SHINING 3D

EinScan H

V1.3.0.1

User Manual

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Overview

About the User Manual

Symbol Convention

Symbol	Description
	**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.

Legal Disclaimer

This document is related to your safety, lawful rights and responsibilities. Read it carefully before installing and using the product.

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- In the event of any ambiguity and/or any advice on the contents of the document, contact us by the contact information in this document.

Getting Started

This chapter provides an overview guide for the hardware and the software of EinScan H, making it easy for you to find the corresponding instructions.

About the Hardware

You can learn about the hardware here, including the appearance of the scanner and its cable connection.

→ Introduction to the device

→ How to connect the device?

About the Software

You can learn about the software here, including its installation, activation and so on.

→ How to install the software?

→ How to activate my device?

→ How to upgrade the firmware or the software?

→ Introduction to the interface

After installation and activation, follow the steps below to use the scanner.

1 Calibrate the scanner

Calibration ensures the accuracy of the scanner and improves the scanning quality.
Calibrate the scanner if you first use it; when the calibration is completed, it will be skipped automatically next time you open the software.

→ How to prepare for calibration?

The calibration sequence is:
Accuracy calibration / Quick calibration > White Balance.

2 Select a scan mode

Select a scan mode before scanning.
The scan mode includes **White Light Mode** and **IR Mode**, depending on the light source.

→ Introduction to White Light Mode

→ Introduction to IR Mode

3 Create a project group

4 Set scanning parameters

After you select a scan mode, choose a folder and create a project group.

→ How to create / open a project group?

→ How to create / open / delete a project in a project group?

→ How to modify a project?

When a project group is created, you can set relevant parameters to get a better scan result.

→ How to set scanning parameters?

5 Scan and generate a point cloud

After you set scanning parameters, scan the object and generate a point cloud.

→ How to scan an object?

→ How to generate a point cloud?

→ How to scan foot?

6 Edit scanned data

You can edit the scanned data when the scanning is paused or completed to reduce noises and get accurate data.

→ How to edit scanned data?

→ How to align scanned data?

→ Other interactions

7 Post-process and measure scanned data

You can post-process and measure the scanned data.

→ How to generate and optimize a mesh?

→ How to edit mesh data?

→ How to create features for further interactions?

→ How to move the scanned data?

→ How to measure the scanned data?

Hardware

Device Introduction

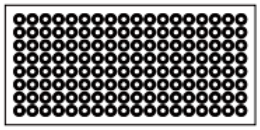
The EinScan H adopts both LED light and infrared VCSEL as light sources to help you efficiently capture the data of hair and other black objects. Its flashless infrared technology also provides better experience for human eyes. In addition, this device's high-accuracy scanning combined with advanced texture mapping algorithms reproduce full-color information of objects, suitable for quickly acquiring high-quality color 3D data of human bodies and objects of a wide range of sizes.

Appearance

Serial Number	Description
1	Working distance indicator
2	Zoom in / Zoom out
3	Brighter / Darker
4	Preview / Scan / Pause
5	USB port
6	Power input

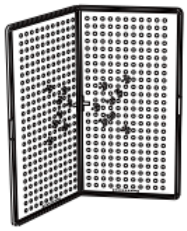
Components

Scanner

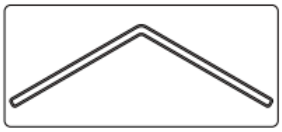


Markers

Power adaptor



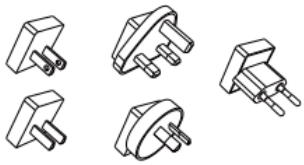
Calibration board



Position paper

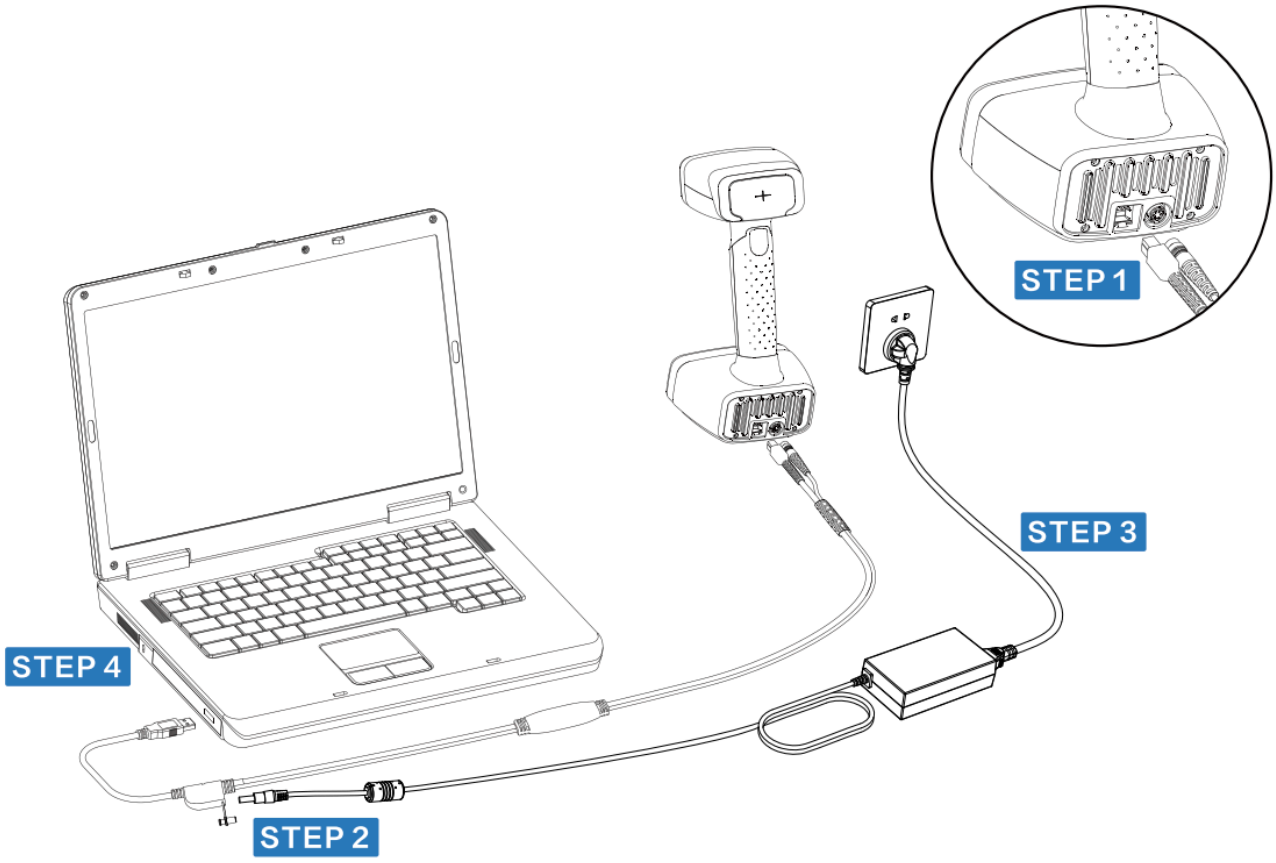
Connection cable
(USB, DC IN)

USB drive



Plug

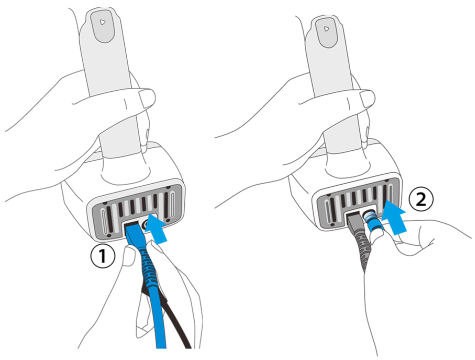
Device Connection



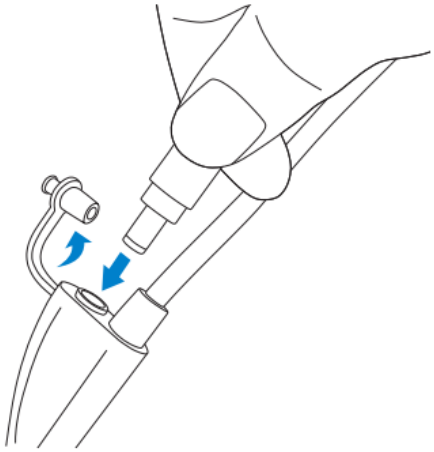
> ⚠ **Caution**
>
> Make sure you are using the supplied power adapter.

The steps to connect the device are as follows:

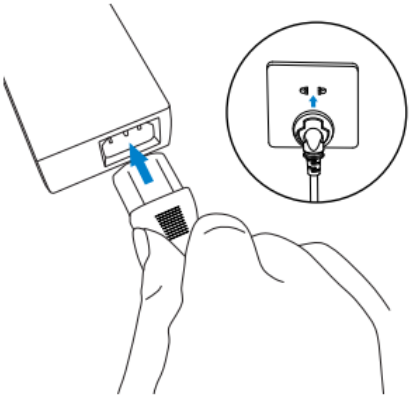
1. Plug USB and DC IN into the bottom of the scanner.



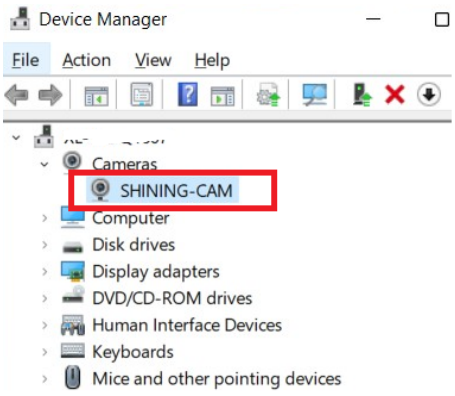
2. Plug the power cable into the connection cable.



3. Powered on, the upper light board lights up once, and the bottom two light strips remain constant.



4. Plug the other side of connection cable into the USB 3.0 port of the computer. Now you can see our device in your Device Manager.



Software

Software Installation

To use the scanner, you need to install the **EXScan H** software first (hereinafter referred to as "the Software").

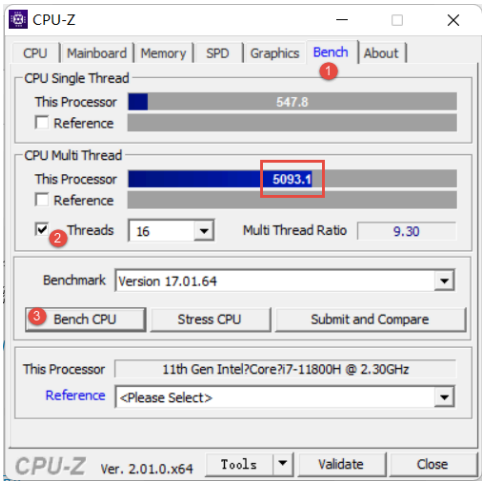
Environmental Requirements

Recommended configuration:

Configuration	Recommendation
Operating System	Window 10 (64-bit) and Window 11 (64-bit).
Processor	Intel® Core™ i7-8700 or above. **Note** Improper computer configuration or hardware issues will cause CPU performance degradation and affect the user experience, it is recommended that you use the CPU-Z tool to check CPU performance before starting scanning; for more, please see processor.
Graphics Card	NVIDIA RTX 3060 or above.
VRAM	4GB or above.
RAM	32GB or above.
Interface	USB 3.0.

Processor

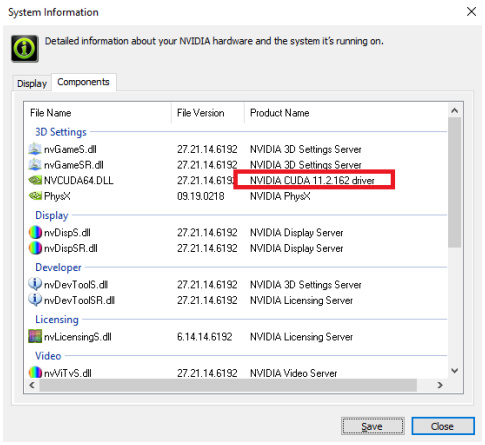
Install and launch CPU-Z, follow the steps in the right figure to get a CPU multi thread performance score. A score of **4000** or more is required.



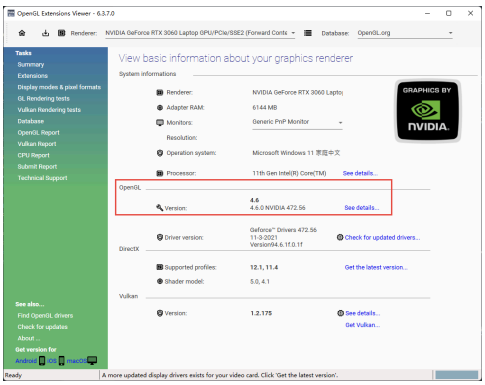
OpenGL

Please use a NVIDIA1[1] discrete graphics card for better and smoother scanning experience. Besides, NVIDIA1 discrete graphics card should meet requirements as follows:

● The graphics card should support **CUDA 10.2** or above. You can use **NVIDIA Control Panel** > **Help** > **System information** > **Components** to get the current CUDA version.



