

According to the scanning requirements, you can choose different laser line modes.

Light Source Mode	Description
50 Lines	50 cross laser lines to scan large objects quickly
7 Lines	7 parallel laser lines to scan fine details
1 Line	A single laser line for deep holes and pocket area scanning

❖ Object

It supports scanning of both normal objects and reflective objects. When scanning reflective objects, select **Reflective** to improve the scanning effect.

❖ Outdoor Mode

To scan normally in the glare environment such as outdoors.

Caution

Please avoid direct sunlight when scanning objects.

⌚ Data Quality Indicator

Differentiating scan quality in colors: blue represents high-quality scanned data and yellow represents insufficient scanned data that requires further scanning. Insufficiently scanned data may disappear or become anomalous after editing.

Note

This function is not available for scanning in scan markers mode or photogrammetry mode.



☁ Scan in Point Cloud

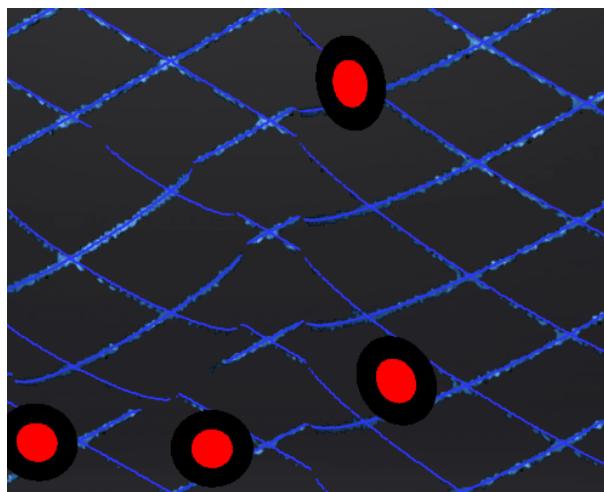
After enabling the **Scan in Point Cloud**, the point cloud data will be displayed during the scanning process, thereby reducing GPU memory consumption.

Note

- Mesh data will be displayed after pausing the scanning whether this mode is enabled or not.
- You can switch another scan mode when only global markers data is present or after all data is cleared.
- Scan modes cannot be switched during pre-scanning, the scanning process, or when data present in the scene.
- Projects within the same project group can adopt different states: Project A within the group can have this mode enabled, while Project B can have it disabled.
- This function is only supported by **Scan Mesh** mode and **Partial HD Scanning** mode.

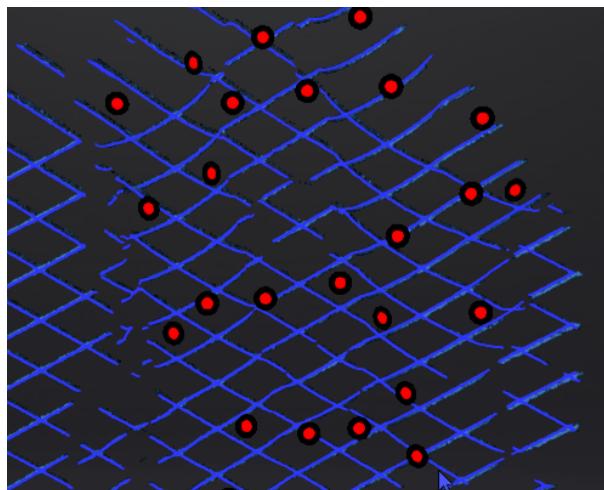
⊕ Local Enlarged View

When the function is enabled, the scanning interface only displays the local perspective of the scanned object, which can be used for supplementary scanning of small holes.



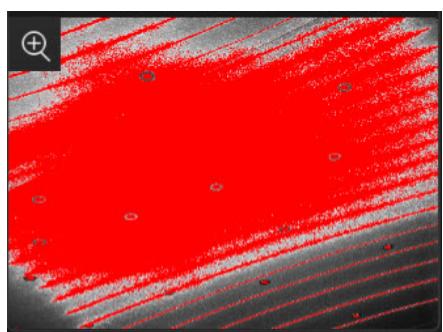
🔒 View Lock

The object view will be locked during scanning and not follow the scanning path, when the function is enabled.

