SHINING 3D

EXScan Rigil

1.3.0

User Manual

Table of Contents

Overview

Welcome

This user manual (hereinafter referred to as "this manual") mainly introduces the operation of the EXScan Rigil.

Symbol Conventions

Symbol	Meaning
	**Note**: This symbol is used to inform you of the additional information of the product.
	**Caution**: This symbol is used to inform you of incorrect operations that may damage the device or result in data loss. Any damages resulting from misuse are not covered by the warranty.
	**Warning**: This symbol is used to inform you of the potential risks that may result in serious personal injury and other safety incidents.

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1. The contents of the Product Instruction and User Manual (hereinafter collectively referred to as the "Product Usage Documentation") are critical to your personal safety, legal rights, and liabilities. Before you use the products, please ensure that you have carefully read the Product Usage Documentation, and use the product correctly in accordance with the requirements of the Product Usage Documentation. We also recommend that the products be operated by trained professional technicians.
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FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.
- Changes or modifications not expressly approved by the manufacturer could void the user’s authority to operate the equipment.
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Statement

This Class B digital apparatus complies with Canadian ICES-003.CAN ICES-3(B)/NMB-3(B).

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts delicence. L'exploitation est autorisee aux deux conditions suivantes : (1) L'appareil ne doit pas produire debrouillage, et (2) L'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillageest susceptible d'en comprome re le fonctionnement.

RESTRICTIONS IN THE 5 GHZ BAND

Within the 5.15 to 5.25 GHz band, UNII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel Mobile Satellite System (MSS) operations.

RESTRICTIONS DANS LA BANDE DE 5 GHZ

Dans la bande de 5,15 à 5,25 GHz, les appareils UNII seront restreints aux opérations intérieures pour réduiretoute possibilité d'interférence pouvant nuire aux opérations du Système satellite mobile dans le mêmecanal (MSS).

RF Exposure Regulations (FCC IC)

The SAR limit of USA/Canada is 1.6 W/kg averaged over one gram of tissue for Body and 4.0 W/kg averaged over ten grams of tissue for extremity SAR, this device has also been tested against the SAR limits.

Body-Worn: The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with RF exposure requirements and should be avoided. To maintain compliance with RF exposure requirements, a 10mm separation distance between the user's body and the back of the device should be maintained.

La limite du das des États-Unis et du Canada est de 1,6 W/kg en moyenne sur un gramme de tissu pour le corps et de 4,0 W/kg en moyenne sur dix grammes de tissu pour le das des extrémités.

Porté sur le corps: l'utilisation de clips de ceinture, de étuis et d'accessoires similaires ne doit pas contenir de composants métalliques dans son assemblage. L'utilisation d'accessoires qui ne satisfont pas à ces exigences peut ne pas être conforme aux exigences d'exposition aux RF et devrait être évitée.Pour maintenir la conformité aux exigences d'exposition aux RF, une distance de séparation de 10mm entre le corps de l'utilisateur et l'arrière de l'appareil devrait être maintenue.

Quick Start Guide

This chapter provides an overview of **EXScan Rigil V1.3.0** to help you quickly find relevant operation instructions.

How to download the software?

Please log in to Download Center, select the software to download; for more details, see Installation.

How to check the current software version?

Click the icon in the upper-right corner > **About** to view the current software version.

If your device is not connected, you can only use EXScan Rigil to import projects for post-processing or measurement. To use scanning functions, connect your device first.

How to connect devices?

Both wireless and wired connections are supported. For detailed instructions, please refer to Device Connection.

After successful device connection, follow these steps to operate the device.

Note

If this is your first time using the scanner or if it has been a long time since you last calibrated it, please calibrate the scanner before connecting. For calibration details, refer to the EinScan Rigil Series User Manual.

Create or Open a Project Group

Before scanning, select a file storage path and create a project group. Alternatively, import a previously scanned project group from the same device to continue scanning.

→ How to create or open a project group?

Configure Scanning Parameters

After creating a project group, you can configure scanning parameters before starting to improve scanning results and experience.

→ How to configure scanning parameters?

→ How to configure project group settings?

→ How to operate on a single project after creating/opening a project group?

3 Scanning

Perform scanning.

→ What preparations are needed before scanning?

→ Introduction to the scan interface

4 Data Editing

You can edit scanned data after pausing scanning to reduce noise and obtain precise data.

→ Editing toolbar introduction

→ Right sidebar introduction

→ Shortcut keys introduction

→ Context menu introduction

→ How to align projects?

5 Save and Export Data

You can save scanned data for future import or export.

→ How to save and share data?

6 Post-Processing and Measurement

You can process or measure scanned data.

→ How to configure mesh parameters?

→ What optimization operations are available after meshing?

→ How to create features in the measurement interface for further operations?

→ How to align scanned data in the measurement interface?

→ How to measure scanned data in the measurement interface?

Software

Installation

When using the scanner to scan and process projects with large amounts of data, you need to install EXScan Rigil software (hereinafter referred to as the "software").

PC Configuration

Recommendation	
Processor	13th Gen Intel® Core™ i7-13700H or above
Graphics Card	NVIDIA GeForce RTX 3060 Laptop GPU or above
VRAM	8 GB or above
RAM	64 GB or above, DDR5 dual-channel
Interface	USB 3.0
Operating System	Windows 10 Pro (64-bit) and Windows 11 Pro (64-bit)

Download

Please log in to Download Center, select the software to download, and complete the installation according to the software installation wizard.

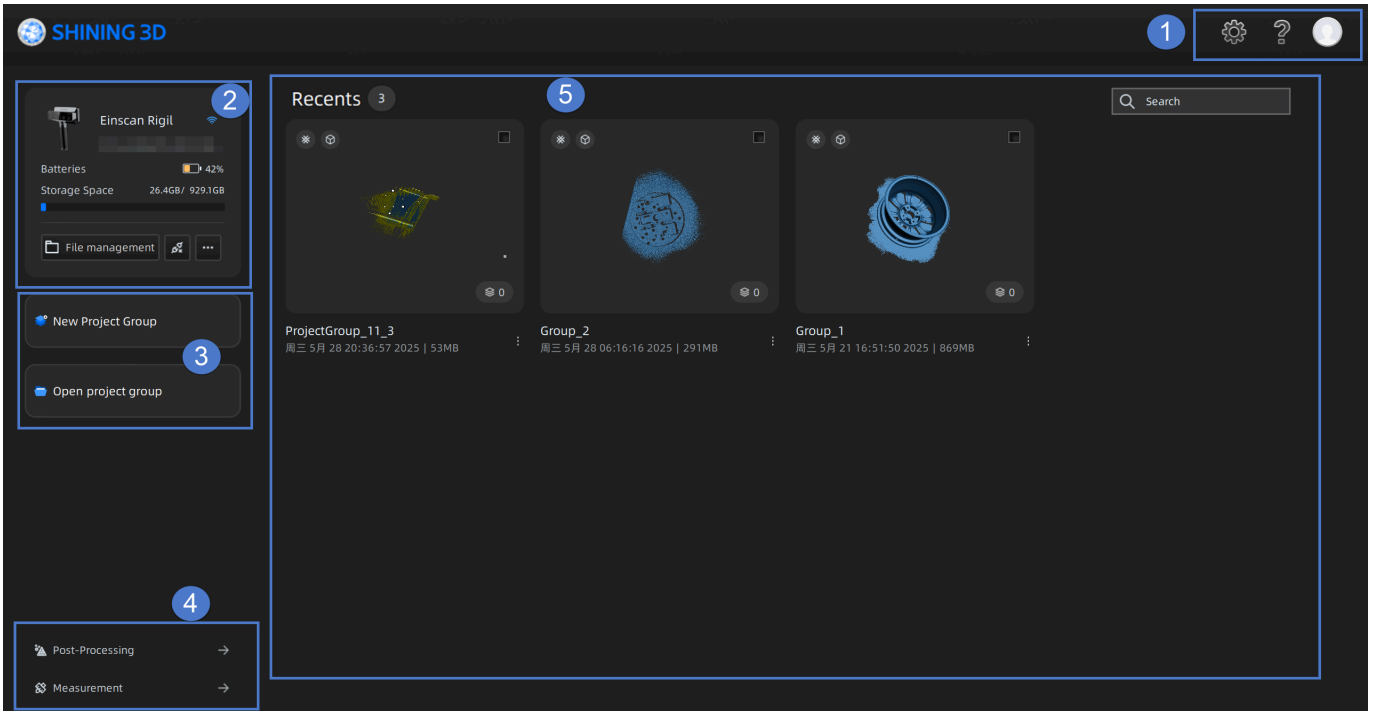
Note

During the software installation, **TeamViewer** is selected by default for bundled installation. After installation, launch the software and click > **Support** > **Remote Assistance** to initiate **TeamViewer**. If remote assistance is not needed, uncheck the **TeamViewer** option during installation to prevent automatic installation of TeamViewer along with the software. You can later download TeamViewer independently via the TeamViewer official website.

Home Screen

After running the software, you will automatically go to the home screen. You can access recent files, create or open project groups, and quickly navigate to other interfaces.

Overview



① Settings and Help

General Setttings

- Select Language: Set the language displayed in the software.
- Compatible with 3Dconnexion SpaceMouse: When enabled, you can quickly rotate, pan, zoom, and perform other shortcut operations on models in a 3D scene with the 3Dconnexion SpaceMouse. See 3Dconnexion SpaceMouse for more details.
- Data Import Path: It displays the import path of the device project file. Click  to change the import path.

Advanced Mode

- Factory Default: Click **Recover** to initialize all settings and the software will restart automatically.
- Temporary File Path: Temporary data may be stored on disk when scanning. You can use this function to select a path with sufficient space.

> **Note**
>
> Do not select storage paths on removable devices, network locations, or paths without write permissions.

- About: You can view the device name, serial number, calibration board, software version and other information. After checking **Download UPdates Automatically**, it will detect the update and prompt you to install. Otherwise, you will need to manually download and update the software to the new version.
- System Diagnose: Check whether your computer configuration meets the running requirements. The software automatically performs a system diagnosis once after installation or update, following the beginner tutorial. If appears, it means that the configuration meets the requirements. If appears, it means that there are some issues that should be resolved. Click **Refresh** to diagnose again.
- Support: You can open the user manual, get remote assistance (TeamViewer) and check contact information here.

