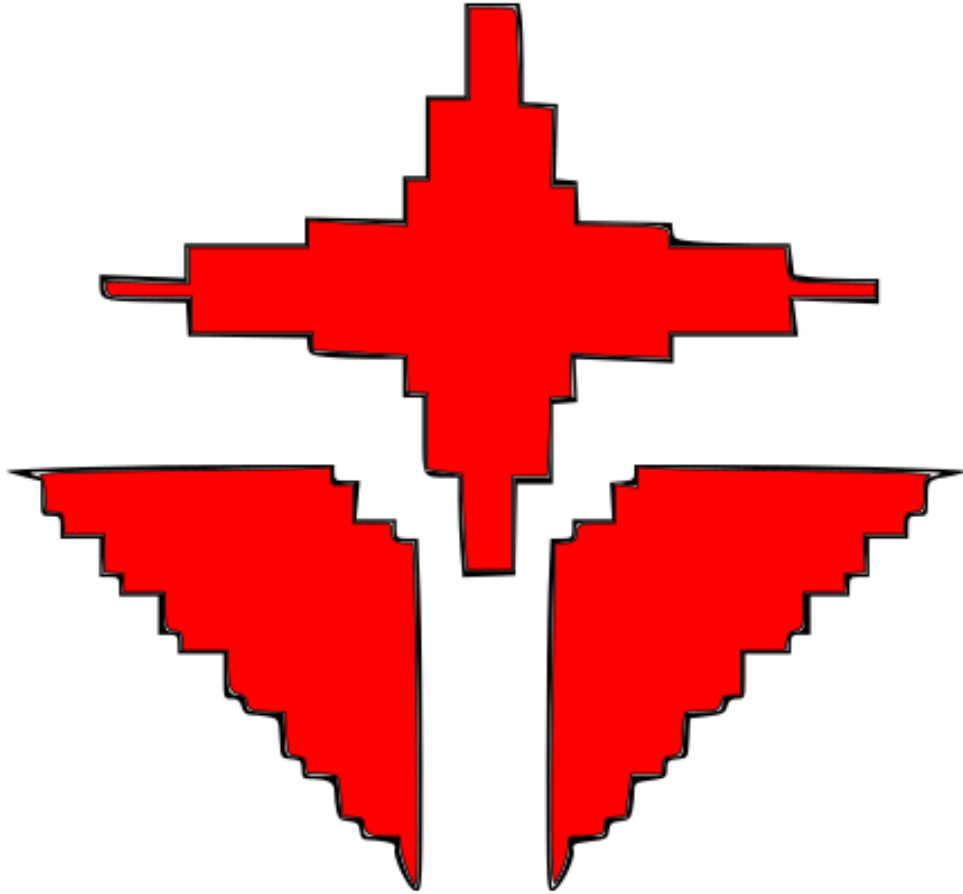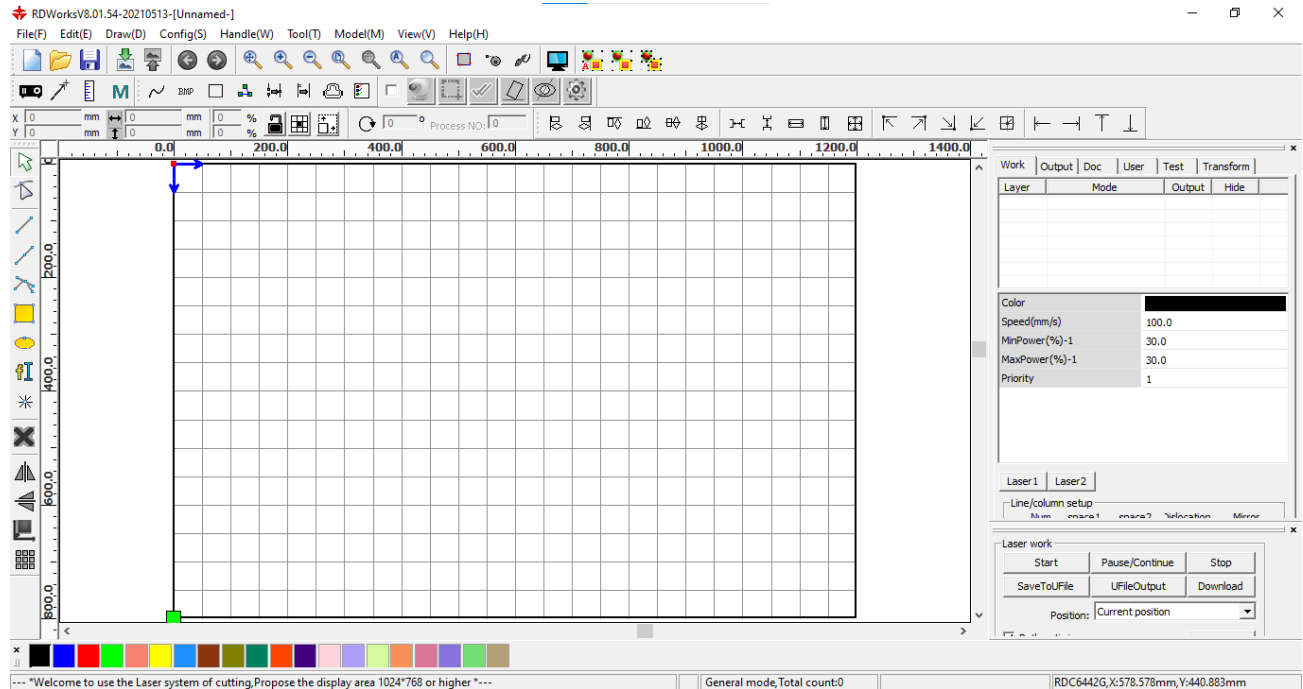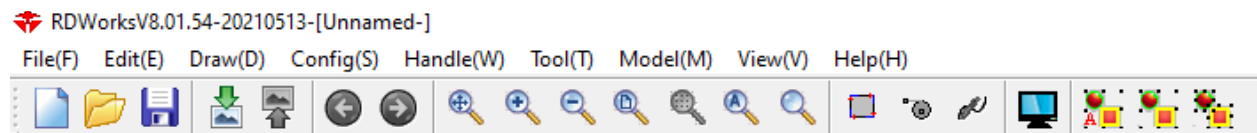# RDWorks Manuals

Main Interface

Menu Bar

The main functions of this software can be done by executing the command options on the menu bar, which is the most basic mode of operation; the menu bar includes File, Edit, Draw, Setup, Process, View and Help menus.

File(F) - Opens and saves new project files
Edit(E) - Has features such as cut, copy, delete, clone, rotate, etc.
Draw(D) - Used to draw simple features such as lines, circles, squares, text, etc.
**Config(S)** - Can adjust file import settings and machine settings
Handle(W) - Can edit imported vector files for optimized output
View(V) - Select which icon bars are visible
Help(H) - Can change language setting

Main Toolbar

Some commonly used options are placed on the system toolbar and are reflected by command buttons; most of these function options are selected from the menu.

File(F) Edit(E) Draw(D) Config(S) Har
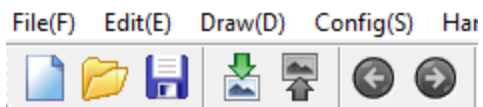
New - Creates a new workspace
Open - Opens .rld files
Save - Saves your workspace as a RLD file

Import - Imports compatible files into the workspace
Export - Exports your workspace as AI or PLT file

Undo - Cancels the last operation
Redo - Cancels the last undo

ındle(W) Tool(T) Model(M) View(V)

Move - Allows you to scroll by clicking and dragging the mouse
Zoom Out - Zooms out of the workspace
Zoom In - Zooms in to the workspace
Show Page - Zooms to fit the workspace
Show Data - Zooms to fit a selected graphic
View All - Zooms to fit all graphics
Show Select - Zooms to the selected graphic

Help(H)

Show Path - Displays the cutting path for the job
Edit Cut In Property - Edit's lead in/out function
Edit Cut Property - Used to change order of operations for cutting

---

Preview   - Shows a simulation of the project
Auto Group   - Automatically creates a group
**Group**   - Manually creates a group
**Ungroup**   -Cancels a created group

Opening and Saving Files

MetalCut uses YLD format files, which save the graphic information, process parameters of each layer and process order of the graphic elements. Saving the imported graphic data in YLD files will facilitate the output and the processing of the graphs.

- **Opening Files:** Click [Open] in [File] menu, or click the "Open" icon. Select the file you want to open, and then click [Open].
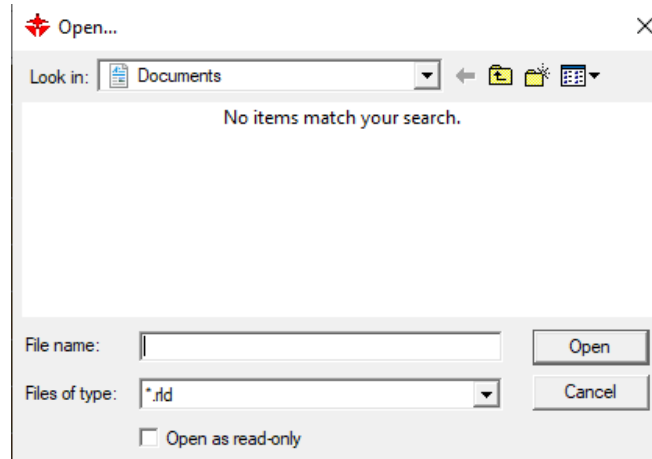
- **Saving Files:** Click [Save] in [File] menu, or click the "Save" icon. Enter the filename in the file name edit box, and then click [Save].
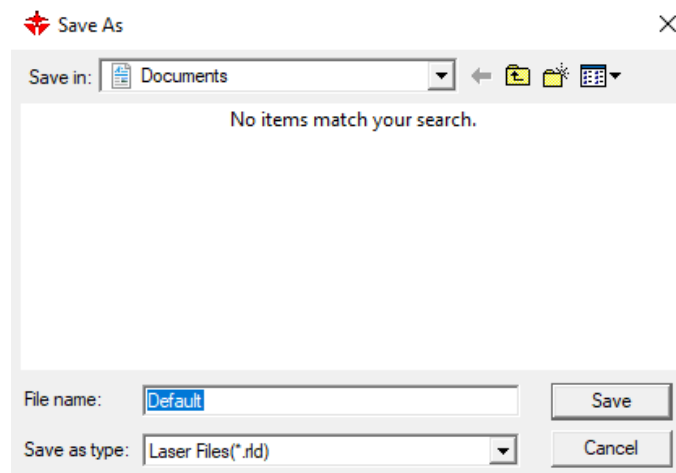
Importing and Exporting Files

Since MetalCut uses .yld format files, other materials should be imported for creation or editing, and the exported graphic files apply to other software. File importing supports: .dxf, .plt, .dst, .dsb ... etc; file exporting supports: .plt and .ai.

