset test

There are two types of offsets: one between tool holders, and another between the camera and tool holder. The offset between tool holders is measured using T1 as the reference point to determine deviations among other tool holders. In edge processing, cameras are employed as the reference point to measure offsets between other tool holders and the camera.

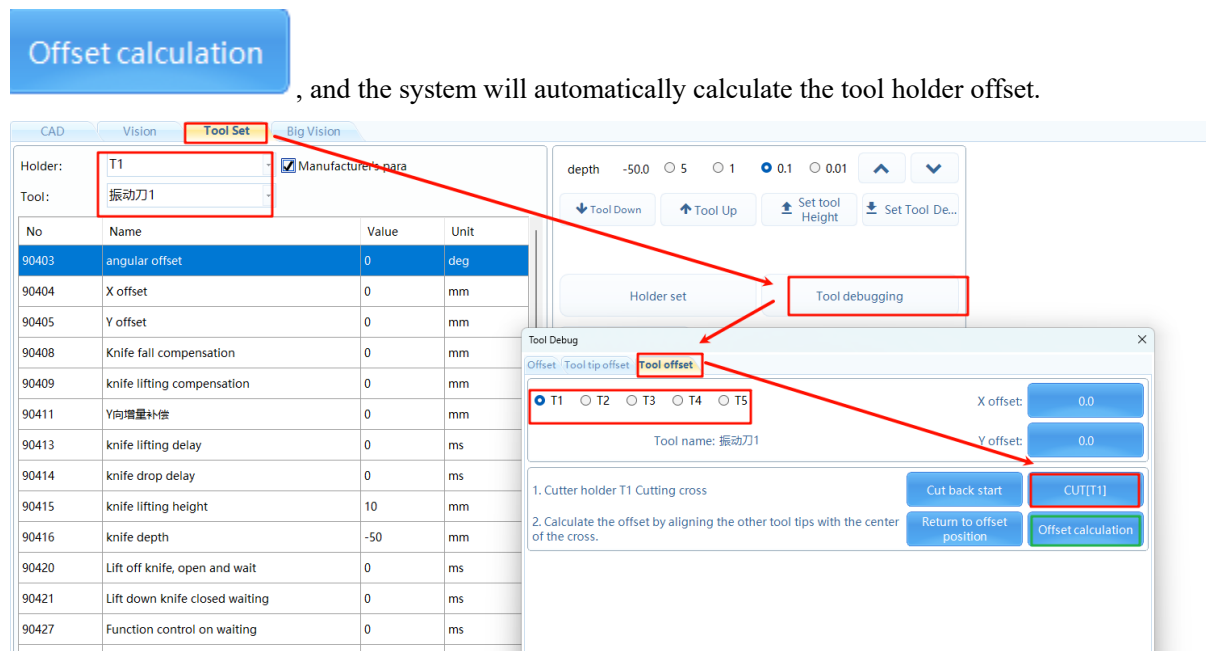
In our processing, we will encounter the situation that multiple tool seats process one figure at a time, and at this time, there are deviations in the cutting trajectory of multiple tool seats. It may be that the offset between the tool seats is not tested well, so it is necessary to test the tool offset.

During the processing of the circuit, the cutting trajectory sometimes deviates to one side. In this case, the camera offset may not be adjusted properly. Therefore, it is necessary to perform cross test and offset correction on the deviated knife holder.