> **Note**
>
> If the software displays a pop-up stating "No TeamViewer detected" when you use remote assistance function, click **Select Path** in the dialog box and choose TeamViewer's .exe file to update the launch path for TeamViewer.

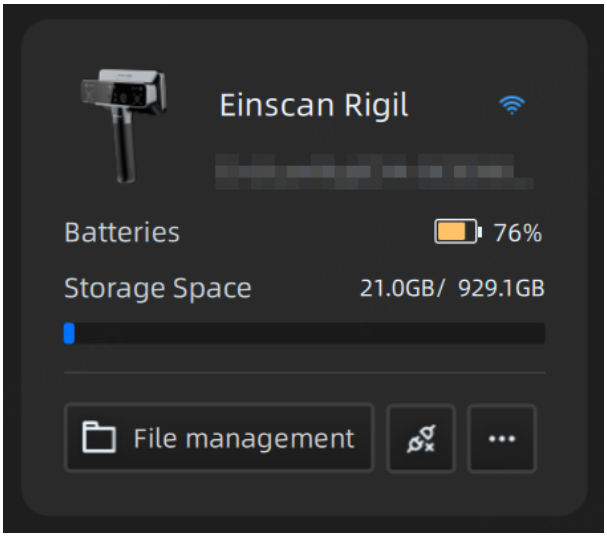
If you have not logged in to the passport, you can click here to log in; if you have already logged in, you can perform the following operations.

- Reverse Engineering Service: By sending us the scanned project files and specific information, you can get our assistance in reverse engineering.
- Account: You can view login status, account information, and authorization period.
- Login: You can log in / log out of your account.
- My SHINING 3D Account: Click to enter the personal center.
- Official Website: Click to visit our official website for more products and information.
- Facebook: Enter our Facebook to view product introduction and learn other operations.
- Shining 3D Digital Cloud: Upload your model to SHINING 3D Cloud.

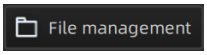
② Device Information

If the device is successfully connected, the name, serial number, power and storage space of the connected device will be displayed here; if the device is not connected, please connect the device wirelessly or wired.

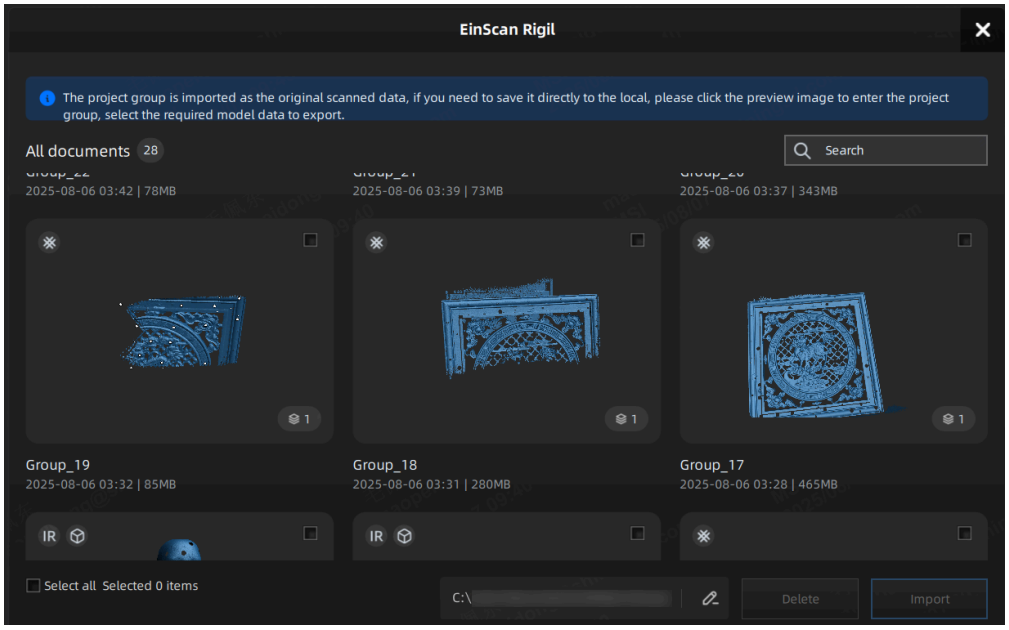
Connected



After the device is connected successfully, the upper left corner will display the device information of the device. You can import the device project, export the device log and do other operations.



Click here to manage the projects in EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite.

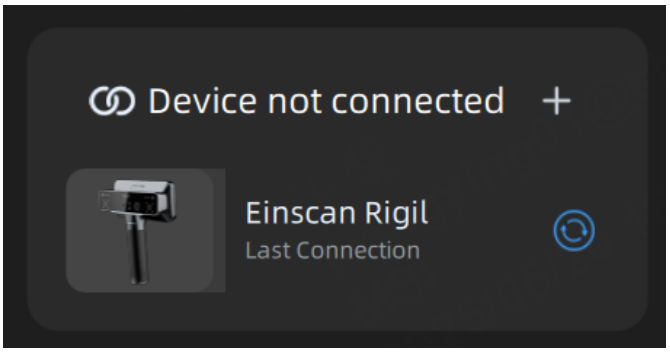


- Check the project group to import the original scan data of the project group into EXScan Rigil.
- Double-click the project group card and select the project to be saved locally and the type of project file (point cloud or mesh).
- Click  to bring up the settings window, and then click  to change the import path of the device project.

Click this button to choose whether to disconnect the device.

Click this button and select **Export device log**.

Not Connected



Click + to view the wireless and wired connection instructions; for specific operation instructions, please see Connection.

> **Note**
>
> If the scanner is disconnected, click the button to reconnect the scanner immediately, or wait for the scanner to reconnect automatically.

③ Project Group

Click here to quickly create or open a project group.

New Project Group

1. Click **New Project Group**.
2. In the prompt window, name the project group and click **Browse** to select the save path.
3. Click **Confirm** and all scanned data will be saved to the folder with the name you just set.

Open Project Group

1. Click **Open Project Group**.
2. Select **Open Local File** or **Open Device File**.
3. In the prompt window, select the project group.
4. Click **Open** to import the project group into the software.

> **Note**
>
> - For projects imported from EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite, only the point clouds are retained.
> - For projects imported from EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite, the software does not support re-scanning. You can only generate point clouds and meshes or measure the model in the software.

④ Quick Links

Click here to quickly navigate to the corresponding interface for Post-Processing or Measurement, where you can perform the relevant operations.

⑤ Project Group List

Recently opened or newly created project group files with relevant information (name, operation time, and file size) are displayed here.

Function	Description
	You can enter the name to quickly find the project or project group.
Delete	This button will appear after selecting a project or project group. Click this button to delete the selected project or project group. Once deleted, it cannot be restored.
	Click to quickly return to the top of the project list.

Version Upgrade

When new functions are released, bugs are fixed, or software performance is optimized, a new version will be available. We recommend upgrading promptly to enhance your scanning experience.

If you check **Automatically download new versions** in  > **About**, the software will notify you via a pop-up when a new version is detected at startup. If unchecked, you can still manually check for updates and view the current version in  > **About**.

Once a new version is detected, click **Download Now** to let the software download the installer in the background while you continue using it.

After the download completes, click **Install Now** to begin installing the new version.

> **Caution**
>
> - If you close the software during download, you can choose to resume the download in the background.
> - The software will close during installation, so ensure your scanned data is saved beforehand to avoid loss.

Connection

Supports both wireless and wired connections to devices. Once connected, you can use the software with the scanner for scanning, file transfer, and other operations.

> **Note**
>
> - Device connection is unavailable while scanning with EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite.
> - If you're using EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite for screen casting, the casting will automatically disconnect when entering the device connection interface, and screen casting cannot be initiated.

Wireless Connection

1. Swipe down the control center from the top of the scanner screen, or tap  to enter the file list interface.
2. Tap  to enter the connection interface.

   > **Note**
   >
   > After entering the connection interface, EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite will automatically enable hotspot mode. The connection interface will display the scanner's wireless hotspot name and password.

3. Search for the scanner's hotspot on your computer and connect to it.

   > **Note**
   >
   > If the computer does not search for the scanner's hotspot, swipe down the control center from the top of the scanner screen, select  > **Hotspot**, and turn the scanner's hotspot off and on again.

4. Once connected, you can perform scanning, file transfer, and other operations with the scanner.

Wired Connection

1. Swipe down from the top of the scanner screen to open the control center, or tap  to enter the file list interface.

2. Tap to enter the connection interface.
3. Use the provided Type-C cable to connect the scanner to your computer.
4. When the software detects the scanner, it will automatically connect to the scanner.
5. Once connected, you can perform scanning, file transfer, and other operations with the scanner.

> **Note**
>
> Start the software before connecting the scanner to the computer with the provided Type-C cable. If you have connected the scanner before, reconnect the Type-C cable after starting the software.

Disconnection

After successful connection, you can disconnect by clicking on the software homepage of EXScan Rigil, or by tapping **Disconnect** on the connection interface of EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite.

> **Note**
>
> Only one device can be connected at a time. To switch devices, please disconnect the currently connected device first.

3Dconnexion SpaceMouse

This software is compatible with 3Dconnexion SpaceMouse. With the 3Dconnexion SpaceMouse, you can rotate, pan, zoom, and perform other shortcut operations on models in a 3D scene.

For more operations, please refer to the 3Dconnexion user manual.

Connection

Steps

1. Take out the 3Dconnexion SpaceMouse from its packaging and insert the connecting cable into a USB port on your computer.
2. Open the official website to download the software.
3. Download and install the latest version of the 3Dconnexion software.

4. Run the software and click **Trainer** for a quick guide.

Interface

Icon	Description
	Learn how to quickly use the 3Dconnexion SpaceMouse.
	Find the manuals for all 3Dconnexion products.
	Open the settings panel to customize your 3Dconnexion devices.
	Use the 3Dconnexion Viewer to review 3D models. Supported formats: .stp, .step, .igs, .iges, .obj, .stl, .ply, .jt, .glTF.
	Create high-resolution picture collages with SpaceMouse by 3Dconnexion Collage.
	Test and practice your skills by assembling the landing gear of an aircraft.
	Register your product after the installation to benefit from 3Dconnexion services.
	Find instructive videos for your 3Dconnexion devices.
	Provide feedback to the 3Dconnexion product team.