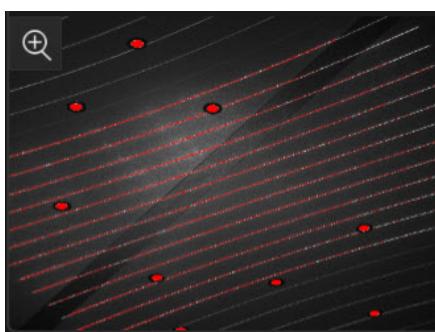


☀️ Brightness

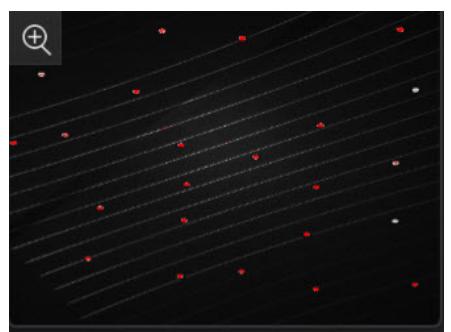
For objects of different materials and colors, adjust the brightness of the scanner to scan better.



Too Bright



Proper



Too Dark

Scanning

Preview / Start scan / Pause scan

You can switch in these 3 status with the trigger on the scanner, or click the button in the software. The normal order is: **Preview(optional) > Scan > Pause**.

Function	Icon	Instruction
Preview (optional)		Preview and adjust the scan parameters for better scanning effects. You can open/close the function in > General Setting .
Start Scan		Click to scan. During scanning, keep the scanner parallel to the surface, keep a proper distance from the object, and adjust the brightness depending on the ambient light or texture of the object.
Pause Scan		Edit the scan data or change the view angle after pausing.

Caution

- Please hold the scanner upright to start to preview / scan.
- When performing a scan, please ensure that there is sufficient VRAM (video random access memory) to prevent any scanning abnormalities or issues.
- When scanning for details or small holes, scan as close as possible to the object.

Generate Data

After completing the scanning, you can [edit the data](#), [align the data](#), or [optimize the data](#).

Data Editing

To edit the scanned data when you pause or finish scanning.

Edit Toolbar

When you pause or finish the scanning, you can use the following tools to edit the scanned data.



Icon	Function	Instruction
	Perspective View	The object appears larger when closer, and smaller when farther away, which is consistent with the rule of normal human eyes to observe the 3D world. You can click this button to switch to orthogonal view.
	Orthogonal View	The object does not appear larger when closer, and smaller when farther away; Also known as "isometric view", the size of the object displayed in the view is independent of the current viewpoint distance; You can click this button to switch to perspective view.
	Multi View	6 different view angles to choose.
	Cutting Plane	Create a plane to do quick cut. For more, see Cutting plane .

Icon	Function	Instruction
	Data Editing	Edit the selected data. Click  again will toggle the editing mode.
	Edit Markers	Select the data area and the markers in this area will be shown in red. The red markers can be edited at this time.

Icon	Function	Description
	Select Visible	To select data on the front view only.
	Select Through	The surface data and the interior data can be selected at the same time.

Icon	Function	Instruction
	Rectangular	Select / Deselect a rectangular area. The selected area is displayed in red.
	Polygon	Select / Deselect a polygon area.
	Lasso	Select / Deselect the area bu using the Lasso tool.
	Straight Line	Hold down <code>Shift</code> + <code>Left Button</code> and move the cursor to draw a straight line to select/deselect the area.
	Brush	Hold down <code>Shift</code> + <code>Left Button</code> and a red circle will appear. At this time, roll the mouse wheel will zoom in and out of the circle. Move the red circle to select/deselect the area to be edited.
	Select All	Select all the data.
	Unselect	Cancel all selected areas.
	Connected Domain	Click the button after selecting a patch of data and all connected region to the selected data will be picked.
	Invert	Revert the selection.
	Delete Selected Data	Delete selected data.

Icon	Function	Instruction
	Undo	The last deletion will be undone. You can click multiple times to undo multiple deleted data.
	Redo	Redo the previous action. You can click multiple times to redo multiple actions.
	Cancel Edit	Undo all edits, and exit the edit mode.
	Apply Edit	Click the button or space bar to apply the edit, and exit the edit mode.

Caution

Once the edit has been applied, the original state cannot be restored, but only by reloading the file.