Import Files Click [Import] in [File] menu, or click the "Import" icon, select the desired file and click the [Open] button.
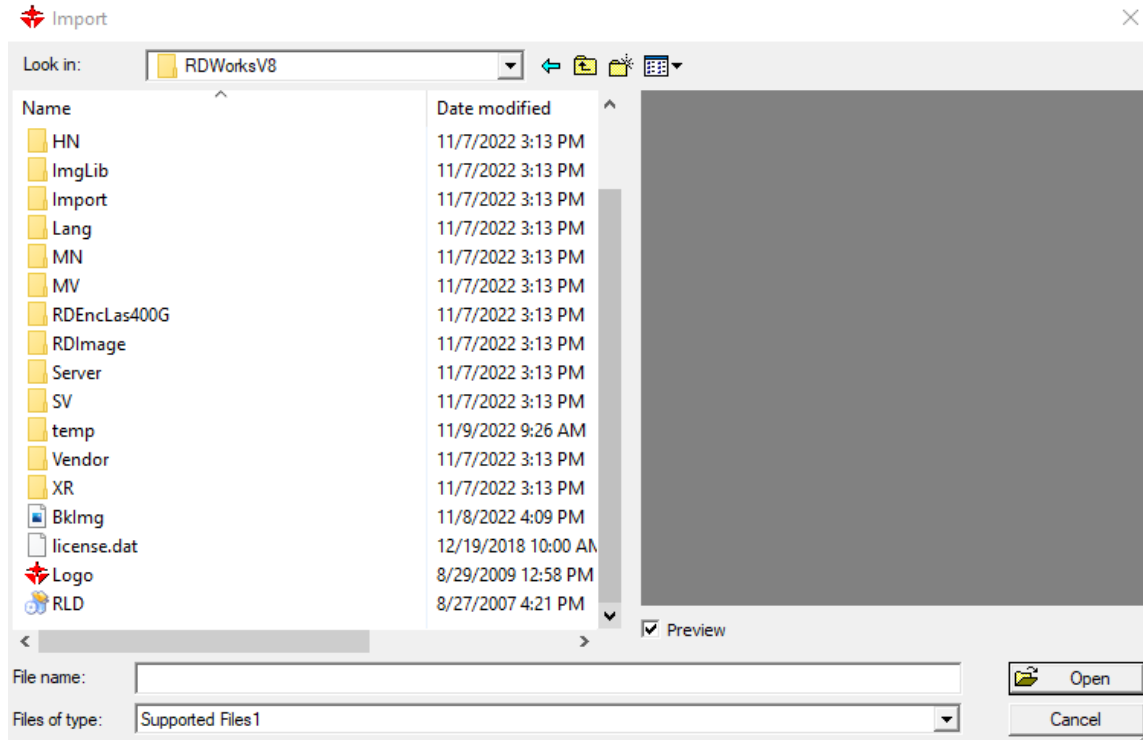
Select [Preview] to display the graphs when selecting files. For vector data, the data is imported into the corresponding layers of CAM automatically and according to the hierarchical description of the appropriate file format; Some special files such as DST / DSB will be imported into the current layer:
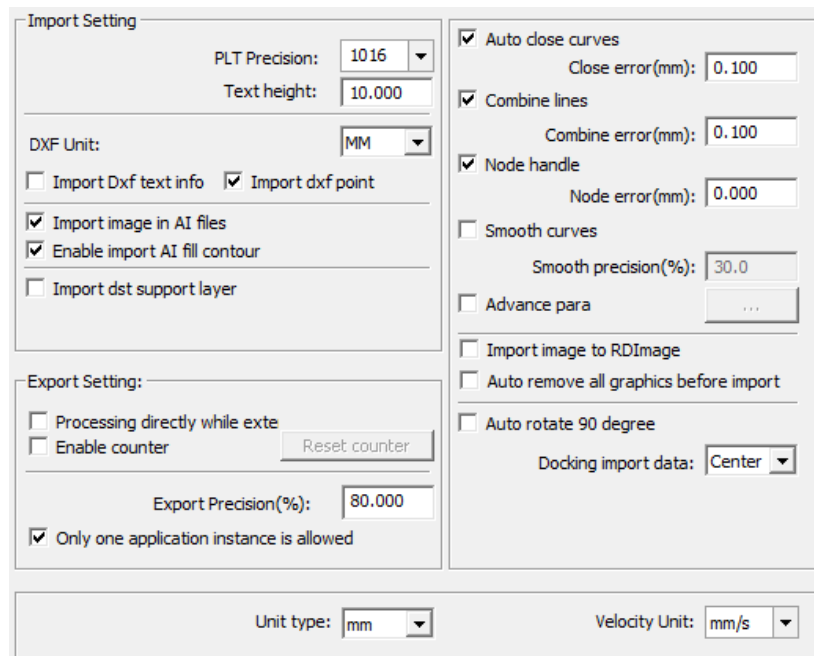

Exporting Files
Click [Export] in [File] menu or click the "Export" icon. Select the file type (.ai or .plt), enter the filename, and then click [Save] button.

Import/Export Settings

Before importing a file, set the parameters of file importing to ensure that the graphs are imported properly. Click [System settings] in [Config(S)] to pop up the dialog box. Then select the Import/Export tab

Import Setting

PLT Precision:	1016
Text height:	10.000

DXF Unit: MM

☐ Import Dxf text info ☑ Import dxf point

☑ Import image in AI files
☑ Enable import AI fill contour

☐ Import dst support layer

☑ Auto close curves
Close error(mm): 0.100
☑ Combine lines
Combine error(mm): 0.100
☑ Node handle
Node error(mm): 0.000
☐ Smooth curves
Smooth precision(%): 30.0
☐ Advance para ...

☐ Import image to RDImage
☐ Auto remove all graphics before import
☐ Auto rotate 90 degree
Docking import data: Center

Export Setting:

☐ Processing directly while exte
☐ Enable counter Reset counter

Export Precision(%): 80.000
☑ Only one application instance is allowed

Unit type: mm   Velocity Unit: mm/s

Plotter Unit of PLT Files: Select the correct importing unit according to the original .plt file.
- **DXF Data Unit:** The default DXF importing unit of the software is in millimeters (mm). If the size of imported DXF data does not match the original graph, it is probably caused by unit mismatch. Other optional units of measurement are centimeters, inches and custom. When custom is selected, you can set the data DXF file to any unit corresponding to millimeters of the CAM software.
- **Importing DXF Text Information:** If you want the graphic information in DXF instead of text information in the file, skp this option.
- **Curve Smoothing:** When vector files are imported, the non-smooth curves of original graphs will be automatically "smoothed". If the original graphs are relatively smooth,, you can uncheck this option to reduce the time of import processing. Process after the file is imported.
- **Close Checking:** Check and close the curve automatically according to the tolerance of closing. Merge connected curves: Connect the curves automatically according to the tolerance.
- **Export Precision:** Set the precision to export the curves when the exported files are .plt and output files.
- **Speed Unit in the Interface:** Speed units include mm/sec and m / min. You can select accordingly, and then the unit of speed parameters in the interface will change automatically.

System Settings

Before graph output, check that the system settings are correct, by clicking [System Settings] in the [Config] menu.

A window will appear with a software tab. These tabs lead to the different setting pages.

Page Setting

Click [Configuration] in the Software tab to pop up the dialog box, seen below:

- **Page Width:** The width of the page in view, usually set to X format size of the machine.
- **Page Height:** The height of the page in view, usually set to Y format size of the machine.

Optimize Setting:

The speed of a small circle and the reverse speed can be found here.

Interface Settings:

Under typical conditions, if the motherboard is connected, the software will automatically obtain the current working area of the machine and use it as the page size. If the motherboard isn't connected, or the page size is to be customized (e.g. set the page according to material size), the page size can be reconfigured in Page Setup.

- **Grid Space:** Set whether to display the grid and the grid spacing in the view.
- **Keyboard:** The software allows adjusting the position of the graph in the view through arrow keys of the keyboard.
- **Color Config:** Set the background color of the drawing area, border color of the working area and the grid color according to usage

Select the graph, and push the arrow keys (up, down, left & right): Push an arrow key once, moving distance of the graph = [trimming distance]; Push the Shift key and an arrow key at the same time, moving distance of the graph = [trimming distance] * [adjusting proportion];Push the Ctrl key and an arrow key at the same time, rotation angle of the graph = [rotation angle]; Push Ctrl + Shift and an arrow key at the same time, rotation angle of the graph = [rotation angle] * [adjusting proportion].

Secondary Toolbar:

Projector
Measure
Mark

Curve Smooth - Smooths jagged curves
Bitmap Handle - Edits bitmap properties for raster engraving
Curve Auto Close - Draws lines between gaps of a set distance in a vector
Cut Optimize - Can edit the order which graphics are cut
Combine Curve - Joins two selected, separate curves
Delete Overlap - Can delete overlapping sections of line
Offset Polygon - Creates an outline or inline of a selected vector
Data Check - Searches for possible issues in vector file drawing

By selecting the box, we enable canvas functions. The canvas functions should be used with a camera. The functions available are:

Camera Capture
Trace Contour
Trace Settings
Correct Position
Background Switch
Canvas Settings
Object Properties Toolbar
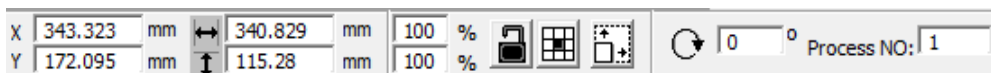
Object Properties toolbar is to execute operations for basic properties of graphs, including graph location, size, scaling, and processing number.
To drag and rotate, set the angle of rotation to 0, and then click [OK]. In the interface, you can adjust the rotation angle by dragging the mouse, and then rotate by dragging the mouse.
- Enter the rotation angle directly in the Object Properties toolbar.
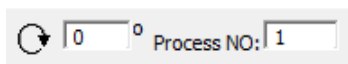
- Use the rotation and transformation tools to rotate; you can set and lock the center of rotation with the rotation and transformation tools.