Buttons

Panel


3Dconnexion Keys
Control Cap
Keyboard Modifiers
Menu Button
Color Display
CustomView Buttons
Rotation Toggle Button
QuickView Buttons
Fit Button
3Dconnexion
3D Designer - Modeling
ESC
ENTER
TAB
CTRL
SHIFT
ALT
SPACE
MENU
DELETE
V1
V2
V3
LOCK
ISO1
FIT

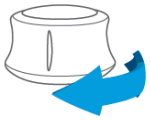
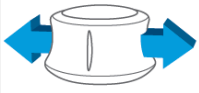
Button	Description
Color Display	It provides visual feedback on the assigned commands. You have the option to adapt the display brightness, switch between text or icons, and change the text size on the LCD in the 3Dconnexion Settings.
3Dconnexion Keys	The SpaceMouse Enterprise features twelve additional programmable function buttons. You can personalize commands assigned to the function buttons using the 3Dconnexion Settings.
CustomView Buttons	Above the QuickView Buttons, the SpaceMouse Enterprise also has 3 CustomView Buttons that allow you to store and retrieve your own views. To save a specific view, press and hold one of the CustomView Buttons until the message 3Dconnexion View saved appears on your screen. If you want to return to your saved view, just press the button once.
Control Cap	The Controller Cap is the heart of your SpaceMouse Enterprise. Its Six-Degrees-of-Freedom (6DoF) sensor allows you to push, pull, rotate,or tilt to pan, zoom and rotate your drawings and 3D models
Rotation Toggle Button	In the center between the QuickView Buttons is the Rotation Toggle Button. Pressing it once locks the rotation around all axes. The status LED will light up to indicate that rotation toggle is now active.
Keyboard Modifiers	The SpaceMouse Enterprise comes with eight Keyboard Modifiers that work like the corresponding keys on your keyboard. You can personalize the commands assigned to the Keyboard Modifiers using the 3Dconnexion Settings.
QuickView Buttons	The SpaceMouse Enterprise features five QuickView Buttons helping you to quickly bring your drawing or 3D model into the desired view. The buttons have a secondary assignment (blue font) that you can call up by a long press. You can program both the first assignment and the second assignment of the buttons in the 3Dconnexion Settings.

Button	Description
Menu Button	The Menu Button allows for fast and easy customization of your 3Dconnexion devices. Pressing it will take you directly to the 3Dconnexion Settings. Select the device you want to configure in the flyout window and customize it.
Fit Button	With the Fit Button, you will never lose sight of your drawing or 3D model. Press it to bring your drawing back to the center of your screen.

3Dconnexion Keys

No.	Keyboard Shortcut	Function
1	^ Ctrl + M	Toggle functions between **Point Cloud Edit** and **Edit Markers** (only works in Scan).
2	^ Ctrl + G	Toggle functions between **select visible** and **select through** (only works in Post-Processing).
3	^ Ctrl + T	To toggle the method of selecting data. For more, please see Data Editing.
4	^ Ctrl + A	Select all
5	^ Ctrl + C	Unselect
6	^ Ctrl + R	Connected domain
7	^ Ctrl + I	Invert
8	⌦ Del	Delete selected data
9	^ Ctrl + Z	Undo
10	^ Ctrl + Y	Redo
11	^ Ctrl + ⇧ Shift + Z	Cancel edit
12	Enter ⏎	Apply edit

Control Cap

Figure	Description
	Tilt cap left/right to rotate the model on its Z axis.
	Rotate the model on its Y axis.
	Tilt cap forwards/backwards to tumble the model on its X axis.
	Zoom the model in and out.
	Move the model up and down.
	Move the model left and right.

Scan

Scan Modes

The software supports two scan modes: **Laser Scan** and **IR Scan**.

Laser Scan

Laser Scan

Laser Scan refers to a method that uses laser lines projected by the scanner to scan objects, typically employed for high-precision industrial inspection scans. It supports two types of scanning light sources: cross-line and parallel-line.

IR Scan

IR Scan is a method to scan people and objects without using laser lines. Before starting the scan, project group settings need to be configured.

Project Group

Project group is the standard file structure of the software. It contains one project or more. Each project contains the data of its own. You need to create or open a **Project Group** before scanning.

 Create a Project Group

> **Note**
>
> If you select **IR scan**, set parameters such as scan mode and alignment mode when creating a new project group; for details, please see the [Project Group Settings] (pc-project-group-settings.md).

Two ways to create a project group:

Method One: Click **New project group** in the home screen interface.

Method Two: Click  and select **New project group** in the scanning interface.

In the prompt window, name the project group and click **Browse** to select the save path; then click **Confirm** and all scanned data will be saved to the folder with the name you just set.

 Open a Project Group

You can open a project group and perform re-scanning or editing on the scanned data.

Method One: Click **Open project group** on the home screen interface.

Method Two: Click  and select **Open project group** in the scanning interface.

In the prompt window, select the project group file and then click **Open**.

> **Note**
>
> - The current project group will be saved automatically when opening a project group.
> - To rescan the imported project, use the same device that scanned the imported project.
> - For project files imported from EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite, only the point clouds are retained.
> - For project files imported from EinScan Rigil / EinScan Rigil Pro / EinScan Rigil Lite, rescanning is not supported in the software. You can only generate point clouds, mesh and measure in the software.

Project Group Settings

In IR Scan mode, after creating a new project group, you need to set it up.

Portrait Scan

Select alignment mode

Align Mode	Description
Feature Alignment	Automatically completes alignment using the geometric features of the scanned object's surface.
Texture Alignment	Automatically completes alignment using the surface texture of the scanned object.

> **Note**
>
> Alignment mode supports multi-selection.

Select resolution

You can adjust the resolution by dragging the slider or by clicking **High**, **Medium**, or **Low** for quick selection.

Level	Point Distance
High	0.5 mm
Medium	1.0 mm
Low	2.0 mm

> **Note**
>
> With smaller point distances, you will get more details, but it will lead to a larger file size and a longer processing time.

Texture Scan (Coming soon)

You can enable or disable texture scan,

Object Scan

Object size

Object Size	Description
Medium and large object	Object size larger than 200mm X 200mm X 200mm
Small object	Object size between 100mm X 100mm X 100mm and 200mm X 200mm X 200mm

Select alignment mode

Align Mode	Description
Hybrid Alignment	Support selecting one or more alignment modes among features, markers, and textures. If the object to be scanned has rich and varied geometric features and texture features, it is recommended to select feature or texture stitching mode.
Global Markers	Completes alignment using markers, suitable for objects lacking rich and variable geometric features and requiring high accuracy.

Select resolution

You can adjust the resolution by dragging the slider or by clicking **High**, **Medium**, or **Low** for quick selection.

Level	Point Distance
High	• Medium and large object: 0.2 mm. • Small object: 0.1 mm.
Medium	• Medium and large object: 0.5 mm. • Small object: 0.2 mm.
Low	• Medium and large object: 2.0 mm. • Small object: 0.5 mm.

Note

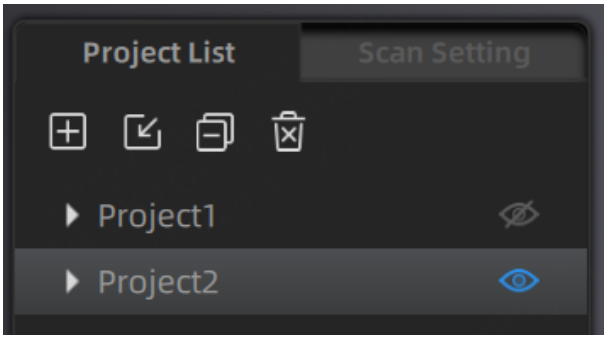
- With smaller setting value, you will get more details, but it will lead to larger file size and longer processing time.
- Resolution cannot be changed once the project group has been created.

Texture Scan (Coming soon)

You can enable or disable texture scan.

Project Management

After connecting the scanner and entering the scanning interface, you can manage the projects in the currently created or opened project group. Each project is a part of the project group. You can use these buttons to manage projects.



Function	Description	Note
 **New Project**	Click this button to create a new project when the scanner is connected.	In **Laser Mode**, if the project group contains a project scanned with **Feature Alignment**, you cannot select other alignment modes (**Marker Alignment** or **Global Marker Alignment**) for the new project.
 **Open Project**	Click this button to import a project.	• It is not supported to open projects with different resolutions in the same project group. • It is not supported to open projects scanned by different devices in the same project group. • In **IR Scan**, it is not supported to open projects with different scanning objects settings (scan people / scan objects) in the same project group. • In **Laser Scan**, it is not supported to open projects with **Feature Alignment** and other alignment modes in the same project group.
 **Remove Project**	Click this button to remove the project from the project list.	The project remains in the folder and can be imported back to the list.
 **Delete Project**	Click this button to delete the project.	This operation will delete the selected project and its data at the same time.
 **Visible** / **Invisible**	Click this button to show or hide the data or markers.	/

Note

- If the project being deleted or removed is the last project in the list (i.e., the current project), the previous project in the list becomes the current project, and you can perform scanning operations on it.
- If a project with the same name as an existing project in the list is opened from a different path, "_1" will be appended to the name of the opened project.
- If a project is imported into the project group from a different path, deleting it will not affect the original data in the original path. Only the project data copied to the project group folder will be deleted.

Scan Preparation

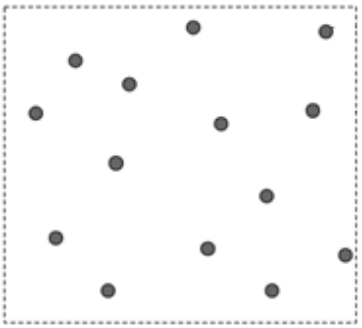
Before scanning, please refer to the following scanning requirements and make the necessary preparations to enhance your scanning experience.