Shortcut

Shortcut	Function
Press and hold the and move the cursor	Rotate the data
Press and hold the and move the cursor	Translate the data
Hold down +	Select the area of data
Hold down +	Deselect the area of data
Scroll Wheel	Zoom in / Zoom out the data
	Apply the edit
	Delete the selected data

Context Menu

Function	Description
Select All / Invert / Unselect / Delete Selected Data	The function is the same as the function on editing bar, and can be operated by shortcut keys.
Fitting View	The data on the interface is displayed in the center according to the appropriate size.
Connected Domain / Select Through / Select Visible	For more, see Edit Toolbar .
Switching the Display Type	You can select different display types(triangles, wireframe, point cloud data as well as triangles and wireframes) and the data display mode of the 3D scene will change synchronously after switching.
Set Rotate Center	The rotation center can be set on the data by the left mouse button.
Reset Rotate Center	After reset, the center of rotation is at the data center.

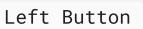
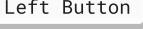
Cutting Plane

Remove the base data from the whole scanned data by creating a cutting plane.

Creation

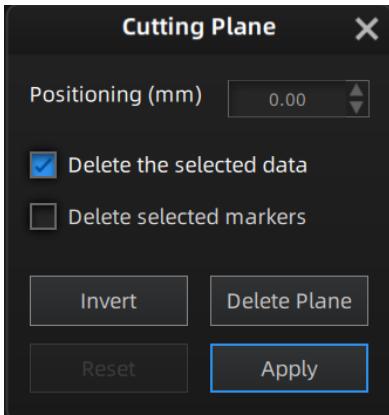
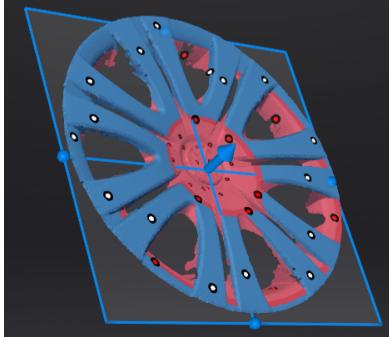
1. Click 

2. Select the creation method and follow the interface prompts to create the cutting plane.

Method	Instruction
Scan Data Fitting	Press  +  to select data, and then click Generate Plane . The direction of the plane will be calculated by the software according to the direction of the data.
Creating Straight Line	Press  +  to draw a line, and generate the cutting plane according to the line.
By Markers	Press  +  to select markers. 3 markers or more are required to generate the cutting plane.

3. Click **Create Plane**.

Settings

Illustration	Instruction
 	<ul style="list-style-type: none">• Delete selected data/markers: Data/Makers in the reverse direction will be shown in red after checking the box. The red data will be deleted after clicking Apply.<ul style="list-style-type: none">• You can not delete all data.• Please keep at least 3 or more markers on the front of the cutting plane.• Invert: Inverse the normal direction of the cutting plane.• Delete Plane: Delete the created cutting plane.• Reset: Reset all operations after creating the cutting plane.• Apply: Apply all edits.• Positioning: After generating the plane, fill in a number in the positioning box or drag the cutting plane normal arrow  to translate the cutting plane.• Rotate the cutting plane: Cutting plane can be rotated around the axis by dragging the blue ball .

Functions

You can use the functions of the sidebar both before and after scanning.

Icon	Function	Instruction
	Project Group	To create / open a project group. For more, please refer to Project and Project Group .
	Delete Your Scan	To delete the current data to rescan.
	Align	To align the data as you need. For more, see Align .
	Export the Scan	 : To save the scanned data in the specified format (ASC, STL, P3, OBJ, PLY, 3MF) locally.  : If you have installed the EXModel and you are in the scan interface with mesh data, click  to switch to the EXModel and import the data into it.
	Mesh Optimization (Laser Mode)	To do mesh optimization and mesh processing . This function is recommended if you scan the mesh data without scanning global markers first. This process will improve the overall accuracy of the mesh data, but may take a longer time.
	Mesh Processing	To do mesh processing . This function is recommended if you scan the mesh data with scanning global markers first.

Alignment

This part introduces how you can align multiple projects in one project group.

Click  on the right side of the interface to enter the project alignment interface.

Mode	Description	Note
	<ol style="list-style-type: none"> 1. Choose Auto Feature Alignment. 2. Select the project to be aligned in the fixed window and the floated window. 3. Click Apply to align them. 	Objects with repeated features, like a round or a ring, or that with small size are not suitable for this mode.
	<ol style="list-style-type: none"> 1. Choose Manual Feature Alignment. 2. Manually choose at least 3 common feature points on the data in the fixed window and the floated window respectively. 3. Click Apply to align them. 	The chosen points should not be in a line.
	<ol style="list-style-type: none"> 1. Choose By Markers. 2. Select the project to be aligned in the fixed window and the floated window. 3. Click Apply to align them. 	The two projects should have at least 3 markers in common.
	<ol style="list-style-type: none"> 1. Choose Manual Markers Alignment. 2. Select the project to be aligned in the fixed window and the floated window. 3. Manually choose at least 3 common markers on the data in the fixed window and the floated window respectively. 4. Click Apply to align them. 	The chosen markers should not be in a line.