Align Left - Align two objects to the left
Align Right - Align two objects to the right
Align Top - Align two objects to the top
Align Bottom - Align two objects to the bottom
Center Horizontal - Align two objects so they the are centered horizontally
Center Vertical - Align two objects so they the are centered vertically

---

Across
Down
Width
Height
Size
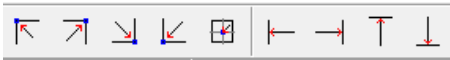
Top Left - Moves object to the Top Left of the Workspace
Top Right - Moves object to the Top Right of the Workspace
Bottom Right - Moves object to the Bottom Right of the Workspace
Bottom Left - Moves object to the Bottom Left of the Workspace
Center Page - Moves object to the Center of the Workspace

Align to Workspace Left - Moves object to the Left of the Workspace
Align to Workspace Right - Moves object to the Right of the Workspace
Align to Workspace Top - Moves object to the Top of the Workspace
**Align to Workspace Bottom**- Moves object to the Bottom of the Workspace

Object View

- **Pan:** Click [Pan] in the [Edit] menu, or click the "Move" icon on the system toolbar, then click and hold the left mouse button in the drawing area, and drag to pan.
- **Zoom In:** Click [Zoom in] in the [Edit] menu, or click the "Zoom In" icon on the system toolbar. The center of the drawing area zooms in when you click the menu or toolbar. Move the mouse cursor to the drawing area, and click to zoom in with the mouse positioned as the center.
- **Zoom Out:** Click [Zoom out] in the [Edit] menu, or click the "Zoom Out" icon on the system toolbar. The center of the drawing area zooms out when you click the menu or

toolbar. Move the mouse cursor to the drawing area, and click to zoom out with the mouse positioned as the center.

- **View In Marquee:** Click [View in marquee] in the [Edit] menu, or click the "Show Select" on the system toolbar. Move the mouse cursor to the drawing area, click and hold the left mouse button and drag to show a marquee dashed box in the drawing area, release the mouse, and the framed area will be displayed in the drawing area in the largest proportion.
- **View Page:** Click [Page range] in the [Edit] menu, or click the "View Page" icon on the system toolbar to display the page in full view.
- **View Data:** Click [Data range] in the [Edit] menu, or click the "View Data" icon on the system toolbar to fully display the selected object
-

System Window

The Control Panel accesses common operations and settings.

Work - Shows the layers, modes, and outputs

Work	Output	Doc	User	Test	Transform	
Layer	Mode		Output	Hide		
	Laser Cut		Yes	No		

Output - Controls feeding and a partition

☐ Enable feeding
Count: 0   Feeding after cutting ▾
Distance: 500.000   Manual input   ▾
Compensation: 0.000   ☐ Pause after feeding

☐ Partition for over range
Frame height: 500.000   ☐ Force block
Angle 0.0000   ☐ Last feed

Doc. -Here you can find information on files loaded on the machine

Work	Output	Doc	User	Test	Transform
Num...	File Name	Time(H:M:S:MS)		Number	

- **Read:** After clicking the [Read] button with the mouse, the system will be connected to Ruida controller to read the files list on the controller and display in the dialog box after reading successfully.
- **Download:** Click on the [Download button] to pop up the file dialog box, select the file to be downloaded and download it to the controller; if the download is successful, the file list in the interface will be updated.
- **Process:** Select the file to be processed from the list and click the [Process] button, and the controller will start the specified file.
- **Delete:** Select the file to be deleted from the list and click the [Delete] button, and the controller will delete the specified file; if deletion is successful, the file list will be updated.
- **Cal Time:** The motherboard supports working hour calculation of the files to be processed. Select the file you want to calculate the working hour and click the [Hours Worked] button. After calculating, the operator panel will prompt the calculation is complete. Then click the [Read] button to display the calculated hours in the list. In addition, when the file is processed, the information worked hours will be covered by the actual processing hours.
- **Upload:** Read selected offline files from the motherboard, and save to your computer.
- **Delete All:** Automatically delete all the files on the controller and update the file list.

User   -allows the user to adjust three settings: Processing, auxiliary, and other

Work	Output	Doc	User	Test	Transform

⊙ Processing ○ Auxilliary ○ Other

Cut parameters	
Idle speed(mm/s)	200.000
Idle Acc(mm/s2)	3000.000
Start speed(mm/s)	20.000
Min Acc(mm/s2)	400.000
Max Acc(mm/s2)	3000.000
Idle Delay(ms)	0.000
Acc factor(0%-200%)	100
G0 Acc factor(0%-200%)	100
Speed factor(0%-200%)	100
Key setting	
Sweep parameters	
x Start Speed(mm/s)	10.000
y Start Speed(mm/s)	10.000
x Acc(mm/s2)	10000.000
y Acc(mm/s2)	3000.000
Line Shift Speed(mm/s)	100.000

Processing:

Cut parameters:

- **Idle Speed -** This parameter determines the maximum speed of the straight lines (that do not emit light) when the machine is in motion. This parameter can't be lower than the smallest of the X/Y axis jump speed, or higher than the largest one of the maximum speed of the two axes. If the user setting is invalid, the controller will automatically set the parameters within the above range; higher idle speed will shorten the working time of the entire graph, but too high a speed may lead to the track shaking.
- **Idle Acceleration -** Corresponding acceleration speed in idling. The idle acceleration should match the idle speed. If it is set too slow, the idle speed may not reach the set value. If it is set too fast, the mechanical structure can't bear it, and it will cause jolting. Generally, the idle acceleration is slightly higher than the cutting acceleration.
- **Starting Speed -** The minimum speed during turning in the cutting process; the turning speed can be reduced appropriately if the processed graph has a lot of jags.
- **Min Acceleration -** It should match the turning speed.
- **Max Acceleration -** Precision cutting, fast cutting and ultra-fast cutting are options. The operator can choose according to actual applications. Select precision cutting if precision is required, or select fast cutting if speed is emphasized.
- **Idle Delay -** Corresponding delay speed in idling.
- **Acc factor -** Controls the degree in which the machine accelerates
- **GO Acc factor -** Controls the degree in which the machine accelerates in GO mode
- **Speed factor -** Controls the speed of the machine
- **Key Setting -** Changes the cutting mode between the 5 types: Slow cutting, Precision cutting, General cutting, Speed Cutting, and Super Speed Cutting.

Sweep parameters:

- **X Start Speed / Y Start Speed -** Starting speed of scanning; if stepper motor is used, it is not necessary to accelerate from zero, instead it can be started directly from certain speed so as to shorten the overall processing time, but the speed can't be too high, and X-axis starting speed is generally slightly higher than Y-axis because X-axis and Y-axis have different loads. X acc, Y acc: It should match the scanning speed (layer speed in the layer parameters); if it is set too small, the scanning requires longer acceleration distance, which will impact the scanning efficiency. The actual condition varies according to the structure of the machine and the load. X-axis acceleration is generally much higher than Y-axis because X-axis and Y-axis have different loads.
- **X Acc. -** The acceleration of the X axis
- **Y Acc. -** The acceleration of the Y aixs

- **Line Shift Speed -** This parameter is used to control the maximum speed of the upper line moving to the next line vertically in the scanning mode. If the line spacing is large during scanning, or the distance between blocks is large during scanning block graphs, and each line or each block should be accurately positioned, please set the scanning line feed speed to a lower value. This parameter can't be smaller than the start speed of corresponding motion axis during line feed and can't be larger than the maximum speed of corresponding motion axis during line feed. If the user setting is illegal, the controller will automatically set the parameters within the above range.
- **Scan Mode -**

Auxillary:
Feeding Parameters:
- **Delay before feed -** Allows a delay to be set before the feed starts
- **Delay after feed -** Allows a delay to be set after the feed ends
- **Progressive feeding**
- **Progressive feeding compensation**
- **Last feeding**

Home Parameters
- **Home Speed -** determines the homing speed when the machine is turned on. If the machine format is large, you can set a higher reset rate.
- **Auto Home X -** reset x axis
- **Auto Home Y -** reset y axis
- **Auto Home Z -** reset z axis
- **Auto Home U -** reset u axis
- **Back Positioning point**

Go Scale Parameter
- **Go Scale Mode:** Laser off and move along border, laser on and cut border, and dot in four corners.
- **Go Scale Blank:** When move along the border, the operator can leave certain white border in top, bottom, left and right according to the actual image size to ensure that the border completely contains the actual graph. This setting relates to the border function on the operation panel, regardless of the border function of the software.

Other Parameters:

- **Array Processing:** Bidirectional array and unilateral array are optional. Bidirectional array: cut the array sequentially back and forth; unilateral array: always cut the array from one direction to another. When unilateral array is selected, the operation mode of each array unit is exactly the same, and the action is same smooth, but it takes a little more time than bidirectional array. Bidirectional array is selected by default.

- **Backlash X & Y:** Used to compensate for the backlash caused by transmission of the machine.
- **Blow Type:**

Return Parameter:
- **Return Position:** Mechanical origin, locating point, and do not return. This parameter determines the stopping position of the laser head after each work.

Focusing Parameter:
- **Focus depth (mm):**
- **Material Thickness:**
- **Focusing Type**

Rotating
- **Enable rotating**
- **Circle Pulse**
- **Diameter**
- **Test**

Wireless Panel
- **Enable speed shift**
- **Fast moving (mm/s)**
- **Slow moving (mm/s)**

Special Parameter
- **Pen up (mm)**
- **Pen down (mm)**
- **Z up down mode**

**Test**   -Allows the user to perform a test run

You can only control the motion of one axis, and set the motion distance and speed. If the laser is on during motion, you can also set the laser power.
To move to the specified absolute position relative to the mechanical origin, check "Move from the origin", and the stepping distance is the absolute position relative to the mechanical origin rather than the jog displacement.