Markers Placement

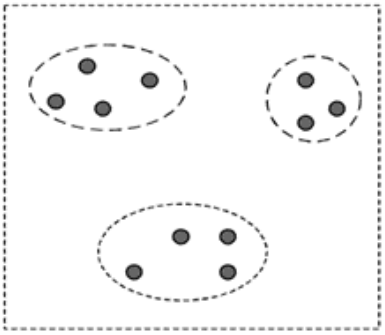
When scanning using **Marker Alignment** or **Global Markers**, markers need to be placed on the object to be scanned in advance.

Please note the following requirements for placing markers:

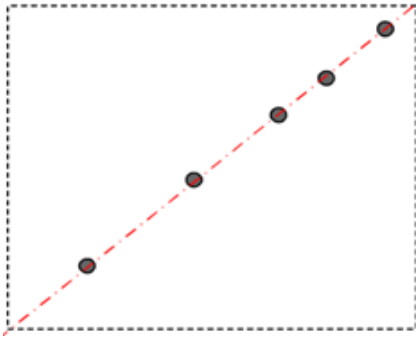
- Place markers evenly and randomly.
- Do not use damaged or incomplete markers.
- Do not place markers on surfaces with high curvature.
- Do not use dirty or contaminated markers.
- Place small markers on edges of models or small areas.



Markers are attached correctly



Wrong: Artificial grouping of markers



Wrong: Attach markers only in one line

Portraits

Please note the following requirements for scanning portraits:

- Hairstyle: Keep hairstyles neat and avoid loose strands or bangs; comb hair before scanning.
- Clothing: Avoid wearing reflective clothing; do not wear accessories or glasses that may cause reflections.
- Posture: Since the person should remain as still as possible during the scanning process, choose a comfortable and easy-to-maintain posture before scanning.

> **Note**
>
> For portrait scanning, please scan the face first and try to complete it in one go to avoid alignment errors caused by muscle movement or blinking.

Objects

Please note the following requirements for scanning objects:

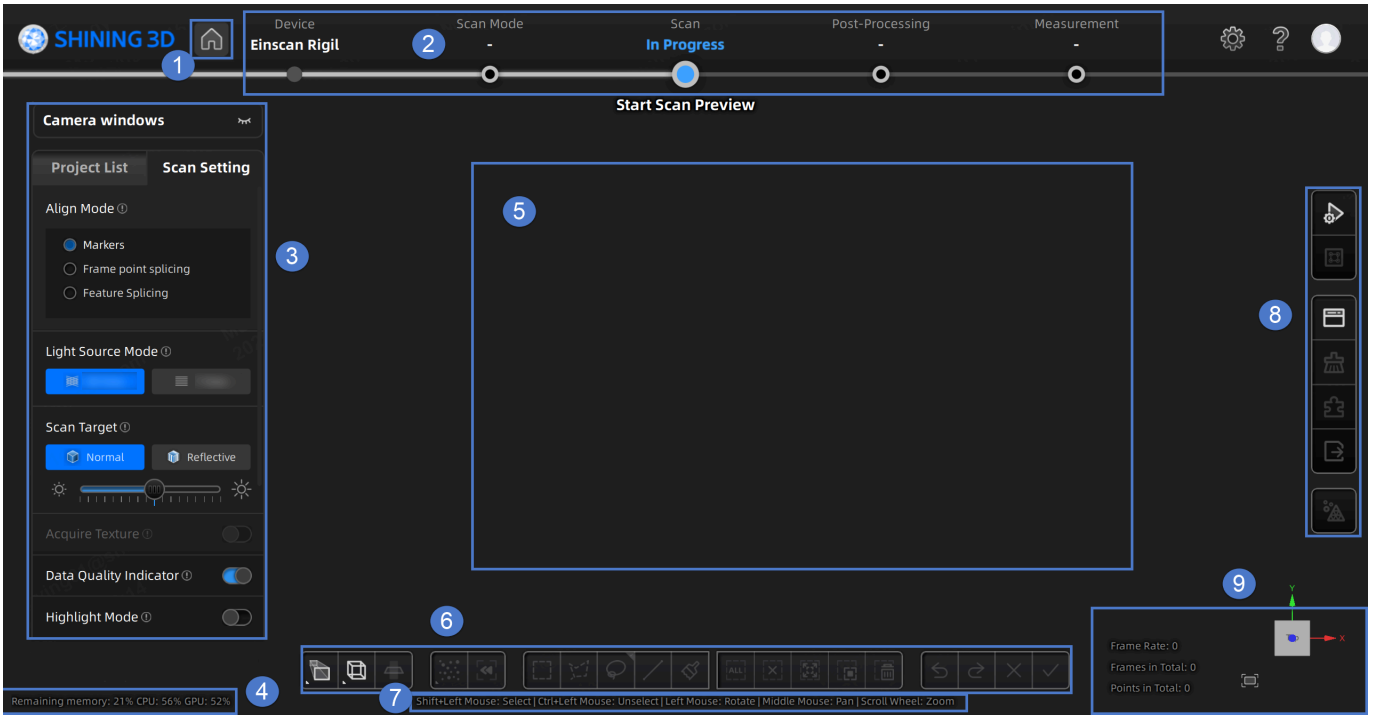
- For scanning transparent, shiny, or reflective objects (especially those with black reflective surfaces), use washable or vanishing scanning spray.
- For objects lacking surface features or with repetitive features:
  - Place markers on the object's surface and select **Marker Alignment** mode for scanning.
  - Randomly add rich geometric features on or around the object's surface and select **Feature Alignment** mode for scanning.

> **Note**
>
> **Types of objects unsuitable for scanning:**
>
> - Soft material object that cannot be hung.
> - Lattice structures with many small deep holes.
> - Moving or shaking objects. Frequent coordinate changes will lead to a poor scanning quality.

Scan Interface

After entering the scanning interface, you can adjust settings and perform scanning operations.

Overview



> **Note**
>
> The screenshot shown above is for illustrative purposes only. Always refer to the actual software interface.

① Home Screen

Click  to quickly return to the home screen.

② Navigation Bar

- Device: When the device is online, the device name is displayed. When the device is offline, click  on the navigation bar to reconnect the device.
- Scan Mode: Click  on the corresponding position in the navigation bar to choose the scan mode.
- Scan: Click  on the corresponding position in the navigation bar to start the scanning.
- Post-Processing: After scanning, click  to switch to the **Post-Processing** interface where you can do mesh and mesh editing for the data. Measurement: Click  on the corresponding position in the navigation bar to switch to **Measurement** interface where you can measure your model here.

③ Scanning Settings

- Camera Windows: To preview the actual scene during scanning. Parameters can be adjusted accurately through the camera window.
- Project List: To create, open, or delete projects. For more, see Project Management.
- Scan Setting: To set scanning parameters. For more, see Settings.

④ Memory / CPU / GPU

- Remaining Memory: To display the percentage of remaining memory.
- CPU Usage: To display the CPU usage of the computer in real time. You may need to close other unrelated software if it is too high.
- GPU Usage: To display the GPU usage of the computer in real time.

⑤ Preview / Scanning Window

To preview the model and check the scanned model.

> **Note**
>
> During pre-scanning, scanning, or scanning pause, you can use the mouse wheel to zoom in or out of the model to check the pre-scan or scanning effect.

⑥ Editing Toolbar

To edit data after scanning. See more details in Data Editing.

⑦ Shortcuts

To change the perspectives and move the model by the composition of keys.

⑧ Right Sidebar

For more, see Scanning.

⑨ Other Information

To show information about FPS, Frames in Total, Points in Total, etc.

Function	Description
 **Fit View**	Click  to center the model and adjust the view size to fit the screen automatically.
 **View Controller**	• When adjusting the model, a coordinate system reference is provided. • You can quickly adjust the model view by clicking on different faces of the view controller.

Settings

You can adjust the scanning settings for the current project in the scan interface.

Laser Scan

Align Mode

Align Mode	Description	Supported Marker Size
Marker Alignment	Completes alignment using markers, suitable for objects with distinct geometric features, flat areas with minimal geometric features, and scenes requiring accuracy.	• 3 mm • 6 mm • 12 mm
Global Markers	Completes alignment using markers, suitable for objects lacking rich and variable geometric features and requiring high accuracy.	• 3 mm • 6 mm • 12 mm
Feature Alignment	Aligns the scanned object's surface features automatically. This function is suitable for objects with detailed surface features or for those that cannot have markers placed.	/

Note

Please make sure the remaining battery of the scanner is more than 25% when scanning with **Feature Alignment**.

Resolution

You can adjust the point distance in real-time by dragging the slider or fill in the value before scanning or after pausing the scan.

Note

- If a project group contains more than one project, this function is not available for the second or later projects.
- It is recommended that you enable the data quality indicator and rescan the areas with lower quality (yellow areas) after changing the resolution.

Light Source Mode

Light Source Mode	Description
	This mode is suitable for rapid scanning.
	This mode is suitable for detailed scanning.

Scan Target

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

Brightness

The red dots in the camera view indicate overexposed areas. To improve scanning quality, it is recommended that you lower the camera brightness when there are large overexposed areas, or increase the camera brightness when the camera view is too dark.

Data Quality Indicator

When enabled, it will differentiate scan quality in colors: blue represents high-quality scanned data and yellow represents insufficient scanned data that requires further scanning.

> **Note**
>
> This function is unavailable when scanning global markers.

Outdoor Mode

To scan normally in the glare environment such as outdoors.

> **Caution**
>
> Please avoid direct sunlight when scanning objects.

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

When the function is enabled, the view will be locked during scanning and not follow the scanning path, which can be used for scanning data from the locked view.

IR Scan

Portrait

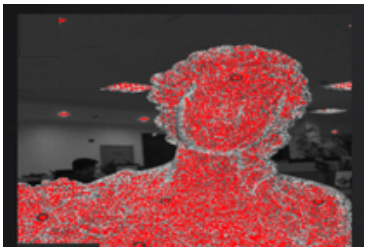
- **Camera View**

  Preview the actual scene during scanning. Parameters can be adjusted accurately through the camera window.