● The graphics card should support **OpenGL 4.3** or above Use OpenGL Extensions Viewer to check the OpenGL version, if it is lower than 4.3, please update the graphics card driver and check again. If it is still lower than 4.3, it means that the graphic card CAN NOT support the scanner.



The instruction about using graphics card on two types of device is shown as follows:

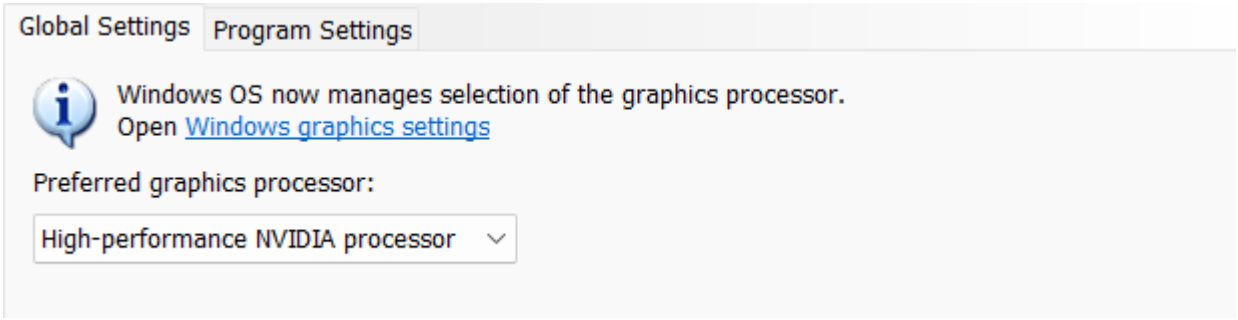
- **Use a discrete graphics card on desktop**:

  Connect your monitor to the port of discrete graphics card on the back of your computer, and OS will use the discrete graphics card automatically.

- **Use a discrete graphics card on laptop**:

  a. Launch **NVIDIA Control Panel** on your laptop.

  b. Go to **3D Settings** > **Manage 3D Settings** > **Global Settings**, select **High-performance NVIDIA processor** and **Apply**.



Software Installation

Please log in, choose the corresponding device for software download. You can also use the software from the USB drive included in the device's packaging for installation.

> ⚠ **Caution**
>
> - Administrator rights are required for the software installation. The initial installation environment may take a long time, please wait patiently.
> - Please do not install the software in "C:\Program Files" or "C:\Program Files (x86)". The software will not run when installed under these folders due to restricted rights.

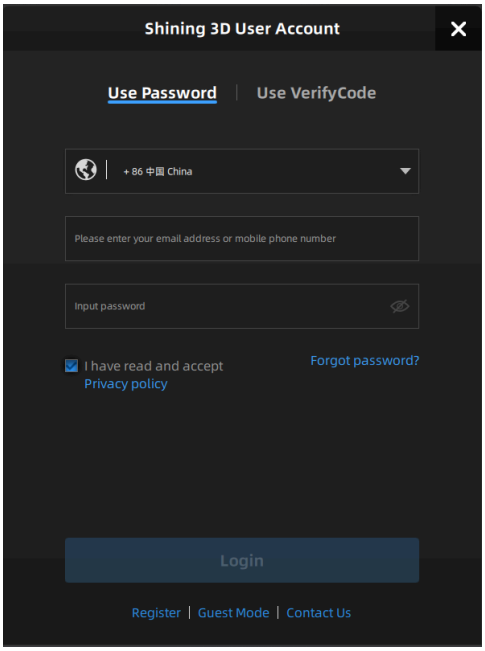
1. We use CUDA from NVIDIA to get high scanning experience. ↩

Device Activation

Before using the device, please activate it first, and you can choose online activation or offline activation.

Online Activation

Launch the software, then register a Shining 3D user account. Login with your new account, and the device will be activated automatically.



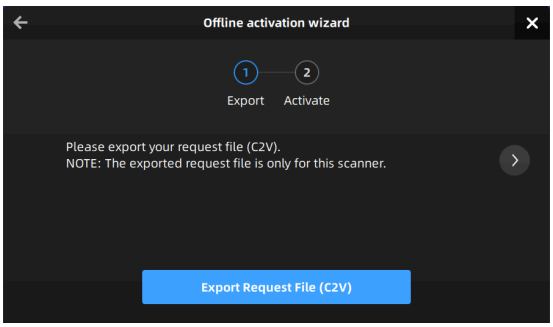
Note

- If you are a new user, please register a Shining 3D Passport account first: you can click **Register** in the pop-up window after starting up the software, or click **Sign Up** in the Shining 3D Passport official website.
- Please read and then check **Privacy Policy** and **Terms of use**.

Offline Activation

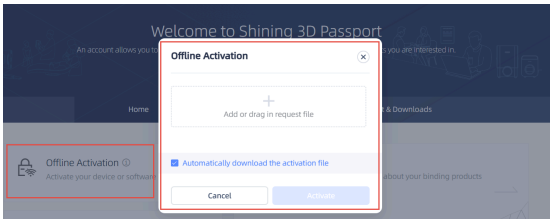
If your computer is unable to connect to the internet, please select the offline activation method.

1.Connect scanner to the computer without network and export C2V file.



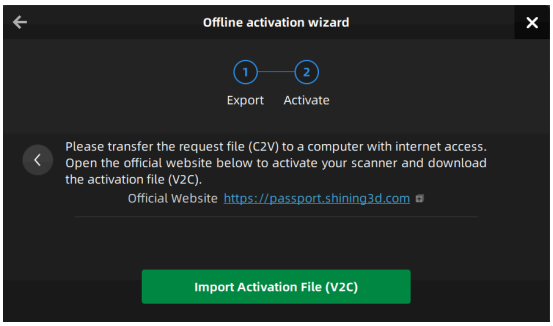
2.Copy the C2V file to the other computer connected to Internet.

3.Log into Shining 3D Passport official website, upload your C2V file in the **offline activation** page and complete the information of activation, you can then download the V2C file.



> **Note**
>
> If you are a new user, please register a Shining 3D Passport account first: you can click **Register** in the pop-up window after starting up the software, or click **Sign Up** in the Shining 3D Passport official website.

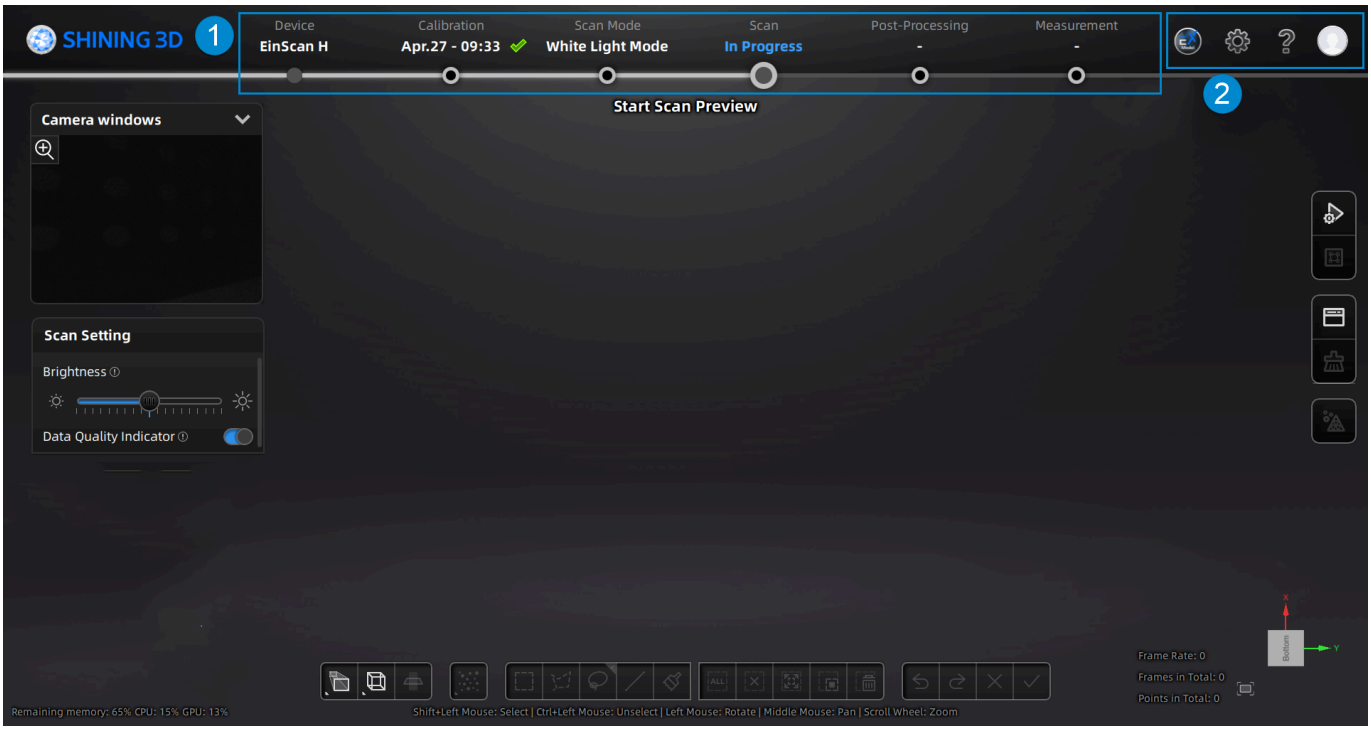
4.Copy the V2C file to the computer without network and import the file into the software.



> **Note**
>
> If you fail to activate the device in neither way, please contact your supplier or our support team.

Software Interface

Interface Overview



① Navigation Bar

Step	Description
Device	Demonstrate the device status： • Display the device name when it is online. • Show "offline" when it is offline; or you can click to reconnect manually.
Calibration	Click to calibrate the device to ensure its scanning accuracy.
Scan Mode	Click to select a scan mode: • White light Mode: Suitable for scanning non-reflective and non-black object, and data quality & accuracy are higher. • IR Mode: Suitable for scanning human and slightly reflective objects, and data quality & accuracy are lower.
Scan	Click to start scanning.
Post-Processing	Click to enter the post-processing step to process the scanned cloud data, including model mesh and mesh editing.
Measurement	Click to switch to the measurement step, where you can measure the cloud data and align the coordinates of the data.

② Settings and Help

- If you have not installed the EXModel, click this button to view the relevant information and our technical support contact.
- If you have installed the EXModel, click this button to directly switch to this software; and if you are in the post-processing or measurement interface with meshed data (STL, OBJ or PLY format), the data can be directly imported into it.

Function	Description
Select language	Select the needed language for software.
Compatible with 3Dconnexion CadMouse	Open (as default) to support connect and use of 3D mouse and related functions, including rotation axis and shortcuts.
Texture Mapper	By checking this option, icon will appear in the right-side function bar in the post-processing and measurement interface.
Calibration guide	Tick and the instructional videos before calibration will be displayed automatically in the Calibration step.
Factory Default	Click **Recover** to recover all settings to its original status and the software will restart itself.

Function	Description
About	Display device and software information.
System Diagnose	Switch to this tab to automatically detect memory, graphics card, remaining disk space, etc.; click **Refresh** to trigger detection again.
Support	Provide the entrance to check user manuals and start up the Teamviewer (for remote assistance), and submit ticket for technical support.

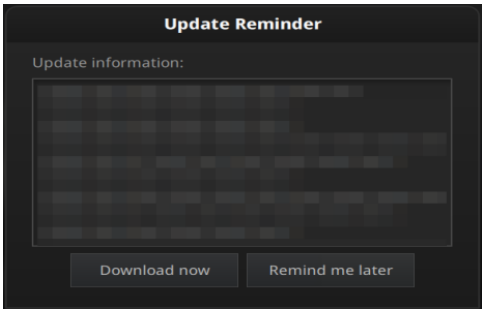
Provide the entrance to login / logout, **My Shining 3D account**, Official Website and official Facebook account page.

Version Upgrade

When a new version of software is released, you will get prompted when launching the software; if the firmware in the software is newer than that in the scanner, you will get prompted as well.

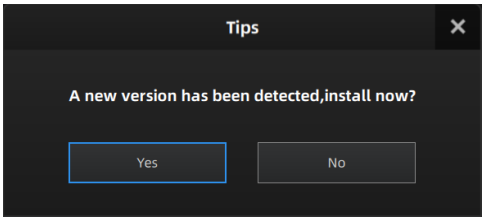
Software Upgrade

The software will be upgraded for releasing new features, fixing bugs or optimizing its performance, when a new version will be released, and you will be prompted with an **Update Reminder** when launching the software next time.



> **Note**
>
> It is recommended that you use the latest version of software, or you will be prompted with a reminder when launching the software every time.

Click **Download now** to download the new installation package in the background; once it finishes, a reminder will pop up as shown in the right figure.
Click **Yes** to start installation.