- Take X-axis as an example, assume that the current position is 100mm and set the stepping distance to 10mm, and the new position will be 110mm after one movement. If "Move from origin" is selected, the new position will be 10mm after one movement, and the position will not change after repeated movements.

- It is worth noting that the absolute position has no negative values in the whole format according to the provisions of the controller. If "Move from origin" is selected, and the stepping distance is set to a negative value, the XY platform device will hit the limit.
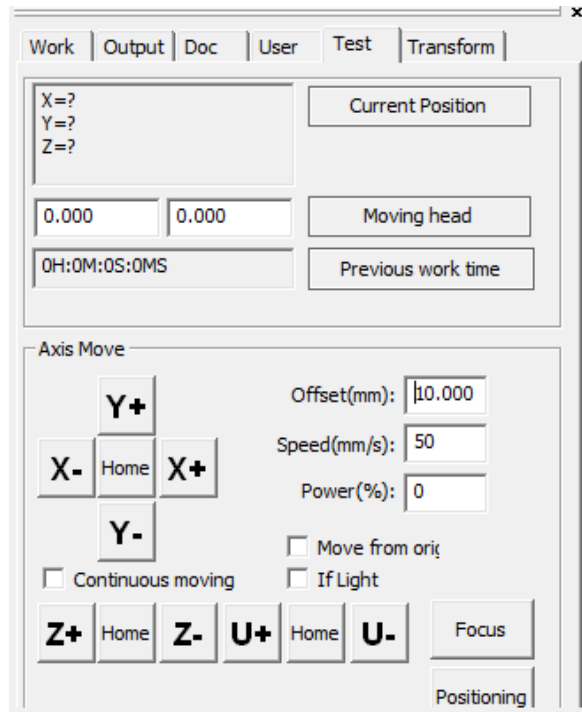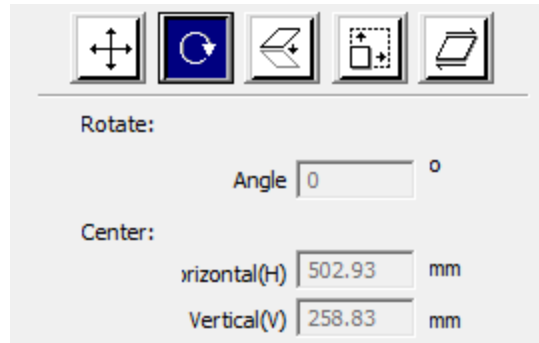
Transform
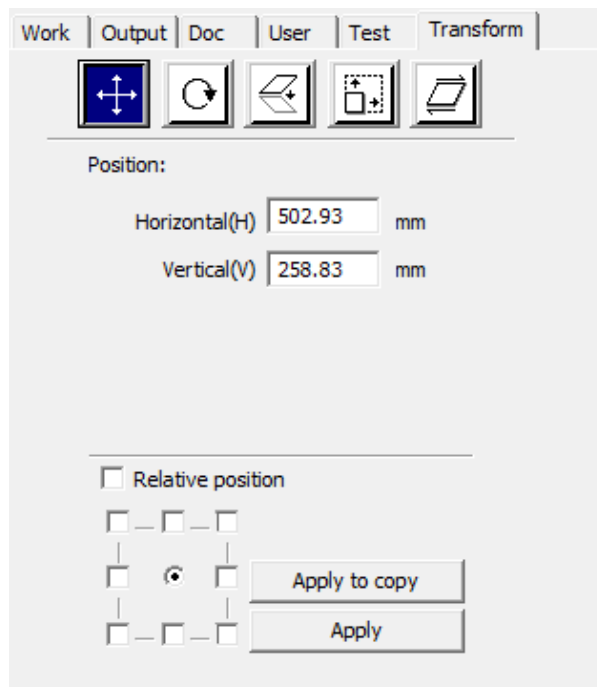
Object Mirror To mirror allows an object to flip in either a horizontal or vertical direction.
- **Horizontal Mirror:** Click the **"**Horizontal Mirror" icon on the object action bar.
- **Vertical Mirror:** Click the "Vertical Mirror" icon on the object action bar.

The mirror transformation tools are used for horizontal and vertical mirror and replication.

Object Rotation

Click the "Rotate" icon on the object action bar to bring up the dialog box for rotation angle settings. Input the angle of rotation, and then click [OK].

Changing Object Size

You can also lock the aspect ratio of the object by entering the length and width of the object. Or input the proportion to change in the Object Properties toolbar directly.
- Operators can also use the size transform toolbar to convert, modify size, choose to lock the aspect ratio, or set to convert relative to the position of the object.

Tilting

Tilting allows operation through the tilting transformation tools, as well as setting the anchor and angle of tilting.
- Note tilting will cause bitmap distortion and there are few practical applications options to prevent this. Only tilting of vector graphs is supported currently.

Laser Work Toolbar

The majority of the lasers work function. You can save and export projects here. Run the project, pause, resume and cancel.
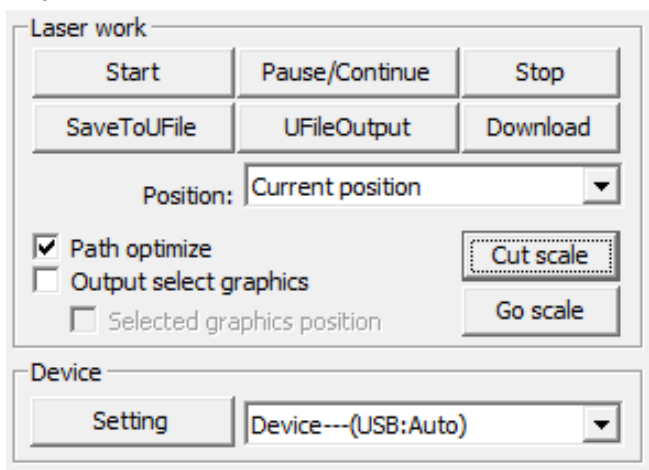
Side Bars

- **Select**   **-** allows users to select objects in the work area.

- **Edit Node**   **-** allows users to edit specific nodes within the object.

- **Line**   **-** create a single line

- **Polygon**   **-** create a multipoint line

- **Curve Edit**   **-** allows users to edit curves within objects.

- **Rectangle**   **-** create rectangle

- **Ellipse**   **-** create ellipse

- **Text**   **-** create a text box/ variable text.

- **Point Creation**   **-** create single point in work area

- **Delete**   **-** deletes selected object

- **Horizontal Mirror**   - mirror selected object horizontally

- **Vertical Mirror**   **-** mirror selected object vertically

- **Center Data**   **-** send selected object to center of work area

- **Rotation**   **-** rotate selected object

- **Array**   **-** create array for an object

Creating Basic Graphs

- **Draw a Straight Line:** Click [Straight line] in the [Draw] menu, or click the "Straight Line" icon on the Edit toolbar, and drag the mouse cursor on the screen to draw a straight line. Press "Ctrl" key and drag the mouse at the same time to draw a horizontal line.

- **Draw a Multipoint Line:** Click [Multipoint line] in the [Draw] menu, or click the "Multipoint Line" icon on the Edit toolbar, drag the mouse cursor on the screen and click the mouse to draw a line segment.

- **Draw a Rectangle:** Click [Rectangle] in the [Draw] menu, or click the "Rectangle" icon on the Edit toolbar, and drag the mouse cursor on the screen to draw a rectangle of any size. Press the "Ctrl" key and drag the mouse cursor at the same time to draw a square. Press the "SHIFT" key to set the position where the mouse is pressed as the rectangular center.

- **Draw an Ellipse:** Click [Ellipse] in the [Draw] menu, or click the "Ellipse" icon on the Edit toolbar, and drag the mouse cursor on the screen to draw an ellipse of any size. Press the "Ctrl" key and drag the mouse cursor at the same time to draw a perfect circle. Press the "SHIFT" key to set the position where the mouse is pressed as the center of the ellipse.

- **Draw a Point:** Click [Point] in the [Draw] menu, or click the "Point" icon the Edit toolbar, drag the mouse on the screen, and click the mouse at any position to draw a point.

Selecting an Object

When in the process of drawing and editing graphs, always select the object first. Once an object is selected, the center of the object will have an "×" mark as well as eight control points around it. Click [Select] in the [Draw] menu, or click the "Select" icon on the Edit toolbar to switch to "selecting" state. In this state, you can select objects using one of the following five methods:

- **Method 1:** Select [Select All] in the [Edit] menu (shortcut: Ctrl + A) to select all objects.
- **Method 2:** Select the mouse to select a single object or single-click on the object to select it.
- **Method 3:** Crop and select objects: Left-click the mouse and drag to select all the objects that the box contacts.
- **Method 4:** Add / reduce selected objects:
  - *Add:* To select multiple graphic objects, select the first object, press and hold the Shift key, and then click a second object (or marquee).
  - *Reduce:* Press the Shift key and click (or marquee) the selected graphic object to remove the clicked (or marquee) object from the selected range.
- **Method 5:** Select object by color of the layer: Right-click the layer you want to select and all the objects of that color will be selected.

Object Color

The color of an object is the color of that object's outline. You can click on any color tool button on the layer toolbar to change the color of any selected object. The color of the button being

depressed is the color of the current layer. Assigning different colors to different objects allows you to specify when that colored object will be cut and can control what parameters that colored object will be completed with compared to the other colored objects.