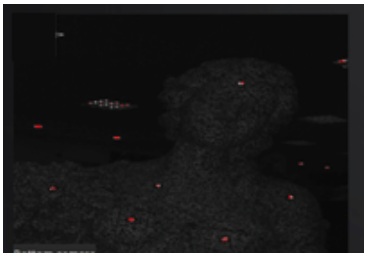
- **Brightness**

  The red dots in the camera view indicate overexposed areas. To improve scanning quality, it is recommended that you lower down the camera brightness when there are large overexposed areas, or increase the camera brightness when the camera view is too dark.

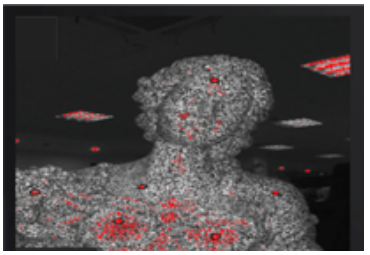
  > **Note**
  >
  > Click (A) to enable auto exposure so the scanner can adjust the brightness automatically according to the actual situation.



Brightness is too high



Brightness is too low



Brightness is proper

- **Working Distance**

  Drag the slider to adjust the working distance and the scanner scans only within the set distance. This function can effectively filter out unnecessary noise data.

- **Flat Detection**

  When enabled, it can reduce the possibility of misalignment.

> **Note**
>
> - If you need to scan flat or featureless objects, it is recommended that you place markers to assist with alignment.
> - If this function does not work well, you can try using **Remove Base**.

- **Data Quality Indicator**

  When enabled, it will differentiate scan quality in colors: blue represents high-quality scanned data and yellow represents insufficient scanned data that requires further scanning.

  > **Note**
  >
  > Show the color only before generating the point clouds.

- **Remove Base**

  When enabled, it will automatically identify the base plane and mask the scanned data below it during scanning; you can effectively filter out unnecessary noise data through this function, improving data processing efficiency.

  > **Note**
  >
  > The marked plane during the scanning preview process can change in real-time and the last marked plane at the end of the scanning preview will be the final plane.

- **Resolution**

  You can adjust the point distance in real-time by dragging the slider or fill in the value before scanning and after pausing the scan.

  > **Note**
  >
  > - If a project group contains more than one project, this function is not available for the second or later projects.
  > - It is recommended that you enable the data quality indicator and rescan the areas with lower quality (yellow areas) after changing the resolution.

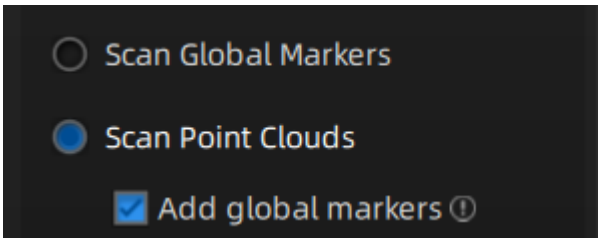
Object

- **Camera View**

  Preview the actual scene during scanning. Parameters can be adjusted accurately through the camera window.

- **Scan Mode**

  In **Global Markers** mode, scan the global markers first before scanning the point cloud.

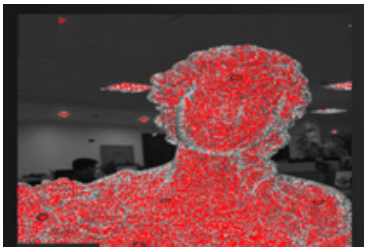


> **Note**
>
> - Click **Open global markers file** to import global markers files.
> - The **Add global markers** cannot be ticked during the scanning.
> - If the **Add global markers** is ticked before scanning the point clouds, new markers recognized during the scanning process will be added, but the newly added markers will not be saved to the opened global markers file.

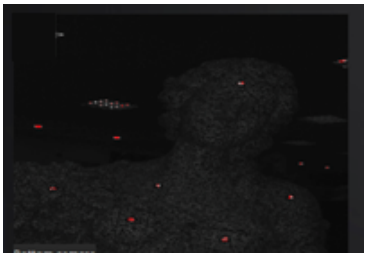
- **Brightness**

  The red dots in the camera view indicate overexposed areas. To improve scanning quality, it is recommended that you lower down the camera brightness when there are large overexposed areas, or increase the camera brightness when the camera view is too dark.

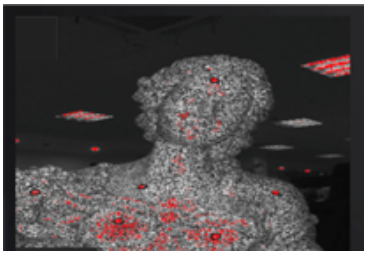
> **Note**
>
> Click to enable the auto exposure and the scanner can adjust the brightness automatically according to the actual situation.



Brightness is too high



Brightness is too low



Brightness is proper

- **Working Distance**

  Drag the slider to adjust the working distance and the scanner scans only within the set distance. This function can effectively filter out unnecessary noise data.

- **Flat Detection**

  When enabled, it can reduce the possibility of misalignment.

> **Note**
>
> - If you need to scan flat or featureless objects, it is recommended that you place markers to assist with alignment.
> - If this function does not work well, you can try using **Remove Base**.

- **Data Quality Indicator**

  When enabled, it will differentiate scan quality in colors: blue represents high-quality scanned data and yellow represents insufficient scanned data that requires further scanning.

  > **Note**
  >
  > Show the color only before generating the point clouds.

- **Remove Base**

  When enabled, it will automatically identify the base plane and mask the scanned data below it during scanning; you can effectively filter out unnecessary noise data through this function, improving data processing efficiency.

  > **Note**
  >
  > The marked plane during the scanning preview process can change in real-time and the last marked plane at the end of the scanning preview will be final plane.

- **Resolution**

  You can adjust the point distance in real-time by dragging the slider or fill in the value before scanning and after pausing the scan.

  > **Note**
  >
  > - If a project group contains more than one project, this function is not available for the second or later projects.
  > - It is recommended that you enable the data quality indicator and rescan the areas with lower quality (yellow areas) after changing the resolution.

Scanning

After adjusting scanning settings, you can proceed with scanning the objects.

> **Note**
>
> The scanned **point clouds** can be directly imported in the **Measurement** interface for creating features, aligning, or measuring.

Switch Scanning Status

You can switch the scanning status by clicking the buttons in the right sidebar.

Function	Description
 **Preview**	Preview scanning effect and scan parameters can be adjusted according to the scanning effect.
 **Start Scan**	Start scanning the objects.
 **Pause Scan**	After starting scanning, click this button to pause scanning.

Generate Point Cloud

After scanning, click  **Optimizing and Generating Point Cloud**，or hover the cursor over the left expand button and click  **Generate Point Cloud** in the expand bar.

Function	Description
 **Generate Point Cloud**	Generate point clouds directly without any optimization.
 **Optimizing and Generating Point Cloud**	Optimize then generate point clouds. Choose this option when you require higher accuracy or when there is a layering problem caused by accumulated alignment errors during scanning.

> **Note**
>
> The time it takes to generate point clouds depends on the data size of your project and the hardware configuration of your PC.

Other Functions

Function	Description	Function	Description
Project Group	Create or open a project group.	**Delete Your Scan**	Delete the current scanned data to rescan.
Align	Align the data as you need.	**Export the Scan**	Save the scanned data in the specified format locally.
Mesh	Mesh your model.		

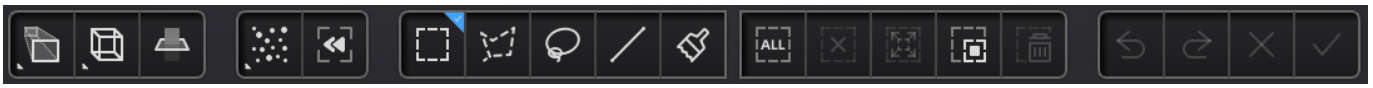
Data Editing

After pausing scanning, you can use the editing tools and right sidebar functions in the scanning interface to edit the data and generate accurate 3D point clouds.

Editing Toolbar

After pausing scanning or generating point clouds, you can use the following tools to edit the data.

> **Note**
>
> After editing the data, you can still click to perform additional scans.



Function	Description
 **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. Click this button again to switch to **Orthogonal View**.
 **Orthogonal View**	The object does not appear larger when closer, and smaller when farther away; the size of the object displayed in the view is independent of the current viewpoint distance; Click this button again to switch to **Perspective View**.
 **Multi View**	Observe the data from 6 different views.
 **Cutting Plane**	Create a cutting plane to make a quick cut.

Function	Description
 **Point Cloud Edit**	In this mode, only point clouds can be chosen. Click it again to switch to **Edit Markers**. **Note** Multiple undo or redo operations are supported.
 **Edit Markers**	In this mode, only markers can be chosen. Click it again to switch to**Point Cloud Edit**. **Note** • It is necessary to retain at least 4 markers. • Multiple undo or redo operations are supported.
 **Rewind**	Drag the progress bar to select (highlighted in red) the scanning data corresponding to a specific frame. Clicking **Confirm** will delete the corresponding data. Clicking **Exit** will discard the current operation and exit rewind. **Note** • This function is only supported in **IR Scan**. • This function is available only for scan data without  global optimization. • If the current data is less than 50 frames, this function is unavailable. • Up to 200 frames of data can be rewound once; you can rewind multiple times until the first frame of this scan.

Function	Description
 **Rectangular**	Select or deselect a rectangular area. • Use `⇧ Shift` + `left mouse button` to select. • Use `^ Ctrl` + `left mouse button` to deselect.
 **Polygon**	Select or deselect a polygon area. • Use `⇧ Shift` + `left mouse button` to select. • Use `^ Ctrl` + `left mouse button` to deselect.
 **Lasso**	Select or deselect the area by using the lasso tool. • Use `⇧ Shift` + `left mouse button` to select. • Use `^ Ctrl` + `left mouse button` to deselect.
 **Line**	Select or deselect the area by using the straight line tool. • Use `⇧ Shift` + `left mouse button` to select. • Use `^ Ctrl` + `left mouse button` to deselect.
 **Brush**	Select or deselect the area by using the brush tool. • Use `⇧ Shift` + `left mouse button` to select; use `⇧ Shift` + `mouse wheel` to adjust the brush size. • Use `^ Ctrl` + `left mouse button` to deselect; use `^ Ctrl` + `mouse wheel` to adjust the brush size.