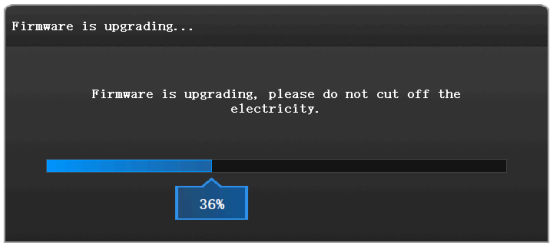


> **Caution**
>
> - During the downloading process, you can continue using the software; if you close the software before the process completes, the process will pause automatically and continue itself the next time you open it.
> - The software will be closed during upgrading, so **please save your projects properly before upgrading**.

Firmware Upgrade

The firmware[1] will be upgraded for fixing bugs or better scanning effects, when a new version will be released, and you will be prompted with a reminder when launching the software next time.

Click **Yes** to upgrade the firmware, as shown in the right figure.



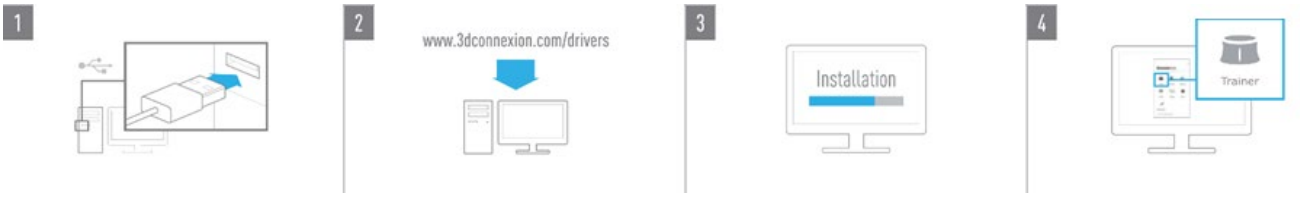
1. Firmware is the software that runs on the scanner. ↩

3D Mouse

This software is compatible with 3Dconnexion CadMouse. With the 3Dconnexion CadMouse, you can quickly 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 CadMouse from its packaging and insert the connecting cable into a USB port on your computer.
2. Open the official website for downloading the software.
3. Download and install the latest version of the 3Dconnexion software.
4. Run the software and click **Trainer** for quick training and guide.

Interface

Icon	Description
	Learn how to quickly use the 3Dconnexion SpaceMouse.
	Here you can 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).
	You can 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

Take SpaceMouse as an example, the instructions are as follows:

Main Panel

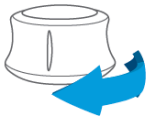
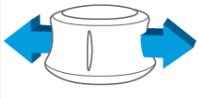

3Dconnexion Keys
Control Cap
Keyboard Modifiers
Menu Button
Color Display
CustomView Buttons
Rotation Toggle Button
QuickView Buttons
Fit Button
3Dconnexion
3D Designer - Modeling
Extrude
Hole
Round
Distance
Angle
Diameter
Sketch
Circle
Spline
Insert Part
Mate
Coincident
1
2
3
4
5
6
7
8
9
10
11
12
ESC
ENTER
DELETE
TAB
SHIFT
CTRL
ALT
SPACE
MENU
V1
V2
V3
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.
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 **markers edit** (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 Edit.
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 + ⇧ Shift + Z	Cancel edit
11	Enter ⏎	Apply edit
12	/	/

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.

Calibration

Calibration Notice

With **calibration**, the scanner parameters are recalculated, which not only ensures the accuracy of the scanner, but also improves the quality of scanning.

Specifically, it includes **quick calibration**, **white balance** and **accuracy calibration**: Please select accuracy calibration in your initial use, and quick calibration is recommended when recalibration is required.

Calibration is required under the following conditions:

- When the scanner is used for the first time.
- The scanner was severely shaken or shocked, such as shocked during transportation.
- Severe accuracy reduction, such as frequent errors in alignment or unrecognized markers.
- Incomplete data is acquired during the scanning or serious deterioration of the quality of scanned data.

Note

- After the calibration completes, will appear next to the "calibration" step button in the navigation bar, and this step will be automatically skipped when you start up this software again.
- If the current device has not been calibrated for more than 14 days, will appear next to the "calibration" step button in the navigation bar; if it has been more than 20 days without calibration, a pop-up window will appear on this interface with the option to **Calibrate now** or set a reminder for **7 days later**.

Warning

- The calibration board is matched to the device. Doing the calibration with an incorrect calibration board will fail to generate good scan data or optimum accuracy.
- Always make sure that both sides of the calibration board are clean and free of scratches.
- Do not place heavy objects or sundries on the calibration board.
- Keep the calibration board away from corrosives, metals and sharp objects to avoid corrosion or damage.
- It is not recommended that you wipe the calibration board. When cleaning the board becomes very necessary, gently wipe it with a piece of a clean damp cloth. Do not use a cloth with chemicals or alcohols to wipe the calibration board.
- After using the calibration board, put it safely in a box or flannel bag.

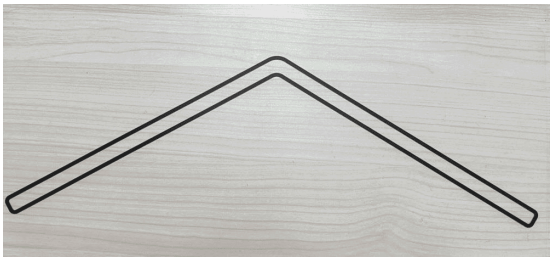
Genauigkeitskalibrierung

Für die erstmalige Verwendung des aktuellen Geräts, wenn keine Kalibrierungsdaten in der Software vorhanden sind, ist es erforderlich, vor dem Scannen eine Genauigkeitskalibrierung durchzuführen.

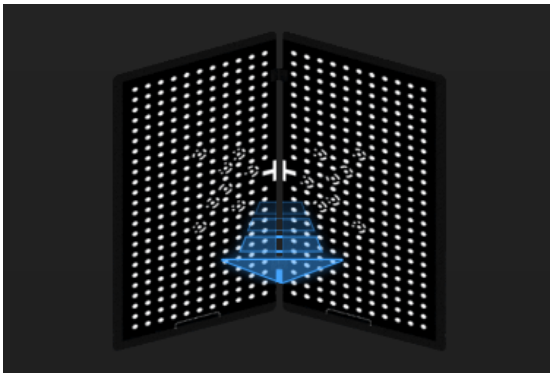
Bitte folgen Sie der **Kalibrierungsanleitung** in der Software, um die Genauigkeitskalibrierung durchzuführen; und drehen Sie den Scanner während der Kalibrierung in 5 verschiedene Positionen.

Die Schritte für Genauigkeitskalibrierung sind wie gefolgt:

1.Legen Sie das pfeilförmige Positionspapier auf eine ebene Fläche, wobei die Pfeilspitze nach vorne zeigt.

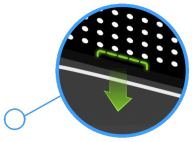


2.Öffnen Sie die Kalibrierungstafel mit der schwarzen gepunkteten Seite zu Ihnen und stellen Sie sie vertikal auf das Positionspapier, sodass sie mit der Umrisslinie übereinstimmt.



Hinweis

Bitte platzieren Sie die Kalibrierungstafel gemäß der Ausrichtung in der rechten animierten Abbildung.



3.Passen Sie die Position des Scanners gemäß der Abbildung in der Software-Schnittstelle an und stellen Sie sicher, dass er sich in derselben Position befindet.

4.Drücken Sie leicht auf die Rückseite des Scanners, um die Aufnahme zu starten, und ziehen Sie den Scanner dann langsam in Pfeilrichtung der Software-Schnittstelle von nah nach fern. Passen Sie während der Bewegung den Abstand zwischen dem Scanner und der Kalibrierungstafel anhand der Farbänderungen der Abstandsleisten an.

Vorsicht

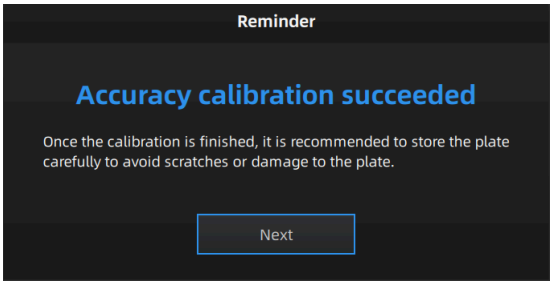
- Bewegen Sie die Kalibrierungstafel nicht, nachdem die Bilder erfasst wurden.
- Achten Sie während der Bewegung auf die Software-Schnittstelle: Bei einem Fehlverhalten wird eine Fehlermeldung angezeigt.
- Stellen Sie während der Bewegung sicher, dass das Kreuz auf der Kalibrierungstafel im weißen Feld des Kamerasichtfensters bleibt.

Abstandsleisten	Farbe	Bedeutung
	Schwarz	Nicht kalibriert
	Blau	Am Kalibrieren
	Grün	Kalibriert

5.Wenn alle Abstandsleisten grün werden, bedeutet dies, dass die Kalibrierung für die aktuelle Position abgeschlossen ist, und die Software geht zum nächsten Kalibrierungsschritt für die zweite Position über.

6.Passen Sie die Position des Scanners gemäß der Abbildung an und wiederholen Sie Schritt 3 bis Schritt 5 (wie oben beschrieben), um die Kalibrierung für die verbleibenden 4 Positionen abzuschließen.

7.Überprüfen Sie das Kalibrierungsergebnis; wenn die Meldung "Genauigkeitskalibrierung erfolgreich" erscheint, können Sie auf **Weiter** klicken, um in den **Weißabgleich**-Kalibrierungsprozess zu gelangen.



Hinweis

- Wenn die Kalibrierung fehlschlägt, versuchen Sie es bitte erneut.
- Wenn die Kalibrierung weiterhin fehlschlägt, kontaktieren Sie bitte Ihren Lieferanten oder unser Support-Team.
- Wenn es sich nicht um die Erstkalibrierung handelt, können Sie direkt mit dem Scannen beginnen, indem Sie auf die Schaltfläche in der Navigationsleiste klicken.

White Balance

When the ambient brightness changes, it is recommended that you calibrate the white balance to ensure the accuracy of the scanned texture data.

Caution

Do not perform white balance calibration under strong light, polarization-color light or monochromatic light in order to avoid color cast or other problems.

The operation steps for white balance calibration are as follows:

1.Place the calibration board horizontally with the white side up.

Caution

To get a better texture, please make sure the calibration board is clean.

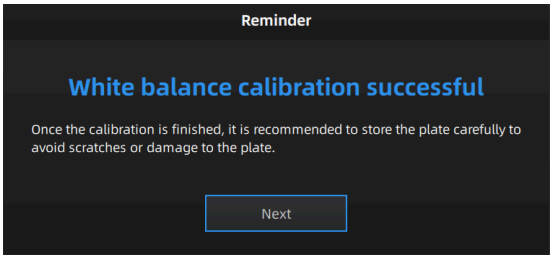
2.Hold the scanner vertically to the calibration board, and make sure to point the scanner to the center of the calibration board on the camera viewpoint.

3.Press gently on the back side of the scanner to start capturing, then slowly move the scanner vertically up to the height of the middle distance bar; during the movement, please adjust the distance between the scanner and the calibration board based on the color changes of distance bars.

> ⚠ **Caution**
>
> - Do not move the calibration board after capturing images.
> - During the movement, please pay attention to the software interface: it will give error message when any misoperation.
> - During the movement, please make sure to point the scanner to the center of the calibration board on the camera viewpoint.

4.When the middle distance bar turns blue (as shown in the right), the software will do the calculation automatically and demonstrates the calibration result.

5.If it prompts "White balance calibration successful", you can click **Next** to **start scanning**.



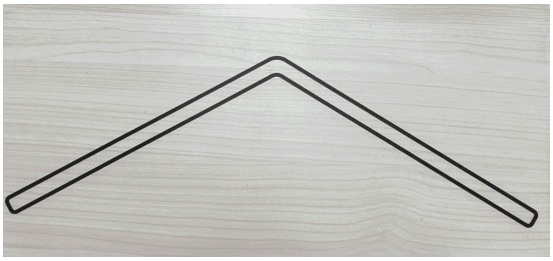
> ⚠ **Caution**
>
> - If the calibration fails, please repeat step 2 to step 4.
> - If you still fail to calibrate the scanner, please contact your supplier or our support team.
> - If still not satisfied with the scanned texture data, please do white balance calibration again, or change the ambient light first.

Quick Calibration

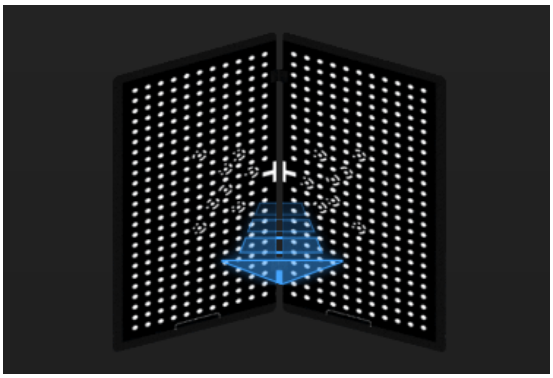
After accuracy calibration or there already exists calibration data in the software, quick calibration is recommended when the scanning accuracy drops or alignment failure occurs frequently.