Button	Description	Button	Description
Apply	To apply the alignment.	Next	To merge the aligned projects into one group. After merging, you can continue to align the group data with other projects.
Cancel	To undo the alignment.	Exit	To exit the alignment interface.

Note

Manual alignment serves as an alternative method of auto alignment. You can choose it when auto alignment fails.

Post Processing

Mesh Optimization

The data after mesh can be directly used for rendering, measurement or printing.

Mesh Parameter

Choose different mesh types according to the reality.

Icon	Name	Description
	Unwatertight Model	For models with unclosed holes, use this mesh type to keep the original state with less meshing time.
	Semi-watertight Model	To fill the holes automatically.
	Watertight Model	To fill all holes automatically. The data can be 3D printed directly.

Note

If there are some data scanned in the **Partial HD Scanning** mode, **Semi-watertight Model** and **Watertight Model** are disabled when meshing the data.

Options

Optimization

Optimize the data and improve the clarity of the data. The higher the level, the less the small details.

- None: No optimization.
- Standard: Optimizes data slightly and preserves data characteristics.
- Med: Reduce the noise on the surface of the scan data.

- **High:** Reduce the noise on the surface of the scan data and make the data smoother.

Smooth

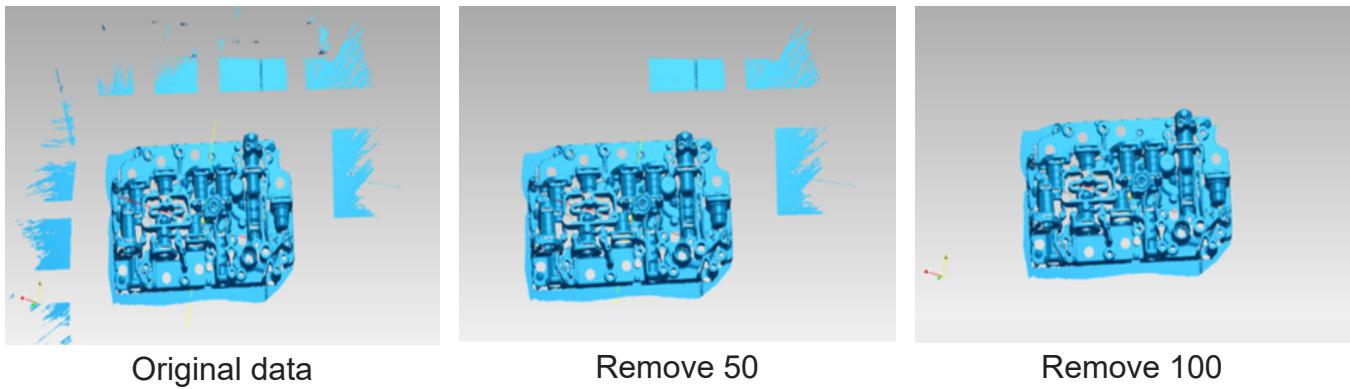
Smooth the possible noise on the surface of the scan data.

Caution

When the **Optimization** is set to **None**, the **Smooth** is not available.

Remove Small Floating Parts

Remove small floating parts on the model.



Max Triangles

Set max plate number to get mesh model's triangle plate number is within configured plate number.

Fill Small Hole

Auto fill the small hole with a perimeter less than or equal to 10 mm (by default). You can set the hole-filling perimeter.

Remove Spike

Remove spike-like data on the image edge.

Markers Hole Filling

Fill the surface holes on an object that were not scanned due to being occluded by markers.

Recommended Parameters

When turning on, it will automatically use the recommended parameters for meshing.

Mesh Editing

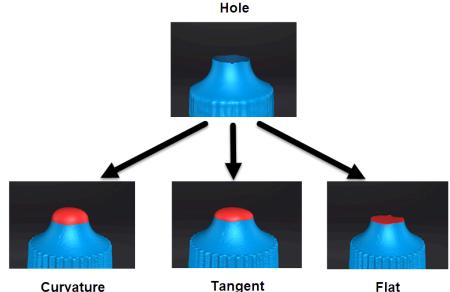
After the model data is meshed, the software automatically switches to the post-processing interface.