Function	Description	Function	Description
 **Select All**	Select all of the data.	 **Unselect**	Cancel all selection.
 **Connected Domain**	Click the button after selecting a patch of data and all connected region to the selected data will be selected.	 **Invert**	Revert the selection.
 **Delete Selected Data**	Delete selected data.		

Function	Description	Function	Description
 **Undo**	The last deletion will be undone. Click multiple times to undo multiple deletion.	 **Redo**	The last operation will be redone. Click multiple times to redo multiple operations.
 **Cancel Edit**	Undo all edits.	 **Apply Edit**	Apply all edits.

Cutting Plane

The cutting plane tool can be used to quickly remove data below the base or multiple planes of an object. You can create and edit cutting planes through the settings panel on the left; after applying the cutting plane, the data below the cutting plane will no longer be collected when scanning again.

Creation

1. On the editing toolbar at the bottom of the interface, click  to enter the cutting plane tool interface.
2. Select the creation method and follow the interface prompts to create the cutting plane.

Method	Description
Fitting Point Cloud	Press `⇧ Shift` + `Left Button` to select data, and generate the cutting plane according to the selected data.
Creating Straight Line	Press `⇧ Shift` + `Left Button` to draw a line, and generate the cutting plane according to the line.
By Markers	Press `⇧ Shift` + `Left Button` to select markers. 3 markers or more are required to generate the cutting plane.

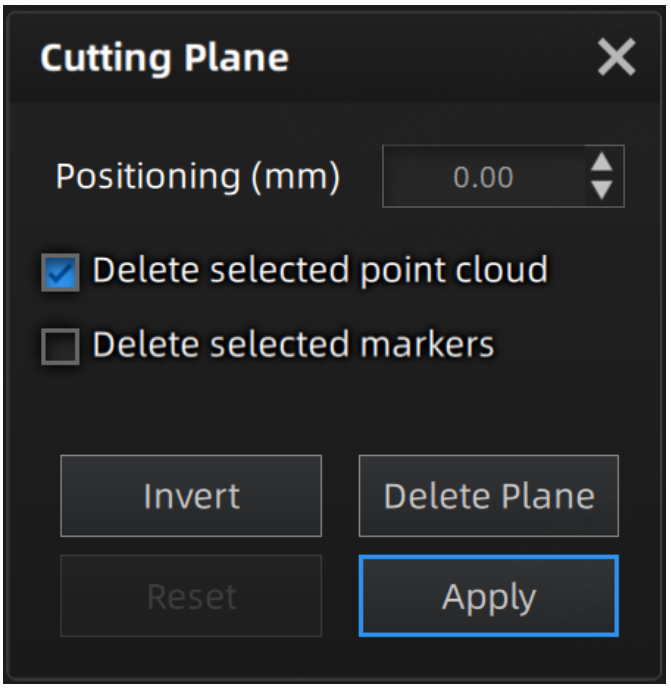
3. Click **Create** to create a cutting plane, which will be displayed in the cutting plane list; click **Cancel** to cancel all operations and exit the cutting plane tool interface.

> **Note**
>
> - When saving a global markers file, the cutting plane will be saved together.
> - The cutting plane created in the current project are only effective for that project.
> - After creating a cutting plane, data below the cutting plane will no longer be collected.
> - Cutting planes can be created after opening a global markers file or scanning global markers (before and after optimization).

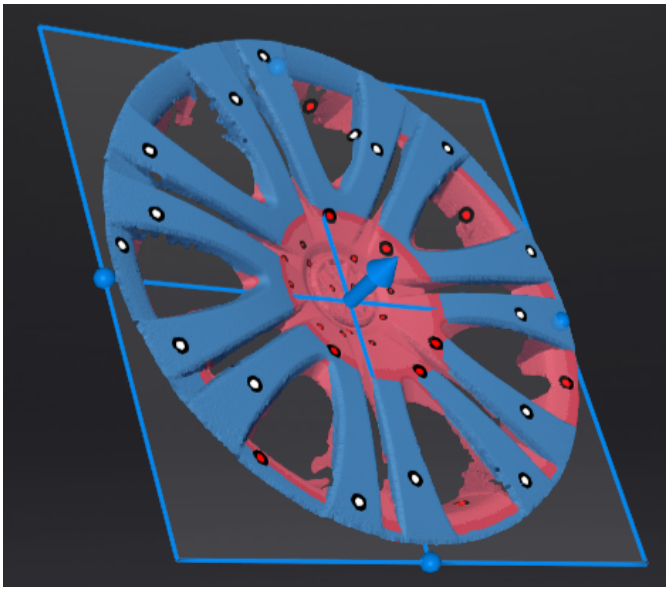
Editing

- **Delete the selected point cloud / markers**: When ticked, the selected point cloud data or markers will be highlighted in red. **Apply** the edit to delete the highlighted point clouds or markers.

  > **Caution**
  >
  > - It is not supported to deleted all point clouds.
  > - At least four markers should be remained on the front of the cutting plane.
  > - Unable to uncheck **Delete the selected point cloud** in the current version.



- **Invert**: Use this button to reverse the selection of data by flipping the cutting plane.
- **Delete plane**: Clicking this button will delete the current cutting plane and return to the interface for creating a new cutting plane.
- **Reset**: Reset all the operations performed after creating the cutting plane.
- **Apply**: Apply all the edits made.



- **Positioning**: The cutting plane can be translated in the following two ways:
  - Dragging the normal arrow on the cutting plane  to translate the cutting plane.
  - Entering the translation distance (unit:mm) in the value box to translate the cutting plane.
- **Rotation**: The cutting plane can be rotated by dragging the sphere on the cutting plane  , using the opposite axis of the currently selected sphere as the center axis for rotation.

Right Sidebar

In the scanning interface, you can use more functions in the right sidebar.

Function	Description
 **Generate Point Cloud**	Generate point clouds directly without any optimization.
 **Optimizing and Generating Point Cloud**	Optimize then generate point clouds, suggest choosing this option when you have higher accuracy requirement or when there is layering problem caused by accumulated aligning errors during scanning.

Function	Description	Function	Description
 **Project Group**	Create or open a project group.	 **Delete Your Scan**	Delete the current data to rescan.
 **Align**	Align the data as needed.	 **Export the Scan**	Save the scanned data in the specified format locally.
 **Mesh**	Mesh your model.		

Shortcut

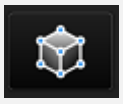
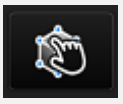
Shortcut	Function
Press and hold the `Left Button` and move the cursor	Rotate the data
Press and hold the `Middle Button` and move the cursor	Translate the data
Hold down `⇧ Shift` + `Left Button`	Select the area of data
Press and hold `^ Ctrl` + `Left Button`	Deselect the area of data
Scroll wheel	Zoom in or zoom out the data
`Spacebar`	Apply edits when editing data
Delete	Delete the selected data

Context Menu

Function	Description
Select all / Invert / Unselect / Delete selected data / Connected Domain	The function is the same as the function on editing toolbar, and can be operated by shortcut keys.
Zoom to Fit	The data on the interface is displayed in the center according to the appropriate size; it can be operated by shortcut keys.
Set Rotate Center	The rotation center can be set on the data by the left mouse button.
Reset Rotate Center	Reset the rotation center back to the data center.
Bottom camera	Open or close the camera window.

Project Alignment

Click the button in the right function panel of the scanning interface to enter the project alignment screen. This feature allows combining scanned data from multiple project files within the current project group into a complete 3D model, improving scanned data completeness.

Alignment Mode	Description	Alignment Mode	Description
 **Auto Feature Alignment**	Automatically aligns based on model features, suitable for scanned data with rich geometric features or when markers cannot be applied.	 **Manual Feature Alignment**	Aligns by manually selecting feature points on models. Use when auto feature alignment performs poorly.
 **By Markers**	Automatically aligns based on markers on models, suitable for marked model data.	 **Manual Markers Alignment**	Aligns by manually selecting markers on models. Use when By Markers performs poorly.

Button	Description	Button	Description
Apply	Click to confirm alignment.	**Next**	Click to merge aligned projects into one group. This group can be further aligned with other projects.
Cancel	Click to undo alignment.	**Exit**	Click to exit alignment interface.

Function	Description	Function	Description
Pan Model	Hold mouse wheel and move cursor.	Rotate Model	Hold left mouse button and move cursor.
Zoom Model	Scroll mouse wheel to zoom.		

 Auto Feature Alignment

1. Click  to select **Auto Feature Alignment** mode.
2. Choose projects to align in the fixed and floating windows on the left.

> **Note**
>
> Use zoom, rotate, and other operations in both windows as prompted on the left to inspect selected models.

3. Click **Apply** to automatically align projects in both windows based on shared features.

> **Note**
>
> Not suitable for objects with repetitive features (e.g., circular shapes) or very small objects.

 Manual Feature Alignment

1. Click  to select **Manual Feature Alignment** mode.
2. Choose projects to align in the fixed and floating windows on the left.

> **Note**
>
> Use zoom, rotate, and other operations in both windows as prompted on the left to inspect selected models.

3. Hold `⇧ Shift` and click common feature points on models in both windows.
4. Click **Apply** to align projects based on selected feature points.

> **Note**
>
> - Selected feature points must not be colinear.
> - Select at least 3 common feature points per project.

 By Markers

1. Click  to select **By Markers** mode.
2. Choose projects to align in the fixed and floating windows on the left.

> **Note**
>
> Use zoom, rotate, and other operations in both windows as prompted on the left to inspect selected models.

3. Click **Apply** to automatically align projects based on shared markers.

 Manual Markers Alignment

1. Click  to select **Manual Markers Alignment** mode.
2. Choose projects to align in the fixed and floating windows on the left.

> **Note**
>
> Use zoom, rotate, and other operations in both windows as prompted on the left to inspect selected models.

3. Hold `⇧ Shift` and click common markers on models in both windows.
4. Click **Apply** to align projects based on selected markers.

Note

- Selected markers must not be colinear.
- Select at least 3 common markers per project.

Post-Processing

Mesh

After generating the point cloud, click on the right sidebar in the scanning interface to enter the post-processing interface, where the point cloud can be converted into the mesh.

Mesh Type

Choose different mesh types based on your requirements.