The operation steps for quick calibration are as follows:

1.Place the arrow-shaped position paper on a flat surface with the arrowhead pointing forward.

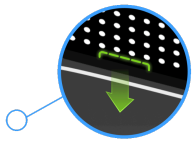


2.Open the calibration board with its black dotted side toward you and place it vertically on the position paper to match the outline.



Note

Please place the calibration board according to the orientation shown in the right animated image.

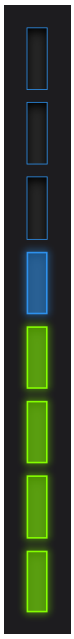


3.Adjust the scanner's position according to the illustration on the software interface and make sure it has the same position.

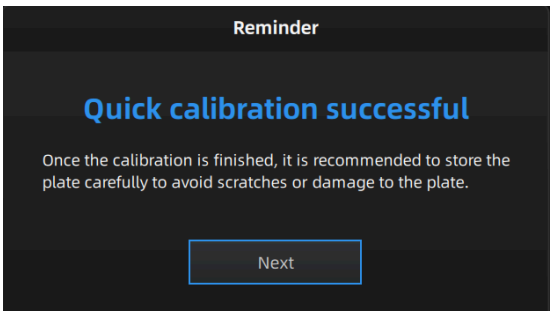
4.Press gently on the back side of the scanner to start capturing, then slowly pull the scanner in the direction of the arrow shown on the software interface from near to far; during the movement, please adjust the distance between the scanner and the calibration board based on the color changes of distance bars.

Caution

- Do not move the calibration board after capturing images.
- During the movement, please pay attention to the software interface: it will give error message when any misoperation.
- During the movement, please make sure the cross on the calibration board is in the white box on the camera viewport.

Distance indication bars	Color	Meaning
	Blank	Not calibrated
	Blue	Calibrating
	Green	Calibrated

5.When all distance bars turn green, the software will do the calculation automatically and demonstrates the calibration result; if it prompts "White balance calibration successful", you can click **Next** to **start scanning**.



Note

- If the calibration fails, please try it again.
- If you still fail to calibrate the scanner, please perform **Accuracy Calibration**.

Scan

Preparation

If the object to be scanned has rich geometric or textural features, the scanning speed and quality can be better guaranteed;
On the contrary, if the object to be scanned has fewer geometric or textural features or a high degree of feature repetition, you need to do some preparation work before scanning to enhance your scanning experience.

For Portrait Scan

Wrong example

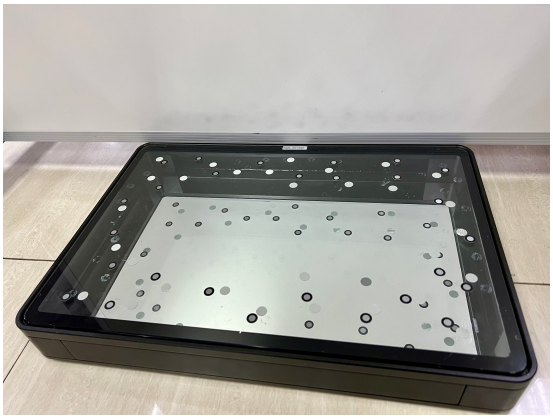
Correct example

Specific requirements:

1. Hairstyle: Please keep it as neat as possible and avoid hairstyles with loose strands or bangs.
2. Clothing: Avoid wearing dark or reflective clothing (such as black leather shoes); do not wear accessories or glasses that may cause reflections.
3. Posture: Since the scanned object should remain as still as possible during the scanning process, a comfortable and easy-to-maintain posture is suggested before the scan begins.

For Foot Scan

If you need to scan foot, it is recommended that you use a glass station (as shown below) to assist in scanning the sole data, and use the professional **Foot station alignment** mode designed for foot scanning; for more, please see foot scan.



For Special Objects

> **Note**
>
> **Not recommend** to scan following objects:
>
> - 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.

Object	Preparation	Notes while scanning
Transparent, shiny, reflective or black objects	Use washable or vanishing scanning spray.	Scan as normal after spraying.
Objects with less features or repetitive features	• Place markers on the object and select **Hybrid mode**. • Mark/draw on the surface to add features and select **Texture** mode.	Scan as normal after preparations.
Thin wall objects	Select **Global Markers** mode and place markers on and around the objects, for more please see scan for thin-wall objects.	Scan as normal after preparations.
Small objects	Select **Global Markers** mode, and **align** projects, for more see scan for small objects.	Scan as normal after preparations.

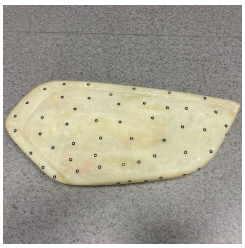
Scan for Thin-wall Objects

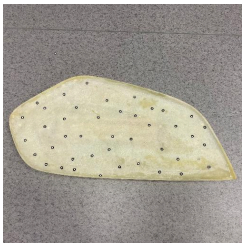
To scan thin-wall objects without distinct features, as shown in the follows:

It is recommended that you select **Global Markers** mode and scan with markers:

1.Prepare two auxiliary objects with markers placed on their upper and lateral sides.

2.Place different markers on lateral sides of the scanned object.





3. Place the scanned object side-upright and fixed, and place the auxiliary objects on both sides of the object (at a distance apart).

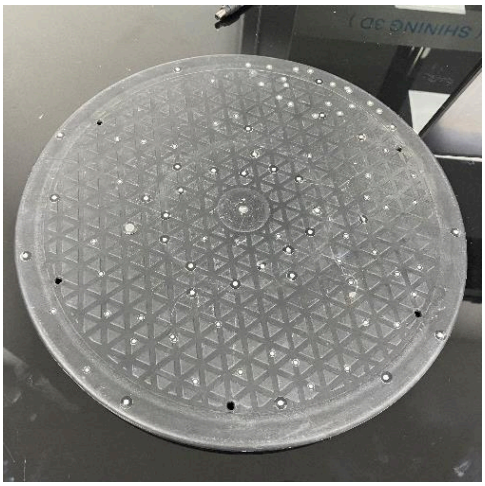
4.During the scanning process, the markers on both sides of the auxiliary objects should be scanned to complete the transition between the front and back side, then scan the lateral sides, and scan the left data after removing the auxiliary objects.

Scan for Small Objects

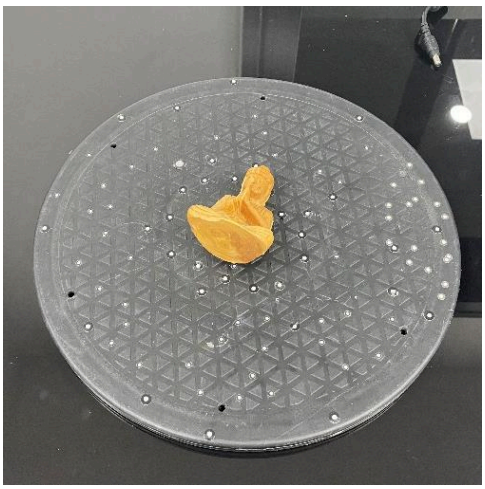
To scan small objects without distinct features, as shown in the right figure:

It is recommended that you select **Markers** alignment mode and align **By Manual**:

1.Prepare one auxiliary object with markers placed on its side.



2.Put the scanned object on the center of the surface with markers, and select **Markers** alignment mode.

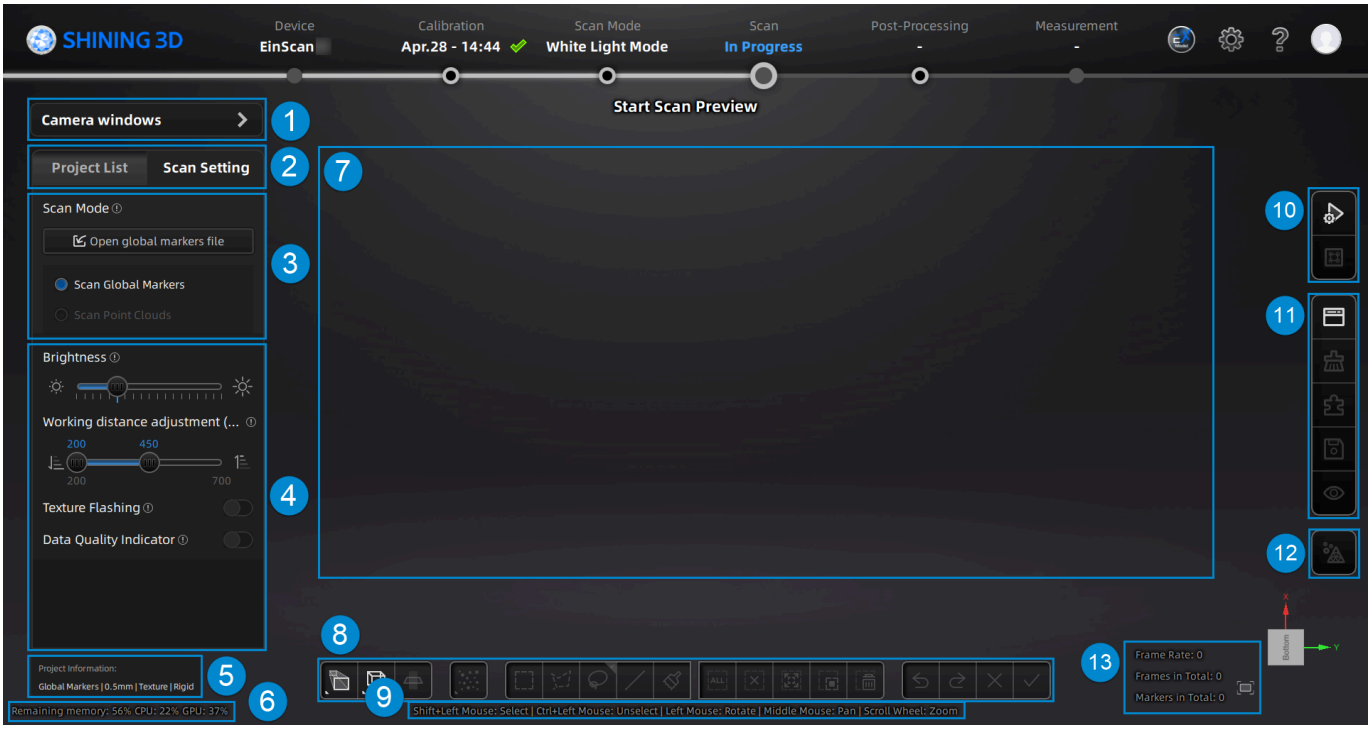


3.Turn over the object, and click  to create a new project within the current project group, and scan the back side of the object.

4.Click align **By Feature** to align two projects (if not successful, click **By Manual** instead).

Scan Interface

Interface Overview



Note

For the introduction to the top navigation bar and **Settings & Help** buttons in the top right corner, please see software interface.

① Camera Windows

Check the actual scanning scenarios captured by bottom camera and texture camera so as to adjust parameters accurately.

> **Note**
>
> The window for texture camera is disabled by default and can be enabled through the menu of the right mouse button.

② Project List and Scan Setting

Switch Project List and Scan Setting.

③ Scan Mode

Support Open global markers file or directly Scan global markers:

- White Light Mode > Global Markers.
- IR Mode > Object > Global Markers.

④ Parameter Settings

Set **Brightness**, **Working distance adjustment** and other scanning parameters, for more see scanning settings.

⑤ Project Information

Display the **Mode of Alignment**, **Resolution**, state for **Texture Scan** & **Non-rigid algorithm** buttons.

> **Note**
>
> - The project set in foot station alignment mode does not display project information.
> - Only the project set in hybrid mode alignment mode (excluding markers) supports setting non-rigid algorithm.

⑥ Remaining Memory, CPU & GPU

- **Remaining Memory**: Display the remaining memory space.
- **CPU**: Indicate the amount of computer's CPU resources it occupies during runtime.
- **GPU Usage**: Graphics card usage.

> **Note**
>
> If the program's memory usage is excessively high, it is recommended that you close other non-scanner software and wait patiently.

⑦ Previewing / Scanning Window

Windows for viewing the pre-scan results and the scanned model effects.

⑧ Data Editing Toolbar

Edit the scanned data and adjust the perspective, for more see data editing.

⑨ Shortcuts

Adjust the angle of models, move models and select data quickly, for more see shortcuts.

⑩ Scan and Generate Point Clouds

Preview, **Start & Pause Scan** and **Generate Point Clouds**, for more see start scanning.

⑪ Side Function Bar

Import the **Project Group**, **Projects Alignment**, **Delete & Save Your Scan**, and **Show/Hide Texture**, for more see side function bar.