Alternatively, users can directly click on the navigation bar to enter the post-processing interface and import the data.

Left Panel

Click **+** to check the function.

Function	Instruction	Note
Simplification	After simplification, the polygon numbers, file size and detail of data will be reduced universally. Set the ratio from 0 to 99 and the default is 0.	The result will not be added by multiple operations on Simplification .
Mesh optimization	It can optimize the quality of the data by adding more triangles to curvature regions. Set the ratio from 0 to 100 and the default is 0.	/
Smooth	Smooth the possible noise on the surface of the scan data. Set the ratio from 0 to 100 and the default is 0.	It might remove some small details or smooth some sharp edges at the same time.
Remove Small Floating Parts	Remove small floating parts which are not connected to the main data. The maximum value is the square of the diagonal length of the floating part/10, $MAX=(L/10)^2$. Set the ratio from 0 to 100 and the default is 0.	The result will not be added by multiple operations on Remove Small Floating Parts .

Function	Instruction	Note
Auto Hole Filling	Automatically fill all holes with a smaller perimeter than the number input.	Filling type: 
Manual Hole Filling	Choose the filling type and click the holes to be filled. The hole edges are shown in green and the holes get red after filling.	/
Cutting Plane Tool	Define a plane by drawing a straight line. Delete the selection and close the mesh at the intersection. Use the cutting plane to align the mesh to the CSYS.	/

Note

When performing hole filling operations, you can first delete the neighboring areas by setting it to optimize the final hole filling effect. The larger the value set for the deletion neighborhood, the more data will be deleted at the edge of the hole.

Bottom Panel



For more details, please refer to [Data Editing](#).

Right Panel

Icon	Function	Description
	Open File	To open a file (STL, OBJ, PLY) for post-processing.
	Export the Scan	<p></p> <p>: To save the scanned data in the specified format (ASC, STL, OBJ, PLY, 3MF) locally.</p> <p></p> <p>: If you have installed the EXModel and you are in the post-processing or measurement interface with mesh data, click to switch to the EXModel and import the data into it.</p>
	Share Your Scan	To use your Sketchfab account to share the model.
	Third-party Software	To open the third-party software .
	Model Display	<p>After clicking or press , the model will be displayed in rotation, and the rotation speed can be adjusted by clicking . Press again or to exit the model display interface. The model is only displayed in a clockwise rotation at the current viewing angle. If you need to display other angles, please exit and adjust the display angle in the post-processing interface.</p>

Measurement

Measurement

When you complete the whole scanning, you can click on the corresponding position in the navigation bar to switch to the measurement interface where you can perform operations such as [creating features](#), [alignment](#), and [measurements](#).

Note

- On the **Measurement** interface, you can use [multi view](#).
- On the **Measurement** interface, you can operate by [right mouse button](#) and [shortcuts](#).

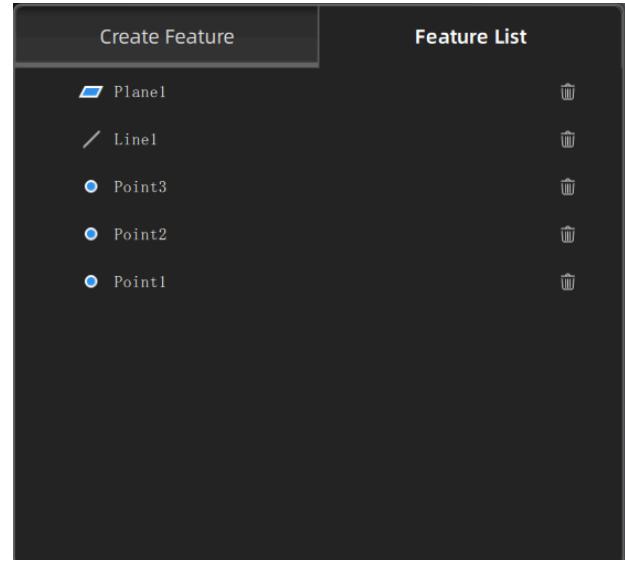
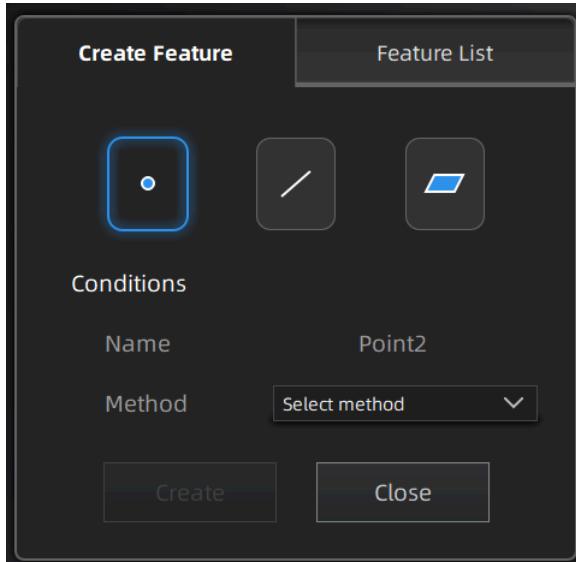
Additionally, it also supports clicking in the right-side function bar to import models (including third-party 3D models).