Function	Description
 **Unwatertight Model**	For models with unclosed holes, use this mesh type to keep the original state with less meshing time.
 **Semi-watertight Model**	Fill the holes automatically.
 **Watertight**	All holes will be filled automatically. The data can directly be 3D printed.

Mesh Optimization

After selecting the mesh type, you can continue to adjust the following parameters to optimize the mesh.

Filter

Optimize the data and improve the clarity of the data.

- Standard: Optimize data slightly and preserve data characteristics.
- Med: Reduce the noise on the surface of the scanned data.
- High: Reduce the noise on the surface of the scanned data and make the data smoother.

Smooth

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

Remove Small Floating Parts

Delete any small disconnected data from the main data.

Simplification

Set the reduction level of the number of triangles in the mesh.

> **Note**
>
> - When the number of triangles removed during simplification exceeds the maximum number of triangles you set, the software will prioritize the simplification effect.
> - In **Laser Scan**, select **Unwatertight Model** as the mesh type and then you can choose to enable **Intelligent Simplification**. The software will automatically set the degree of simplification based on the model.

Max Triangles

Set the maximum number of triangles for data simplification.

> **Note**
>
> Please enter a reasonable value to avoid excessive simplification that may result in a decrease in data quality.

Remove Spike

Remove spike-like data on the edge.

Markers Hole Filling

Fill the surface holes on the data that are covered by markers before.

Recommended Parameters

When enabled, the software will automatically use the recommended parameters for meshing; when disabled, you can customize the parameters.

Buttons

Function	Description
Preview	Click this button to preview the effects of the applied settings.
	Click this button to discard the current settings and reset the preview effect.
Confirm	Click this button to apply the settings and enter the mesh editing interface.

Mesh Editing

After mesh generation and optimization, you can further process the mesh using the tools of the sidebar and the editing toolbar of the Post-Processing interface.

Left Sidebar

Click **+** to expand the left sidebar.

Texture

Adjust the brightness and contrast of the texture to improve the texture effect.

> **Note**
>
> - The default value is 0, and the range is -100 to 100.
> - This function is available for the project with textures.

Simplification

Set the reduction level of the number of triangles in the mesh.

> **Note**
>
> - The default value is 0, and the range is 0 to 99.
> - Excessive simplification will cause the loss of some data details.

Mesh Optimization

Optimize the quality of the data by adding more triangles to curvature regions.

> **Note**
>
> - The default value is 0, and the range is 0 to 100.
> - The optimization time increases with the volume of data.

Smooth

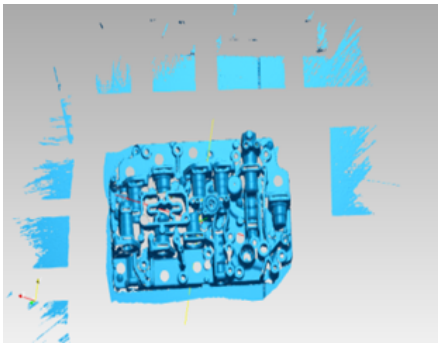
Smooth the possible noise on the surface of the scanned data.

> **Note**
>
> The default value is 0, and the range is 0 to 100.

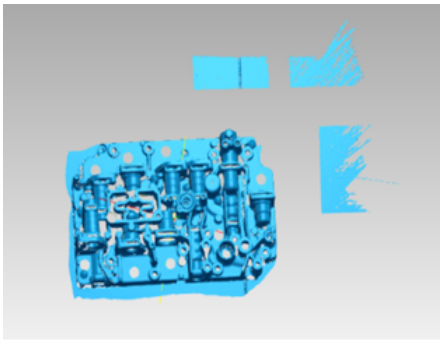
Remove Small Floating Parts

Delete any small disconnected data from the main body data.

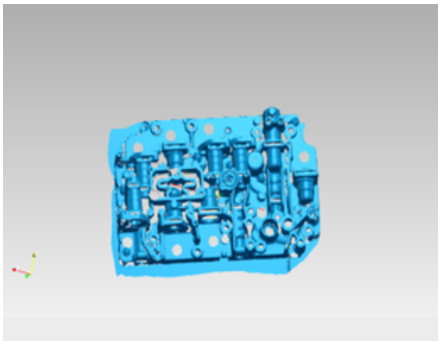
> **Note**
>
> The default value is 0, and the range is 0 to 100.



Original



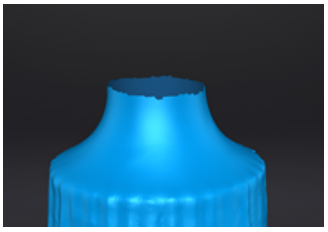
Remove 50



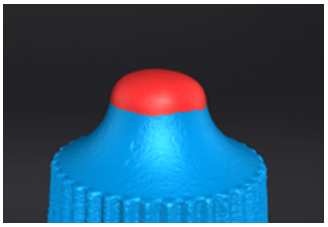
Remove 100

Auto Hole Filling

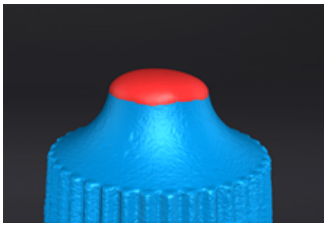
Fill every hole automatically whose perimeter is within the entered value (unit: mm).



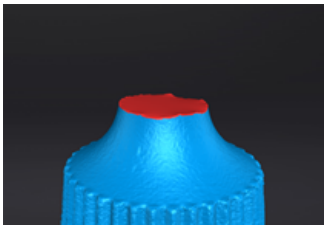
Original



Curvature



Tangent



Flat

Manual Hole Filling

Fill the hole by clicking the edge of the hole.

> **Note**
>
> The edge of the hole to be filled is displayed green, and the filled hole is displayed red.

Flip Normal

To redefine the front direction of the scanned data in reversal engineering.

> **Note**
>
> - Use `⇧ Shift` + `Left Button` to select data.
> - If you don't select an area, the normal of the entire data will be flipped.
> - **Texture Remapping** should be performed first as it is unavailable after **Flip Normal**.

Cutting Plane Tool

Adjust the coordinate of the data with a custom plane as the bottom.

> **Note**
>
> Use `⇧ Shift` + `Left Button` to create a straight line and generate a plane.

Mirror

Draw a straight line as the central axis and perform a symmetrical copy.

> **Note**
>
> Use `⇧ Shift` + `Left Button` to create a central axis.

Zoom

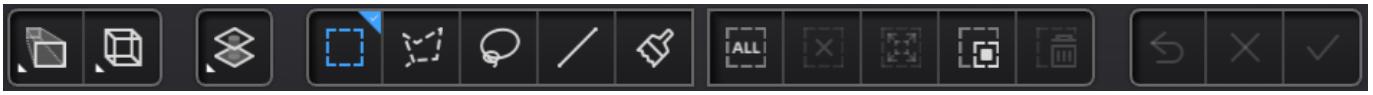
Adjust the scaling ratio of the model.

> **Note**
>
> The default value is 100, which means to maintain the original size.

Buttons

Button	Description	Note
	Resetting the preview effect.	It is unavailable in **Cutting Plane Tool** and **Zoom**.
Apply	Applying the operation.	/
Cancel	Undoing the operation and exit.	/

Editing Toolbar



功能	描述
 **Select Visible**	Selecting visible data on the front view only.
 **Select Through**	Selecting the visible area and the data behind it at the same time.

> **Note**
>
> To learn more, see Editing Toolbar.

Right Sidebar

Function	Description
 **Mesh**	Reopen the mesh panel to regenerate the mesh. **Note** If the mesh is imported locally, this function is not available.
 **Open File**	Open a project for post-processing.
 **Export Your Scan**	 : Save the scanned data in the specified format locally.  : If you have installed EXModel, clicking this button will switch to EXModel, and the data will be automatically imported.
 **Share Your Scan**	• Sharing your model to Sketchfab. • Uploading your model to SHINING 3D Digital Cloud.
 **Texture Remapping**	Refining texture misalignment issues after mesh optimization and mesh editing. **Note** • If hole filling or simplification is applied, remap the texture before saving the data. • If you are going to process the texture in a third-party software, click **Texture Layout Optimization** to create an optimized arrangement which will make the texture editing much more convenient.
 **Show Texture / Hide Texture**	Toggle model texture visibility.
 **Model Display**	After clicking the button or press F12, the model will be displayed in rotation, and the rotation speed can be adjusted by clicking  . Press F12 again or Esc to exit the model display interface. The model is only displayed in the 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.

Measurement

Measurement

After completing mesh optimization, click  in the corresponding position of the navigation bar to enter the measurement interface, where you can perform operations such as **creating features**, **alignment**, and **measurement**. Alternatively, you can directly click  in the navigation bar from any interface to access the measurement interface. Click  on the right-side function panel or drag and drop project files to import models (including third-party 3D models) for measurement.

Interface Operations

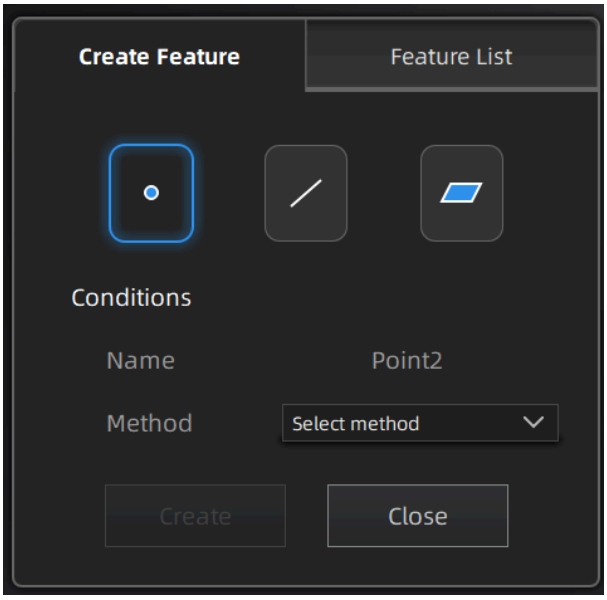
Function	Instructions
Rotation	Hold the left mouse button and move the cursor to rotate the model.
Movement	Hold the middle mouse button and move the cursor to move the model.
Zoom In/Out	Scroll the mouse wheel up or down to zoom in or out.
Fit View	Click this option in the right-click menu or press `^ Ctrl` + `D` to center and resize the data to fit the view.
Set Rotation Center	By default, the rotation center is the data center. Click this option in the right-click menu or press `^ Ctrl` + `D`, then click any point on the data to set it as the new rotation center. Press `⎋ Esc` to cancel.
Reset Rotation Center	Click this option in the right-click menu to reset the rotation center to the data center.