Object Transformation

Object transformation allows an operator to change the object position, orientation, or size, without changing the basic shape and elements of the object.
The software provides a convenient user interface to transform objects:
- **Method 1:** The operator can use the buttons on the draw toolbar to perform mirror and rotation operations.
- **Method 2:** Adjust object position, width and rotation through the Object Properties toolbar.
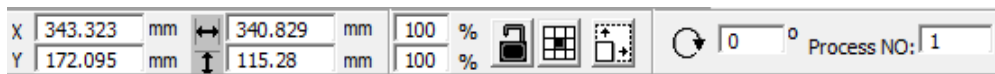
- **Method 3:** Use the transform tool

Edit Text
Click [Text] in the [Draw] menu, or click the "Text" icon on the Edit toolbar, and click anywhere in the drawing area to pop up the text input dialog box, as shown below:
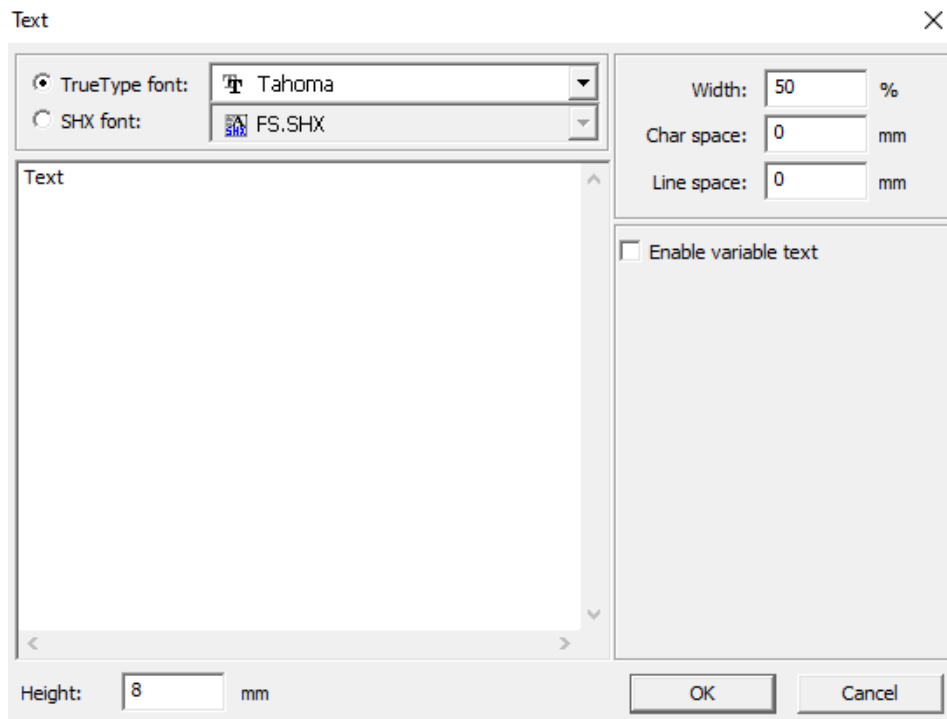
- **TrueType Font:** Select the bubble for TrueType font and press the expand menu arrow and select a font. Then select [OK].
- **SHX Font:** Select the bubble for SHX font and press the expand menu arrow to access AutoCad fonts. Then select [OK].
- **Height:** Select the window and input character height. Then select [OK].
- **Width:** Select the window and input character width. Then select [OK].
- **Char Space:** Select the window and customize character spacing. Then select [OK].
- **Line Space:** Select the window and customize line spacing. Then select [OK].
- **Enable Variable Text:** The software also supports variable text, which allows that if the text needs to change according to certain inputs, it will automatically change after each output processing.
- Types of variable text supported by the system are:
  - **Date Variable and Serial Number.** Date variable allows you to output the current system time of current computer for each processing. The software offers a variety of date formats to choose from. You can also set the date shift according to day, month or year. This function allow you many options, such as, it can be used to engrave the shelf life of products on the packaging.


Serial number variables may be numeric numbers (0-9) or letters (A-Z or a-z). This means the set of serial numbers of ABC0001DEF, ABC0002DEF, ABC003DEF to ABC9999DEF will be processed repeatedly.

- **Prefix:** Prefix of the serial number.
- **Suffix:** Suffix of the serial number.
- **Start SN:** Specify the serial number to begin processing.

- **Current SN:** Represents the serial number currently being processed, it can also be used to specify the current number to be processed. If a set of serial numbers is being processed and specific number isn't processed, you can supplement the processing by specifying the current number, rather than setting the start number. This is because a set of serial numbers needs repeated processing in some cases, that is, it needs to return to the start number to begin processing at a specific number.
- **SN Inc:** You can specify the number of intervals in the serial number. For example, if the serial numbers from 0001 to 9999 should be processed in sequence, and the increment is 1. If you only need to output even or odd serial numbers, set the increment to 2.
- **Enable Reset:** When the serial number is processed to the reset number, the current number will be automatically reset to the starting number. For example: If you need to process the serial numbers from 0001-9999 repeatedly, you can specify 9999 as the reset number, and the text will automatically change to 0001 after the serial number 9999 has been processed.
- **Enable Profix Zero:** If leading zero isn't enabled, the system will automatically remove the first zero before the first non-zero digit in the serial number. In the example, if leading zero isn't enabled, ABC0001DEF will change to ABC1DEF. But it is worth noting that, if we want to output number ABC1DEF, ABC2DEF until ABC9999DEF, we can't achieve this by setting the "Start number" to 1; instead, cancel "Enable leading zero" due to setting start number not only specifies the serial number to start, but also specifies the number of significant digits. If the start number is set to 1, the sequence of number changes is: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, 1, 2, 3, 4, 5 ... The number won't change to 10, because the effective number of digits is only one.
- **Enable SN Array:** Process multiple numbers at one time, in an array. For example: 0001 0002 0003 0010 0011 0012 0006 0005 0004 go to the next group directly after processing these numbers 0015 0014 0013 0007 0008 0009 0016 0017 0018.
- **Obtain Scanned Image:** Click [capture] in the [Draw] menu, or click the "Capture" icon on the Edit toolbar, and the dialog box will appear, if the computer has been connected to the image device. Then click [Select] to capture images from the specified device.

Object Array Replication

Select the "Select" icon on the Edit toolbar to select the objects you want to replicate in the array. Then, click the "Matrix Copy" icon on the object action bar to bring up the following dialog box:
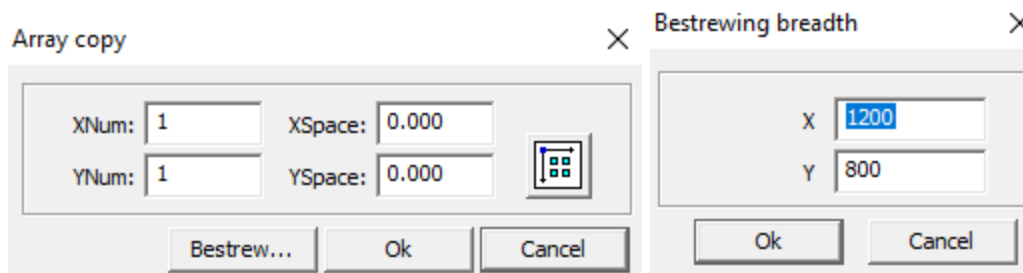
- **X Number:** the number of horizontal arrays.
- **Y Number**: the number of vertical arrays.
- **Stretch:** the graph fills the entire space.
- **X Spacing:** spacing of graph borders in horizontal direction.
- **Y Spacing:** spacing of graph borders in vertical direction.
- **Array Direction:** Options are upper right, lower right, upper left, and lower left.

Object Grouping/Ungrouping

To edit the graph, sometimes a part should be operated as a whole (for example: typeset multiline text).

- Select the graphs to be grouped, and then select [Group] ([Break down]) in the [Edit] menu, or select the toolbar directly.


Software Tools

With these tools, operators can make graphs in current documents more orderly when outputting and processing is faster.

Cutting Property Settings

The software provides operators with a tool to manually sort. Select [Set cut property] in [Edit] to bring up the "Cutting Properties" dialog box. This window is also accessible from the icon located under the System Toolbar. Manual sorting and inputting settings of cutting point and cutting direction can be done with this dialog box
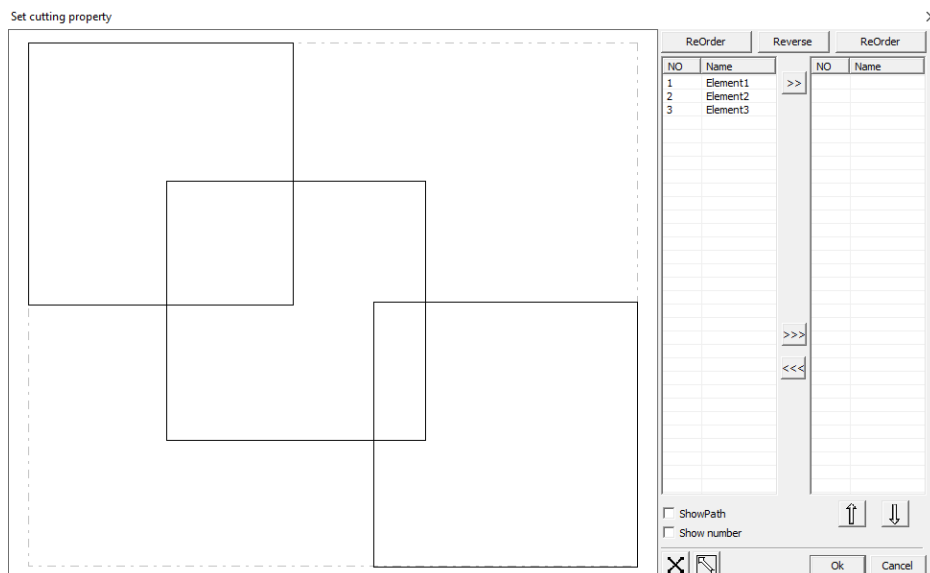
- **Display Path:** First, check "Show path" to show the cutting sequence and cutting direction of the current graph. The operator can observe the changes in the actual processing sequence while modifying.

- **Manual Sorting:** Select the button on the dialog box. This button switches the current status between edit and view. Operators can then marquee or click the graph in the graph display area (or click and check the element in the right list next to the dialog box).

