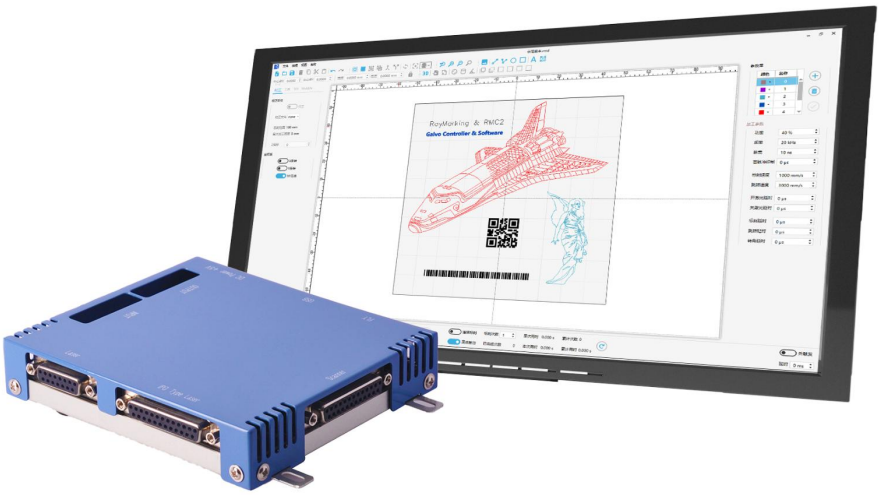
Manual for RayMarking & RMC2



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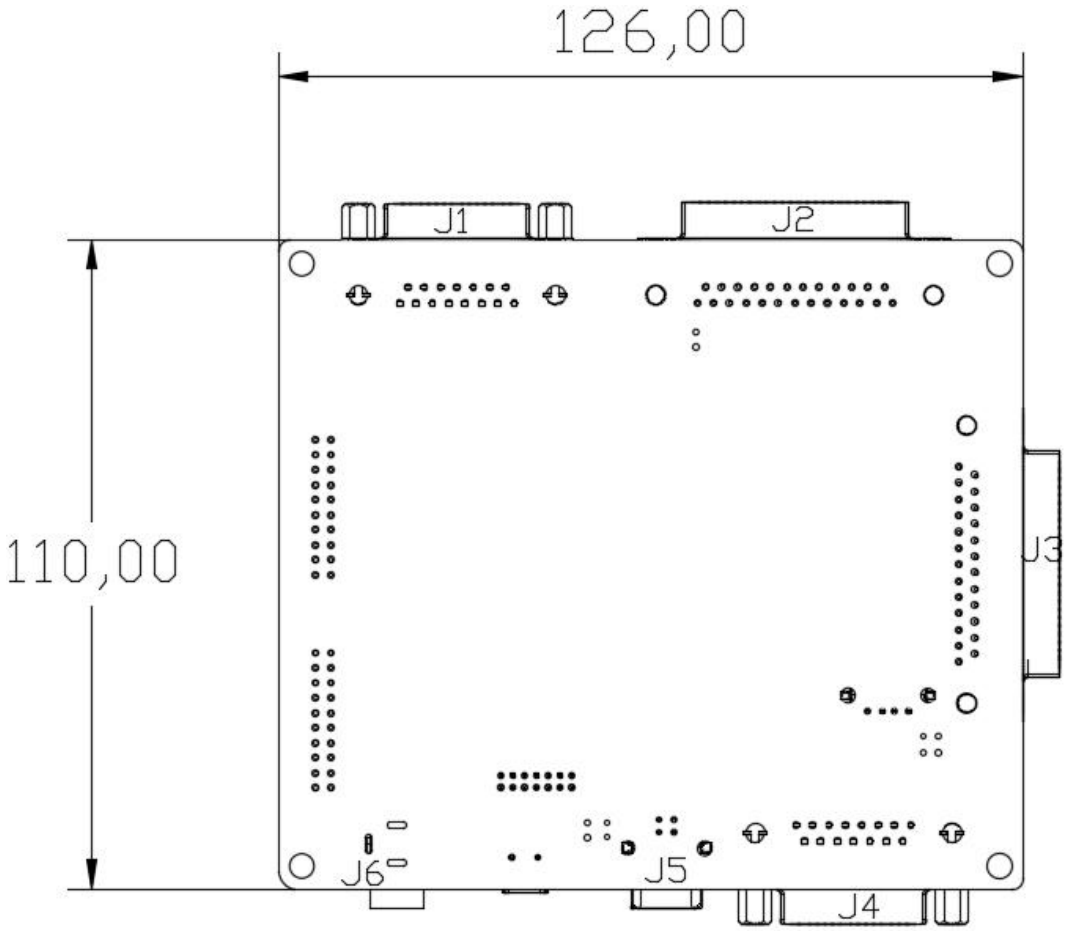
1. About RMC2

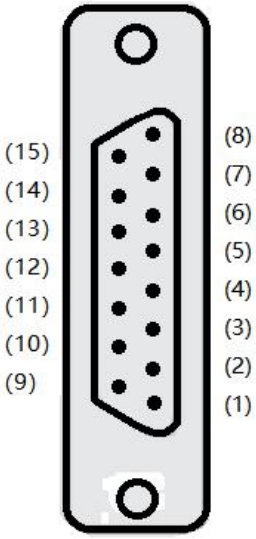
1.1 Card drawing



Index	Name
J1	Laser connector
J2	IPG type laser connector
J3	Scanner connector
J4	Marking-on-the-fly connector
J5	USB 2.0
J6	DC Power

1.2 Master Card interface configuration

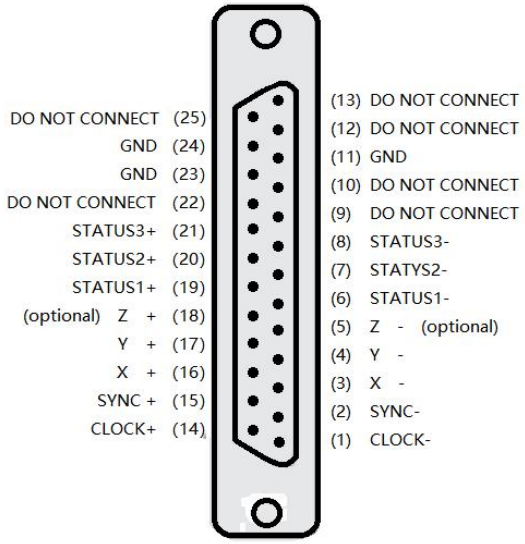
Laser connector(J1):

D-SUB15 female connector foot map	Index	Name	Explain
	1	Analogout	Analog output signals of 0-10V for power control.
	3	GND	Reference Ground Signal.
	4	PWM	Pulse-width modulation signal, which sets laser power in terms of signal duty cycle, can also be used as a pulse repetition frequency signal.
	5	FPK	First pulse suppression signal, high level effective.
	6	Laser On	Laser switching signal, high level effective.
	7	Leading On	Indicating optical switch signal, high level effective.
	10	Lamp On	Main oscillator switch signal, used for some fiber laser MO switch, high level effective.
	11	Finish	Marking completion signal, low level when marking, high level for the rest of the time.
	12	Start	External trigger marking start signal, short circuit with PIN15 can trigger marking start command.
	13	Stop	External trigger marking stop signal, short circuit with PIN15 can trigger marking stop command.
	14	VCC	+5V Power output.
	15	GND	Reference Ground Signal.

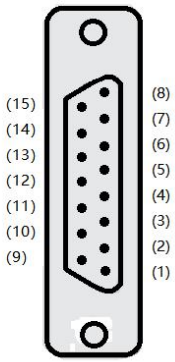
IPG-Type Laser connector(J2):

Explain
IPG laser interface, with d-sub25 1 to 1 and laser wiring can be connected.

Scanner connector(J3):

D-SUB25 female connector foot map	Index	Explain
	1、14	Differential output(CLOCK)
	2、15	Differential output(SYNC)
	3、16	Differential output(X)
	4、17	Differential output(Y)
	5、18	Differential output(Z)
	6、19	Differential input(STATUS1)
	7、20	Differential input(STATUS2)
	8、21	Differential input(STATUS3)
	11、23、24	GND

Marking-on-the-fly(J4):

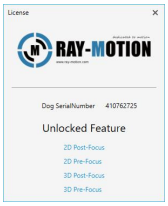
D-SUB15 female connector foot map	Index	Explain
	1	Encoder A+
	9	Encoder A-
	2	Encoder B+
	10	Encoder B-
	6、14	GND
	7、15、8	+5V output

1.3 Dongle

Provide dongle upgrade service, and we need to get dongle information at that time.

The dongle information is inquired in the menu bar-help-license.

The menu bar will be detailed in ”chapter 4.0” .



2. Software installation instructions

2.1 Installation notes

Before installing make sure your computer's hardware and software are configured to meet the following requirements：

·The main frequency of processor is above 1GHz

·More than 2G memory

·Hard disk free space exceeds 200M

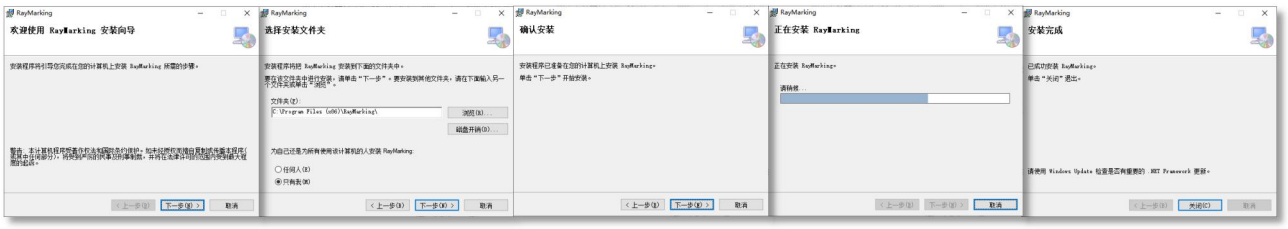
·Microsoft Windows 7/8/8.1/10 is required

·Requires Microsoft .Net Framework 4.6 to be installed

This is only the minimum required for the software to function properly. To ensure a smooth experience, it is recommended to select Intel Core I5 cpu of the same or higher level with 8 GB or more of Ram.

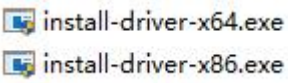
2.2 Software installation

Double-click the installer(RayMarkingSetup_XXX.exe), follow the installation wizard.

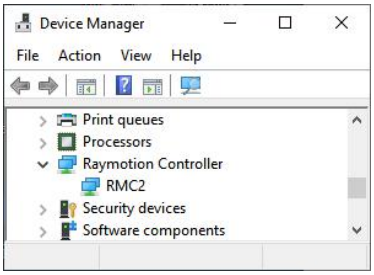


2.3 Driver installation

Connect the control card to the power supply and connect to the computer via a USB cable. As shown in the figure below, select the correct driver according to your system and install it (x86 for 32-bit systems, x64 for 64-bit systems).



“RMC2”will be found under the “Raymotion Controller” column of the device manager after the software installation is complete.



2.4 Language

The language of the software is consistent with the ststem settings (CN or EN).

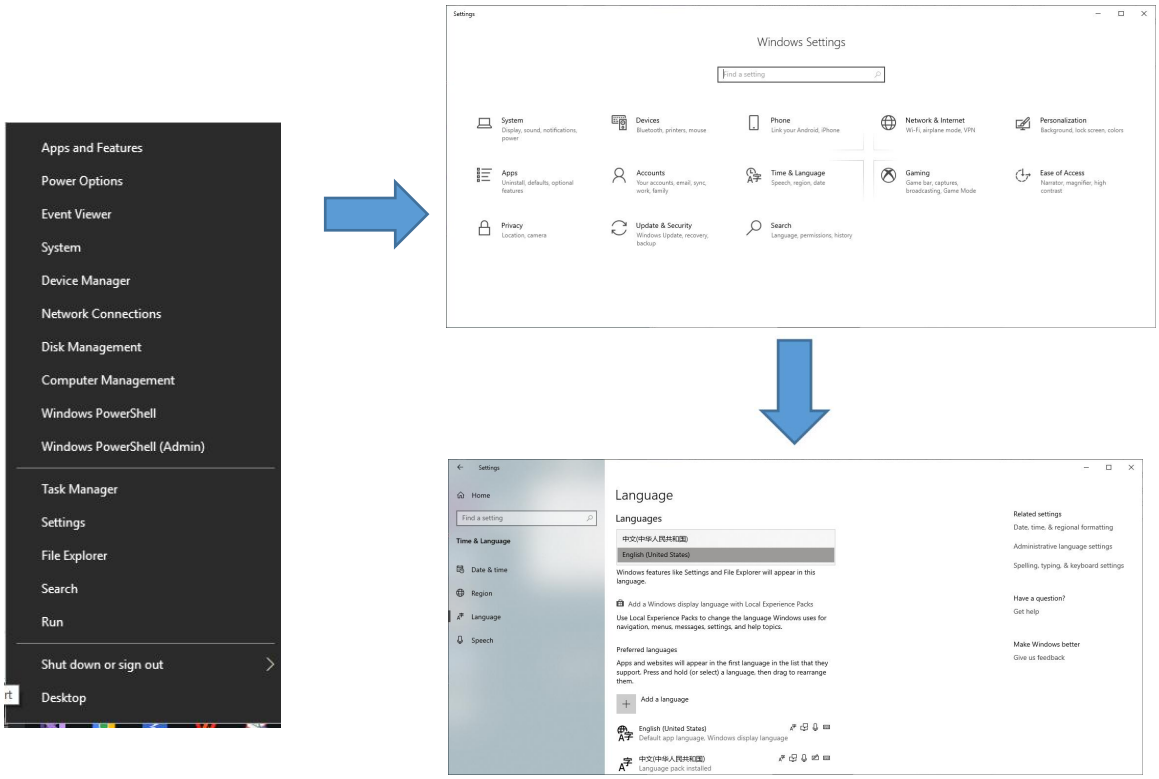
Follow the steps below to set if you want to change the language.（Win10）：

1) Right-click on the Start menu to open Settings.

2) Choose time & language in Windows Settings.

3) Select the language on the left, and select English or Chinese under Windows display language.

4) Sign out or restart the computer.



3. CorrectionWizard instructions

3.1 Introduct

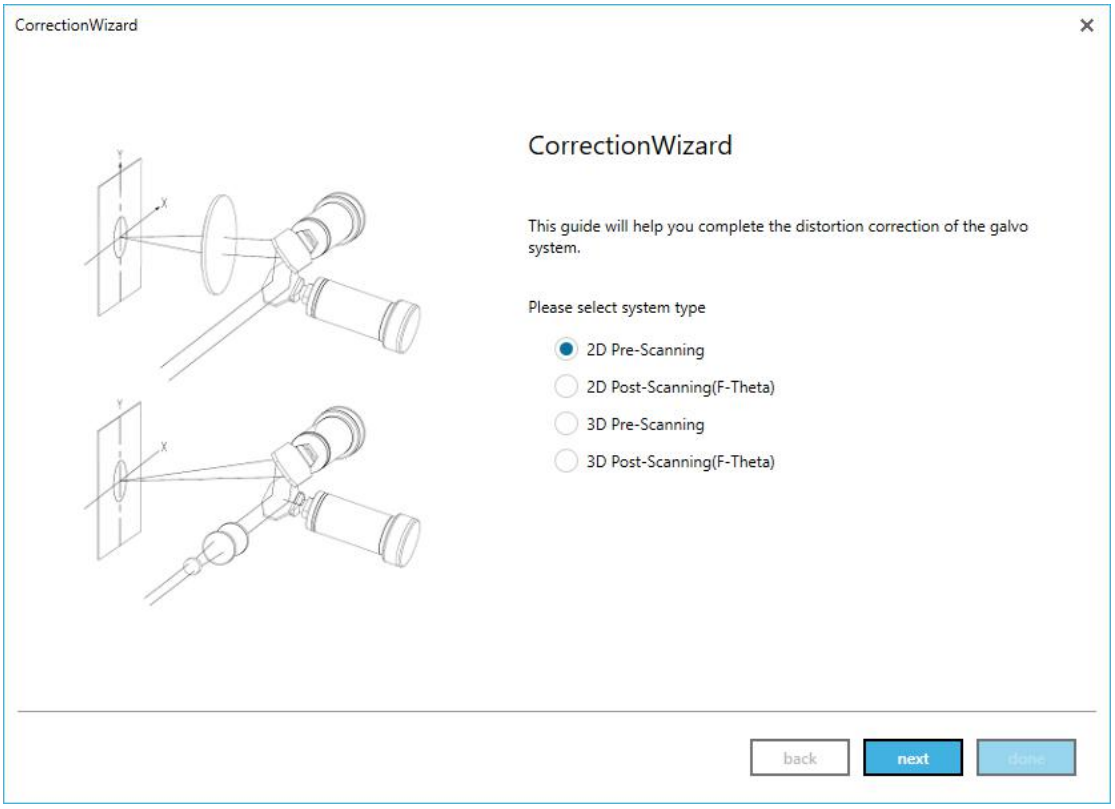
CorrectionWizard is used to help users create correct files. The software is a wizard-style operation, users only need to follow the interface marked with a number of steps, step-by-step operation.