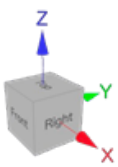
⑫ Mesh Model

See more details in mesh model.

⑬ Others

Display the **Frame Rate**, **Frame in Total** and **Points in Total** of the current project.
Click **Fitting View** to adjust the model size automatically to fit the screen.

Besides, a view controller is also provided in the lower right corner to help switch perspectives conveniently, as shown in the right figure.



Project and Project Group

Project Group

Create or open a **project group** before scanning.
Project group is the standard file structure of the EXScan H, and each project contains the scan data of its own; one project group can contain one project or multiple projects, **the introduction of application scenarios is as shown in the table below:**

> **Note**
>
> The "Scenario" mentioned below refers to the situation where all scanned objects are located within the same environment or setting.

Project group is mainly used in the following scenarios:

Project group	Scenario	Description
Only one project in the project group	• One object needs to be scanned with only one alignment mode. • Multiple objects need to be scanned with only one alignment mode.	One project can contain all scanned data of one or multiple objects.
Multiple projects in the project group	• One object needs to be scanned with multiple alignment modes. • Multiple objects or one large object needs to scan with one or more alignment modes	It is recommended that you create multiple projects within one project group when need use multiple alignment modes, scan a large object or multiple objects. After scanning, you can align these projects.

New Project Group

To create a project group, please refer to two ways as follows:

- In the navigation bar, enter the **Scan** step and click **New project group**. In the file dialog that appears, enter the **name** and **path** for the project group, then click **Confirm**. All data related to this project group will be saved to the specified path.

- In the **Scan** step interface, click the  **Project Group** button in the right-side function bar. In the pop-up window, click **New project group**. The following steps are the same as mentioned above.

> **Note**
>
> - The default name for the project group is the content entered during the last creation of the project group, followed by "_1" (if it is the first time, the default name is ProjectGroup_1). The default save path is the path selected during the last creation of the project group (if it is the first time, it will be saved to the default location: "C:\Users\Administrator\Documents\EXScanH").
> - If the remaining disk space in the selected path is less than 50 GB, it is recommended that you switch to another save path to avoid potential issues subsequently.

Additionally, you can also **create an individual project within the current project group**:

In the **Scan** step interface, click the  **New Project** button in the left **Project List** panel. In the pop-up **New Project** window, configure the project settings and click **Confirm**. All data related to this project will be saved in the current project group's path.

> **Note**
>
> If the current project is still in the scan process, please create after generating point clouds.

Open Project Group

> **Note**
>
> The current project group (if there is) will be saved automatically when you open another one.

> **Caution**
>
> The software of latest version does not support importing software projects from version 1.0.5.3 or earlier.

To open a project group, please refer to two ways as follows:

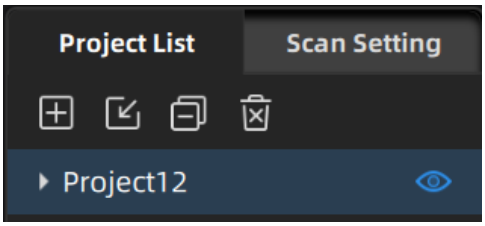
- In the navigation bar, enter the **Scan Mode** step and click **Open project group**. In the file dialog that appears, choose the specified project group or search for it, then click **Open**.
- In the **Scan** step interface, click the  **Project Group** button in the right-side function bar. In the pop-up window, click **Open project group**. The following steps are the same as mentioned above.

Additionally, you can also **open an individual project within the current project group**:

In the **Scan** step interface, click the **Open Project Group** button in the left **Project List** panel. In the pop-up file selection dialog, choose a project file by directly clicking or searching, and click "Open".

Project

Consider each **project** as a part of the **project group**. All operations of **project** can be done using the following buttons.



Icon	Function	Description	Notes
	Create new project	Click this button will create a new project within the current project group.	You can only create a new project when a device is connected. The last project in the project list is the current project, and only the current project can continue scanning.
	Open project	Click this button will open the selected project within the current project group.	/
	Remove project	Click this button will remove the selected project from the current project group.	This operation will keep the data of the selected project and you can still open it again.
	Delete project	Click this button will delete the selected project and its data.	This operation will permanently delete the data of the selected project from your computer and cannot be recovered.
	Project visibility	Click this button will hide/show the point cloud or markers of the current project. You can also double-click on different projects to switch their visibility.	/

Project Settings

After creating a new project group, please configure the project group.
Different scanning modes have different settings, the introduction to the configuration options of White Light Mode and IR mode are shown individually as follows.

> **Note**
>
> When you select **IR Mode** > **Object Scan** mode, it supports setting the **object size**.

White Light Mode

Select Mode of Alignment

Alignment Mode	Description
Hybrid mode	Support selecting one or multiple modes among **Features**, **Texture** and **Markers**. • Features: Automatic align using the geometric features on the surface of the object to be scanned; suitable for objects with rich geometric features. • Texture: Automatic align using texture features on the surface of the object to be scanned; suitable for objects with rich color textures. • Markers: Suitable for objects with fewer features or with feature symmetry, and require marker points to be placed on the surface; support opening global markers file in scanning settingss.
Global markers	Support opening global markers file in scanning settings or directly scanning global markers; suitable for objects with fewer features or with feature symmetry, and require marker points to be placed on the surface.
Foot station alignment	This align mode is mainly used for foot scanning and requires a custom foot station, please import the configuration file of foot station (*.p3). **Note** Each foot station has its own configuration file; please log into Shining 3D Passport official website, choose **EinScan-FootPlatform** and enter serial number in the window of **Bind More Products** to complete binding, and download the configuration file in the interface of **My Products**.

Select Resolution

Resolution	Description
High	0.2 mm
Medium	0.5 mm
Low	2.0 mm

Note

- Foot station alignment mode does not support custom resolution, and the default value is 0.5 mm.
- With smaller setting value, you will get more details, but it will lead to larger file size and longer processing time, and requires higher computer configuration.

Texture Scan

You can enable or disable texture scan, and the full color information of the scanned object can be acquired when it is enabled.

Note

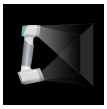
- Foot station alignment mode does not support this function.
- This function can not be disabled under the **Texture** alignment mode.
- Texture switch cannot be changed once the project group has been created.

Non-rigid Algorithm

You can enable this function to make it smoother while scanning objects that will slightly change shape during the scanning process.

Note

- Foot station alignment mode does not support this function.
- Hybrid mode (with Markers selected) and Global Markers mode do not support this function.
- It is not recommended that you enable this function for scanning stationary objects.



IR Mode

Portrait

Select Mode of Alignment

Alignment Mode	Description
Features	Automatic align using the geometric features on the surface of the object to be scanned; suitable for objects with rich geometric features.
Texture	Automatic align using texture features on the surface of the object to be scanned; suitable for objects with rich color textures.

Note

Support selecting one or multiple modes.

Select Resolution

Resolution	Description
High	0.5 mm
Medium	1.0 mm
Low	2.0 mm

Note

With smaller setting value, you will get more details, but it will lead to larger file size and longer processing time, and requires higher computer configuration.

Texture Scan

You can enable or disable texture scan, and the full color information of the scanned object can be acquired when it is enabled.

Note

- This function can not be disabled under the **Texture** alignment mode.
- Texture switch cannot be changed once the project group has been created.

Object

Object Size

Object Size	Description
Large objects	Object size larger than 300 mm * 300 mm * 300 mm.
Medium objects	Object size between 100 mm * 100 mm * 100mm and 300 mm * 300 mm * 300 mm.

Select Mode of Alignment

Alignment Mode	Description
Hybrid mode	Support selecting one or multiple modes among **Features**, **Texture** and **Markers**. • Features: Automatic align using the geometric features on the surface of the object to be scanned; suitable for objects with rich geometric features. • Texture: Automatic align using texture features on the surface of the object to be scanned; suitable for objects with rich color textures. • Markers: Suitable for objects with fewer features or with feature symmetry, and require marker points to be placed on the surface; supports opening global markers file in scanning settings.
Global markers	After selecting this alignment mode, open global markers file or scan global markers directly in scanning settings to assist scanning and aligning.

Select Resolution

Resolution	Description
High	• Medium objects: 0.2 mm. • Large objects: 0.5 mm.
Medium	• Medium objects: 0.3 mm. • Large objects: 1.0 mm.
Low	• Medium objects: 0.5 mm. • Large objects: 2.0 mm.

Note

With smaller setting value, you will get more details, but it will lead to larger file size and longer processing time, and requires higher computer configuration.

Texture Scan

You can enable or disable texture scan, and the full color information of the scanned object can be acquired when it is enabled.

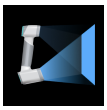
Note

- This function can not be disabled under the **Texture** alignment mode.
- Texture switch cannot be changed once the project group has been created.

Start Scanning

Scanning Settings

After entering the **Scan** step, you can set scanning parameters on the left side of the interface.
The scanning parameter settings for different scanning modes are different, and the introduction to settings for White Light Mode and IR Mode are as follows:



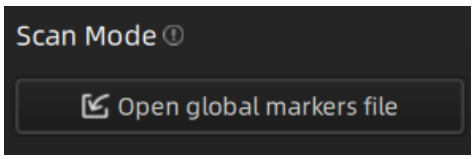
White Light Mode

- **Camera Window**

Preview the real-time image captured by the scanner camera so as to adjust the brightness of the camera accordingly.

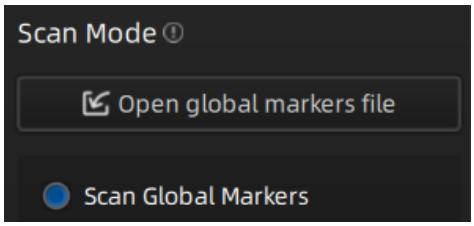
- **Scan Mode**

  Hybrid alignment mode (including markers):
  Click **Open global markers file** button to import local global markers file.

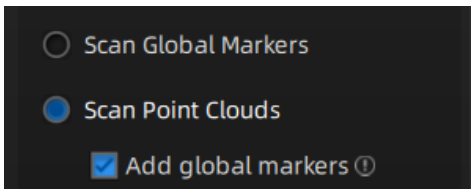


> **Note**
>
> - If you click **Open global markers file** button when a global markers file already exists in the current project, you will be prompted with a message "Are you sure to clear current data and rescan?".
> - If you click **Open global markers file** button when there exists point cloud data, you will be prompted with a message "Are you sure to clear current data?".

  Global Markers alignment mode:
  Click **Open global markers file** button to import local global markers file, or directly click **Scan Global Markers** and **optimize global markers**.



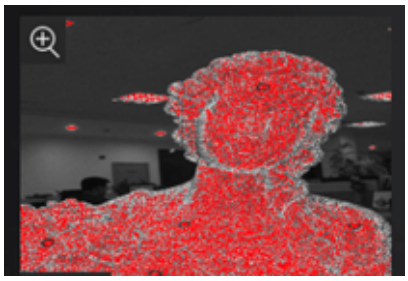
  After switching to **Scan Point Clouds**, you can click **Add global markers** and new recognized markers can be added to global markers.



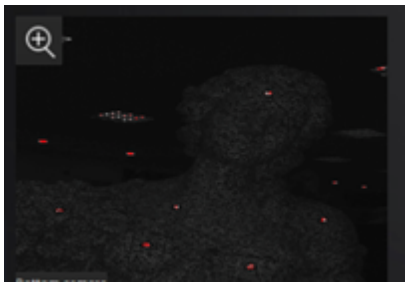
> **Note**
>
> - **Add global markers** switch can not be changed during the scanning process.
> - If you click **Open global markers file** button when a global markers file already exists in the current project, you will be prompted with a message "Are you sure to clear current data and rescan?".
> - If you click **Open global markers file** button or switch to **Scan Global Markers**, when there exists point cloud data, you will be prompted with a message "Are you sure to clear current data?".
> - Newly recognized global markers will not be saved into the used global markers file during the **Scan Point Clouds** process.

- **Brightness**

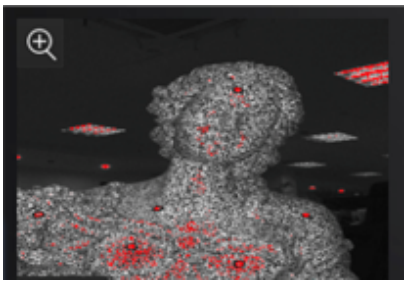
  Drag the slider or use buttons on the back side of the scanner to adjust the brightness for different material or color of the object to get better scanning data. Please ensure that the object is clearly visible within the camera window and that there is no excessive red color displayed on the object.



Brightness is too high



Brightness is too low



Brightness is normal

- **Working Distance**

  According to different object size and alignment requirements, you need to drag the slider to adjust the working distance, namely effective area of the scanner.
  The range of value is 200 mm ~ 700 mm; higher value means using longer working distance to get more data, but will lose some detail of the data.

> **Note**
>
> Foot station alignment mode does not support this function.

- **Texture LED Light**

  It is recommended that you turn on the texture LED light when there is not enough light for better texture scanning.