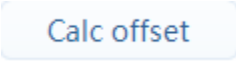
6.2.1 Tool holder offset

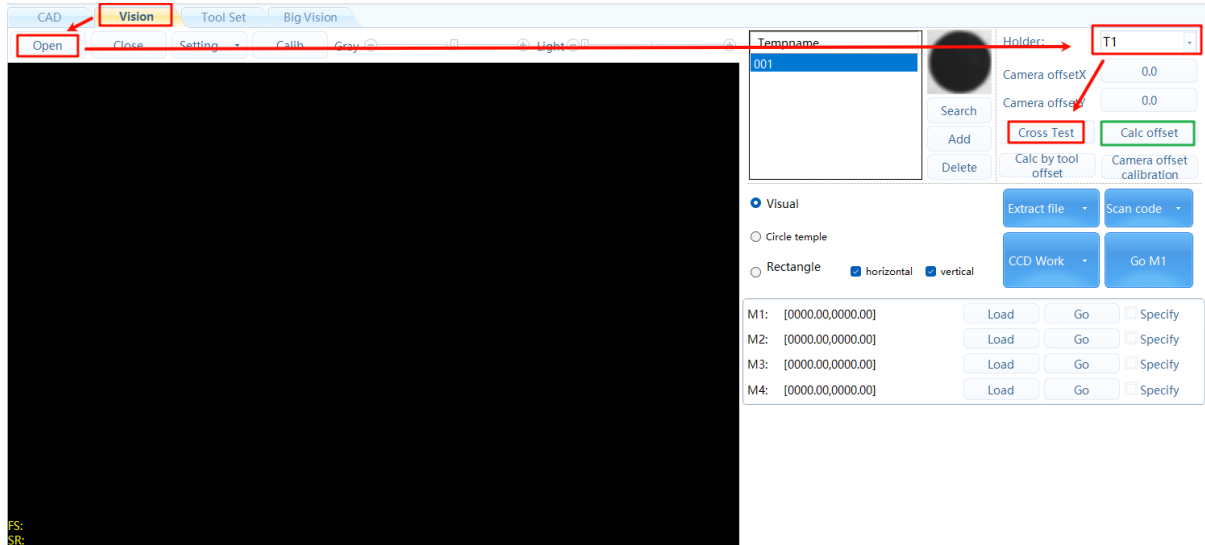
The tool holder offset is based on the tool holder 1. Under the tool adjustment interface, open the "tool debugging" interface and click "tool offset".

Select "T1", click cut, and confirm. The equipment will cut a cross on the material. After cutting, move the tools of T2-T* and other tool holders to the center of the cross in sequence, click the button respectively



6.2.2 Camera offset test

To calibrate the camera, first turn it on in the visual interface. Select "Test Blade Holder Number" and choose the blade holder to be tested using the small triangular arrow on the right. Click "Cross Test" to start cutting a cross on the material. After completion, move the camera above the cut cross to align the green cross in the frame with the actual cut. Finally, click . The system automatically calculates the offset. Select another tool holder in turn and repeat the above steps to test the offset



6.2.3 Dual head offset test

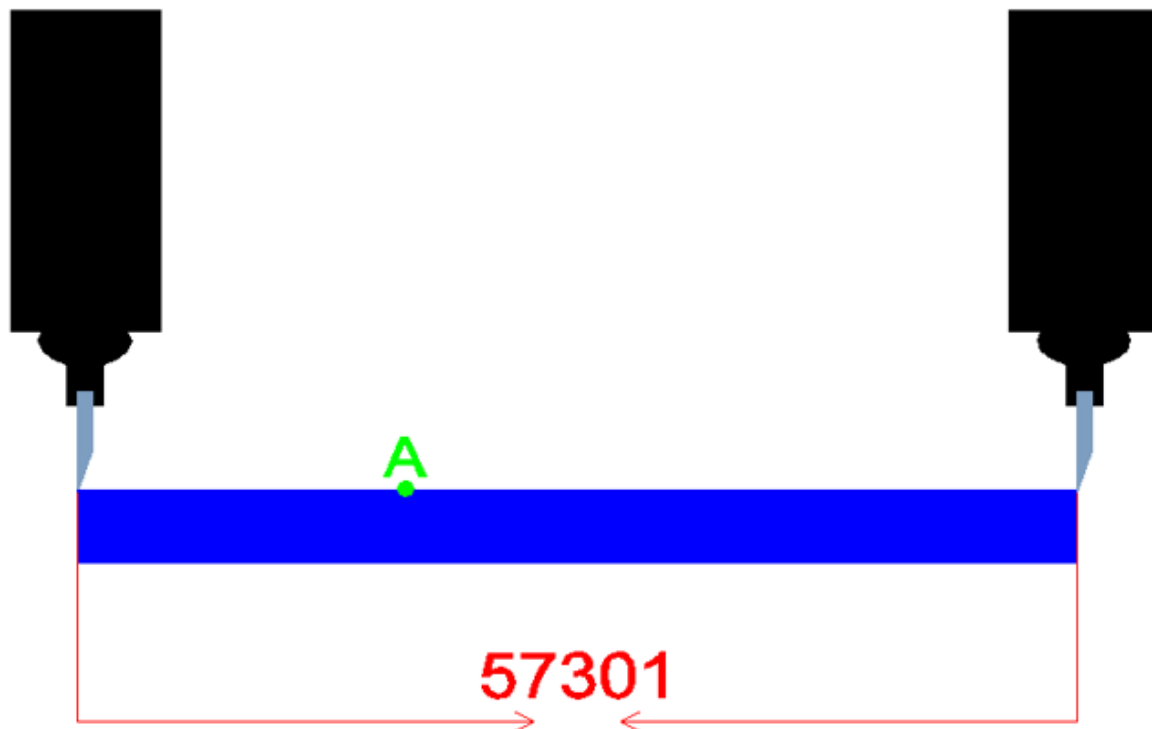
The offset between the two machine heads refers to the distance between the tool tips of the two machine heads after they return to zero. This parameter refers to the upper limit of the X/X1 stroke in the system and parameter 57301 (the mechanical origin coordinates of the machine head 2X1 returning to zero).