Note

- Support opening files in the type of STL, OBJ, PLY, P3, ASC, TXT and DGM.
- Support dragging the model file into the software interface.

Create Features

Click  to display the menu of creating features. To close the menu, please click the icon again, or click **Close**.



Note

You can switch to **Feature List** to check the created features; you can also click  to delete features.

Feature Point

Creation Method	Description	Note
Selected Points	<ol style="list-style-type: none"> 1. Click the data to select the point. 2. Click Create to create a feature point. 	/
Markers	<ol style="list-style-type: none"> 1. Click existing markers to select the point. 2. Click Create to create a feature point. 	You can select markers to create feature points for model data that only have markers and are not meshed yet.
Line-Plane Intersection	<ol style="list-style-type: none"> 1. Click the existing feature lines or choose lines in the drop-down list. 2. Click the existing feature planes or choose planes in the drop-down list. 3. Click Create to create feature points. 	<ul style="list-style-type: none"> • The feature line can't be in the feature plane. • The feature line can't be parallel with the feature plane.



Feature Line

Creation Method	Description	Note
Point-Point	<ol style="list-style-type: none"> 1. Click the data or existing feature points to select the point. 2. Click Create to create a line. 	You can tick the checkbox before From or to and re-select the feature points.
Marker to Marker	<ol style="list-style-type: none"> 1. Click two existing markers. 2. Click Create to create a line. 	<ul style="list-style-type: none"> • You can select this mode to create a feature line for model data that only have markers and are not meshed yet. • You can tick the checkbox before From or to and re-select the feature points.
Plane-Plane Intersection	<ol style="list-style-type: none"> 1. Click existing feature planes or choose planes in the drop-down list. 2. After selecting two planes, click Create to create an intersection of two non-parallel planes. 	<ul style="list-style-type: none"> • Create two feature planes in advance. • The feature planes can't be parallel to each other.



Feature Plane

Creation Method	Description	Note
3 Points Fit	<ol style="list-style-type: none"> 1. Click the data or existing feature points to select the point. 2. Click Create to create a plane. 	<ul style="list-style-type: none"> • The three points can't be in a line. • You can tick the checkbox before the three points and re-select the point.
Point-Line Fit	<ol style="list-style-type: none"> 1. Click existing feature lines or choose lines in the drop-down list. 2. Click the data or existing feature points to select the point. 3. Click Create to create a plane. 	The point can't be in the line.
Best Fit	<p>When there are selected data, click Create to create a plane that has the smallest deviation from the selected area.</p>	/
	<p> Note</p> <p>You can use editing tools or shortcuts to select the data.</p>	
Three Markers	<ol style="list-style-type: none"> 1. Click the data or existing markers to select the point. 2. Click Create to create a plane. 	<ul style="list-style-type: none"> • You can select this mode to create a feature plane for model data that only have markers and are not meshed yet. • The three markers can't be in a line. • You can tick the checkbox before the three points and re-select the point.
Markers Point-Line Fit	<ol style="list-style-type: none"> 1. Click existing feature lines or choose lines in the drop-down list. 2. Click the existing marker to select the point. 3. Click Create to create a plane. 	<ul style="list-style-type: none"> • You can select this mode to create a feature plane for model data that only have markers and are not meshed yet. • The feature point can't be in the feature line.
Markers Best Fit	<p>When there are selected markers (≥ 3), click Create to create a plane that has the smallest deviation from the selected area.</p>	<p>You can select this mode to create a feature plane for model data that only have markers and are not meshed yet.</p>
	<p> Note</p> <p>You can use editing tools or shortcuts to select the data.</p>	