> **Note**
>
> - Foot station alignment mode does not support this function.
> - This function is available only when **Texture scan** is enabled.
> - This switch cannot be changed during scanning.

- **Plane Detection**

  With this feature being enabled, the software will automatically detect and erase the plane where the object is located. This helps reduce the chances of misaligning planes or objects with distinct features.

> **Note**
>
> - Only Hybrid mode (with Features) supports this function.
> - If you need to scan objects that are flat or have few features, it is recommended that you paste markers for helping alignment.

- **Data Quality Indicator**

  With this feature being enabled, the scanning data will be displayed in the form of quality chromatography.

  - Green indicates high-quality scanning data at that location.
  - Orange indicates low-quality scanning data at that location, indicating insufficient scanning. Further scanning is needed. Otherwise, insufficiently scanned data may disappear or display abnormally after data processing.

> **Note**
>
> By default, this feature is disabled for texture scanning, while it is enabled for other scanning modes.

- **Auto Cutting Plane**

  With this feature being enabled, during the scanning preview, the software will intelligently and in real-time identify the largest plane and mark it with a blue-green grid. The data below the marked plane will not be shown.

> **Note**
>
> The unique plane marked during the scanning preview can change in real-time. The plane marked as the last one at the end of the scanning preview will be considered. If the **Cutting Plane** feature is used, this feature cannot be used.

- **Adjust Point Distance**

To modify the point spacing size for the current single project, you can drag the slider or click the up/down arrow buttons: the default value is set to the point distance when creating a project group.

> **Note**
>
> - If the number of projects in the current project group is greater than 1, this feature is not available.
> - If the adjusted point distance is smaller than the original setting, it is recommended that you should modify the point distance based on the prompts in the pop-up window, or it may result in insufficient memory for generating the mesh model or point cloud.

IR Mode

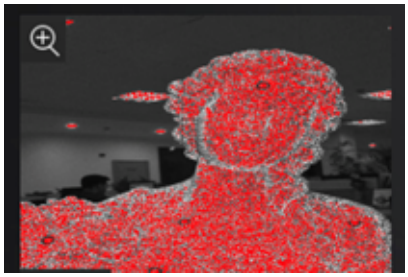
Portrait

- **Camera Window**

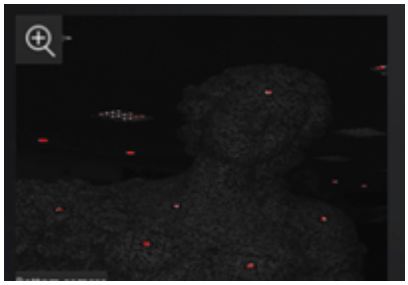
  Preview the real-time image captured by the scanner camera so as to adjust the brightness of the camera accordingly.

- **Brightness**

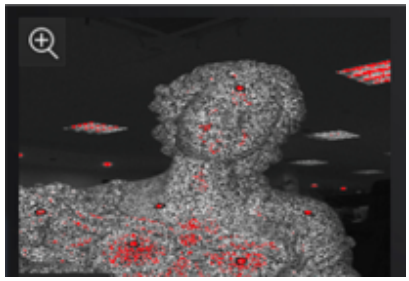
  Drag the slider or use buttons on the back side of the scanner to adjust the brightness for different material or color of the object to get better scanning data. Please ensure that the object is clearly visible within the camera window and that there is no excessive red color displayed on the object.



Brightness is too high



Brightness is too low



Brightness is normal

- **Working Distance**

  According to different object size and alignment requirements, you need to drag the slider to adjust the working distance, namely effective area of the scanner.
  The range of value is 200 mm ~ 700 mm; higher value means using longer working distance to get more data, but will lose some detail of the data.

- **Texture LED Light**

It is recommended that you turn on the texture LED light when there is not enough light for better texture scanning.

> **Note**
>
> - This function is available only when **Texture scan** is enabled.
> - This switch cannot be changed during scanning.

- **Hair Mode**

  Enable this function to scan hair easier, but it could increase data noise.

  > **Note**
  >
  > This switch cannot be changed during scanning.

- **Plane Detection**

  With this feature being enabled, the software will automatically detect and erase the plane where the object is located. This helps reduce the chances of misaligning planes or objects with distinct features.

  > **Note**
  >
  > Only Hybrid mode (with Features) supports this function.

- **Data Quality Indicator**

  With this feature being enabled, the scanning data will be displayed in the form of quality chromatography.

  - Green indicates high-quality scanning data at that location.
  - Orange indicates low-quality scanning data at that location, indicating insufficient scanning. Further scanning is needed. Otherwise, insufficiently scanned data may disappear or display abnormally after data processing.

  > **Note**
  >
  > By default, this feature is disabled for texture scanning, while it is enabled for other scanning modes.

- **Auto Cutting Plane**

  With this feature being enabled, during the scanning preview, the software will intelligently and in real-time identify the largest plane and mark it with a blue-green grid. The data below the marked plane will not be shown.

> **Note**
>
> The unique plane marked during the scanning preview can change in real-time. The plane marked as the last one at the end of the scanning preview will be considered. If the **Cutting Plane** feature is used, this feature cannot be used.

- **Adjust Point Distance**

  To modify the point spacing size for the current single project, you can drag the slider or click the up/down arrow buttons: the default value is set to the point distance when creating a project group.

> **Note**
>
> - If the number of projects in the current project group is greater than 1, this feature is not available.
> - If the adjusted point distance is smaller than the original setting, it is recommended that you should modify the point distance based on the prompts in the pop-up window, or it may result in insufficient memory for generating the mesh model or point cloud.

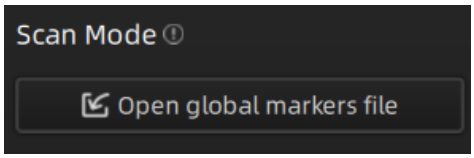
Object

- **Camera Window**

  Preview the real-time image captured by the scanner camera so as to adjust the brightness of the camera accordingly.

- **Scan Mode**

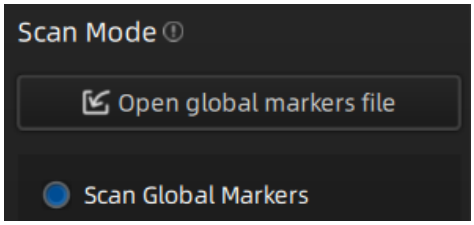
  Hybrid alignment mode (including markers):
  Click **Open global markers file** button to import local global markers file.



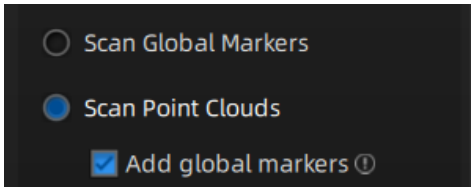
> **Note**
>
> - If you click **Open global markers file** button when a global markers file already exists in the current project, you will be prompted with a message "Are you sure to clear current data and rescan?".
> - If you click **Open global markers file** button when there exists point cloud data, you will be prompted with a message "Are you sure to clear current data?".

Global Markers alignment mode:

Click **Open global markers file** button to import local global markers file, or directly click **Scan Global Markers** and **optimize global markers**.



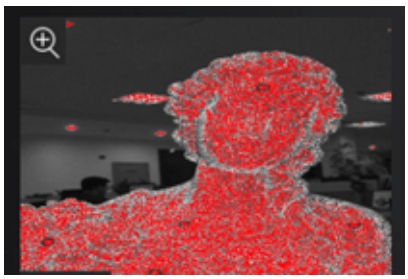
After switching to **Scan Point Clouds**, you can click **Add global markers** and new recognized markers can be added to global markers.



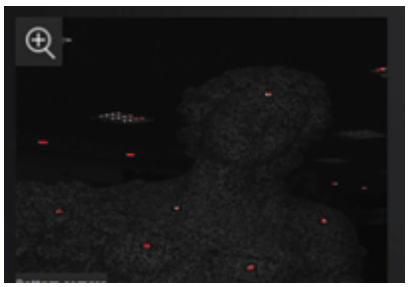
> **Note**
>
> - **Add global markers** switch can not be changed during the scanning process.
> - If you click **Open global markers file** button when a global markers file already exists in the current project, you will be prompted with a message "Are you sure to clear current data and rescan?".
> - If you click **Open global markers file** button or switch to **Scan Global Markers**, when there exists point cloud data, you will be prompted with a message "Are you sure to clear current data?".
> - Newly recognized global markers will not be saved into the used global markers file during the **Scan Point Clouds** process.

- **Brightness**

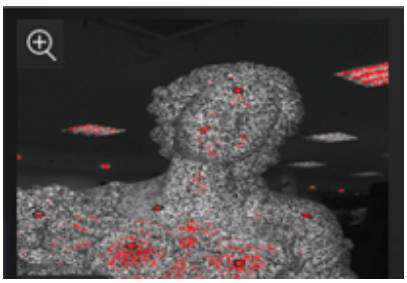
  Drag the slider or use buttons on the back side of the scanner to adjust the brightness for different material or color of the object to get better scanning data. Please ensure that the object is clearly visible within the camera window and that there is no excessive red color displayed on the object.



Brightness is too high



Brightness is too low



Brightness is normal

- **Working Distance**

  According to different object size and alignment requirements, you need to drag the slider to adjust the working distance, namely effective area of the scanner.
  The range of value is 200 mm ~ 700 mm (200 mm ~ 450 mm for medium objects); higher value means using longer working distance to get more data, but will lose some detail of the data.

  > **Note**
  >
  > Foot station alignment mode does not support this function.

- **Texture LED Light**

  It is recommended that you turn on the texture LED light when there is not enough light for better texture scanning.

  > **Note**
  >
  > - This function is available only when **Texture scan** is enabled.
  > - This switch cannot be changed during scanning.

- **Plane Detection**

  With this feature being enabled, the software will automatically detect and erase the plane where the object is located. This helps reduce the chances of misaligning planes or objects with distinct features.

  > **Note**
  >
  > - Only Hybrid mode (with Features) supports this function.
  > - If you need to scan objects that are flat or have few features, it is recommended that you paste markers for helping alignment.

- **Data Quality Indicator**

  With this feature being enabled, the scanning data will be displayed in the form of quality chromatography.

  - Green indicates high-quality scanning data at that location.
  - Orange indicates low-quality scanning data at that location, indicating insufficient scanning. Further scanning is needed. Otherwise, insufficiently scanned data may disappear or display abnormally after data processing.

  > **Note**
  >
  > By default, this feature is disabled for texture scanning, while it is enabled for other scanning modes.

- **Auto Cutting Plane**

  With this feature being enabled, during the scanning preview, the software will intelligently and in real-time identify the largest plane and mark it with a blue-green grid. The data below the marked plane will not be shown.

  > **Note**
  >
  > The unique plane marked during the scanning preview can change in real-time. The plane marked as the last one at the end of the scanning preview will be considered. If the **Cutting Plane** feature is used, this feature cannot be used.

- **Adjust Point Distance**

  To modify the point spacing size for the current single project, you can drag the slider or click the up/down arrow buttons: the default value is set to the point distance when creating a project group.

  > **Note**
  >
  > - If the number of projects in the current project group is greater than 1, this feature is not available.
  > - If the adjusted point distance is smaller than the original setting, it is recommended that you should modify the point distance based on the prompts in the pop-up window, or it may result in insufficient memory for generating the mesh model or point cloud.

Scanning

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

> **Note**
>
> The **point cloud** data in the **Scan** step can be directly imported in the **Measurement** step for creating feature, alignment or measurement.

Switch Scanning Status

You can switch the scanning status by pressing on the back side of the scanner or clicking the buttons in the right-side function bar.
The basic switch order is: **Preview** > **Start Scan** > **Pause Scan**.

> **Caution**
>
> When scanning the recessed areas of an object, please hold the scanner directly towards the area to be scanned.

Icon	Function	Description
	Preview	Preview scanning effect. **Note** In this mode, the scanning data will not be saved and scan parameters can be adjusted according to the scanning effect.
	Start Scan	Scan the objects. **Note** In this mode, the scanning data will be saved.
	Pause Scan	After starting scanning, click this button to pause scanning.

Generate Point Clouds

After finishing the scan, you can edit the data or click  **Optimizing and Generating Point Cloud**, or hover the cursor over the left expand button and click  **Generate Point Cloud** in the expand bar.

Icon	Function	Description
	Optimize and Generate Point Cloud	Select to generate the point cloud to optimize the data first. **Note** Suggest choosing when there is layering problem caused by accumulated aligning errors during scanning; but it will take long time processing and requires high memory usage.
	Generate Point Cloud	Select to generate point cloud directly without any optimization which is faster and consumes less memory. **Note** Suggest choosing when the data is well aligned without significant layering.