For the 2D Pre-Scanning solution, the correction of the dynamic focusing section requires the use of the attached dynamic axis compensation file. For more information about this file and how to obtain it, please consult the manufacturer.

This software can not be opened at the same time as RayMarking.

3.2 System type selection

After opening the software, first make the system type selection, as follows. (There will be differences here due to different permissions)



3.3 Dynamic focus correction

3.3.0 Attention*

If the system type is “2D Post-Scanning”, please skip directly to “chapter 3.4”.

Plaese skip to the corresponding chapter as needed when the system type is “3D Pre-Scanning”, “3D Post-Scanning” or “2D Pre-Scanning”.

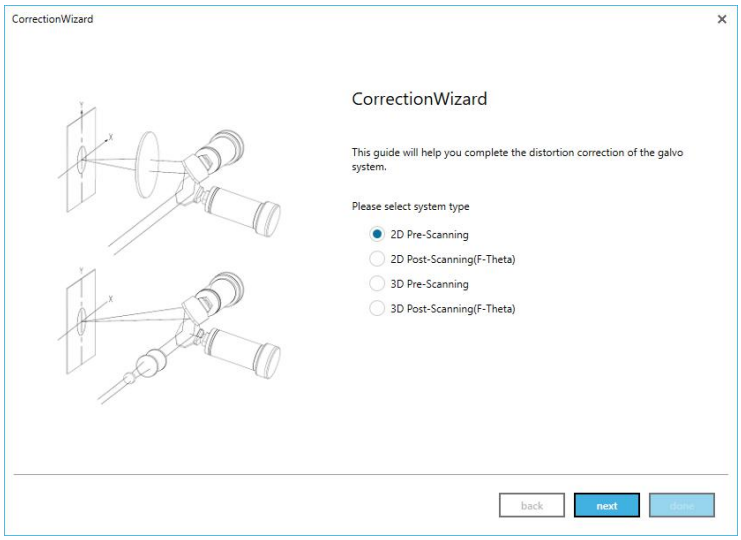
Please refer to Appendix 1 for the system type comparison table.

The difference between 2D and 3D Pre-Scanning is reflected in the dynamic axis correct files.

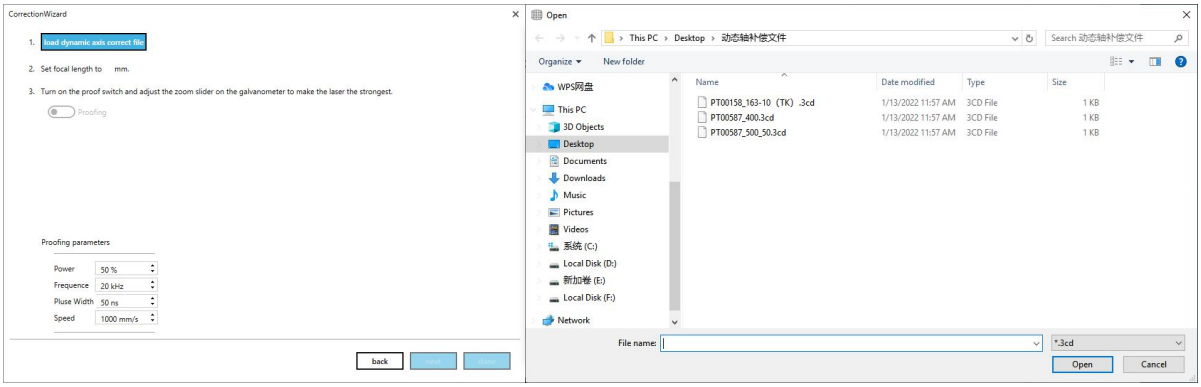
Contact RAY-MOTION for service.

3.3.1 2D Pre-Scanning

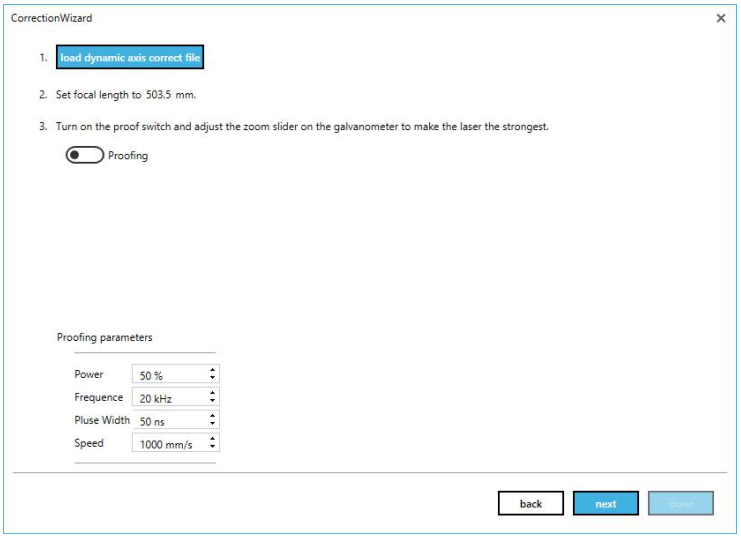
1） Select 2D Pre-Scanning. Next step.



2） Load the dynamic axis correct file.

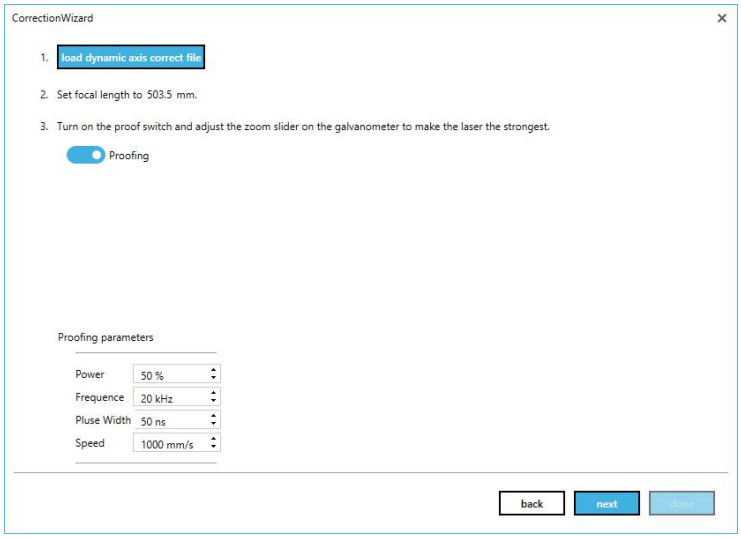


3） According to the values displayed on the interface, adjust the focal length, that is the distance from the surface under the galvo to the machining plane.

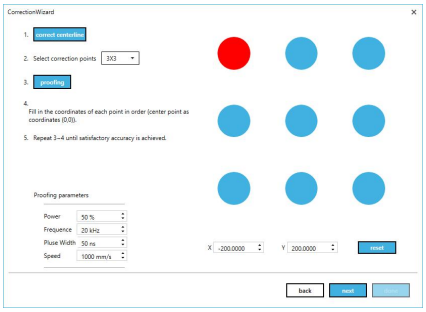


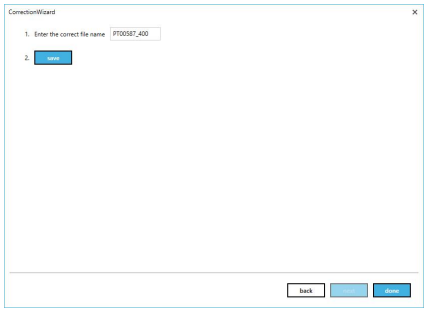
4） Open the mirror side cover, and turn on the “Proofing” switch, fine-tuning the zoom slider until the best focusing effect is achieved. If the marking effect is not obvious at this time, you can adjust the parameters in the "Proofing parameters" below.

Turn off the “Proofing” switch. Next step.



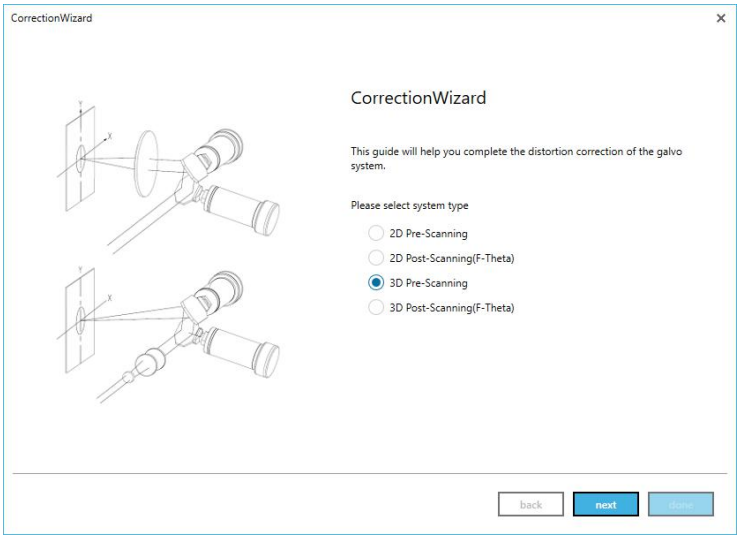
5） The rest of the process is the same as 2D correction, please skip directly to “chapter 3.4.2”.



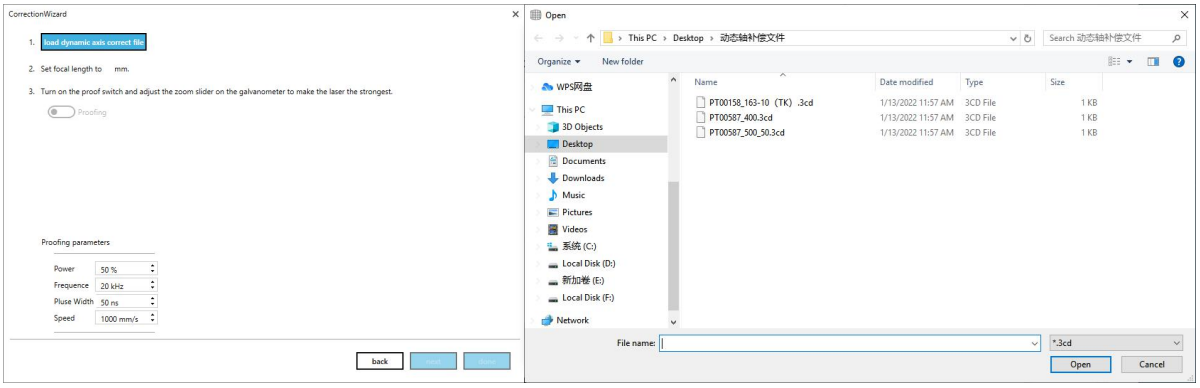


3.3.2 3D Pre-Scanning

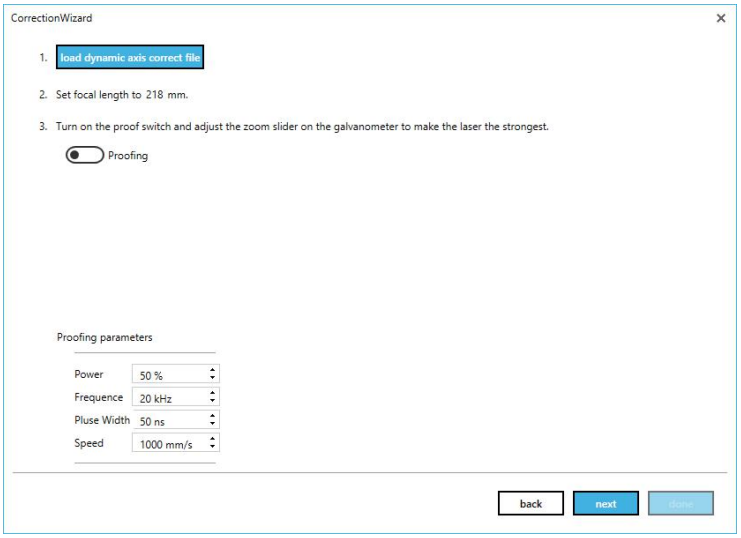
1） Select 3D Pre-Scanning. Next step.



2） Load the dynamic axis correct file.

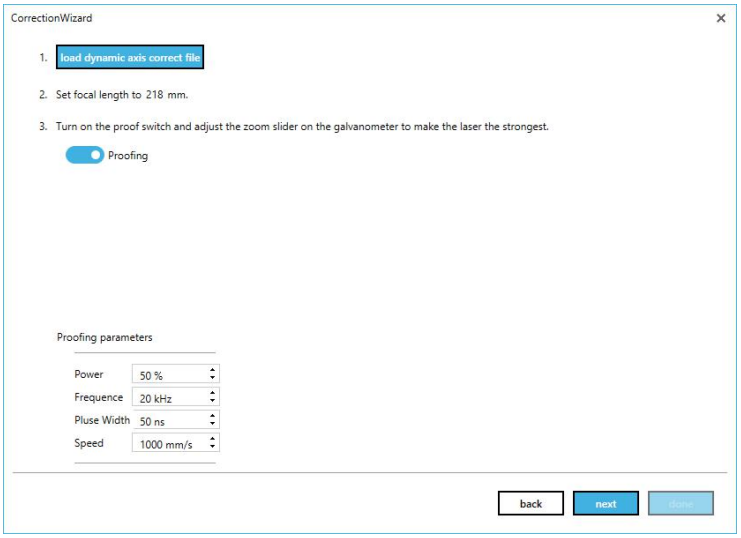


3） According to the values displayed on the interface, adjust the focal length, that is the distance from the surface under the galvo to the machining plane.

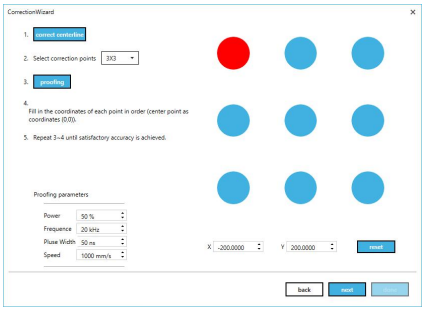


4） Open the mirror side cover, and turn on the “Proofing” switch, fine-tuning the zoom slider until the best focusing effect is achieved. If the marking effect is not obvious at this time, you can adjust the parameters in the "Proofing Parameters" below.

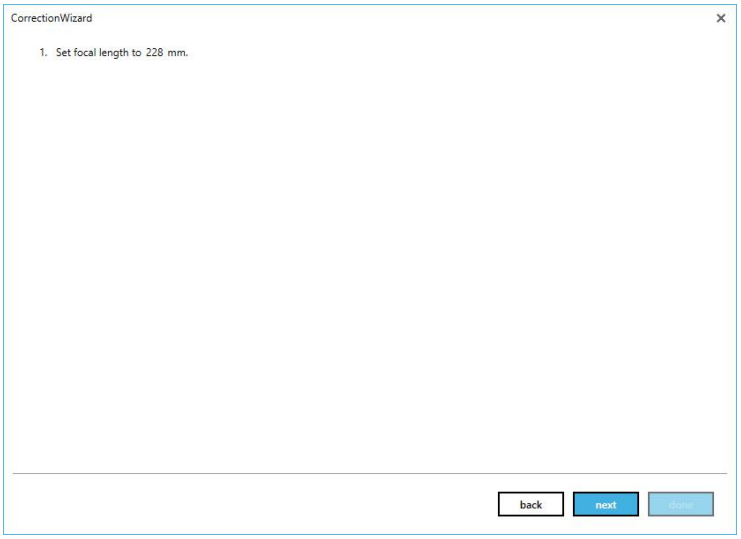
Turn off the “Proofing” switch. Next step.



5） Refer to “chapter 3.4.2” for 2D correction. Next step.



6） According to the values displayed on the interface again, adjust the focal length, that is the distance from the surface under the galvo to the machining plane. Next step.