Align

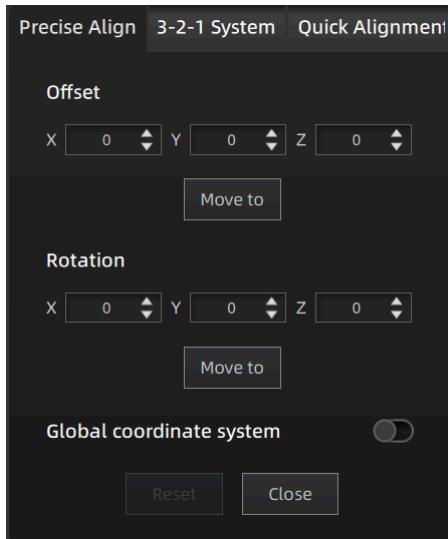
Use this mode to modify the alignment of the data to the global coordinate. This action is useful for post-processing or reverse engineering.

Caution

- The shape and accuracy of the model will not be changed by the alignment.
- After the alignment and exiting, the changes are irreversible so you can only reset the model by reloading the original file.

Click  to enter the alignment interface. Click it again to exit.

Precise Alignment



Click **Move to** to align the model center with the input coordinates, and the axis direction is adjusted to match the input rotation angle.

- **Global coordinate system** (disabled by default and need to be enabled manually)

The coordinate system displayed on the interface is the global coordinate system, in which the direction of the red line is the positive direction of X-axis, green is the positive direction of Y-axis and blue is the positive direction of Z-axis.

- **Adjust coordinates by the object mover tool**

Hover the cursor on object mover tool. Once the object mover tool shines, hold Left Mouse Button or Middle Mouse Button to adjust the position and angle of model.

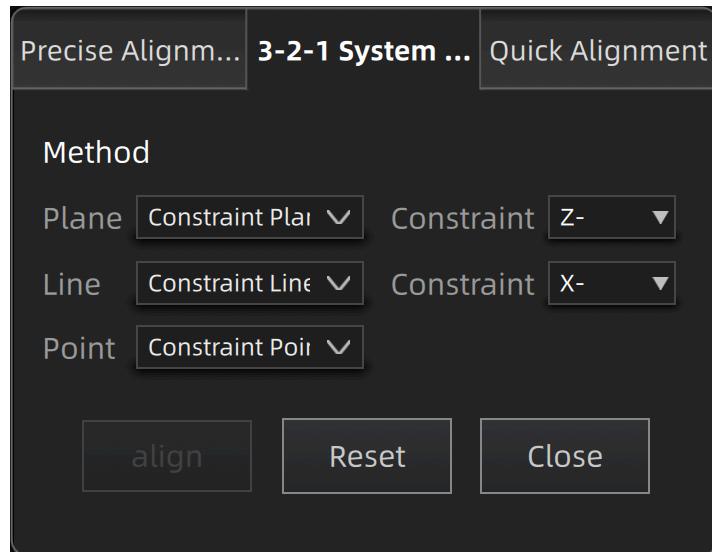
Click **Reset** to cancel all the transformation in the exact alignment interface.

Click **Close** to save the results and exit.

3-2-1 System Alignment

3-2-1 system alignment aligns data by selecting the point, line and plane. Before alignment, create feature points, lines and planes. The feature lines created are not perpendicular to the plane.

The coordinate system on the interface represents the global coordinate system: Red=X+, Green=Y+, Blue=Z+.



- Select a feature surface in the plane drop-down menu, and select an axis in the corresponding constraint drop-down menu of the plane. The arrow on the plane corner indicates the positive direction of the plane, and the selected axis direction will be consistent with the plane direction.
- Select a feature line in the drop-down menu of the line, and select an axis in the drop-down menu of the line. The arrow of the line indicates the positive direction of the line, and the direction of the selected axis will be consistent with the direction of the projection of the line on the selected plane.
- Click the drop-down menu to select a point, the position of this point is the origin of the coordinates (0, 0, 0).