First, after the two machine heads return to zero, please measure the distance between the two machine head tips with a measuring tool (ruler). Fill in the measured value to the upper limit position of X/X1 mechanical stroke and parameter 57301.

To obtain more precise spacing measurements, we first need to move Machine Head 1 to position A (anywhere). At this location, mark a point on the material as a reference while recording its X-axis coordinates and taking a photo. Next, move Machine Head 1 to the left side and position Machine Head 2 at the previously marked point, ensuring the cutting edge of Machine Head 2 perfectly aligns with position A. Record the X1 coordinates and take another photo. By $\pm$ subtracting the previously recorded X-axis coordinates of both heads, we calculate the error value. This result is then entered into the X/X1 travel limit parameter and parameter No.57301.

machine head 1

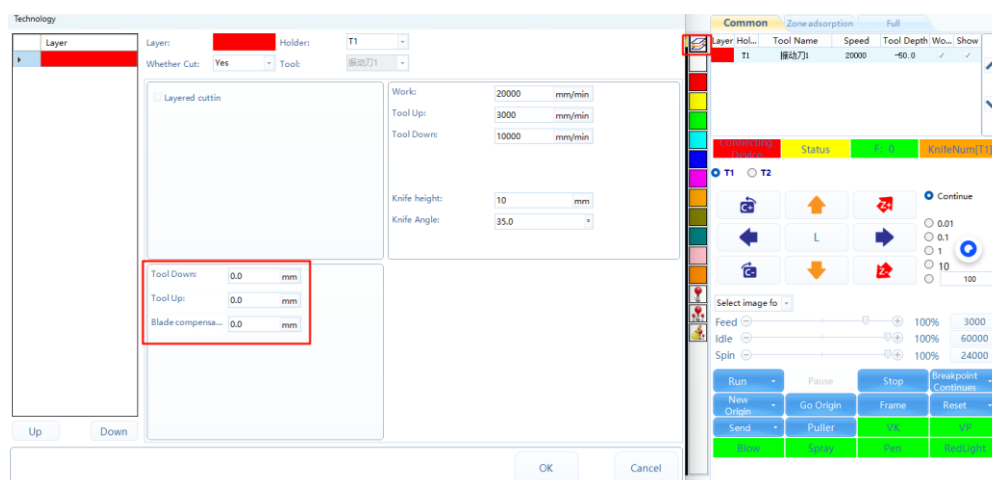
machine head 2



6.3 Tool compensation

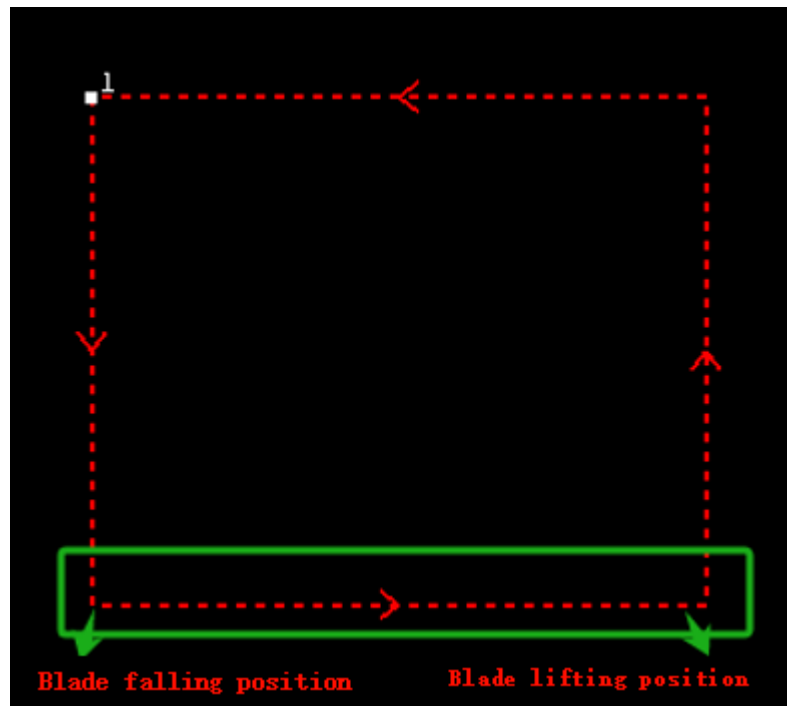
Tool compensation includes lifting tool compensation, falling tool compensation, blade compensation, tool radius compensation and so on. The following is a list of different situations.