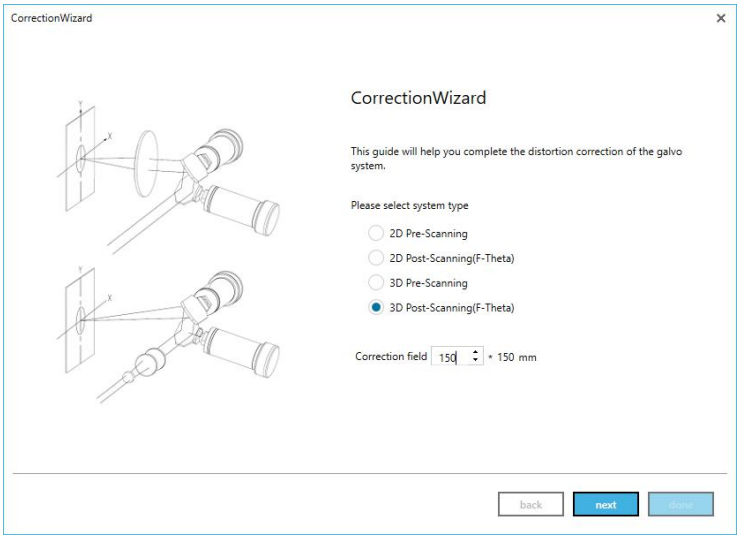


7） Refer to “chapter 3.5” for the remaining steps.

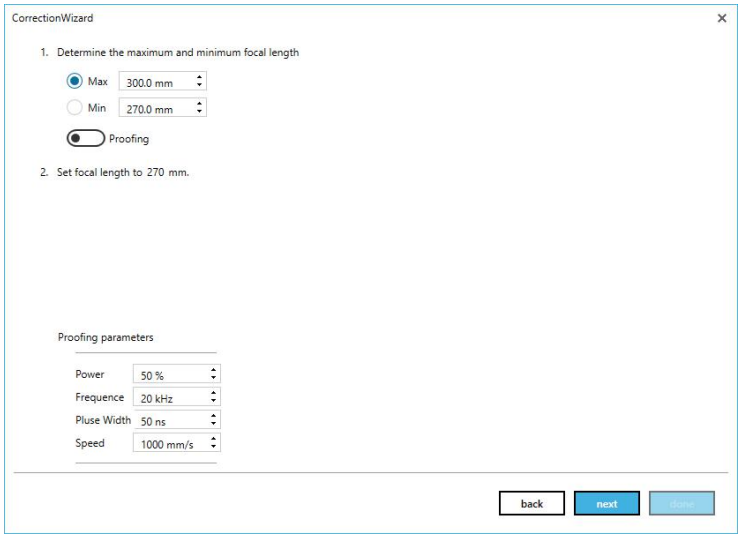
3.3.3 3D Post-Scanner（F-Theta）

1） Select 3D Post-Scanner，fill in the required format size and press Enter to confirm，next step. There is a limit to the size of the field to be filled in, please refer to the following formula (non-absolute)：

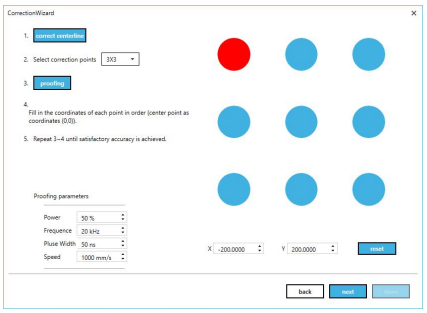
field-size = [focal-length × 0.364 ×2]



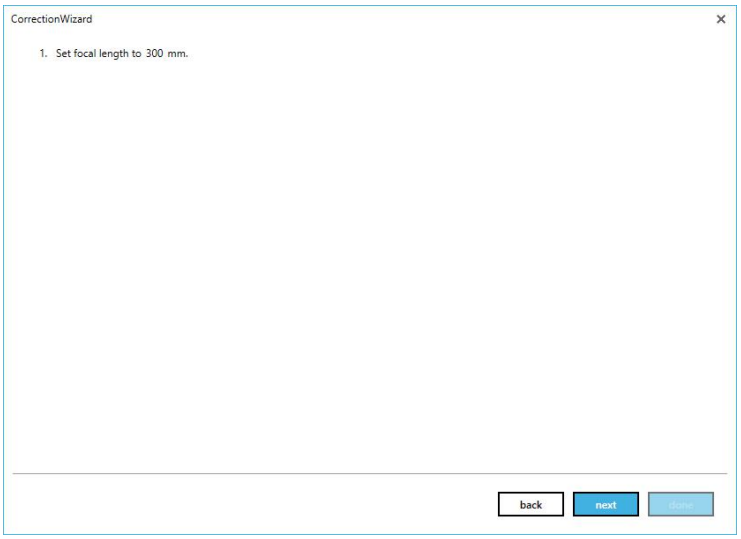
2） Select the highest and lowest options respectively and turn on the “Proofing”.
Adjust the height of the galvo to make the laser the strongest.
Obtain the highest and lowest focal length of the galvo and fill in the window.
According to the values displayed on the interface, adjust the focal length, next step.
You can adjust the parameters in the “Proofing parameters” for better results.



3） Refer to “chapter 3.4.2” for 2D correction. Next step.



4） According to the values displayed on the interface again, adjust the focal length, that is the distance from the surface under the galvo to the machining plane. Next step.



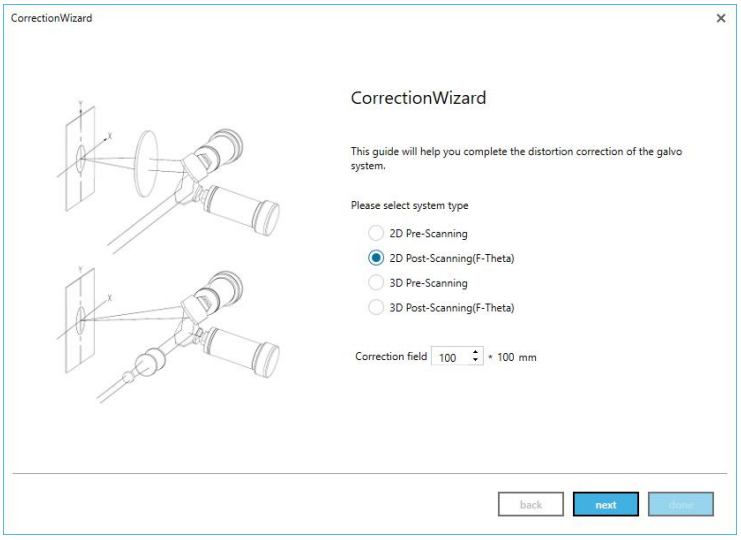
5） Refer to “chapter 3.5” for the remaining steps.

3.4 2D calibration

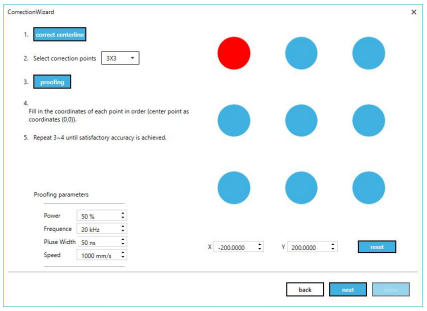
3.4.1 2D Post-Scanner（F-Theta）

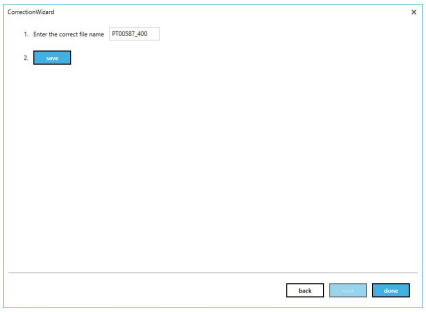
1） Select 2D Post-Scanner,fill in the required format size and press Enter to confirm，next step. There is a limit to the size of the field to be filled in, please refer to the following formula (non-absolute)：

field-size = [focal-length × 0.364 ×2]



6） The rest of the process is the same as 2D correction, please skip directly to “chapter 3.4.2”.

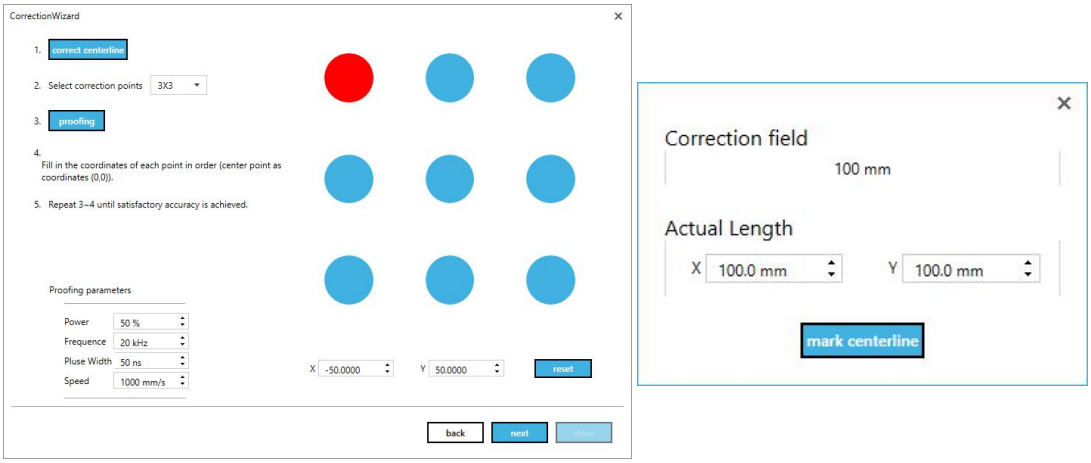




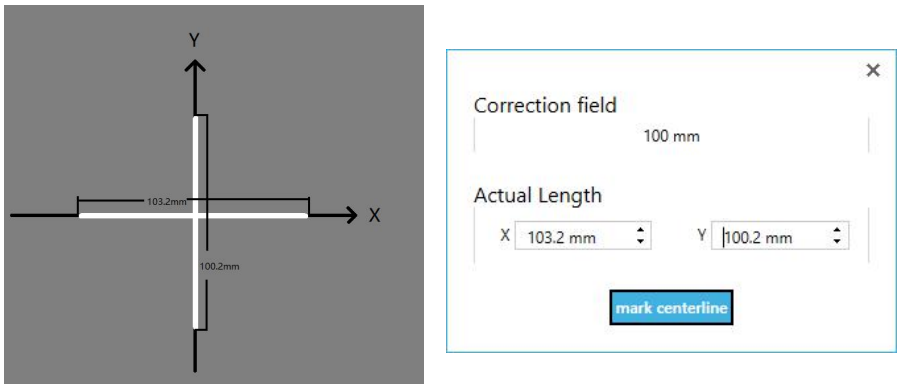
3.4.2 2D correction

This step is used to correct for marking distortion.

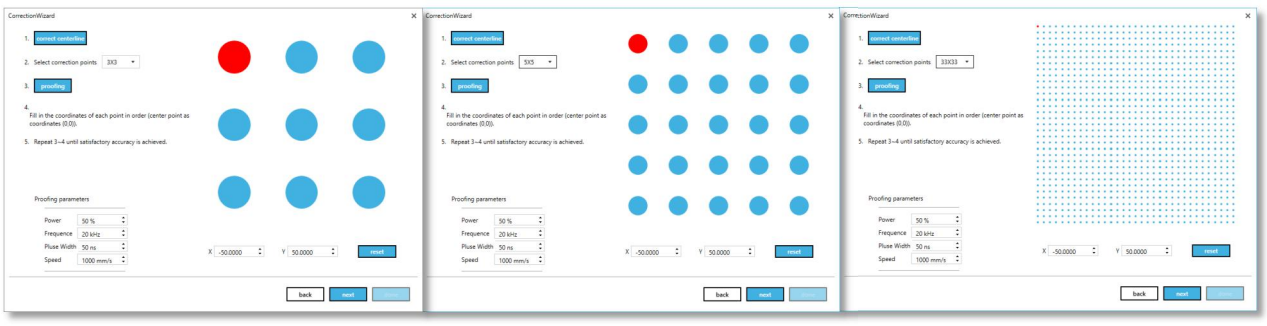
1） Click "correct centerline", and the system will mark a set of cross centerlines and a coordinate system at the corners.



2） Measure the lengths of the center lines in the X and Y directions respectively, according to the coordinate system, and fill in the corresponding text boxes.Press “mark centerline” till the until the length is satisfied.

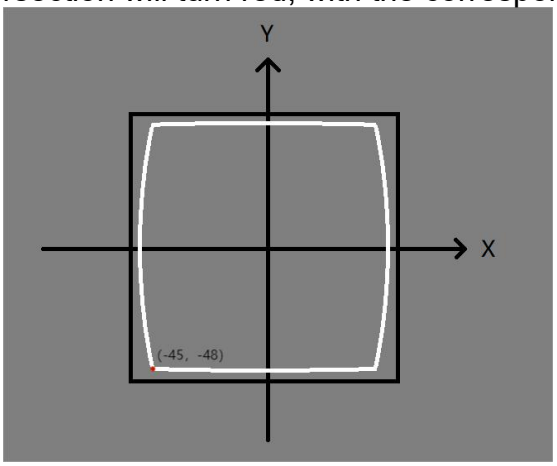


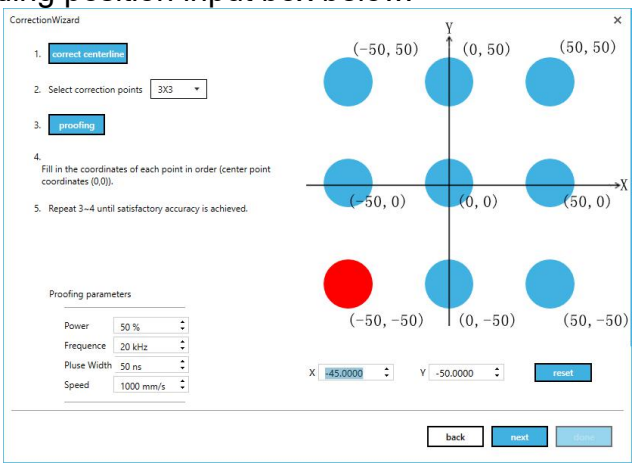
3） Select the appropriate number of points. The denser the number of points, the higher the correction accuracy.



4） Click "Proofing", the system will mark a set of grid lines according to the selected correction points. Create a coordinate system with the center point as the coordinate zero point, measure the coordinates of each intersection point of the grid, and fill in the position input box. The center point coordinate defaults to "(0,0)" and no need to be changed.

The more accurate the value filled in, the better the final correction result. The selected intersection will turn red, with the corresponding position input box below.





5） After filling in all the intersection coordinates, click "Proofing", the system will save the correction and mark the calibrated grid lines. If not satisfied, repeat the Previous step.

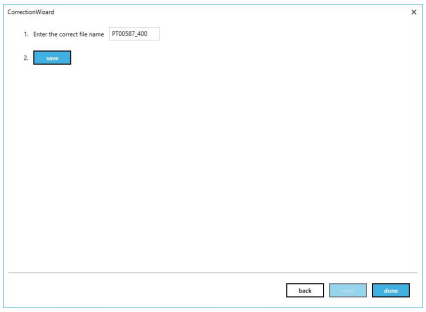
6） If you need to re-calibrate, click the "Reset" button and re-execute “chapter 3.4.2”.

7）

3.5 Save the correct file

1） Enter the correct file name into the input box.

Naming rules can be customized, also available as “SN_focal-height/field”.



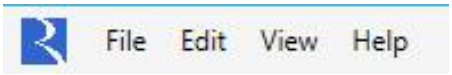
2） Click the “save” and “done” buttons to complete the correction process.

3） The files can be selected directly in the correction list of RayMarking software.

4. RayMarking Instructins

4.0 Menu Bar and View Tabs*

1）Menu Bar



2）Basic toolbar：

New, Open, Save, Delete, Copy, Cut, Paste, Undo, Redo.

3）Edit toolbar

Select All, Select Invert, Group, Ungroup, Combine, Split, Reverse, To Center, Alignment.

4）View toolbar

View Back, Zoom In, Zoom Out, Zoom to select。

5）Drawing toolbar

Vector File, Line, Polyline, Circle, Rectangle, Text, BarCode.

6）Outline toolbar

CenterX, CenterY, Width, Height, Keep Ratio.