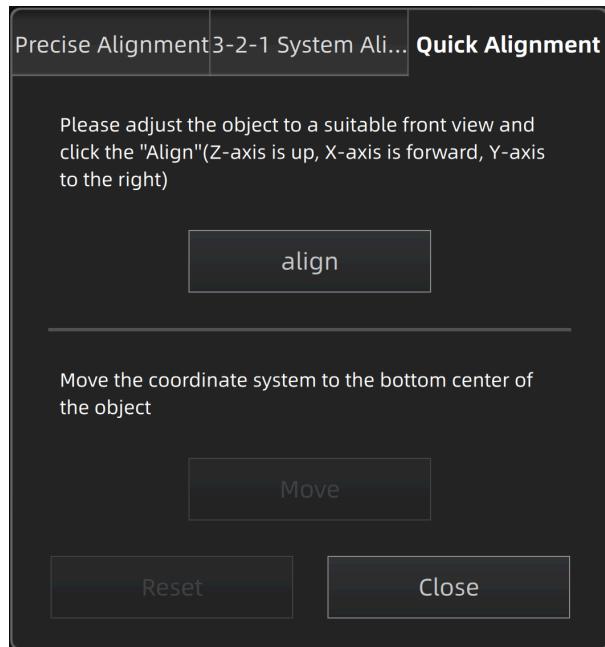
Click **Align** to start the coordinates transformation. When the lines are perpendicular to the plane, the transformation fails, so the alignment fails.

Click **Reset** to cancel all the transformation in the 3-2-1 system alignment interface.

Click **Close** to save the results and exit.

Quick Alignment

The coordinate frame is displayed on the model when the model is rotated to the expected angle.



Click **Align** to move the coordinate frame to the center of the object, and the position of the coordinate frame is that the Z axis is parallel to the screen and faces upward, the X axis is perpendicular to the screen and the Y axis is parallel to the screen and faces to the right.

Click **Move** to move the coordinate frame to the center of the bottom of the object.

Click **Reset** to restore the coordinate frame to its original state (before opening the function).

Click **Close** to apply the adjusted coordinate frame and exit.

Note

If you are not satisfied with the alignment result this time, you can re-adjust the model and perform it again.

Measurement

Click  to enter the measurement interface and the menu is displayed. Click it again to exit.

Measurement	Description	Note
Distance	<p>Calculate the straight-line distance between two points on the surface of the model.</p> <ul style="list-style-type: none"> • Total is the 3D distance. • X, Y and Z are the projection of the segment to the respective planes. 	Click on the surface of the model to pick two points, the calculation will be done automatically.
Surface Area	Calculate the surface area value.	<ul style="list-style-type: none"> • Press <code>Shift + Left Button</code> and move the cursor to select an area • Press <code>Ctrl + Left Button</code> and move the cursor to unselect. • <code>Ctrl + A</code> to select all. • Press <code>Ctrl + C</code> to deselect all the date.
Volume	Calculate the volume of the watertight data .	<p>It returns the volume in mm^3 and the coordinates of the bounding box.</p> <p> Note: Only available for watertight mesh.</p>

Once the measurement is completed, click  to export the measurement result¹ and save it to your computer.

1. By default, the exported file is in TXT format. You can also save it in CSV format. 

Save and Export

Save Data

You can save the scanned data.

Click  >  to select the save path and the file format, enter the file name as well.

Format	Data Type	Saved as	Application
ASC (whole piece)	Optimized cloud points	Scan.asc	<ol style="list-style-type: none"> 1. Check the data; 2. Quick export and no need for post-operation. 3. Use other software to post-possess the data.
STL	Mesh data	Scan.stl	<ol style="list-style-type: none"> 1. 3D printing; 2. Reverse designing; 3. Compatible with most post-processing software.
PLY	Mesh data	Scan.ply	<ol style="list-style-type: none"> 1. Compact size; 2. Easy for texture editing.
OBJ	Mesh data	Scan.obj Scan.jpg Scan.mtl	<ol style="list-style-type: none"> 1. Used for artworks 2. 3D rendering 3. Compatible with most post-processing software.
3MF	Mesh data	Scan.3mf	<ol style="list-style-type: none"> 1. Compact size; 2. Compatible with Microsoft 3D printing software
P3	Global markers	Scan.p3	<ul style="list-style-type: none"> • Reuse the markers' position. • Contain the cutting plane.

Data Sharing

You can upload the mesh data to [Sketchfab](#) .

Click  to upload the encapsulated data to Sketchfab, where the title, username and password are required to be provided. You can register an account on the Sketchfab to view the shared models.

Caution

The files uploaded are in STL format.

Third-party Software

You can import scanned mesh data into a third-party software / third-party softwares.

Note

You can select the third-party software to be launched and the path by clicking  > **Third-party Software Setting**. Only the selected third-party software will be displayed in the third-party software list in the post-processing and measurement interfaces.

Third-party Software	Use for
 Geomagic Control X	Metrology
 Geomagic Design X	Reverse Engineering
 Geomagic Essentials	Mesh Editing
 Polyworks Metrology Suite	Metrology

Contact

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Support platform: support.shining3d.com

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