  - Select the graph and select the button, and these graphs will be imported into another list and used as the elements first processed. By manipulating the elements repeatedly in sequence, operators can sort all the graphs.
- **To Change the Graph Processing Direction:** Select a graph in the graphics display area or in the graphs list with the mouse, and then click the "Reverse" button.
- **To Change the Cutting Point:** Select the graph you want to change the cutting point, and all the nodes in the current graph will be displayed. Select the start point to be set and double-click the mouse, and then the start point of the current graph will be changed.
  - After all the changes, click [Okay] to save the modified results.

In addition to cutting property settings, the software also provides some simple tools to modify the cutting sequence, the cutting direction and the cutting point. Select in the toolbar or click [Show Path] in the [Edit] menu.

- **Manual Sorting:** Select the element to change the cutting sequence, and the object properties bar will display the cutting number of the current element. Fill in the serial number directly in the processing number, and then press the "Enter" key, or click the drawing area, and the cutting sequence will change.
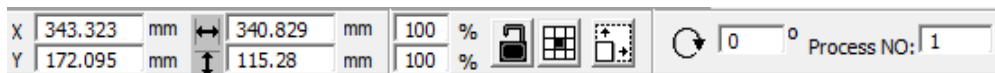
- **Change Processing Direction:** Click [Set cutting direction] in [Edit] to enter the cutting direction editing mode. Then double-click anywhere on the selected graph.
- **Change Cutting Point:** Click [Set cutting point] in [Edit] to enter the cutting direction editing mode. Then select the curve to be edited and double-click on the node that the cutting point will be set to change the cutting point.

Cut In/Out
Note that the curve does not have lead in/out, by default, when drawing or importing graphs. Cut in/outs will have to be inputted as shown below:

- Select the graph to be cut in/out, and then click [edit cut in property] in [Edit], or click the "Edit Cut In Property"" icon on the system toolbar to pop up the lead in/out settings dialog box:

- To cut in/out, first enable lead in/out. The outward arrow is cut out, and the inward arrow is cut in.

- Straight lead in can be achieved in three ways:
  - Cut in at an angle and the cut in and the starting line are angled, the counterclockwise angle is positive, and the length is set according to the length of the cut in.
  - Cut in from the center, and the starting point of the lead in is the center.
  - Cut in from the center, the direction of the lead in is from the center of the graph to the starting point of the graph, and the length is set according to the length of lead in.

Path Optimization

Path optimization function is used to re-sort the path of vector graphs.
- Click [Path optimization] in the [Handle] menu, or click the "Cut Optimize" icon to show the dialog box as shown:
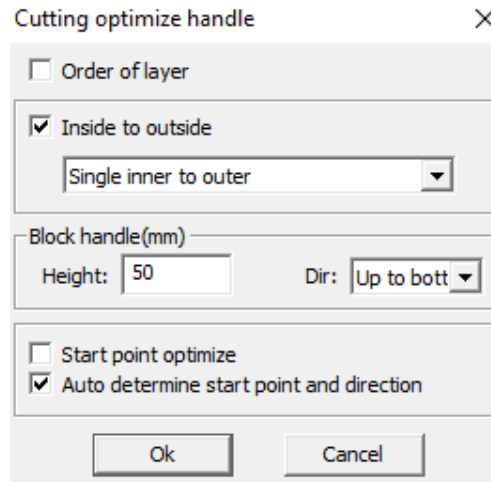
- Click the menu [Edit] / [Show path], or click the "Show Path" icon on the system toolbar. The graph will show the processing path, and you can see the path before and after processing. Note that the processing path of graphs always starts from the position of the laser head.
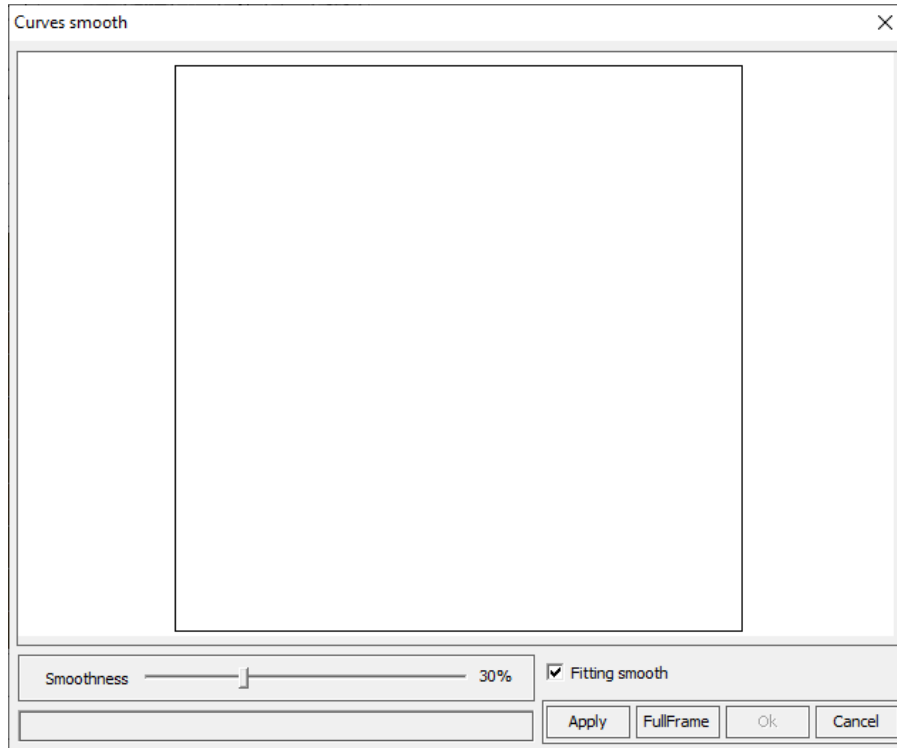
Curve Smoothing

For the graphs with poor curve precision, curve smoothing can make the graphs and processing smoother.

- Click [Curve smooth] in the [Handle] menu, or click the "Curve Smooth" icon on the system toolbar to show the dialog box:
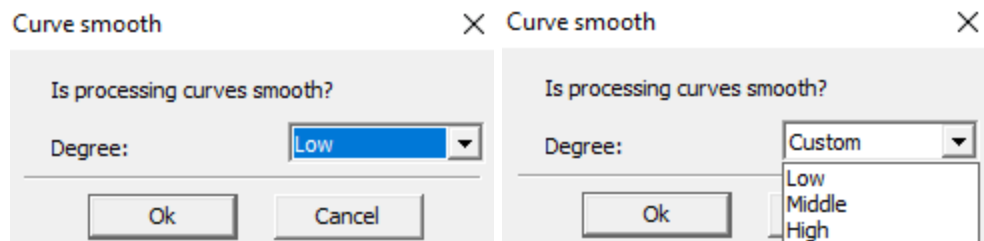
- Curve Smooth has three options: high, middle and low. Operators can also select "Custom" to set the smoothness manually. When you select "Custom", a dialog box will appear.

- Drag the smoothness and click the [Apply] button. The interface will show the curve before and after smoothing for comparison. The black curves are the original curves, and the red curves are the smoothed curves.
    - You can drag and view the graphs with the mouse.
    - You can zoom in/out of the graphs with the mouse wheel.
    - Click the [Full Format] button, and the graph will return to the largest display in the dialog box.
    - If the smoothing effect is satisfying, click the [Apply] button, and the curve will be smoothed according to the settings.
    - Select [Fit smooth] to use another smoothing method.

    The smoothing method should be changed according to the actual graph.

Close Checking

Click [Curve auto close] in the [Handle] menu, or click the "Curve Auto Close" icon on the system toolbar.
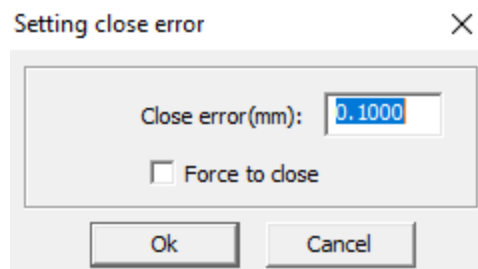
- **Close Error**: Close the curve automatically when the distance between the starting point and end point of the curve is less than the tolerance.
- **Force To Close:** Force close all of the selected curves.

Combine Curve

Click [Combine Curve]in the [Handle] menu, or click the "Combine Curve" icon on the system toolbar to bring up the dialog box:

Setting combine error ✕

Combine error(mm): 0.1

Ok | Cancel
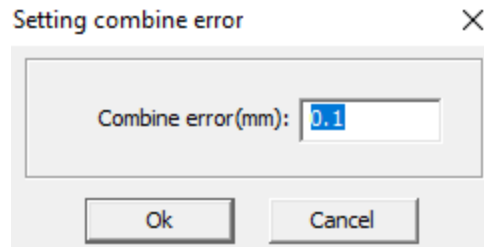
The software will connect all the curves where the connection tolerance is smaller than the merging tolerance according to the settings of merging tolerance into one curve.

Deleting Overlapping Lines

Click [Delete Overlap] in the [Handle] menu, or click the "Delete Overlap" icon on the system toolbar to pop up the dialog box.

Delete overlap lines ✕

☐ Enable Overlap error

Overlap error(mm): 0.001

Ok | Cancel
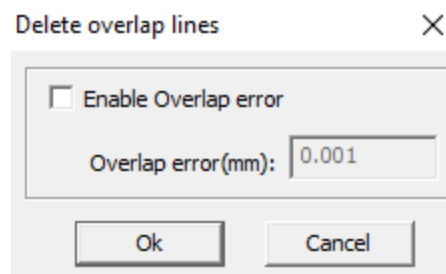
Generally, uncheck "Enable overlap error". The overlapping lines can be deleted only when two lines are highly overlapped. If you need to delete all overlapping lines of a certain error range, you can check "Enable overlapping tolerance" and set the tolerance. Do not set the tolerance too large, so as to avoid deletion by mistake.