7）3D toolbar

3D View, Import Model, Delete, Sphere, Cylinder, Slop, Front View, Back View, Left View, Right View, Top View, Bottom View.

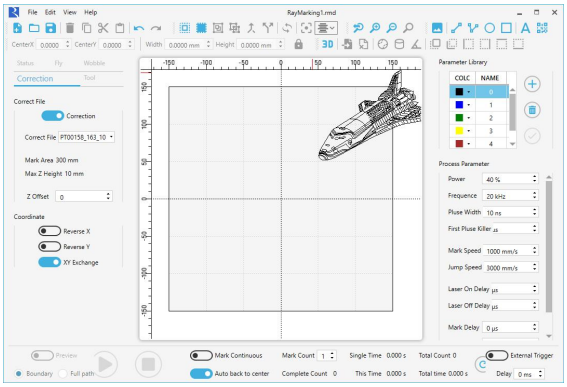
4.1 View switch

4.1.1 Zoom in and out

Use the mouse wheel to control zoom in and out, forward to zoom in and backward to zoom out. Or use the “Zoom In” and “Zoom Out” buttons in the View toolbar.

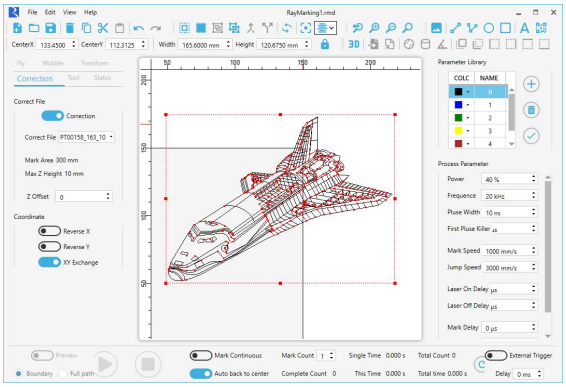
4.1.2 View back

“View Back” means centering the entire work area in the drawing area, click the "View back" button in the view toolbar to achieve this function.



4.1.3 Zoom to selected

“Zoom To Selected” means that the selected primitives will be enlarged or reduced appropriately, and displayed in the drawing area in the center. This function can be achieved by clicking the "Zoom To Selected" button in the view toolbar.



4.1.4 Horizontal and vertical viewing angle movement

Hold the Shift key, and the mouse wheel will move to move the camera vertically.

Hold the Ctrl key, and the mouse wheel will move to move the camera horizontally.

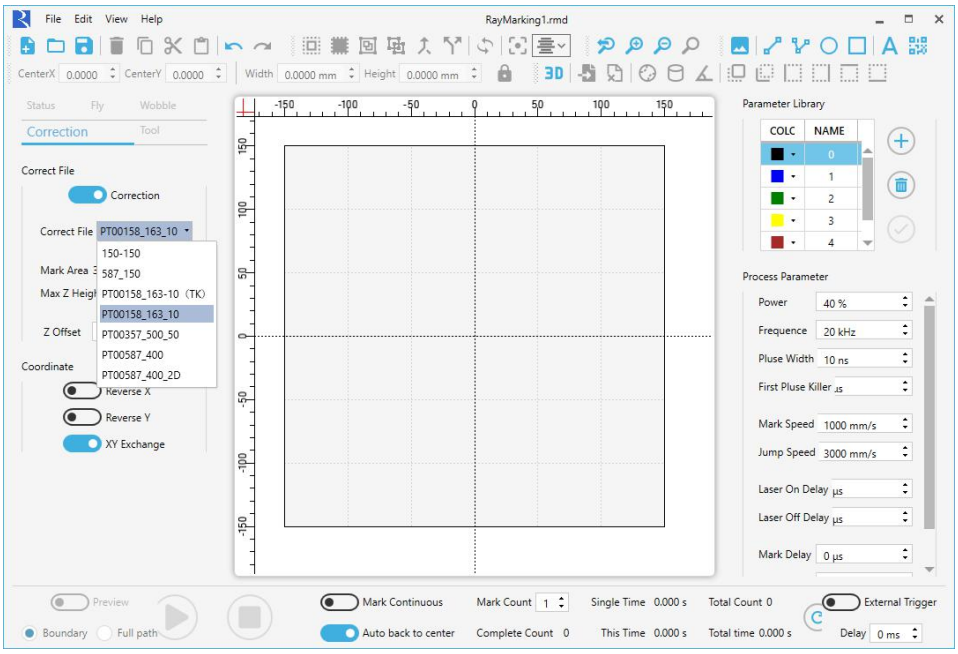
4.2 Choose a correct file

4.2.1 Correction Tab

Correction Tab is used to display and select correction files.

When no correct file is available, "None" will be displayed in the text box and the area feature will be grayed out.

Refer to “Chapter 3” for details on correcting files.



4.2.2 Functions

Correction：This switch indicates whether correction is enabled. When this switch is checked, correction is enabled. Correction function is not enabled, even if the correction file is selected, still no correction effect.

Correction File：It will be displayed directly in the drawing area. The format size set in the file should not exceed this area.

Maximum processing height：Indicates the size of the Z-axis focal length that the device can move in dynamic axis correction.

Z-axis offset: When using this function, you need to turn off the correction switch, you can fill in the value within the range of -65534 ~ 65534 to control the dynamic axis position, the default is "0" when using without changing, see Appendix 3 for the position reference table.

Note: The Z-axis offset should be set back to zero before the software is closed or after restarting the software to ensure the correctness of the dynamic axis position.

Coordinate System：

X reversal: Instruction output for reversing the X direction of the galvo.

Y reversal: Instruction output for reversing the Y direction of the galvo.

XY swap: Switch the output of the galvo x and y direction.

4.3 Creat and edit

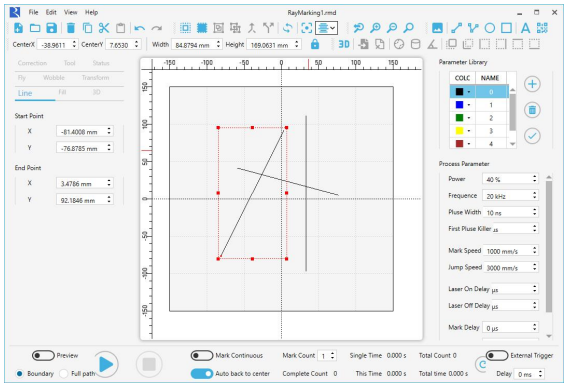
4.3.1 Basic graphics creation

1）Line

Activate the “Line” button in the drawing toolbar, specify the starting point, drag it to the end point and release it to complete the drawing of the line.。

If you need straight lines with angles of 0°, 30°, 60°, 90°, etc., you need to hold down the Ctrl key and then perform the drag operation.

Select the drawn line and adjust the coordinates of the start and end points in the "Line" tab on the left.

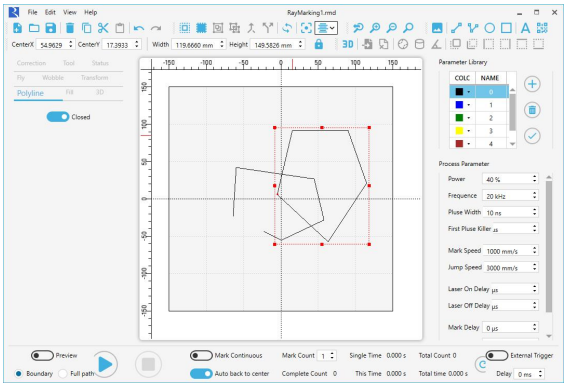


2）Polyline

Activate the “Polyline” line button in the drawing toolbar, left-click at the starting point of the drawing area, move to the next inflection point and click the left-click again to complete the drawing of polyline for many times.

If you need straight lines with angles of 0°, 30°, 60°, 90°, etc., you need to hold down the Ctrl key and then perform the drag operation.

Select the drawn polyline and turn on the closed loop switch in the "Polyline" tab on the left to make the polyline a complete closed polygon.

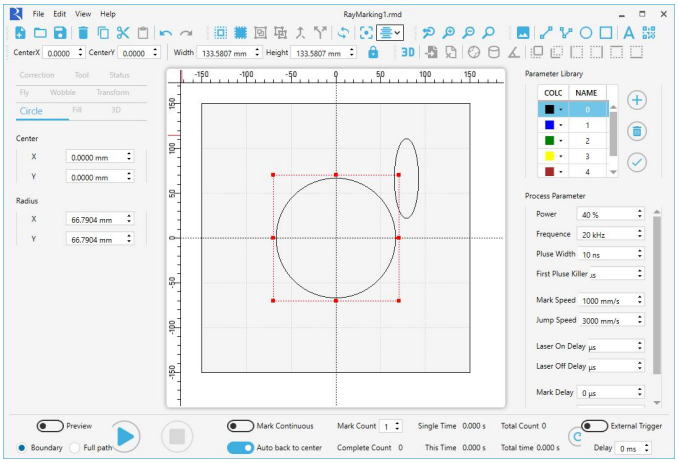


3）Circle

Click the “Circle” button in the drawing toolbar, determine a corner of the circumscribed rectangle at the starting point of the drawing area, drag it to the end point and release it to complete the drawing of the circle.

If a perfect circle is required, hold down the Ctrl key and perform the operation.

Select the drawn circle and adjust the coordinates of the center point and the radius in the X and Y directions on the "Circle" tab on the left.

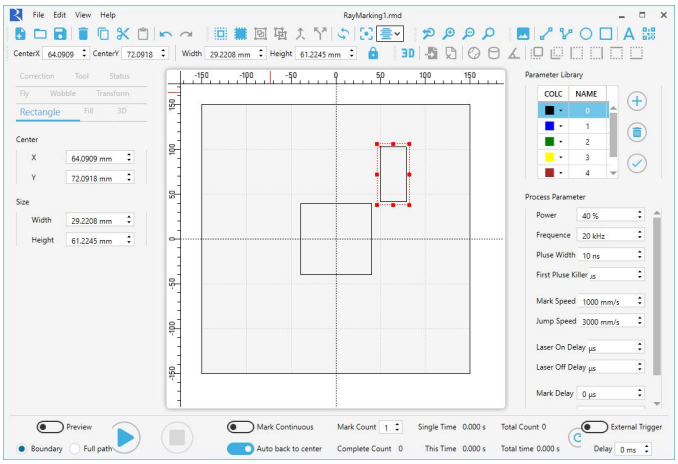


4）Rectangle

Click the “Rectangle” button in the drawing toolbar, determine a corner of the rectangle at the starting point of the drawing area, drag it to the end point and release it to complete the drawing of the rectangle.

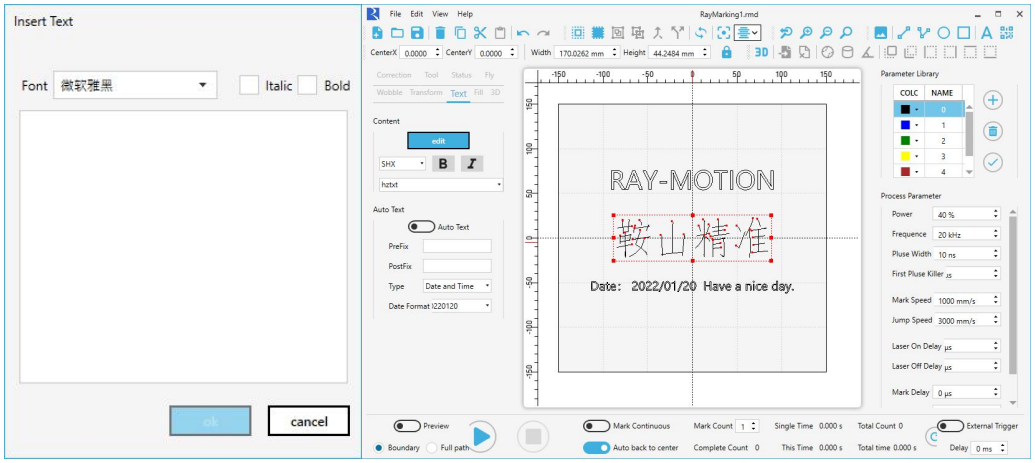
If a square is required, hold down the Ctrl key and perform the operation.

Select the drawn rectangle, and adjust the coordinates of the center point and the length and width in the "Rectangle" tab on the left.



5）Text

Click the “Text” button in the drawing toolbar, complete the settings of the document in the window and click OK, and then click the left button in the drawing area to complete the creation of the graph.



If you need to modify the text, select and execute it in the "Text" tab on the left.

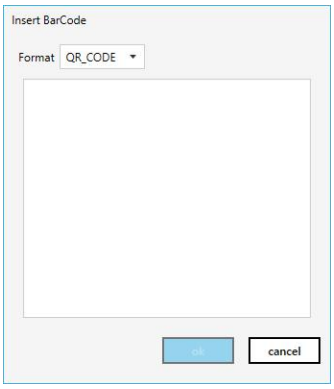
“Edit” button to re-edit the text content.

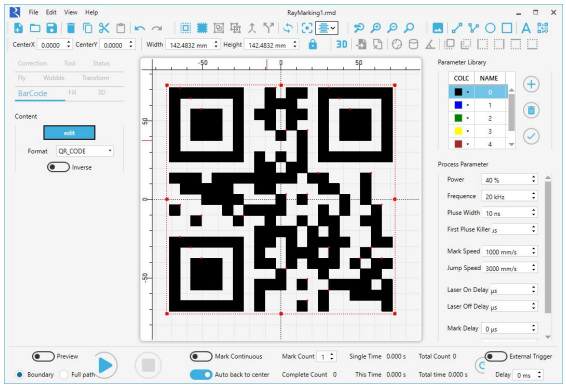
There are two types of fonts: TTF and SHX. TTF is consistent with the system font library, and SHX is the CAD preset font. If the selected font library does not include the entered text, it will display an error or disappear。

Auto text is activated to automatically add the system time or date. Format, prefix and postfix can be set.

6）BarCode

Click the “BarCode” button in the drawing tool, select the coding form and fill in the content, and click the drawing area to complete the production after confirmation.

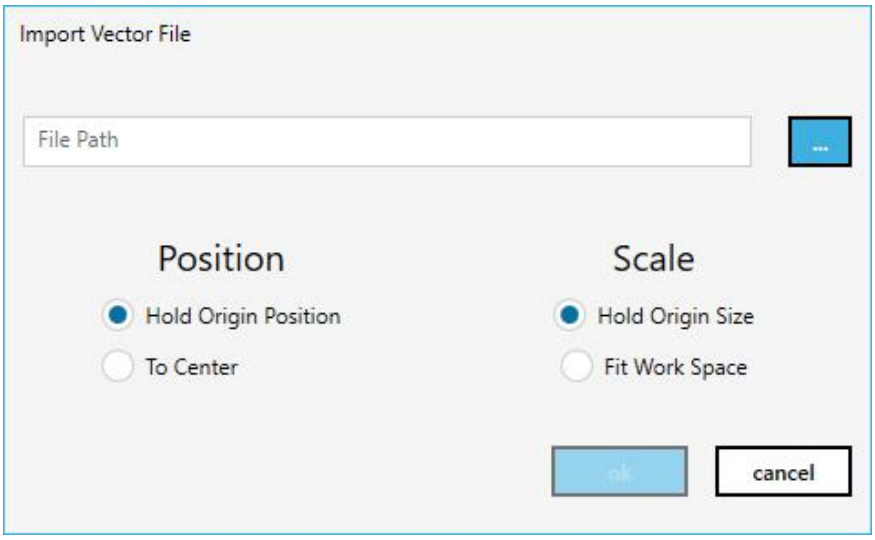




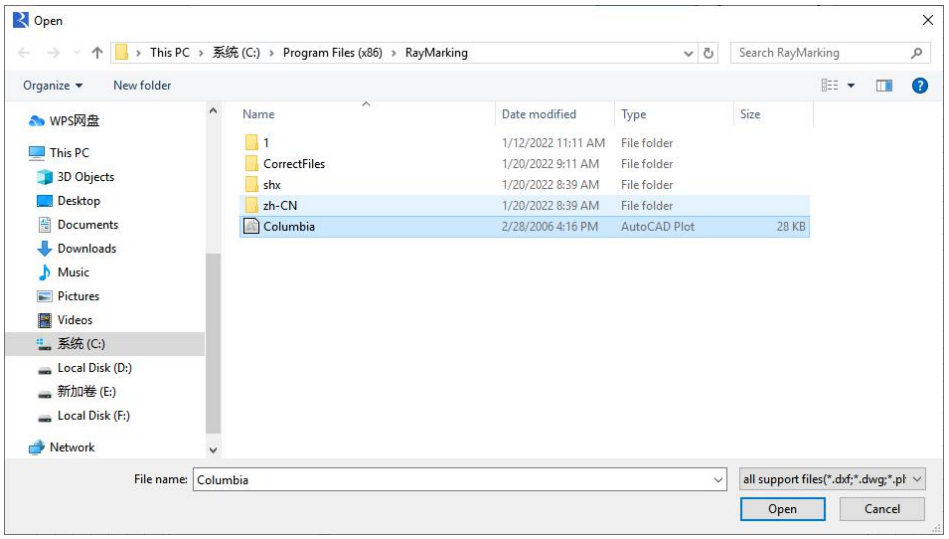
The arcode can be re-edited. Content and code system needs to match.