Note

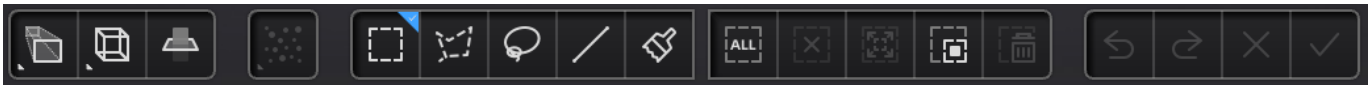
- Foot station alignment mode and portrait scan only supports Optimize and Generate Point Cloud.
- The time it takes to generate point cloud depends on the data size of your project and the hardware configuration of your PC.
- If necessary editing operations have been performed on the scanned data, please ✓ apply the edits before generating the point cloud.

Data Editing

When you start scanning, you can edit the scanned data in the **Scan** step to generate accurate point clouds. You can also use other functions.

Data Editing Toolbar

You can use following tools to edit data after the scanning paused or the point cloud is generated.



Note

- After editing the data, you can continue scanning to acquire more data.
- If necessary editing operations have been performed on the scanned data, please ✓ apply the edits before generating the point cloud.

Icon	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. 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	Observe the scanned data from  Top View,  Bottom View,  Front View,  Back View,  Left View and  Right View.
	Cutting Plane	Create a Cutting Plane to do quick cut.

Icon	Function	Description
	Point Cloud Edit	In this mode, a point cloud is chosen. Click it again and you can switch to the **Edit Markers** mode.(This mode is enabled by default if there is a point cloud.) **Note** • After switching to this mode, the selected markers data (if any) will be retained to facilitate synchronized deletion and other editing operations. • Point cloud data under the cutting plane cannot be edited. • Stay in the current interface, multiple undo or redo operations are supported.
	Edit Markers	In this mode, the selection tool is used to only select markers data. Clicking this button again will switch to the **Point Cloud Edit** mode (assuming there is point cloud data available), and by default, this button is in **Point Cloud Edit** mode. **Note** • In the **Hybrid Alignment** (including **Markers**) mode or **Global Markers Alignment** mode, this function can be used. • After switching to this mode, the selected point cloud data (if any) will be retained to facilitate synchronized deletion and other editing operations. • It is necessary to retain at least 4 markers. • Markers data under the cutting plane cannot be edited. • Stay in the current interface, multiple undo or redo operations are supported.

Icon	Function	Description
	Rewind	To select (highlighted in red) the scanning data corresponding to a specific frame, drag the progress bar. Click **Confirm** to delete the corresponding data; click **Exit** to exit rewind. **Note** Up to 200 frames of data can be rewound; and you can rewind multiple times until the first frame of this scan.
	Rectangular	Select or deselect a rectangular area.
	Polygon	Select or deselect a polygon area.
	Lasso	Select or deselect the area by using the lasso tool.
	Straight Line	Move the cursor to draw a straight line to select or deselect the area.
	Brush	Select or deselect the area by using the brush. Hold down `⇧ Shift` or `^ Ctrl`, and at the same time, roll the mouse wheel will scale the brush size.
	Select All	Select all of the data.
	Unselect	Cancel all the selections.
	Connected Domain	Click the button after selecting data, all connected region to the selected data will be selected.

Icon	Function	Description
	Undo	Undo the last deletion and recover the last deleted data. Multiple deletions can be undone by clicking multiple times.
	Redo	Redo the last operation and recover the last operation data. Multiple operations can be redone by clicking multiple times.
	Cancel	Undo all edit, and exit edit mode.
	Apply	Click the button or space bar to apply the edit, and exit edit mode.

Side Function Bar

You can use more functions on the right panel in Scanning.

Icon	Function	Instruction
	Generate the Point Cloud	After completing scanning, generate the point cloud directly. You can click the button to expand the list to switch functions. **Note** Foot station alignment mode and portrait scan only supports Optimize and Generate Point Cloud.
	Optimize & Generate Point Cloud	After completing scanning, optimize the point cloud and generate. You can click the button to expand the list to switch functions.
	Project Group	Create or open a project group.
	Clean Data	Clean the current point cloud data to redo scan.
	Align	Align the data as you need, please refer to Align. **Note** Foot station alignment mode does not support alignment.
	Export Data	Export the scan data.
	Show / Hide Texture	Show or hide texture on the screen.
	Mesh Model	Click to enter the **Post-Processing** step to mesh model. **Note** If the point cloud of the current project has not been generated yet, this button can not be clicked.

Menu of the Right Mouse Button

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.
Connected Domain	Click the button after selecting a patch of data and all connected region to the selected data will be picked; can be operated by shortcut keys.
Fitting View	The data on the interface is displayed in the center according to the appropriate size; can be operated by shortcut keys.
Set Rotate Center	The rotation center can be set on the data by `Left Button`; can be operated by shortcut keys.
Reset Rotate Center	After reset, the center of rotation is at the data center.
Show/hide cutting plane	Click to hide or show the cutting plane (if has been set).
Bottom camera	Ticked by default, and can be cancelled to close the left **Camera window**.
Texture camera	With this option being ticked, a second **Camera window** will show at the left side.

Shortcut

Shortcut	Function
Press and hold ^ Ctrl + D	Fit view
Scroll wheel	Zoom in/zoom out the data
Press and hold the Middle Button and move the cursor	Translate the data
Press and hold ^ Ctrl + F	Set Rotate Center
Press and hold the Left Button and move the cursor	Rotate the data
Hold down ⇧ Shift + Left Button	Select the area of data
Press and hold ^ Ctrl + Left Button	Deselect the area of data
Press and hold ^ Ctrl + A	Select all
Press and hold ^ Ctrl + C	Deselect all data
Press and hold ^ Ctrl + I	Switch selected or unselected data.
Delete	Delete the selected data

Cutting Plane

If you need to remove the object's base data during the scanning process,  **Cutting Plane** can be a very effective tool.

By setting up a cutting plane, the data below the plane will not be captured.

> **Note**
>
> A cutting plane can be set up after opening a global markers file or scanning global markers, and can be saved while saving the global markers.

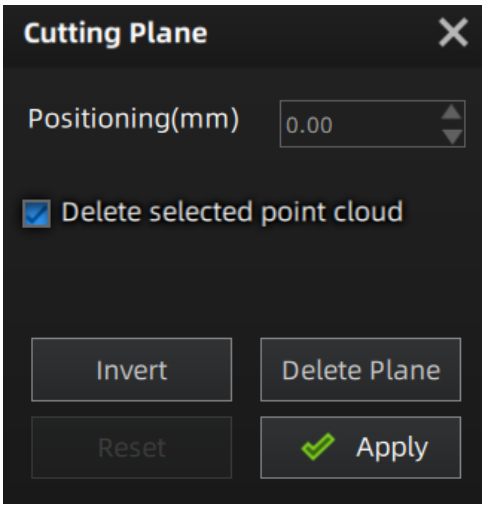
Create a Cutting Plane

Three methods to create a cutting plane are shown in the table as follows:

Method	Description
Fitting Point Cloud	Hold `⇧ Shift` + `Left Button` to select the point cloud data, and click **Create Plane**.
Creating Straight Line	Hold `⇧ Shift` + `Left Button` to draw a line, and click **Create Plane**.
Markers	Hold `⇧ Shift` + `Left Button` to elect at least three markers, and click **Create Plane**.

Edit the Cutting Plane

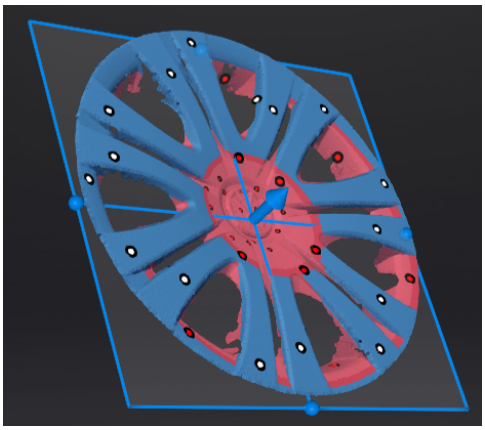
- **Delete the selected point cloud data or markers**: When ticked, the selected point cloud data or markers will be highlighted in red. **Apply** the edit to delete the highlighted point cloud data or markers.
- **Invert**: Use this button to reverse the selection of data by flipping the cutting plane.
- **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.



Note

- It is not supported to deleted all point cloud data.
- At least four markers should be remained at the front appearance of the cutting plane.

- **Translate the cutting plane**: after generating the plane, you can enter numbers in the editing box or drag the arrow of the cutting plane's normal  to translate the cutting plane.
- **Rotate the cutting plane**: you can drag any of the four small balls on the edges of the cutting plane  to rotate the cutting plane along a certain direction.

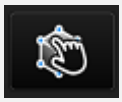


Projects Alignment

If there are multiple projects in a project file, you need to align the data after Scanning and **generating the point cloud**.

Click  in the right-side function bar of the **Scan** step interface and start projects alignment.

> **Note**
>
> Foot station alignment mode does not support alignment.

Alignment mode	Description	Note
 **By Feature**	1. Choose **By Feature**. 2. Select the project which needs alignment in the fixed window and the floated window. 3. Click **Apply** to align the data.	Objects that have repeatable features (like rounds or rings) or small objects are not suitable for this mode.
 **By Manual**	1. Choose **By Manual**. 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 features should not be in a line.
 **By Markers**	1. Choose **By Markers**. 2. Select the project which needs alignment in the fixed window and the floated window. 3. Click **Apply** and align the data.	The two projects should have at least 3 markers in common.
 **By Manual Markers**	1. Choose **By Manual Markers**. 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.

Note

- Manual alignment serves as an auxillary method of auto alignment. You can choose it when auto alignment fails.
- Projects can only be aligned after generating the point cloud.

Foot Scanning

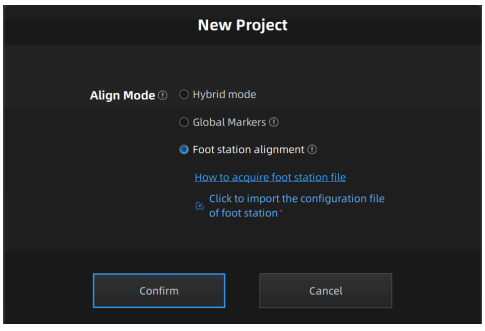
If you need to scan the feet, it is recommended that you use a glass foot station to assist in scanning the sole data, and utilize the specialized **foot station alignment** mode for foot scanning.

> ⚠ **Caution**
>
> - It is recommended that you keep the surrounding environment clean and unobstructed before scanning.
> - Please place the feet parallel to the long edge of the glass foot station and do not cover the markers.
> - Please avoid scanning in environments with strong direct light above the foot station, as it may cause overexposure and affect speckle projection.
> - Please ensure to scan all necessary data of the sole refracted on the bottom of the glass foot station to avoid impacting the alignment effect. It is recommended that you enable the data quality indicator during scanning, and scan until the green data is complete and without gaps.

Operation Steps

1.Create a new project group and select the scan mode as White Light Mode.

2.When setting the project, select **Foot Station Alignment** mode and import the configuration file (.p3) of foot station, and click **Confirm** to enter the foot scanning process.



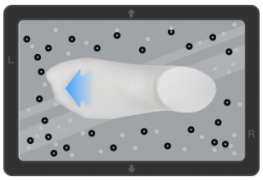
Note

- Each foot station has its own configuration file; please log into Shining 3D Passport official website, enter serial number in the window of **Bind More Products** to complete binding, and download the configuration file in the interface of **My Products**.
- If it prompts "Please import the configuration file of the foot station".
- You can click button in the uploaded configuration file bar to delete the file.

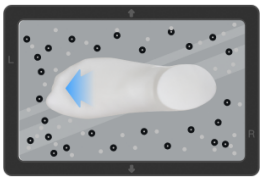
3.Please place the left foot (default) according to the bottom left corner illustration on the **Scan** step interface; you can click **Switch Right Foot** button to switch to the right foot for scanning.

Note

During the pre-scan / scanning process or when there is scanned data but no point cloud generated, you cannot switch between left and right foot.



Left foot



Right foot

4.On the **Step** step interface, you can preview the real-time foot images captured by the scanner camera through the camera window, adjust the scanner brightness, switch data quality indicator function by scan settings; you can also use data editing toolbar to edit scanned foot data.

Note

For the instruction of menu of right mouse button and shortcuts, please see data editing.

5.After completing the scan, click **Optimizing and Generating Point Cloud** in the right-side function bar, and click **Mesh** the foot model.

Note

- Foot station alignment mode does not support generating the point cloud directly.
- Foot station alignment mode uses default settings for mesh, and can not be adjusted.
- For the instruction to the right-side function bar, please see data editing.

6.After mesh completes, you will be directed to the **Post-Processing** step for mesh editing.

> **Note**
>
> - If both left and right foot have been scanned, **Two Feet** model is displayed as default; you can click this button to switch to **Left Foot** and **Right Foot**.
> - For the instruction to data editing tools and right-side function buttons, please see data editing, foot station alignment mode does not support texture remapping and model display; additionally, when sharing data and exporting to third-party softwares, you can choose to share two feet, left foot or right foot model, and the former situation supports multiple choices.
> - If the data of displayed model on the current **Post-Processing** step interface is not scanned but imported, the recognition of left or right foot is not supported.