Click the process parameter button in the  upper right corner of the CAD interface. Open the "Layer Parameters" interface. Compensation parameters can be modified

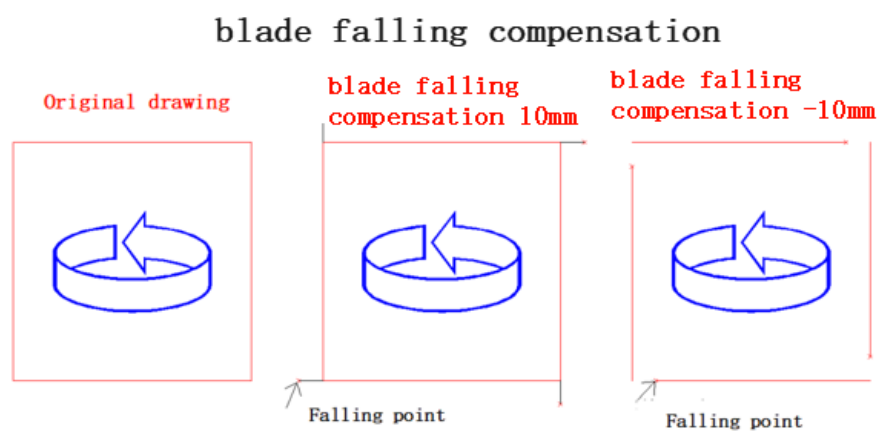


6.3.1 Blade lifting and blade falling compensation

First, we need to observe the direction of the graphics. As shown in the figure below: The direction is counterclockwise. The left side of the green-lined straight line represents the blade landing position, and the right side represents the blade lifting position. Compensation can be applied at either the blade lifting or landing position to adjust the cutting trajectory's lag or lead. The parameter value can be $\pm$.



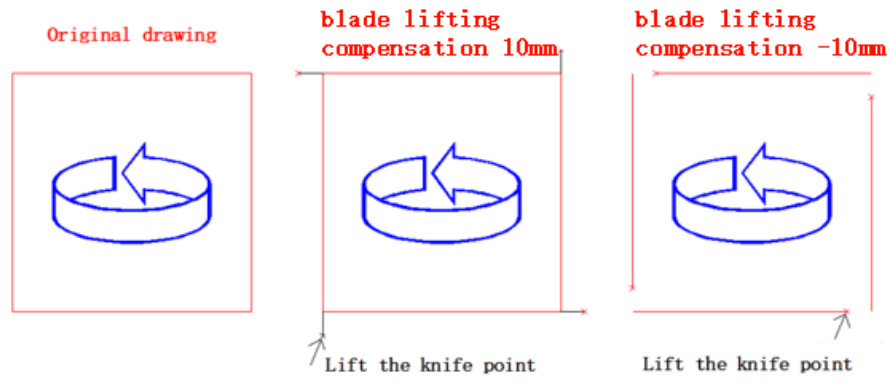
As shown in the figure below: the left is without compensation, the middle is when the blade compensation is 10MM, and the right is when the blade compensation is -10MM.



The following figure shows: the left is without compensation, the middle is when the blade lift

compensation is 10MM, and the right is when the blade lift compensation is -10MM.

blade lifting compensation



6.3.2 Blade compensation

To use blade compensation, you need to close the processing general parameters and change the parameters shown in the figure below to 1.