4.3.2 Import Vector File

1）Select “File” - “Import Vector File” in the menu bar, or directly click the “Vector File” button in the drawing toolbar to open the import vector file window.

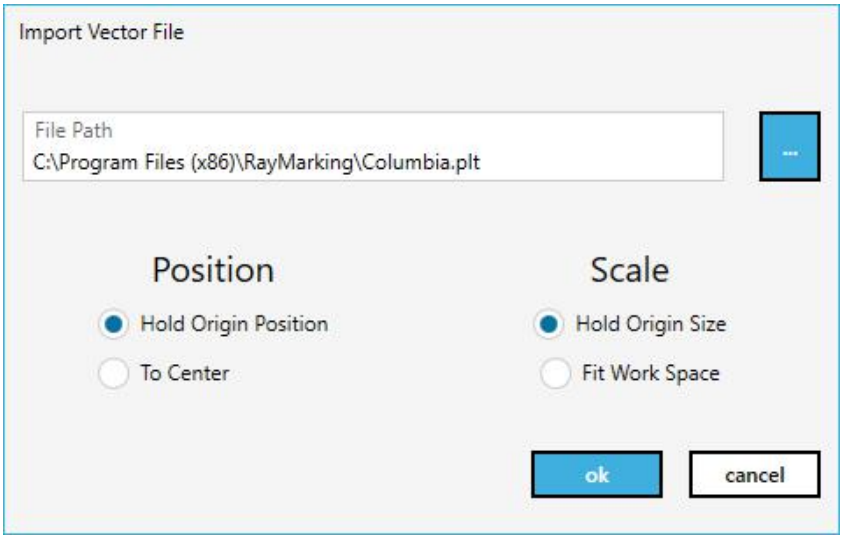


2) Click the blue button on the right side of "File Path" to open the file path index, go to the file path and select the file to be imported, and click "Open".



3) Select the desired position, scale options and click the "OK" button to complete the

4) import of the vector file.



Position：

Hold origin Position：Maintain element position in drawings.

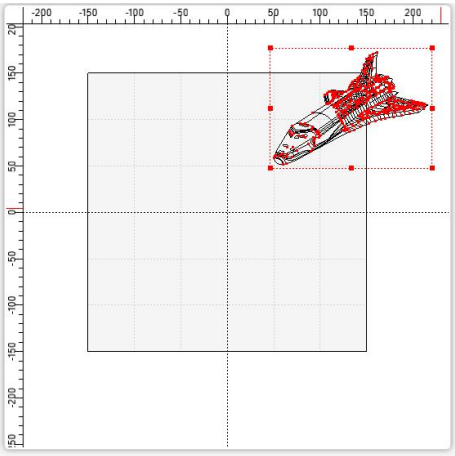
To Center：Centers the element center into the workspace.

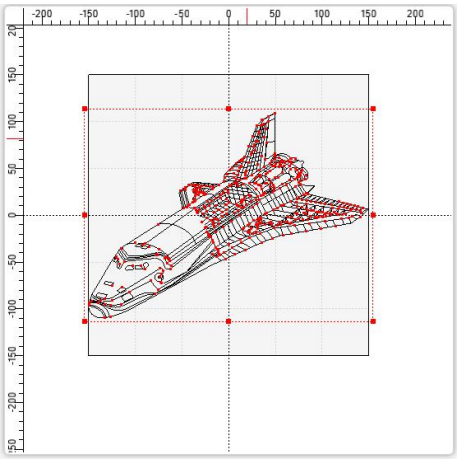
Scale：

Hold origin Size：Import with original drawing size.

Fit Work Space：Full-scale scaling based on workspace size.

The specific effect is as follows, the left picture is the original position and the original size, the right side is centered and adapted to the work area.





4.3.3 Select and cancel

There are four ways to select primitives:

① Left-click directly, when a red dotted rectangle appears on the outer frame of the primitive, it means that it has been selected.

② Frame selection from left to right, only when the entire element is framed will it be selected.

③ Frame selection from right to left, when any part of the element is framed, it will be selected.

④ Right-clicking in the drawing area will display the options of select all and inverse selection, or select the "select all" and "inverse selection" buttons in the editing toolbar. Select all will select all elements in the page, and inverse selection will select all elements except those already selected.

Clicking on an empty space in the drawing area will cancel the selection.

4.3.4 Move

There are three ways to move:

① After the graphic element has been selected, the mouse icon will turn into a cross arrow after moving the mouse into the red dotted rectangle, and you can move it by dragging.。

② When the element has been selected, you can use the "Move" function in the "Transform" tab on the left, set the displacement amount and click the corresponding direction to move。

③ When an element has been selected, pressing the arrow keys on the keyboard will move the element in the direction. The amount of displacement is related to the parameter of the Move function in the Variation tab on the left.。

4.3.5 Rotate

When the element has been selected, the "Rotate" function in the "Transform" tab on the left can set the rotation amount. Click the “Clockwise” or “Anticlockwise” button to rotate by a predetermined value according to the set direction.

4.3.6 Scaling

When the graphic element has been selected, the graphics can be expanded and retracted through the red dotted rectangle that appears in the outer frame of the graphic element, and the red dot can be directly dragged with the mouse.

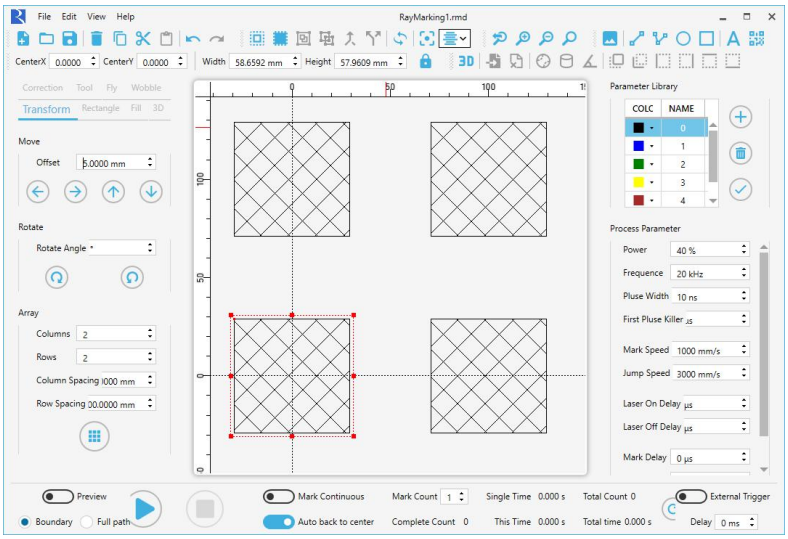
When the element has been selected, the length and width of the element can also be directly defined in the outline toolbar.

The default is to lock the ratio of length and width. If you need non-proportional scaling during the operation, click "Keep Ratio" in the outline toolbar to turn off this state.

4.3.7 Array

The array function can copy the selected primitives and place them in a rectangular array with a set length and width.

When the element has been selected, fill in the number of rows, columns and corresponding spacing in the "Array" function in the "Change" tab on the left, and click the Array button to complete the operation.



4.3.8 Copy, Cut and Paste

Copy: You can right-click to select “copy”, "Ctrl + C" on the keyboard, or directly click the "Copy" button in the basic toolbar when the element has been selected. The copied element will not disappear, but copying it again will remove the previous copy.

Cut: You can right-click to cut or directly click the "Cut" button in the basic toolbar when the element has been selected.

Paste: You can restore the previously copied or cut primitives by right-clicking and pasting, "Ctrl+V" or directly clicking the "Paste" button in the basic toolbar.

4.3.9 To center and Alignment

1）To Center: Clicking the "To Center" button in the editing toolbar.

2）Alignment: Select the alignment operation of the corresponding primitive by clicking the "Alignment" button in the editing toolbar. There are six alignment methods.

4.3.10 Group, Ungroup, Combine, Split

When two or more primitives have been selected, the primitives can be processed into one primitive by right-clicking and clicking the "Group" and "Combine" buttons in the group, merge or editing toolbar for convenient operation.

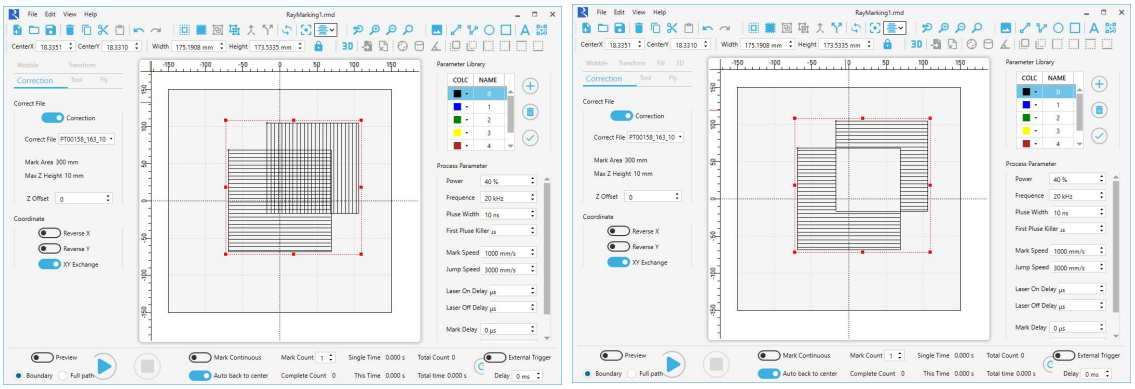
When the complete grouping or merging of primitives has been selected, right-click to ungroup, split, or click the "Ungroup" and "Split" buttons in the editing toolbar to restore the primitives to an independent state.

The difference between Group and Combine:：

1）Group: Into a primitive group, an independent individual or a whole with a fixed relative position.

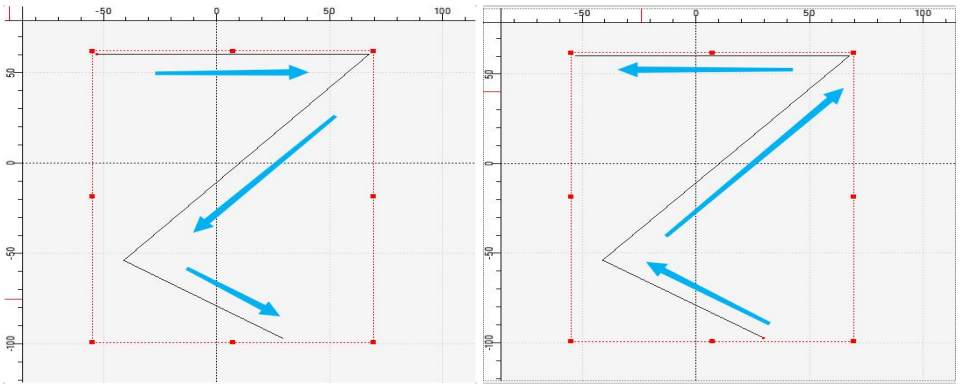
2）Combine: Into one primitive and become a unique individual。

Combine will affect the filling result of primitives. When adding filling, the position of the overlapping part will be "empty". For details of filling content, please refer to “chapter 4.3.13”.



4.3.11 Reverse

The laser processing process completed by the laser galvo is directional, so there is a red dot at the starting point in the primitive. If you want to reverse the processing direction, you can click "Reverse" in the editing toolbar when the primitive has been selected.



4.3.12 New, Open, Save, SaveAs

In the menu bar file options, you can perform operations such as New, Open, Save, Save As, etc.。

1）Save: The previous file will be overwritten. If it has not been saved before, it will be the same as “SaveAs”.

2）SaveAs: Save the file and give the file a new name, the path and name can be chosen by yourself.

3）New: If there is nothing or it has been saved, create a new blank file, otherwise it is the same as the save operation.

4）Open: Find the required file in the corresponding path and click to open.

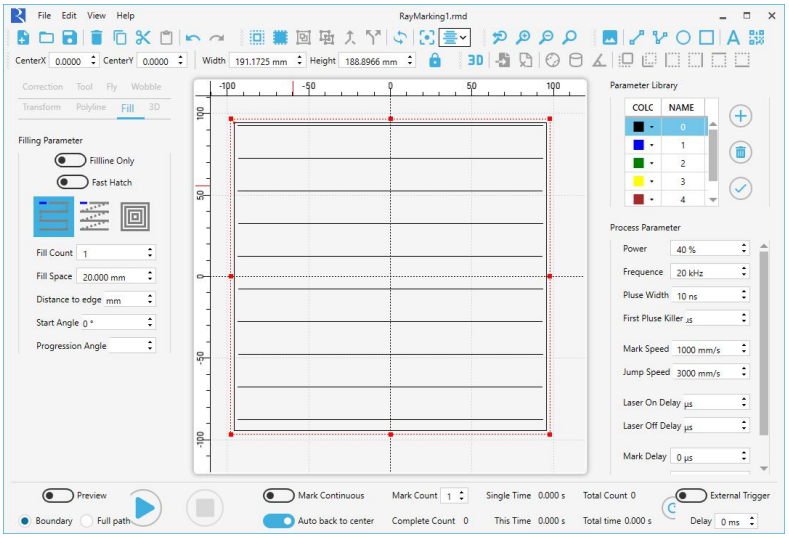
4.3.13 Fill Tab

This tab is only available on closed elements.

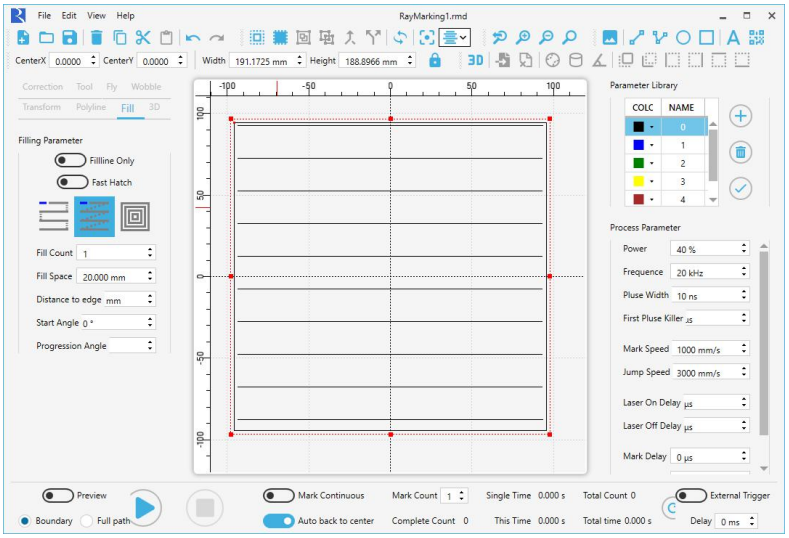
1）Fill line Only: Only fill lines are marked, no outline lines are marked.

2）Fast Hatch: The bow fill will be done with one power on command,may be accompanied by additional fill lines.

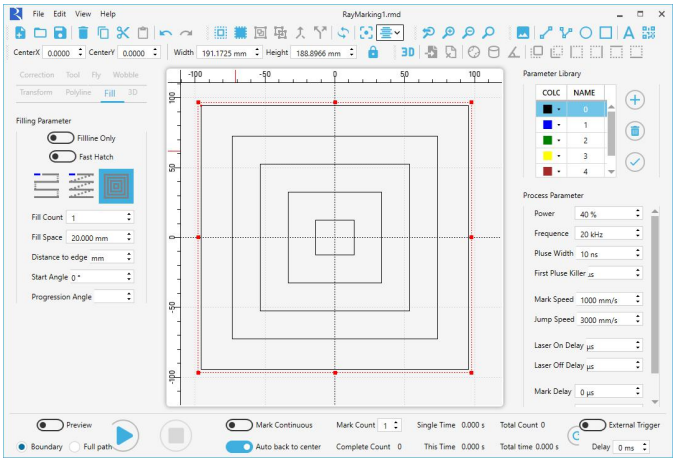
3）Bow Fill: Make the fill in a bow motion, filling adjacent lines always in the opposite direction.