Processing Preview

Click [Preview] in the [Edit] menu, or click the "Preview" icon the system toolbar, as shown:
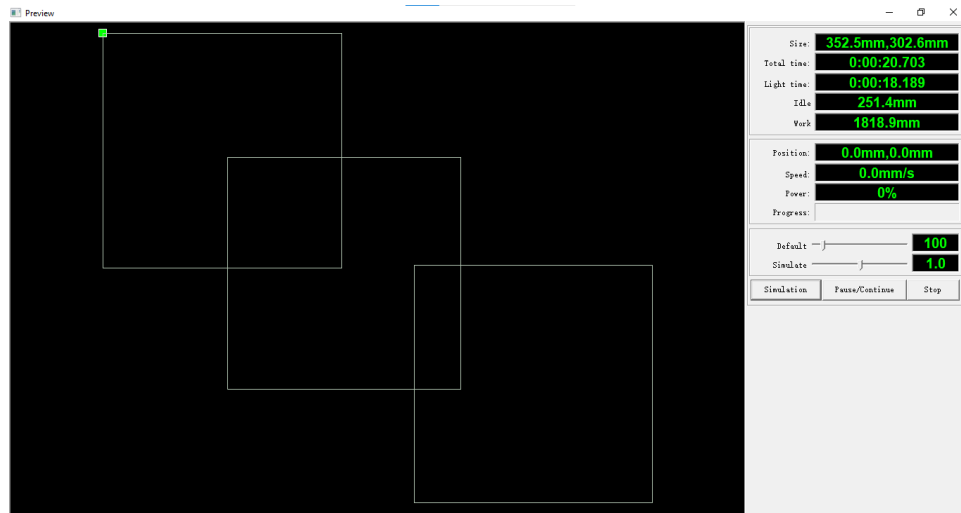
The software supports previewing of files you want to process. You can get some basic information about processing through the preview window, such as the actual output processing path, rough processing time and processing distance, and simulate the processing.

- **Preview Files:** double-click anywhere within the graphic display area and select the graph you want to preview in the dialog box, and open it.
- **Set Preview Parameters:** Right-click anywhere in the graphic display area to show the Config menu:
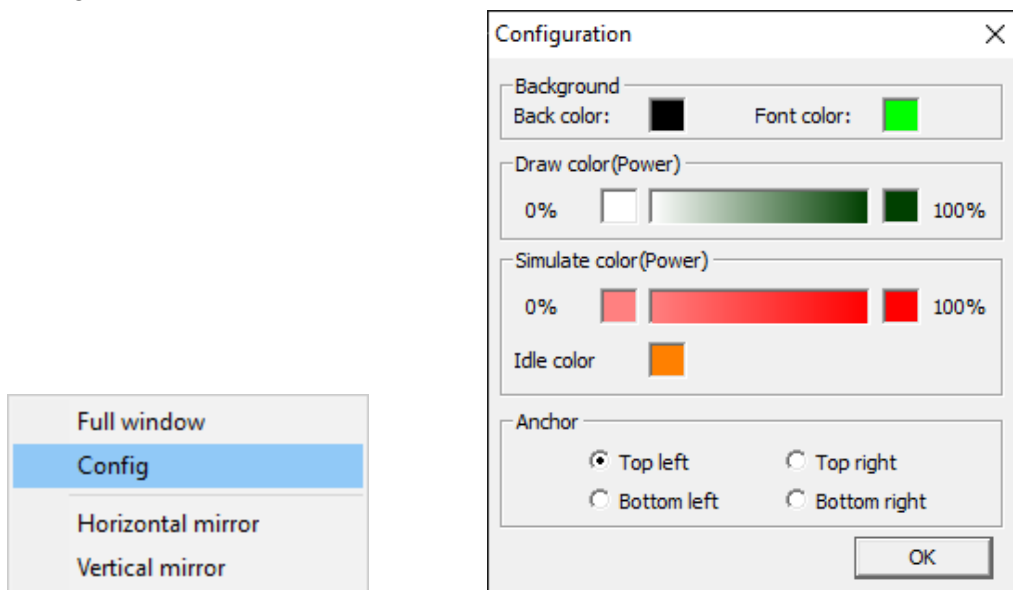
You can match the color of the preview graph with actual output energy, so that the operators can check whether the layer energy is set correctly.

Data Check

Select the graph you want to check, click [Data check] in the [Handle] menu, or click the "Data Check" icon on the system toolbar:
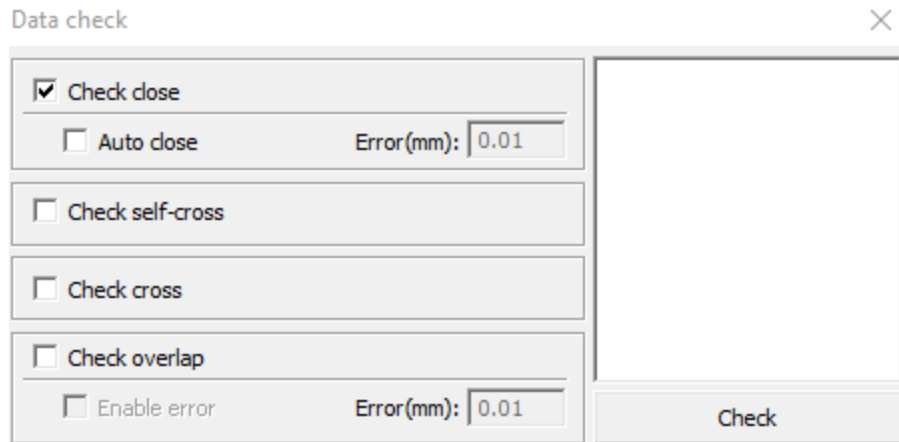
Data check integrates close checking, self-intersection checking, intersection checking, and data overlapping checking. The operator can select the items as needed. If any data have problems, the right side of the dialog box will prompt the problems, and the graphs with problems will be selected. Repeat the process of checking -> excluding error -> checking until all the data are in line with processing requirements.

Retracting/Expanding

Select the data to be retracted/expanded click [Offset Polygon] in the [Handle] menu, or click the "Offset Polygon" icon on the system toolbar, to bring the popup window:
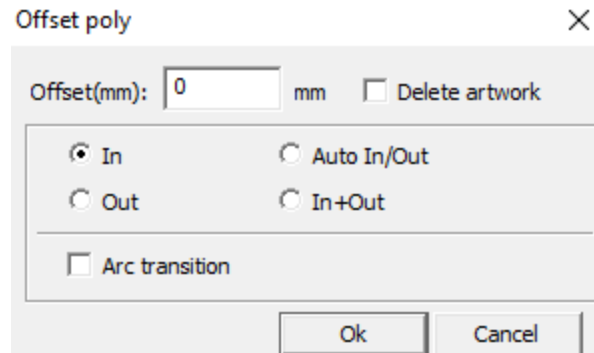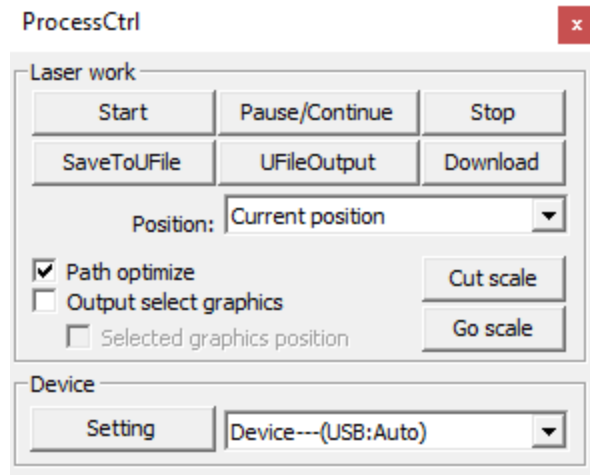

The black lines in the figure are the original graph, and the red lines are retracted graph.
- **Offset:** Set the offset distance.
- **Delete Artwork:** Click to delete artwork.
- **In/Out/Auto In/Out:** Choose one.

Processing Data

Data processing settings appear in the lower right of the main interface, as shown:

- **Device Port:** Two methods are available to connect devices: USB and Web. Click the [Device] port button, and set the connection mode and select the port to be connected in the dialog box.
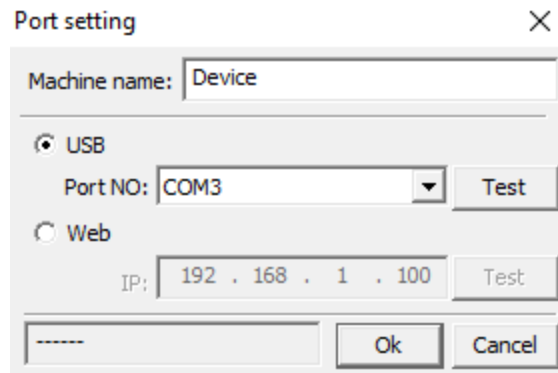
- ○ **USB:** If the computer is connected with one laser device only, this option can be set to Auto, and the software will automatically determine the port connecting to the device. If the computer is connected to more than one laser device, you need to first click [USB: Auto], click the [Search] button in the pop-up dialog box, and the currently connected device ports will be displayed in the drop-down list after searching. You just need to select the desired device port for output in the drop-down list to specify the device output.
  - ○ **Web:** If the computer is connected with one laser device only, you can directly enter the IP address of the device to be connected in the default IP address. If the computer is connected to more than one laser device, the operation is similar to USB. Search the connected devices, and select the machine of appropriate IP address from the dropdown list.

- **Processing By Layers:** First, check "Order of Layer" in [Cut Optimize] in the [Handle] menu, and click OK to exit. Adjust layer order, select the layer you want to adjust and then click the button "Up", "Down", or drag the layer directly to the designated location with the mouse. You also need to check the option "Path Optimization".
- **Graphic Positioning Location:** Set the position that the laser head returns to after processing. Current location, original locating point and machine origin are available.
    - **Current Position:** The laser head returns to the position before processing.
    - **Anchor Point:** The laser head returns to the last locating point, which can be set by buttons on the machine panel.
    - **Machine Zero:** The laser head returns to the limit point of the machine.
- **Go Scale and Cut Scale**
    - **Go Scale:** When you click the button. "Go Scale", the laser head will run a perimeter in the work area of where the object will be cut at. You will be asked to specify the speed at which the perimeter will be performed at.
    - **Cut Scale:** When you click the button "Cut Scale", the laser head will cut along the perimeter of the object being cut.
- **Start, Pause, Stop, SaveToUFile, UFileOutput, & Download**
    - **Start:** Output current graph to the machine for processing. Step: click the [Start] button directly.
    - **Pause\Resume:** Click [Pause] to stop current processing, and click it again to resume processing.
    - **Stop**: Stop the current processing.
    - **SaveToUFile:** Save the current file as an offline file in .rd format for USB offline processing (you can also copy to another memory and motherboard for completely offline operation).
    - **UFileOutput:** Output offline files in .rd format (after saving the offline files, click "UFileOutput", select the file and click [OK] to output to the machine and start processing).
    - **Download:** Save the graph processing data processed by the software to a file. Download the saved files to the machine, and you can directly start the file output processing through the buttons on the machine panel.
- **Output Selected Graphs:** Check "Output Selected Graphs", and only the selected part will be output when you click "Process" or "SaveToUFile". If no part is selected, it will not output.
- **Path Optimization:** Check "Path Optimization" and the path will be optimized before processing or saving as offline files. If the path optimization function has been used in the process of graph operations, path optimization does not need to be selected, and the output will take less time.