57517	After the blade compensation takes effect, walk to the original endpoint	0		Immediately	The default blade does not produce overcutting when it reaches the endpoint, but when turned on, the blade tip will produce overcutting when it reaches the endpoint
-------	--	---	--	-------------	--

Edge compensation refers to cutting the circular arc track in advance of the turn. It avoids excessive cutting or deformation of the circular arc when cutting thick materials

The following figure shows the cutting effect without blade compensation:

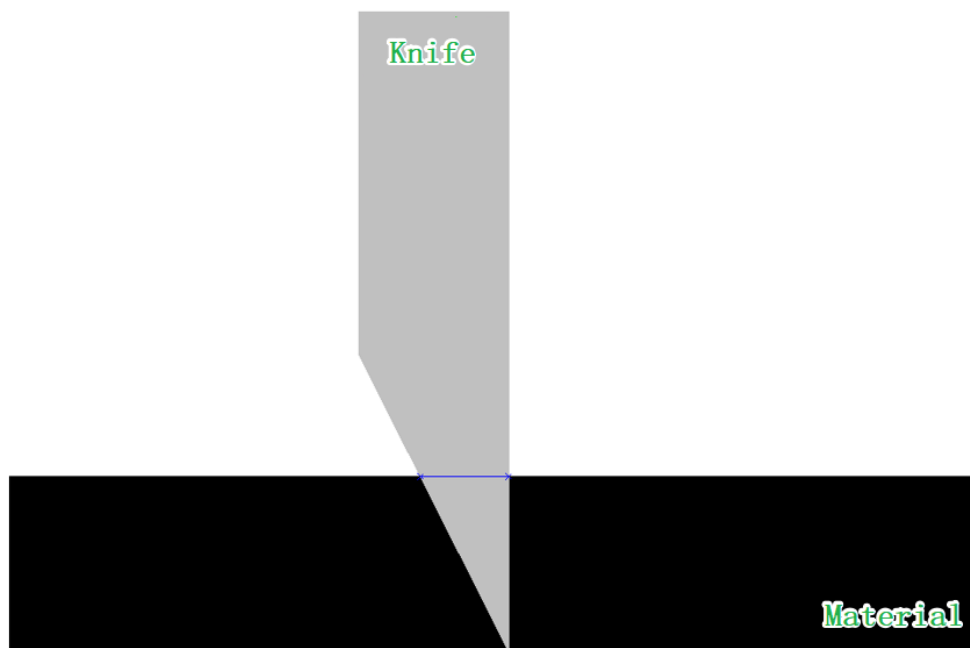


You can increase the "Blade Compensation" appropriately under "Layer Parameters". Blade Compensation can only be filled with positive numbers.

The value of blade compensation depends on other factors such as material thickness and tool Angle.

6.3.3 Blade radius compensation

As shown in the figure below: Because the tool is a cone with a wide upper and narrow lower part, the upper blade width in the process of material processing leads to a large amount of cutting on the upper side, which is much larger than that on the bottom side. As a result, the conical effect is produced when cutting a circle.

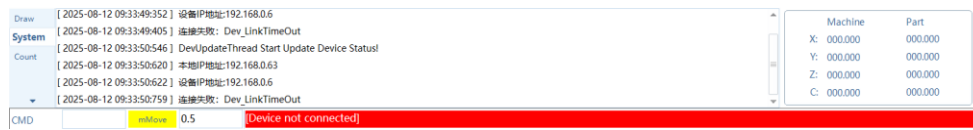


The addition of "tool radius compensation" refers to the tool C-axis steering in advance during machining to compensate for the defect of upper width and lower width, so as to achieve the desired cutting effect.

Note! "Blade radius compensation" does not support layered cutting.

6.4 The device is not connected

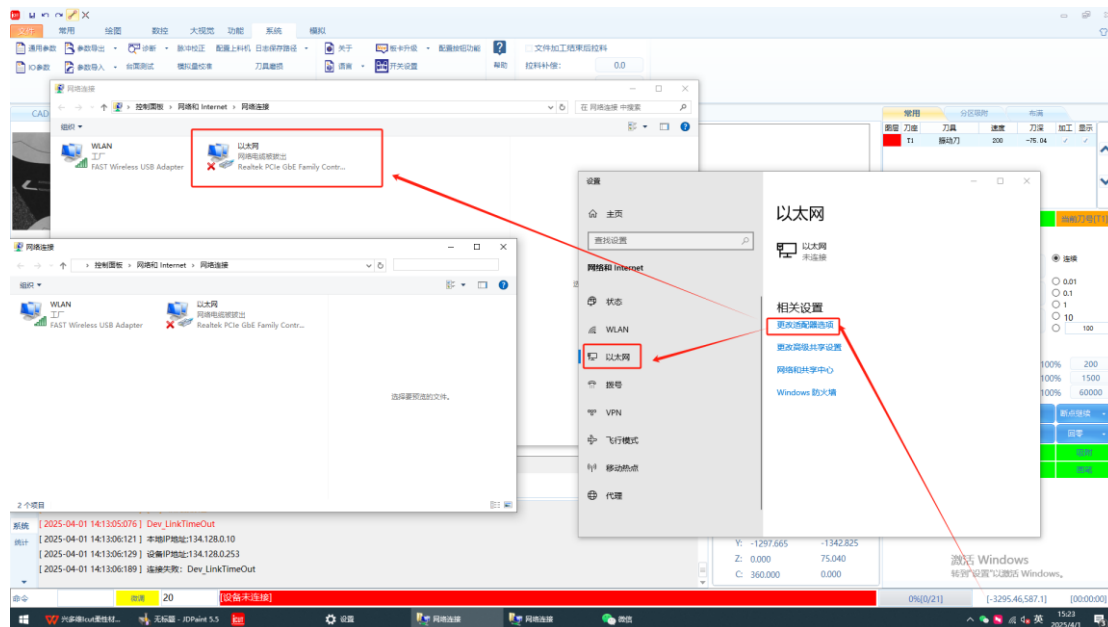
Sometimes we encounter a "device not connected" situation, as shown in the following figure: The status is displayed directly below the software