4）Z Filling: Make the fill in a Z-shaped motion, and the line direction of the same filling is always the same.

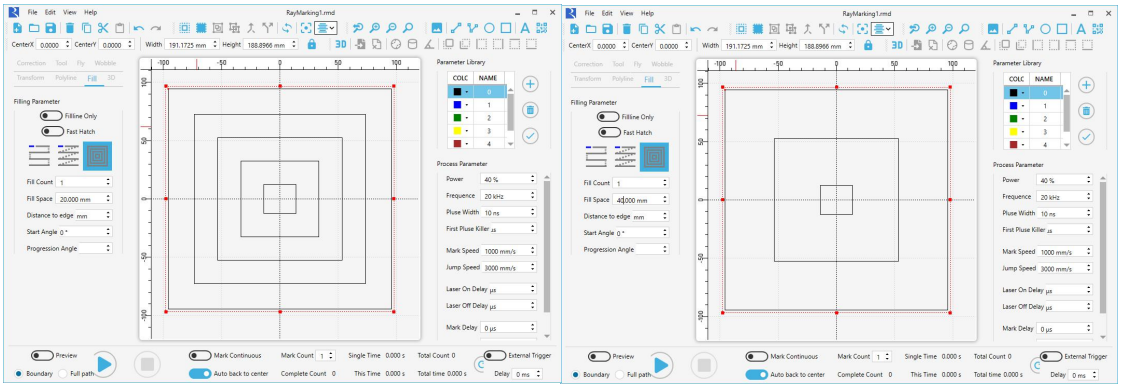


5）Rectangular-ambulatory-plane Filling: Make the fill in a rectangular-ambulatory-plane motion.

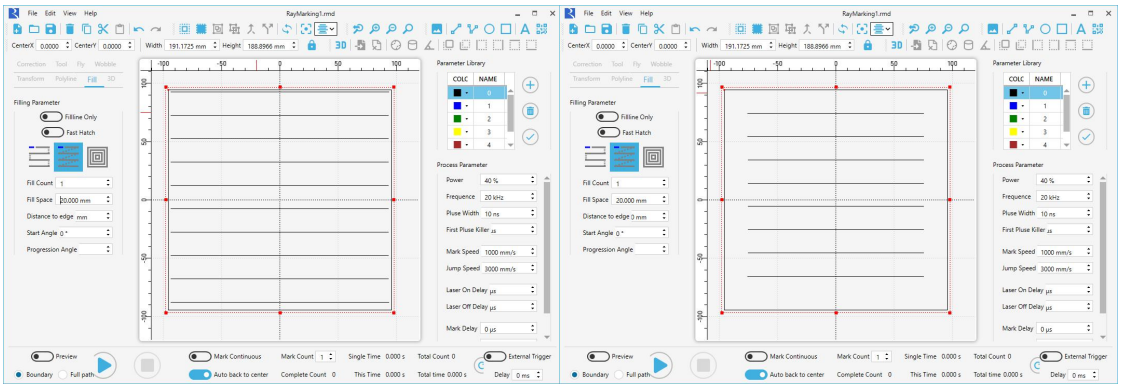


6） Fill Count: Represents the number of fill lines, generally used in conjunction with “Start Angle” and “Progression Angle”.Generally used with starting angle and progressive angle.

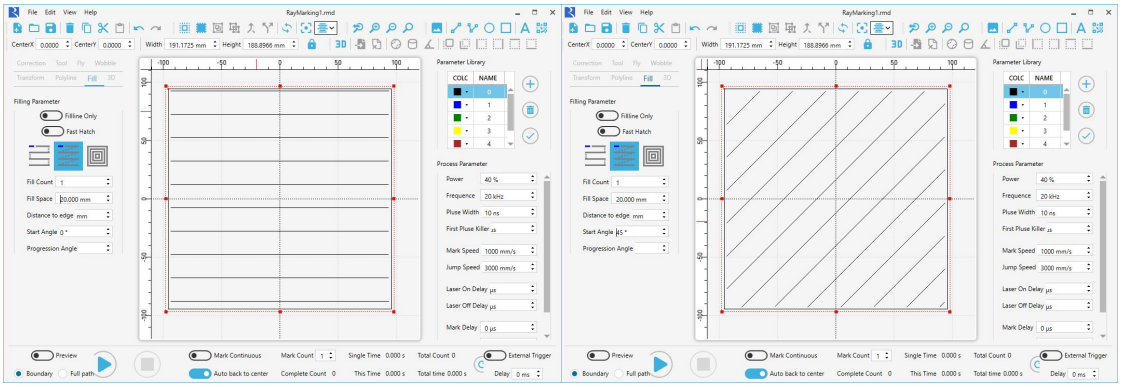
7）Fill Space：Set the distance between fill lines.



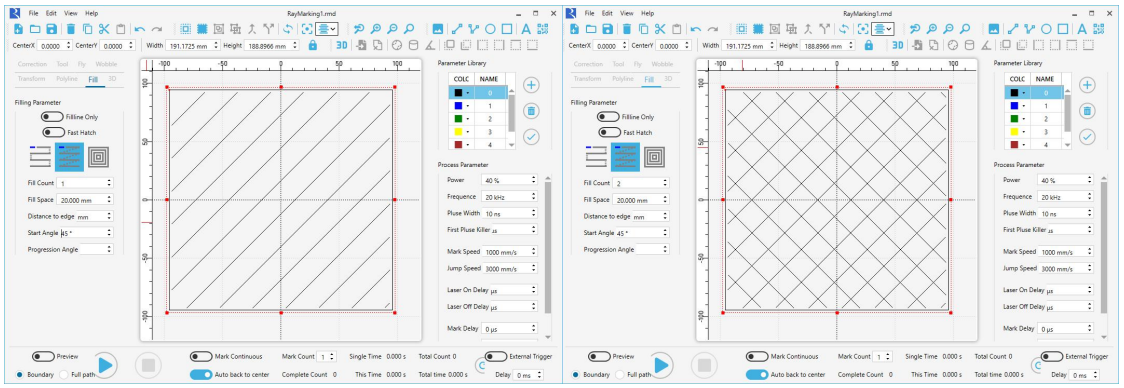
8）Distance to edge: Set the distance between the fill line and the box.



9）Start Angle: Set the start angle deflection of the filled line.



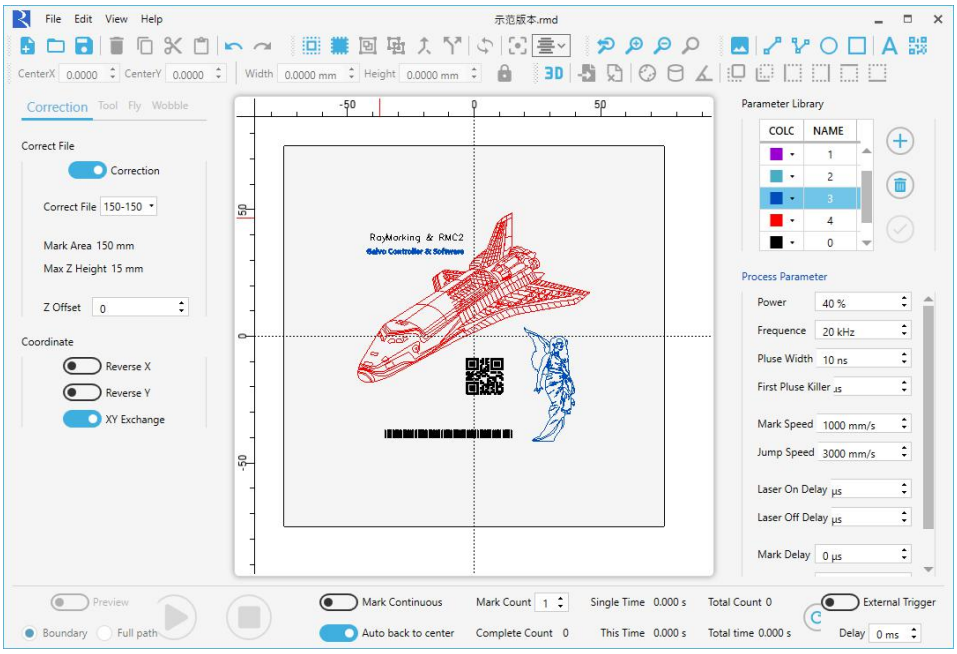
10）Progression Angle: Sets the angle that the line direction of the next fill needs to be changed after a fill, Only when the number of times is two or more.



4.4 Parameter adjustment

4.4.1 Parameter Library

RayMarking has a parameter library on the right side of the interface, you can set the parameters and distinguish them in the drawing area with different colors.



1）Picking: In the parameter library list, click the left button to select a parameter group, and the scroll bar on the right can drop down to display the hidden parameter group. Modifications to the processing parameters below will be automatically saved to the corresponding parameter group.

2）Color: The color in front of the parameter group can be selected from the drop-down list triggered by clicking the left button.

3）Name: The name of the parameter group defaults to the number from the number, and the name can be modified by double-clicking the number.

4）New/Delete: "New" and "Delete" buttons on the right can add and delete groups。

5）Apply: Click the "Apply" button to the right of the parameter table to apply the current parameter group and color to the selected element。

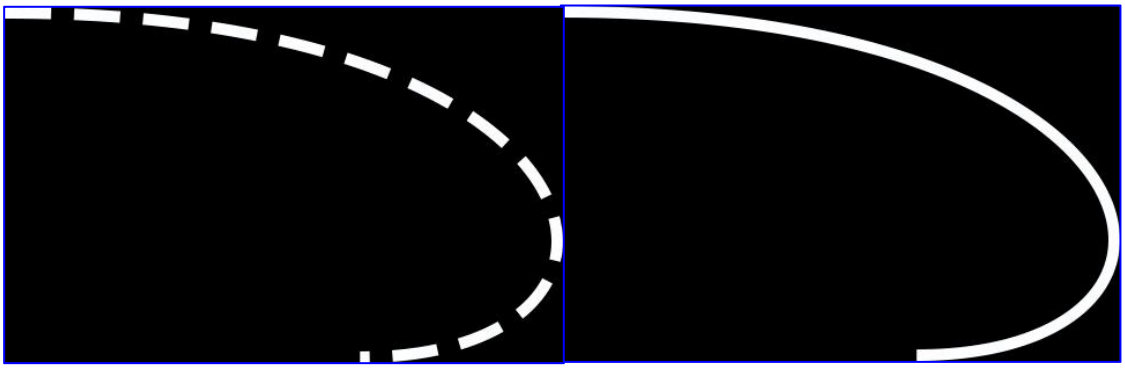
4.4.2 Power

Used to set the laser output power. The larger the value, the greater the laser output. You can set it according to the actual needs.

4.4.3 Frequency

sed to set the pulse repetition rate (PRR) of the laser output.

If the frequency is low and the marking speed is fast, the laser break point will be more obvious; otherwise, the connection will be tight.



4.4.4 Pluse Width

Used to set the pulse width of the MOPA laser. This parameter will affect the applicable range of the frequency parameter.

The higher the pulse width, the stronger the laser output energy per unit time, but it is not an absolute factor.

4.4.5 First Pluse Killer

Used to set the first pulse suppression value for some lasers.

4.4.6 Mark Speed

Used to set the speed of laser processing, which has an absolute influence on the processing time of primitives.

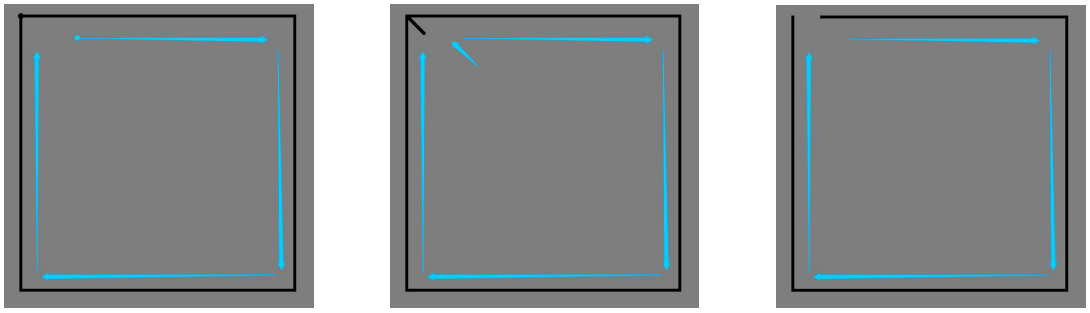
4.4.7 Jump Speed

Used to set the speed of the air jump, which has an indirect effect on the processing time of the primitive.

4.4.8 Laser On Delay

After the marking command starts, after this delay time, the laser starts to emit light. (This parameter can be set to a negative value.)

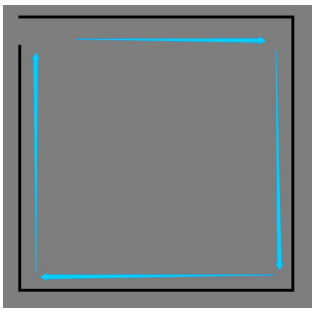
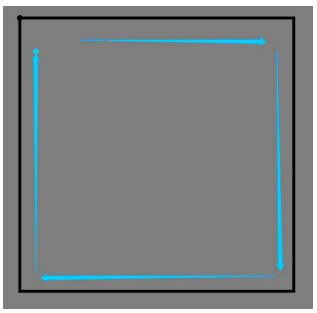
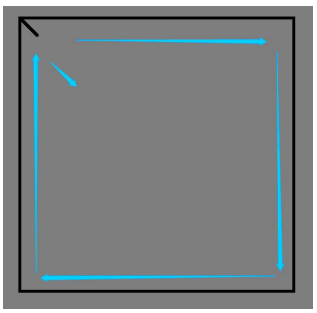
It is generally set at high speed, and added when the laser starting point leads or lags to correct the opening position.When the delay of turning on the laser is positive, the turning on of the light will be delayed, otherwise, it will be advanced. The picture on the far right shows that the graph is not closed due to too large parameters.



4.4.9 Laser Off Delay

After the marking command ends, after this delay time, the laser stops emitting light. (This parameter can only be a positive value.)

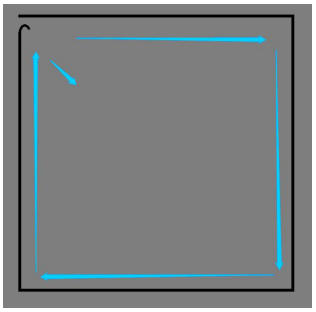
It is generally set at high speed, and added when the laser end point is ahead to correct the light-off position.The two pictures on the right show the over-etching caused by the high delay of turning off the laser.

4.4.10 Mark Delay

After the marking command ends, the next command will only start after this delay time.

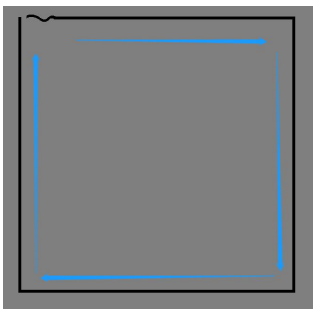
It is used for stability after high-speed marking movement. If the delay is too short, it will cause tailing, and if the delay is too long, it will affect the processing time.



4.4.11 Jump Delay

After the jump instruction ends, the next instruction will only start after this delay time.

It is used for stabilization after high-speed jump movement. Too short delay will cause jitter (overshoot), and too long will affect processing time.

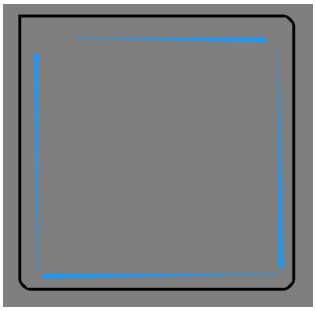


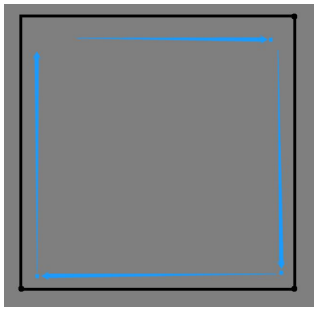
4.4.12 Polygon Delay

When there are multiple marking instructions in succession, this delay will be inserted between every two markings, and the laser will continue to emit light within the delay time.