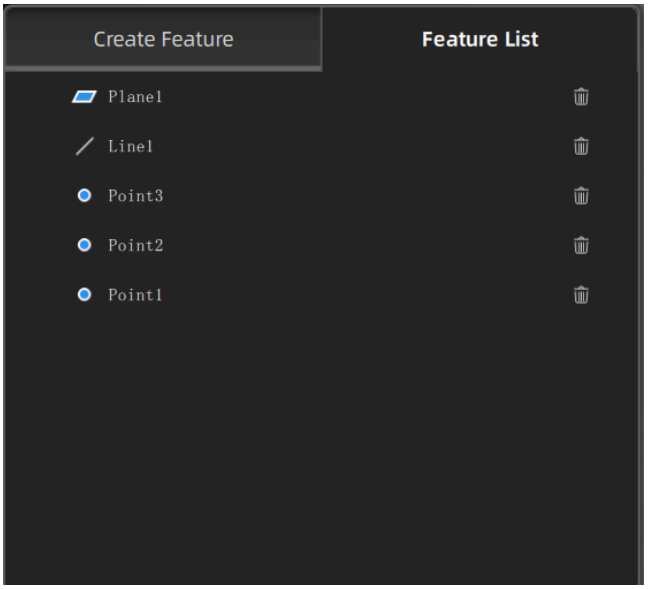
Right Sidebar

Function	Description
 **Open File**	Open a project for measurement.
 **Export Your Scan**	 : Save the scanned data in the specified format locally.  : If EXModel is installed, clicking this button will switch to EXModel, and the data will be automatically imported.
 **Share Your Scan**	• Share your model to Sketchfab . • Upload your model to SHINING 3D Digital Cloud .
 **Create Feature**	Click to enter feature creation mode for measurement. See Creating Features for details.
 **Align**	Click to align the model with the coordinate system. See Model Alignment for details.
 **Measure**	Click to measure distance, surface area, and volume. See Model Measurement for details.
 **Multi-View**	View the model from multiple angles during feature creation, alignment, or measurement.
 **Show Texture / Hide Texture**	Toggle model texture visibility.

Creating Features

On the right side of the measurement interface, click  to open the create feature window, where you can create feature points, lines, and planes for the model.





Note

You can switch to the **Feature List** to view created features; click to delete created features.

Feature Point

You can create feature points using either the **Select Point** or **Line-Plane Intersection** method.

Select Point

1. Choose **Select Point** as the creation method.
2. Click on the model to select points.
3. Click **Create** to generate a single feature point.

Note

If you do not click **Create** after selecting a point, you can click elsewhere on the model to reselect.

Line-Plane Intersection

1. Choose **Line-Plane Intersection** as the creation method.
2. Click on a created feature line on the model, or select one from the line dropdown list.
3. Click on a created feature plane on the model, or select one from the plane dropdown list.
4. Click **Create** to generate a single feature point.

> **Note**
>
> - You cannot select feature lines that lie on feature planes.
> - You cannot select parallel feature lines and planes.
> - This method requires pre-created feature lines and planes.

Feature Line

2 Points

1. Choose **2 Points** as the creation method.
2. Select two points by clicking anywhere on the data or by selecting created feature points.

   > **Note**
   >
   > Under **Selection**, you can click ◯ **From** or ◯ **To** to reselect points.

3. Click **Create** to generate a single feature line.

Plane-Plane Intersection

1. Choose **Plane-Plane Intersection** as the creation method.
2. Click on created feature planes on the model, or select them from the plane dropdown list.
3. After selecting two planes, click **Create** to generate a single feature line.

> **Note**
>
> - You cannot select two parallel feature planes.
> - This method requires at least two pre-created feature planes.
> - Before clicking **Create**, you can click ◯ **Plane** under **Selection** to reselect planes.

Feature Plane

3 Points

1. Choose **3 Points** as the creation method.
2. Select three points by clicking anywhere on the data or by selecting created feature points.

> **Note**
>
> - The three selected points must not be colinear.
> - Under **Selection**, you can click ◯ **Point 1** / **Point 2** / **Point 3** to reselect points.

3. Click **Create** to generate a single feature plane.

Point-Line Fit

1. Choose **Point-Line Fit** as the creation method.
2. Click on a created feature line on the model, or select one from the line dropdown list.
3. Select a point by clicking anywhere on the data or by selecting a created feature point.
4. Click **Create** to generate a single feature plane.

> **Note**
>
> - The selected point must not lie on the selected feature line.
> - Before clicking **Create**, you can click ◯ **Line** / **Point** under **Selection** to reselect.

Best Fit

Use the selection tool in the editing toolbar to select data, then click **Create** to generate a single feature plane. The resulting plane minimizes deviation from the selected area.

> **Note**
>
> For details about the editing toolbar, see the Point Cloud Editing section.

Model Alignment

Click  to open the alignment window. This function allows adjusting the spatial coordinates of data for easier post-processing or reverse engineering.

> **Caution**
>
> - Aligning models does not affect data shape or accuracy.
> - Once a model is aligned to a new position and the alignment function is exited, you can only restore its previous position by reloading the project file.

Precise Alignment

Achieve accurate alignment between models and coordinate systems by entering precise values.

> **Note**
>
> You can enable the **global coordinate system**. When enabled, the interface will display the global coordinate system with red indicating the positive X-axis direction, green for positive Y-axis, and blue for positive Z-axis.

1. Use  multi-view function or pan/rotate the model to check different viewing angles and verify if the placement meets requirements.
2. Determine the translation or rotation axis (X, Y, or Z axis), enter corresponding values, then click **Move To**.
3. Repeat step 2 until suitable rotation values are identified.
4. After adjusting one direction, click **Close** to exit the alignment window and save adjustments.
5. Re-enter the alignment window and repeat steps 2-4 until the model placement meets requirements across different viewing angles.

3-2-1 Coordinate System Alignment

3-2-1 Coordinate System Alignment aligns data through point, line, and plane constraints. Before alignment, use  **Create Feature** to establish feature points, lines, and planes.

> **Note**
>
> The coordinate system displayed represents the global coordinate system, with red indicating positive X-axis, green for positive Y-axis, and blue for positive Z-axis.

1. Select a feature plane from the plane dropdown menu, then choose an axis from the corresponding constraint dropdown. The arrow on the plane corner indicates its positive direction and the selected axis direction will match the plane's orientation.
2. Select a feature line from the line dropdown menu, then choose an axis from the corresponding constraint dropdown. The line's arrow indicates its positive direction and the selected axis direction will match the projection direction of the line on the chosen plane.

3. Select a point from the point dropdown menu and this point's position will become the coordinate origin (0,0,0).
4. Click **Align** to perform coordinate axis transformation; click **Reset** to restore the coordinate system, undoing all transformations made since entering the 3-2-1 alignment interface.

> **Note**
>
> Avoid selecting perpendicular feature lines and planes for alignment to prevent failure.

5. After alignment, click **Close** to confirm the transformation and exit the alignment interface.

Quick Alignment

Quickly align coordinate systems by adjusting model angles.

1. Rotate the model to the desired angle.
2. Click **Align** to move the coordinate frame to the model's center with X-axis perpendicular to screen, Y-axis parallel to screen pointing right, and Z-axis parallel to screen pointing up (model position remains unchanged). Click **Move** to position the coordinate frame at the object's bottom center.
3. After alignment, click **Close** to apply the adjusted coordinate frame and exit alignment. If unsatisfied with results, click **Reset** to restore the coordinate frame to its initial state for re-alignment.

Model Measurement

In the right function panel of the measurement interface, click  to open the measurement window, where you can calculate the surface distance between points, the surface area of selected data, and the volume of enclosed data.

Distance

When you select two points on the data, the straight-line distance between those two points will be automatically calculated.

> **Note**
>
> - **Total value** represents the 3D distance.
> - **X value**, **Y value**, and **Z value** are the projection lengths of the line segment formed by the two points onto each coordinate plane.
> - You can click to select ○ **First point** / **Second point** to reselect points.

Surface Area

After selecting data using the selection tool or shortcut keys, click **Calculate** to compute the area of the selected surface region, measured in square millimeters (mm²).

> **Note**
>
> - Point clouds or markers cannot be used for surface area calculation.
> - For detailed information about selection tools and shortcut keys, refer to the Point Cloud Editing section.

Volume

When entering the volume measurement function, the overall volume of the data and its bounding box coordinates (the smallest axis-aligned box enclosing the data) will be automatically displayed, with volume measured in cubic millimeters (mm³).

> **Note**
>
> Only closed mesh models support volume measurement.

Save and Export

The processed model files can be exported or shared.

Save Model

The model can be exported locally or to EXModel.

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

Format	Data Type	Saved as	Application
ASC (whole scan)	Optimized point cloud	Scan.asc	• Data viewing and analysis. • Further data processing, registration, etc in other software.
STL	Mesh	Scan.stl	• 3D printing. • Reverse engineering. • Further editing, rendering, etc. in other 3D modeling or rendering software.
PLY	Mesh	Scan.ply	Further editing, rendering, etc. in other 3D modeling or rendering software.
OBJ	Mesh	Scan.obj Scan.jpg Scan.mtl	• 3D printing. • Data conversion and sharing in different platforms.
3MF	Mesh	Scan.3mf	• 3D printing. • Data conversion and sharing in different platforms. • Further editing, rendering, etc. in other 3D modeling or rendering software.
P3	Global markers	Scan.p3	Quickly importing the global markers and the cutting plane (if any) together into the scanning interface to assist with the scanning process.

Note

When saving the file in .p3 format, complete the optimization after scanning.

- Click > to switch to EXModel, and the data will be automatically imported.

Share Model

You can upload the mesh to Sketchfab.

Click to upload the 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 uploaded files are in STL format.

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