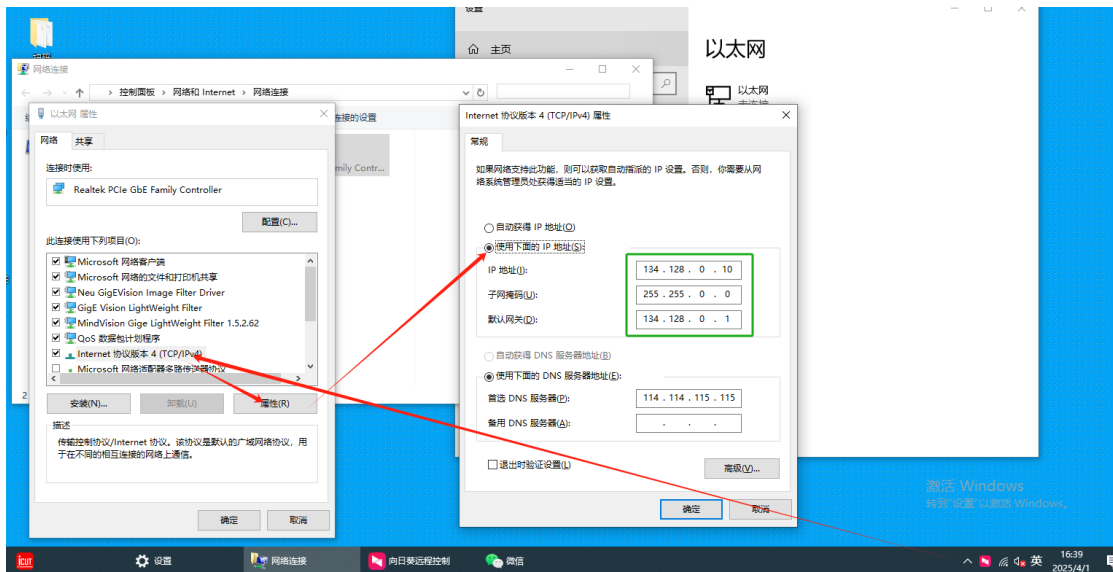
This situation is caused by a variety of problems, and we can conduct a preliminary investigation ourselves. First, check the network cable connection. If there is a CCD camera, check



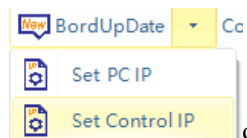
whether the switch is powered on. Check the network status; if this state is displayed, it indicates a problem with the network cable or port.



Check protocol address 4 to see if the IP address is set correctly.



If the controller cannot be connected after configuration, it may be that the controller IP has changed.



The default IP address of the system is 134.128.0.100. To open the software, go to the system, click the triangle arrow drop-down on the right side of the board upgrade, and click "Set Controller IP".

Open the "Configure Device IP Address" window and click "Refresh Device". The device serial number will then be refreshed. Click on the device shown in the serial number display. In the "SN" column, you'll see the board serial number, and in the "IP" column, you'll see the IP address. At this point, click "Auto Configure". Wait for a moment until a dialog box appears, then click OK. Finally, close the window to complete the configuration, and the device will connect automatically.

配置设备IP地址

设备序列号	设备IP地址	电脑IP地址
NTA2-224A-ND8J	134.128.0.253	134.128.0.10

SN:

NTA2-224A-ND8J

IP:

134

128

0

10

删除配置

刷新设备

手动配置

自动配置

If you still can not connect through the above steps, please contact us