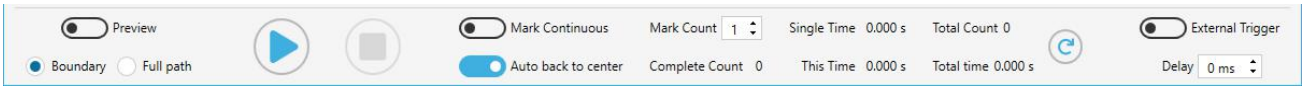
It is used for the stabilization of high-speed corners (radians), and has a great influence on the processing speed of arcs.

Too short may result in an arc near the corner (left), and too long may result in over-etching at the corner (right).





4.5 Process executes



4.5.1 Preview

Provides a pointing light preview of selected objects.

The “Boundary” represents the smallest enclosing rectangle of the marked object.

The “Full path” represents the entire path of the marked object.

4.5.2 Mark Continuous and Mark Count

If "Marking Continuous" is selected, the marking will not stop after completion, but will repeat the marking process indefinitely until the current marking is stopped.Otherwise, it will execute the marking task for the set number of times.

When continuous marking is turned on, the set marking times will be invalid.

4.5.3 Auto back to center

If "Auto back to center" is selected, after marking stops, the galvo will return to the origin coordinates (0, 0).

4.5.4 Start and Stop

Start Process: After this button is pressed, the processing process will start, and if the laser is turned on, the laser will be output.

Stop Process: Used to stop the current processing.

4.5.5 Results show

Total Count: Displays the number of markings completed.

Single Time: Displays the time taken for a single marking process.

This Time: Display the total time spent since the start of this processing.

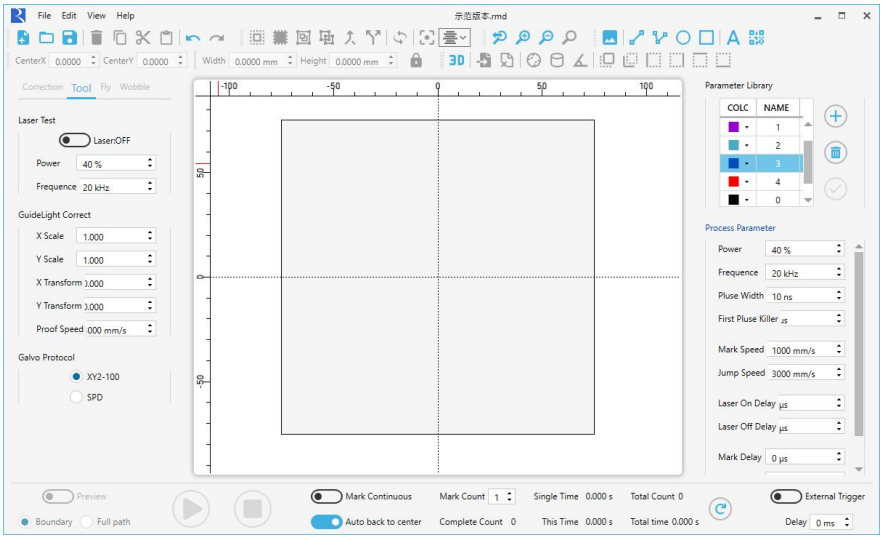
Reset Time: Reset all result display contents to zero, restart accumulation and display.

4.5.6 External Trigger

Used to activate the external trigger function, and can set the delay parameter after the external trigger signal arrives.

For detailed wiring information, please refer to “chapter 1.2”.

4.6 Tool Tab



4.6.1 Laser Test

1）Laser: Used to turn the test laser output on or off. When this switch is turned on, the laser will output the test laser according to the set parameters.

2）Power: Used to set the output power of the test laser, refer to “chapter 4.4.2”.

3）Frequency: Used to set the pulse repetition rate (PRR) of the test laser output, refer to “chapter 4.4.3”.

4.6.2 Guide-Light Correct

1）X、Y Scale: Used to set the scaling of the indicator light in the X and Y directions.

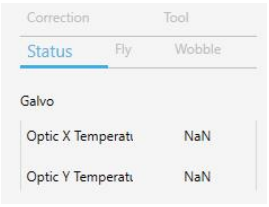
2）X、Y Transform: Used to set the offset of the indicator light in the X and Y directions.

3）Proof Speed: Used to set the scan speed of the preview light.

Attention: After the operation, the element may be out of the marking range of the calibration file, and the path during preview may be incorrect.

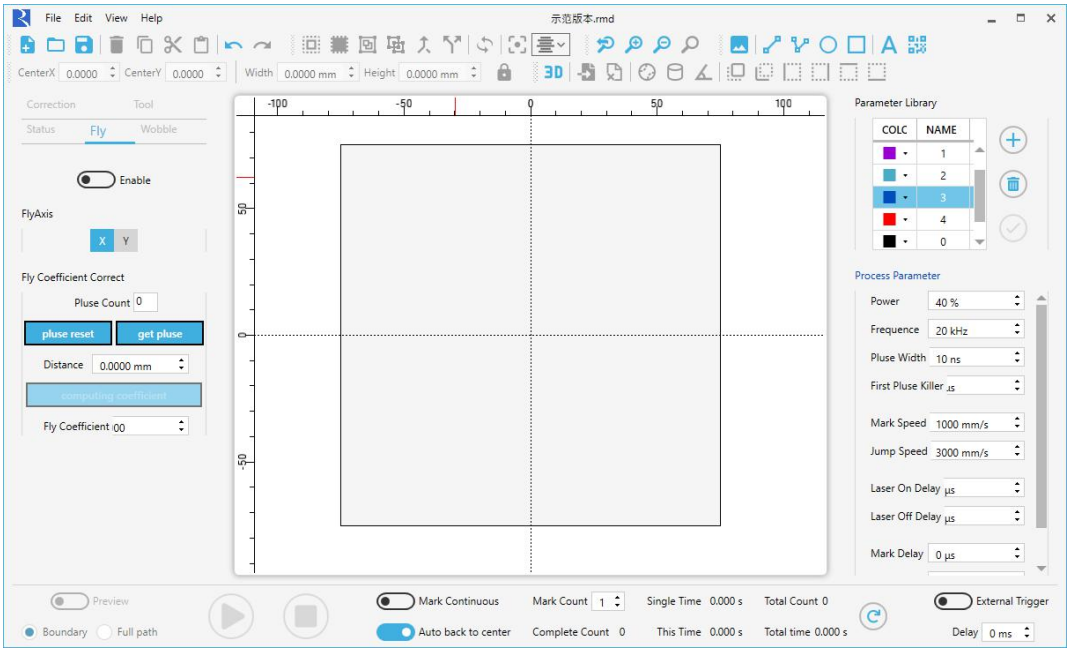
4.6.3 Lens temperature feedback（Galvo Protocol）

SPD：Checking this protocol will pop up a status tab showing X, Y lens temperature. Neutron series only.



4.7 Fly Tab

Used to make various settings for Marking-on-the-fly.



1）Enable: Used to enable MOTF function.

2）FlyAxis: Used to set the direction of travel of the conveyor belt.

3）Flight Coefficient Correct: Used to calibrate the flight coefficient, which directly affects the effect of flight marking。

①Pluse Count

Click "get pluse" to get the number of pulses output by the encoder during a period of time when the conveyor belt is running.

Click "pulse reset" to reset the pulse count。

②Distance

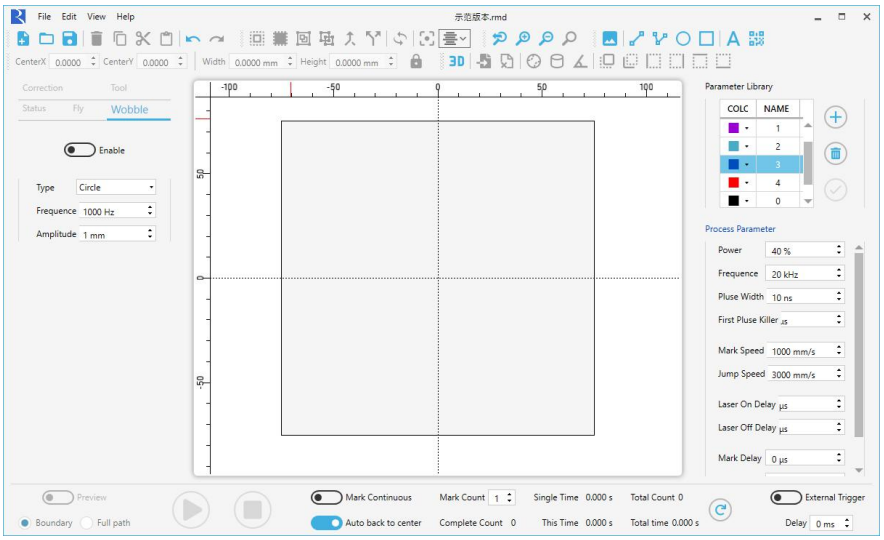
Used to fill in the distance traveled by the conveyor belt.

③Fly Coefficient

Click "computing coefficient" to calculate the flight coefficient according to the obtained encoder pulse number and the distance filled in. This flight coefficient can also be filled in by yourself. Generally, if the flight marking pattern is deformed, it can be solved by fine-tuning left and right on the basis of the calculated flight coefficient.

4.8 Wobble Tab

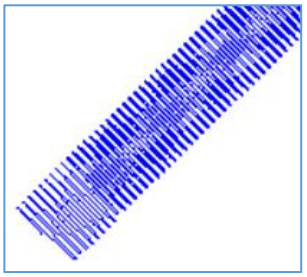
Used to set the Wobble function of the galvanometer, which is generally applicable to the welding field (welding seam widening).



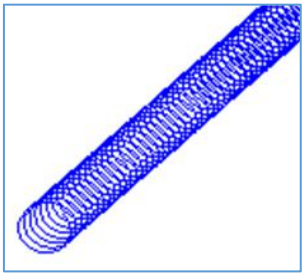
1）Enable: Used to turn on the Wobble function.

2）Type: Four types of Wobble types are available, each type is shown as follows：

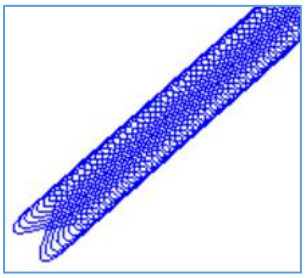
Line：



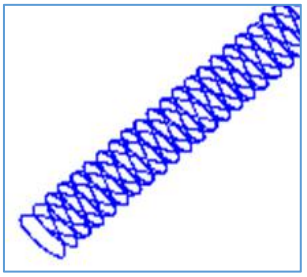
Circle：



Eight：



Infinity：



3）Frequency: Used to set the number of cycles per second the Wobble oscillates.

4）Amplitude: Used to set the width of the Wobble wiggle.

4.9 Curved surface

4.9.1 Deep Carving

After selecting the drawing element in the drawing area, the 3D tab appears on the left side. Checking the Deep Sculpt option in the 3D mode will set the currently selected drawing element to Deep Sculpt mode, and the parameters for the Process Height and Focus Down Per Processing will appear below.

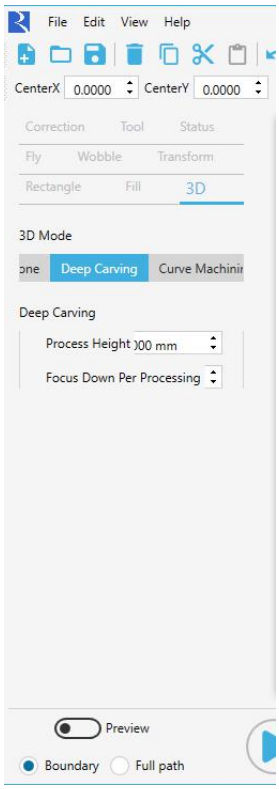
Process Height: Total change in focal length of the process.

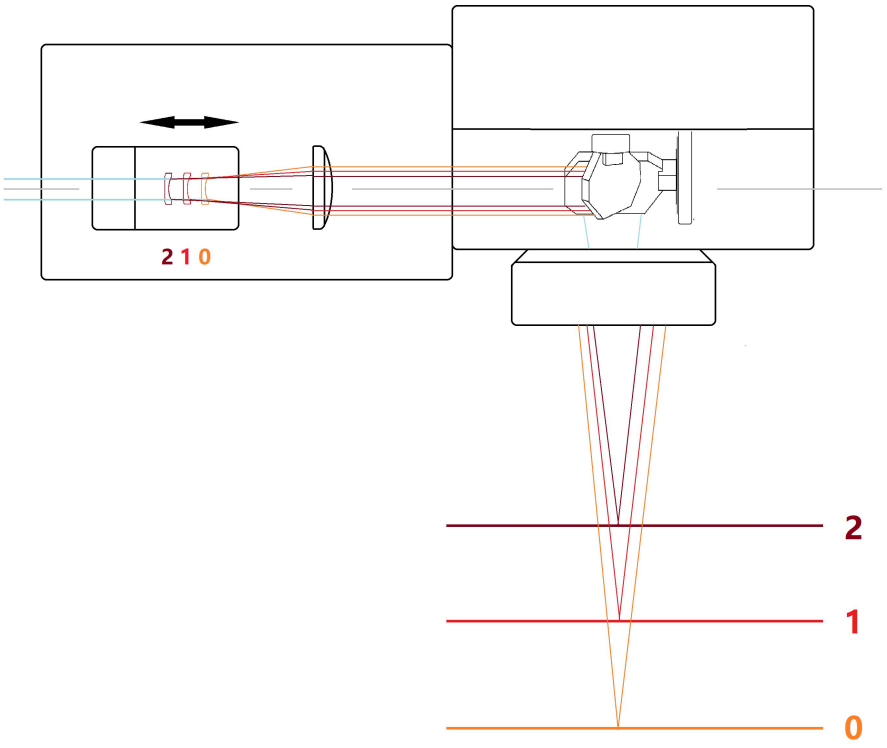
Focus Down Per Processing: Focal height to be changed for each completed layer.

Deep Carving is based on the focal length, and the focal length is shortened by adjusting the dynamic axis position.

The following figure is an example: after the device is powered up, the plane where the focal length located is Position 0. After setting the "Process Height" parameter, the dynamic axis position will be changed and the focal length will be set to Position 2. After that, setting the parameter "Focus Down Per Processing" will generate multiple parallel Position 1 to achieve layer by layer engraving.

No need to adjust the height of the oscillator throughout this process.





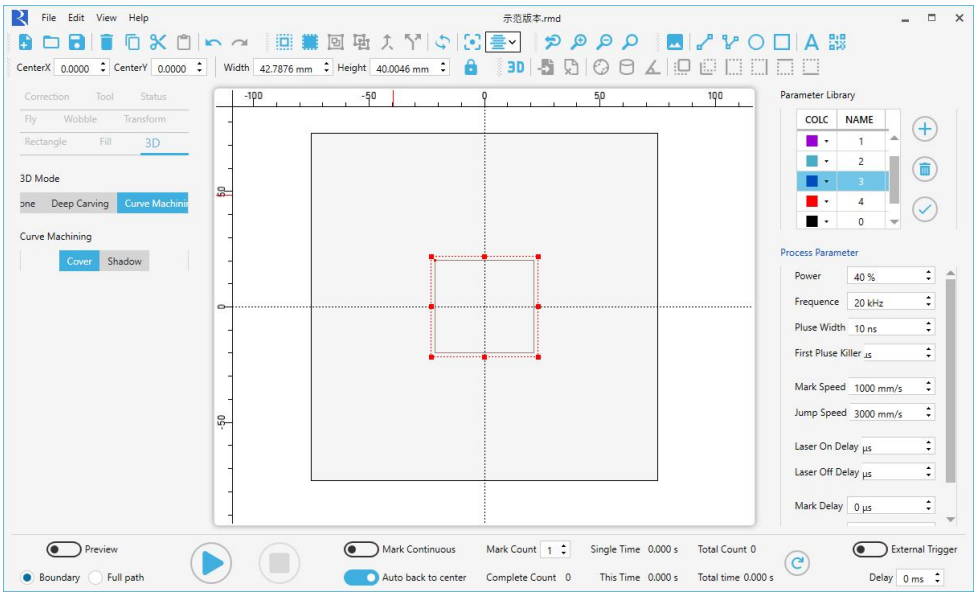
Attention!

All drawing elements can have parameters in the 3D tab, and the 3D tab will only appear if a single drawing element is selected. If you need to do 3D engraving of multiple elements at once, you can choose to merge, group and then set parameters or set each element individually.