Output Settings

In this tab you can select rotary axis and other options

Feeding Settings

To use feeding, you must first enable the feeding. After setting the feeding parameters and finishing one process, the feeding axis will feed according to the feeding length and repeat the processing until the processing times reach the setting of feeding times. If the machine is not equipped with a feeding device, feeding is disabled generally.

Partition For Over Range

To make a partition, it must first be enabled. After enabling the settings a petition can be created by setting the frame height and angle.

Work Settings

In this tab you can select and edit layer settings.

Line /Column Setup

Line /column settings are used to process the graphs to be processed conveniently.

- **X Number and Y Number:** the number of lines and rows of the array.
- **X Spacing and Y Spacing:** the row spacing and line spacing of the array.
  - indicates X spacing and Y spacing, representing margins between graphs.
  - X spacing and Y spacing, representing center distance of the array graph.

Adjust X spacing and Y spacing to make the graph layout more closely. You can click the drawing area to deselect the graphs, then adjust with the arrow keys on the keyboard and scroll the mouse to zoom in/out window to make the adjustment process more accurate.

Full Format Settings/Bestrew

Determine how many rows (i.e. X number) and line (i.e. Y number) can be output according to the format size and the line/row spacing set by current user. Click the button "Bestrew…" to pop up the interface as shown below:
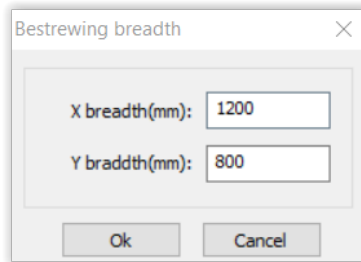
Press the OK button, and the software can automatically calculate the number of lines and rows that can be arranged within the entire format.
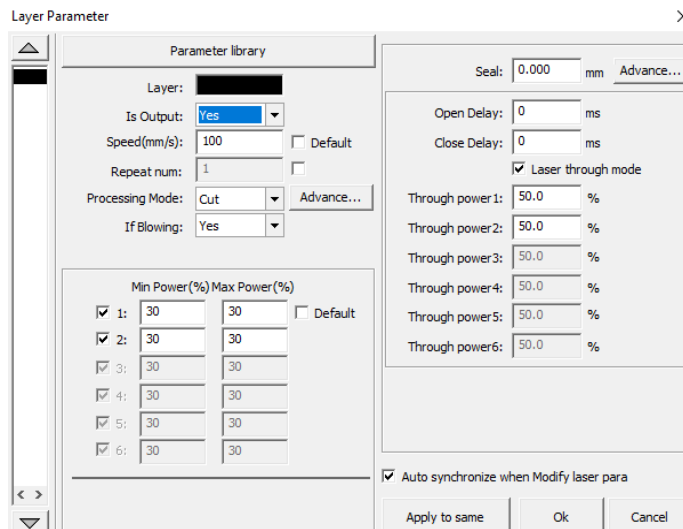
Dislocation

For some graphs, use dislocation in arrangement to make the arrangement more compact.

Virtual Array

After arranging the array, select the graphs and click "Virtual array" to replicate the array graphs.

Layer Parameter Settings

Double-click the layer to be edited in the layer list to pop up the layer parameter dialog box, as shown below:

The color bar on the left represents the layer of the current graph. Select different colors to switch between different layers. You can modify the parameters for multiple layers in one time.

- Layer parameters include two parts: Public layer parameters and proprietary layer parameters.
- Public layer parameters refer to the layer parameters which are valid regardless of the processing type of the layers;
- Proprietary layer parameters refer that the parameters will change when the processing type of the layers changes.

Public Layer Parameters

- **Layer:** The software distinguishes the processing parameters of different graphs by layers. For scanning processing methods, multiple bitmaps in the same layer will be output as one graph. If you want to output every bitmap separately, place the bitmaps into different layers.
- **Is Output:** Two options are available: Yes and No. Select "Yes", and the layer will be output for processing; select "No", and it won't output.
- **Speed:** The processing speed of appropriate processing methods.
  - For cutting, the slower, the better the processing, the smoother the track; the faster, the worse the processing, and the less smooth the track;
  - For scanning, the slower, the deeper scanning under equal energy, scanning traces thicken, and the scanning resolution also reduces accordingly. The faster, the shallower scanning under equal energy, and detail distortion increases.
  - For dot processing, mainly the idle speed is changed.
  - If "default" is selected, the actual speed is determined by the speed set by the panel.
- **If Blowing:** If the machine is connected to an external fan, and the fan has been enabled, the fan will be turned on during processing of the layer data if "Yes" is selected, or else the fan won't be turned on. If the fan is not enabled, both the options "Yes" and "No" are meaningless. **(Not an option for your machine purchase).**
- **Processing Mode:** The method to process corresponding layers;
  - If a vector layer (i.e. color layer) is currently selected, three options are available: laser scanning, laser cutting and laser dotting;
  - If a bitmap layer (i.e. BMP layer) is currently selected, only one option is available: laser scanning.
- **Laser 1 & Laser 2:** Correspond to the laser output of the first channel and the second channel laser signals of the motherboard. If the machine has a single head, the second channel laser is meaningless.
- **Min/Max Power:** The range of the power value is 0~100, which indicates the laser intensity of the processing; larger value indicates stronger laser intensity, and smaller value indicates weaker laser intensity; the minimum power should be lower than or equal to the maximum power.
  - Different processing types have different meanings.
    - For cutting, the actual power follows the cutting speed. Lower speed requires lower energy, and higher speed requires higher energy, so as to

ensure uniform energy throughout the cutting process. Thus the minimum energy corresponds to the power at the minimum speed, which is usually 0. However, if the start speed is set, the minimum speed is the start speed; the maximum power corresponds to the layer speed.

- Minimum/maximum power setting flow:
  - (1) If the minimum power and the maximum power are set to the same value, adjust synchronously until all cutting curves have appeared.
  - (2) Keep the maximum power constant, and gradually reduce the minimum power until the power of the cutting curves drops to the minimum, and all connected parts can be processed.
  - (3) If the optimal effect isn't achieved yet, tune the maximum power appropriately, and repeat step 2. For cutting through, the minimum power and the maximum power have no significant difference and can be set to the same. For scanning process and common scanning, the minimum power and the maximum power must be consistent. During slope engraving, the minimum power corresponds to the power on slope top, and the maximum power corresponds to the power on the slope bottom. If the minimum power is too small, the top is wide, and the details are unclear. If the minimum power is too large, the slope is not obvious. For dot processing, set the minimum power and the maximum power to be consistent. If "default" is selected, the actual power is determined by the power set by the panel.

Other Layer Parameters Click the button "Advanced" and you can also set other layer parameters.

- **Enable Pen Up/Down:** If the machine is equipped with a lifting platform, and the processing needs to be done on different platform heights, enable pen-lift/ down function. The pen down position is the height that the platform performs processing, and the pen lift position is the height that the platform moves to before the laser head panning which will not interfere with the workpiece to be processed. If it is confirmed that the laser head panning won't interfere with the workpiece to be processed, it is not necessary to set the pen lift position. The usage is:
    - (1) Enable pen up/ down.
    - (2) Enable pen down position, control the panel buttons manually to move the platform to the plane of the graph to be processed, and adjust the focus. Then click the button "Read" to set the pen-down position.
    - (3) Enable pen lift position, control the panel buttons manually to move the platform to the height that the laser head won't interfere with the workpiece, and move the laser head through panel buttons, confirm that no interference will be caused, and click the button "Read" to set the pen lift position.
- **Point:** Dotting is designed for dot elements drawn by the drawing tool, or dot elements imported from .dxf files. It is independent of the processing method of the current layer, that is, whether the current layer is cut or scanned, the dot elements in the graph will be always output by dotting. Dotting speed is the layer speed, and the dotting energy is the maximum laser energy of the layer.
- **Laser Enabled:** If the machine is equipped with two lasers, both channels generally output simultaneously. However, you can also disable the output of one channel by setting enabled laser.
- **Extend IO:** output It is IO output associated with the layer and reserved.

Laser Cutting Parameter Settings

Seal: 0.000 mm [Advance...]

Start punch times: 0

End punch times: 0

Punch power: 50.0 %

☐ Enable auto check microlink

Max dis: 0.000 mm

Seal: If the seal is not closed while cutting closed graphs, the seal compensation can be used to close. However, if the seal is misplaced, it can't be compensated. Please compensate with 4.9.5 Backlash compensation optimization, or use backlash compensation in user parameters.

Start Punch Times: Set the piercing times of start point.

End Punch Times: Set the piercing times of the end point.

Punch Power: Set the power for piercing. When cutting thick plates, you can set a small perforation power for multiple perforations to avoid popping.

Slit Width Compensation: Click "Advance" to set the slit width compensation, which can be used to compensate for the deviation between graph size and actual cut graph caused by laser kerf. Slit width compensation is only valid for closed graphs.

       (1) Direction: It is set according to actual needs. For example, to cut a circle, if you want to keep the cut out circle, please set the compensation direction to outward; if you want to keep the hole, please set the compensation direction to inward.

       (2) Width: The width of the laser kerf.