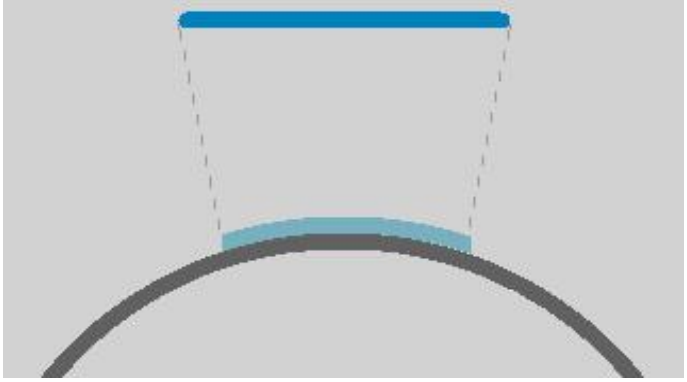
4.9.2 Curve Machining

1) 3D Tab

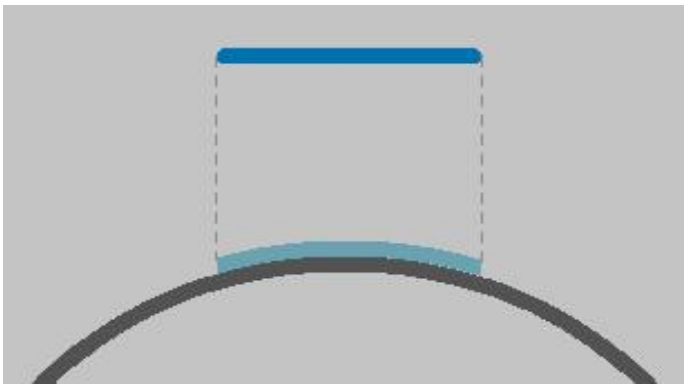
After selecting the drawing element in the drawing area, the 3D Tab appears on the left side. Selecting the surface sculpting option in 3D mode will set the currently selected drawing to surface sculpting mode, and the options for Cover and Shadow will appear.



Cover: Deform the graphic element into a shape that fits the surface of the target and covers it with the target, as shown below.



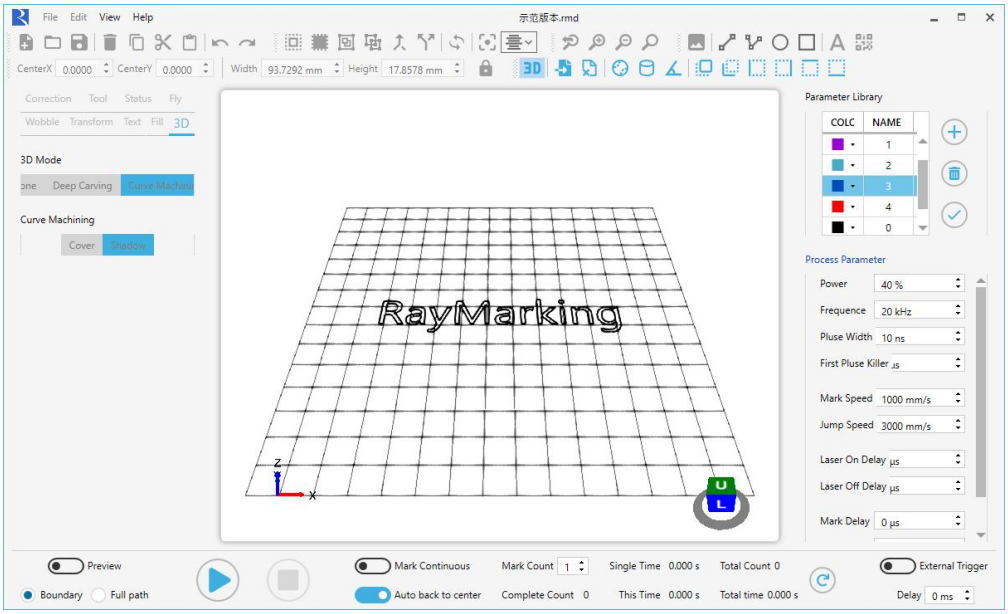
Shadow: Projecting the shape of the figure element vertically onto the external surface of the target object.



2）3D mode and 3D toolbar

After you have finished setting the mode for surface engraving in the 3D tab, you also need to apply the drawing elements in the 3D view (each time you make changes to the mode or the dimension and position of the drawing elements, you need to enter the 3D view again to complete the drawing element application).

The 3D view allows you to set the surface environment in which the engraving task will be processed.



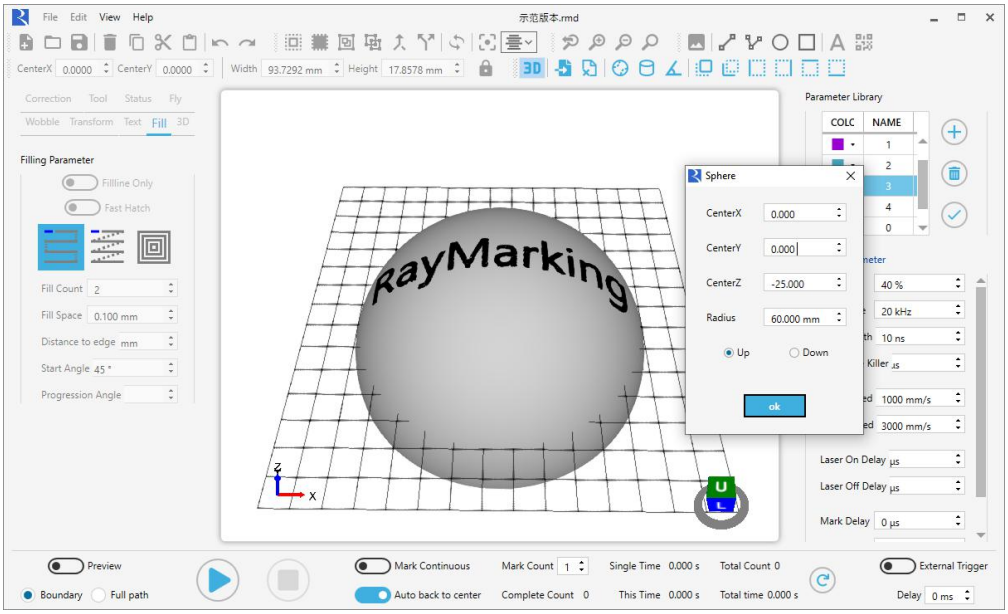
① View angle operation: Hold down the right button in the drawing area and drag to make the view angle rotate, or click the view button on the right side of the 3D toolbar.

② 3D view switch: Turning it on will turn off most of the functions of the software, while turning on other functions of the 3D toolbar.

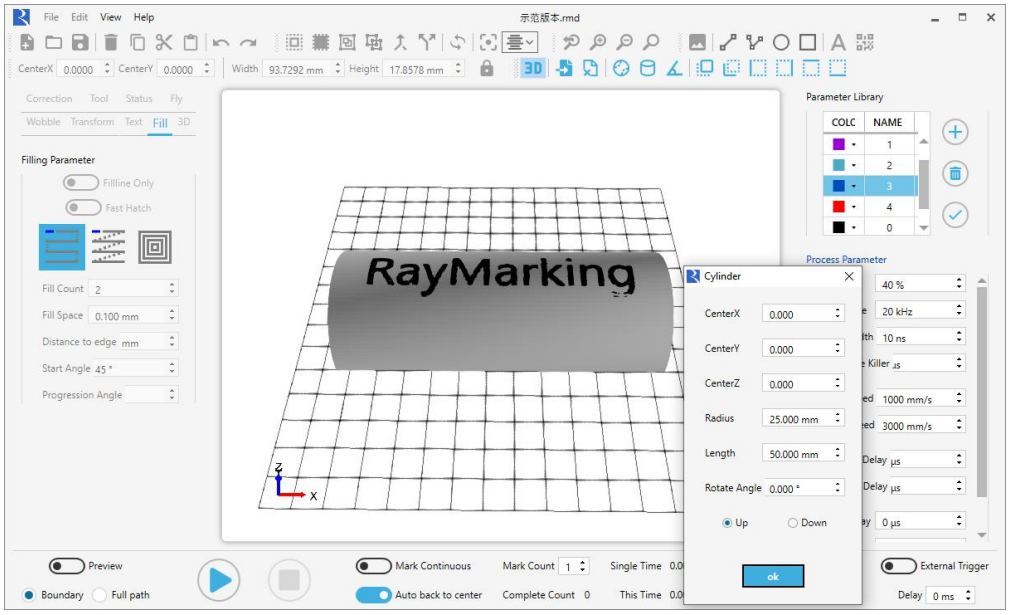
③ Import model: You can import 3D files in STL format to simulate surface models.

④ Delete: Delete the set surface model.

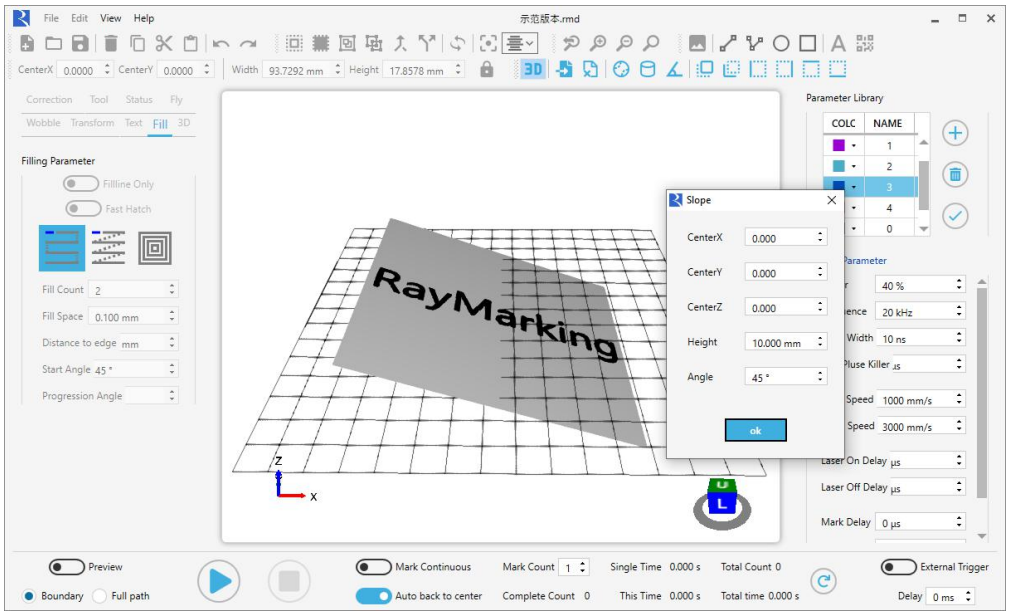
⑤ Sphere: Creates a hemispherical surface with the ability to set the center position, radius, and upper and lower hemispheres.



⑥ Cylindrical: Creates a hemispherical surface with the ability to set the cylinder rotation angle, position, radius, and length.



⑦ Bevel: Create a bevel, you can set the tilt angle, bevel rectangle side length (height) and position.



Attention!

The same settings as in the figure above on this page will cause partial focal lengths to cause undesirable results.

The grid plane in the drawing area is the limit of the position that the dynamic axis of the oscillator can reach, i.e. the farthest focal position. The focal lengths of the elements below this plane will be the same as this plane. For normal processing, you can increase the value of "center point Z" to make the target plane higher than the grid plane.

In addition, the surfaces and inclined planes created in the 3D view can be moved in the 3-axis direction, but cannot be rotated. The orientation problem can be solved by rotating the elements.

3) Surface positioning: In principle, the creation of surfaces in the software should be fully consistent with the actual marked surface of the target item, including size, shape, height and other parameters, in order to optimize the marking effect.

5. Safty

Caution: Laser beams are hazardous to humans.

The laser can cause serious damage to the eyes and skin, make sure the wiring of the equipment is correct and protective equipment is worn before use. Users must be trained such as laser safety.

Before running the program, ensure that RayMarking, RMC2, scanning galvo and the laser are in a stable state, otherwise the reliability and safety of the entire processing operation cannot be guaranteed.

The correct shutdown sequence will help improve the stability of the software and the laser. Please confirm that the laser is turned off in the software after each processing is completed, and the software can be turned off when the laser is stopped.

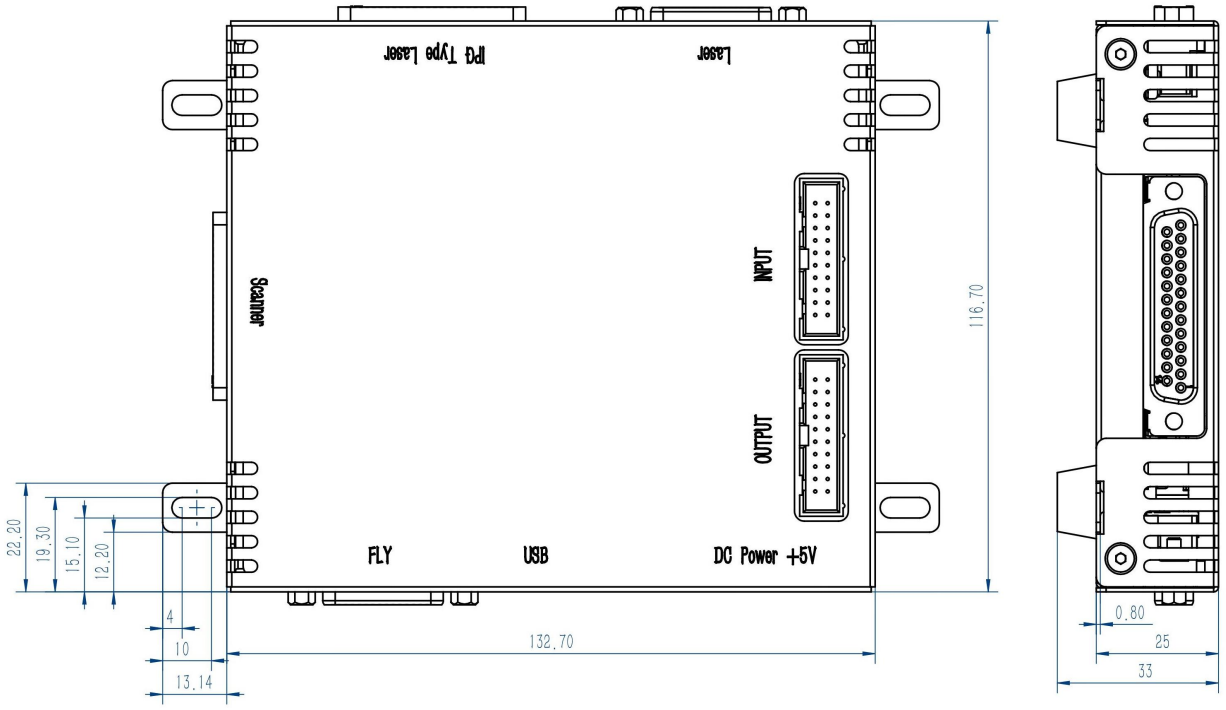
In case of sudden software problems, it can be reinstalled by itself when the laser is disconnected, so as to prevent the galvo or the laser from obtaining wrong instructions.

Please do not disassemble and repair the RMC2 by yourself if there is an unexpected problem, you should obtain our technical support as soon as possible after the power is cut off.

Appendix 1 System Type Table

System type	Model
2D Post-Scanner	Atom 10 Series
	Quantum 10 Series
	Quantum 14 Series
	Quantum 20 Series
	Quantum 30 Series
	Neutron 14 Series
	Neutron 20 Series
	Neutron 30 Series
3D Post-Scanner	Proton-BX167 Series
	Proton-BX167FS Ⅱ Series
	Proton-BX185 Series
	Proton-BX200 Series
	Proton-BX200FS Series
	Proton-BX200FS Ⅱ Series
	Proton-BX250 Series
	Proton-BX300 Series
	Proton-BX300FSⅢ Series
2D/3D Pre-Scanner	Proton-TF200 Series
	Proton-TF200FSⅢ Series
	Proton-TF300 Series
	QP20 Series
	NP20 Series
	QP30 Series
	NP30 Series
	QP50 Series

Appendix 2 RMC2 Installation Size Drawing



Appendix 3 Z-axis Position Reference Table

Number	Correction Selection	Filled in Z-axis position	Actual Z-axis position
1	No correction	-65534 ~ -32767	Positive limit value
2		0	Center zero point
3		+32767 ~ +65534	Negative limit value