7.After completing post-processing, you can click in the right-side function bar to save data locally.

> **Note**
>
> You can choose to save two feet, left foot or right foot model, and support multiple choices.

8.(Optional) Support measuring the point cloud data of the scanned foot.

Post Processing

Mesh Model

After generating point cloud, you can use **Mesh Model** tool to convert the point cloud into triangular mesh data, which can be subsequently used for rendering, measurement or 3D printing.

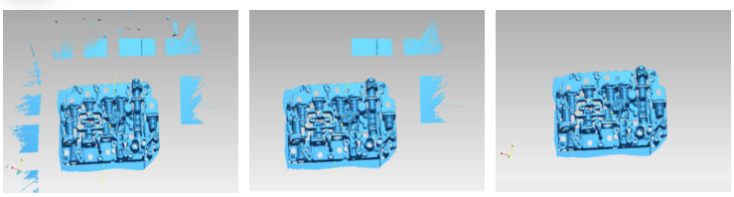
Click in the right-side function bar of the **Scan** step interface to enter **Post-Processing**.

> **Note**
>
> Foot station alignment mode uses default settings for mesh, and can not be adjusted.

Mesh Parameter

Icon	Function	Description
	Unwatertight	Unclosed model stays the way it is scanned. Processing time is quicker than Watertight.
	Half watertight	Some of the holes will be filled automatically. Holes with a diameter less than or equal to the resolution*5 will be filled.
	Watertight	All holes will be filled automatically. The data can directly be 3D printed. Only watertight mesh can set model quality.

Mesh Optimization

Optimization options	Description	Instructions
Filter	Optimize the data and improve the clarity of the data. The higher the level, the less the small details. • **None**: No optimization. • **Standard** (default): 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 sharpen it powerfully.	Setting the filter level high will lose some small details.
Smooth	Smooth the possible noise on the surface of the scan data. Three optimization options are available: **Standard** (default), **Med**, **High**.	/
Remove small floating parts	Remove small floating parts isolated from the main data. Set the isolated data ratio by dragging the slider or clicking the up/down arrow. Default value is 1, with a range of 0 to 100. The value 0 indicates not removing isolated data. **For a specific illustration of the effect, refer to the following images:**  Original data Set value as 50 Set value as 100	/

Optimization options	Description	Instructions
Simplification	Set the triangle number. 1. When the point distance is or lower than 0.5 mm, this function is enabled as default and the default value is 40 with a range of 0 to 99. 2. When the point distance is higher than 0.5 mm, this function is disabled as default and the default value is 20 with a range of 0 to 99.	When the simplification is greater than the maximum triangles, prioritize the simplification.
Max triangles	Set max plate number to get mesh model's triangle plate number is within configured plate number (enabled by default).	Please input the value reasonably, avoiding entering too small values, as excessive simplification may result in lower data quality. If the number of triangles after simplification is still greater than the maximum number of triangles, the number of triangles will be forced to simplify to the maximum number of triangles; if the number of triangles after simplification is less than the maximum number of triangles, the model will be simplified with the set parameters.
Fill Small Hole	Auto fill the small hole when mesh (enabled by default); The default value is 10 with a range of 0 to 100. You can delete unwanted neighboring areas to delete edge noise data; the default value is 3, and the range is 0 ~ 10 (0 indicates no neighboring area deleted).	This function is unavailable for watertight models.

Optimization options	Description	Instructions
Remove Spike	Remove spike-like data on the image edge.	/
Marker Hole Filling	Fill in the surface of the object that is not scanned to the pasting marker.	For the align mode of **Markers**, this functions is enabled by default for unwatertight and semi-watertight models; for other align modes, this function is unavailable.
Beauty Enhance	Beautify the texture effect of the model face, including dermabrasion, whitening and other functions.	• Only **texture scan** supports beauty enhancement. • It is suggested that this function be applied to complete face data.

Note

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

Mesh Generation

1. Click **Preview** to preview the mesh effects.

   Note

   If there exist texture model files that exceed the resolution limit in the project, please follow the prompts to choose whether to simplify the data.

2. After the mesh generates, click **Confirm** to confirm the mesh result.

   Note

   Click to restore the mesh.

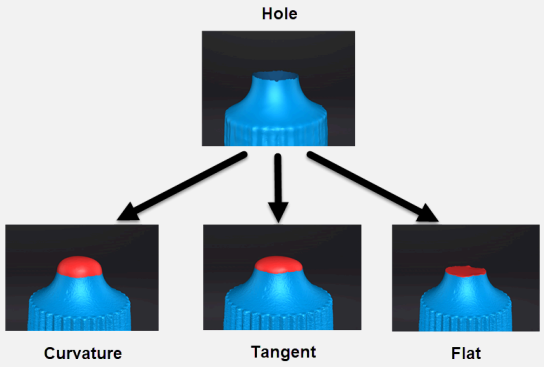
Mesh Editing

After meshing model, you can perform mesh editing, data editingand use some other functions.

Mesh Editing

In the **Mesh Editing** window on the left side of the interface, click **+** to unfold the function panel.

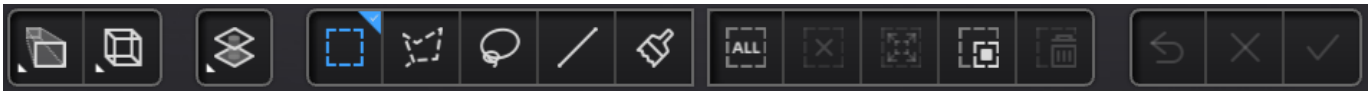
Optimization options	Description	Instructions
Texture	**Brightness** and **Contrast** can be adjusted. Drag the slider or click the page up/down arrow to set the value from -100 to 100. The default is 0, indicating no adjustment.	• Only project files that exclusively contain textures are accessible to this function. • Click ↻ to reset the texture. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.
Simplification	Simplify the model data as the triangular mesh generated from the scan is in a large size. Drag the slider or click the page up/down arrow to set the ratio from 1 to 99. The default is 0, indicating no simplification.	• Over-simplification will result in the loss of data details. • Click ↻ to reset the value to default. • Click **Preview** to preview. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.
Mesh Optimization	Restructure the mesh topology based on the mesh curvature and sharpen the surface features of scan data. Drag the slider or click the page up/down arrow to set the ratio from 1 to 100. The default is 0, indicating no optimization.	• The optimization duration varies depending on the amount of data. • Click ↻ to reset the value to default. • Click **Preview** to preview. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.
Smooth	Smooth the possible noise on the surface of the scan data. Drag the slider or click the page up/down arrow to set the ratio from 1 to 100. The default is 0, indicating no smoothness.	• Click ↻ to reset the value to default. • Click **Preview** to preview. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.

Optimization options	Description	Instructions
Remove Small Floating Parts	Remove small floating parts in the scan data. Drag the slider or click the page up/down arrow to set the ratio from 1 to 100. The default is 0, indicating no removal.	• Click to reset the value to default. • Click **Preview** to preview. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.
Auto Hole Filling	After selecting the hole filling type and entering the perimeter (mm), and holes within the specified perimeter will be filled automatically; the default value is 80, and the range is 10 ~ 100000. You can delete unwanted neighboring areas to delete edge noise data; the default value is 3, and the range is 0 ~ 10 (0 indicates no neighboring area deleted). **Hole filling types:**  	• The settings for **Delete unwanted neighboring areas** will be applied to all filled holes. • Click **Reset** to reset the value to default, and the deleted edge data will also be restored. • Click **Preview** to preview. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.
Manual Hole Filling	After entering the manual hole filling mode, the hole edges are displayed green and get red after picking. The number of the holes and the number of holes filled will be displayed on the interface. Select filling types before picking a hole and then click the edges to perform filling actions.. You can delete unwanted neighboring areas to delete edge noise data; the default value is 3, and the range is 0 ~ 10 (0 indicates no neighboring area deleted).	• The post-processing data needs to be saved manually. • Click **Reset** to reset the value to default, and the deleted edge data will also be restored. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.

Optimization options	Description	Instructions
Flip Normal	To redefine the front direction of the scanned data in reversal design. Hold `⇧ Shift` + `left mouse button` to select areas to be flipped.	• Texture remapping should be performed first as it is not accessible after flip normal. • Default is to flip the entire dataset if no flip areas is selected. • Click **Preview** to preview. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.
Cutting Plane Tool	Define a plane to re-adjust the coordinate system of the scanned data. Hold `⇧ Shift` + `left mouse button` to select a plane by drawing a straight line and then activate **Delete selection and close intersection** or **Delete selection**.	• Click **Preview** or **Orient Based On Plane** to preview. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.

Optimization options	Description	Instructions
Mirror	Take the front view plane of scan data as the working plane. Draw a straight line as the central axis and perform a symmetrical copy. Hold `⇧ Shift` + `left mouse button` to draw a straight line as the central axis and then the data will be reproduced axisymmetrically with this line; you can tick to **Keep the initial mesh**.	• Click **Preview** to preview. • Click **Confirm** confirm and save. This action is irreversible. • Click **Cancel** to restore and exit. • Texture remapping should be performed first as it is not accessible after mirror.
Zoom	Adjust the scaling ratio of the model. The default value is 100, indicating no zoom.	• Click to reset the value to default. • Click **Preview** to preview. • Click **Confirm** confirm and save. This action is irreversible. • Click **Cancel** to restore and exit. • Texture remapping or Texture Mapper is not accessible after performing zoom.

Data Editing Toolbar



Icon	Function	Description
	Select Through	To select data all through.
	Select Visible	To select data on the front view only.

Note

- If both left and right foot have been scanned,  **Two Feet** model is displayed as default; you can click this button to switch to  **Left Foot** and  **Right Foot**.
- For the instruction to other editing tools, please see data editing toolbar.

Side Function Bar

Icon	Function	Description
	Open file	Open a file (STL, OBJ, PLY) for post processing.
	Export Your Scan	 : Save the scanned data in the specified format (ASC, STL, OBJ, PLY, 3MF) locally.  : If you have installed the EXModel software and you are in the post-processing or measurement interface with mesh data, click this button to start up the software and import the data into it.
	Share Data	• Use your  Sketchfab account to share the model. • Upload your model to  Shining3D Digital Cloud .
	Texture Mapper	Merge HD texture images with the model file to enhance the overall texture quality of the scanned data. It is recommended that you complete the removal of noise and hole filling before using the Texture Mapper.
	Third-party software	Save the data and open with third-party software.
	Texture remapping	After the post-processing, textures on the scanned data will be misrendered. By doing the texture remapping, the texture information will be reapplied on the mesh. **Note** • It is recommended that you remap the texture before saving data if hole filling or simplification has been applied. • You can tick **Texture layout optimization** to create better texture arrangement, so as to facilitate subsequent mapping and editing.
	Show Texture	To show / hide texture on the screen.

Icon	Function	Description
	Model Display	After enabling the model display by clicking the icon or pressing F12, the model will rotate at a specified speed (Click  to adjust the rotate speed; press F12 or Esc again to exit). **Note** The model will only rotate and display from the current view after entering the model display interface. Exit and adjust the angles in the post-processing interface if other views are in need.

Menu of the Right Mouse Button

Function	Description
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. **Note** Only accessible after applying meshing.
Select Through	To select data all through.
Select Visible	To select data on the front view only.

> **Note**
>
> For the introduction to other buttons, please see data editing.

Shortcuts

Please see data editing.

Measurement

Measurement

After meshing model or scanning some **point cloud** data, you can click **Measurement** step in the top navigation bar to enter the measurement interface to import data directly, and select data for **creating feature**, **alignment** and **measurement**.

Note

- On the **Measurement** step interface, you can use multi view and other editing tools.
- On the **Measurement** step interface, you can operate by right mouse button and shortcuts.

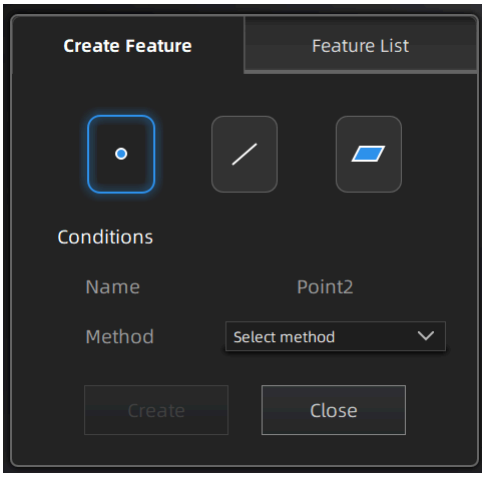
Additionally, it also supports clicking button in the right-side function bar to import models (including third-party 3D models).

Note

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

Create Feature

On the right panel of **measurement**, click and a **Create Feature** window will pop up on the left.



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	1. Click the data to select the point. 2. Click the **Create** button to create a feature point.	/
Please Select a Marker	1. Click an existing marker to select the point. 2. Click the **Create** button to create a feature point.	You can select this method to create feature points for model data that only have markers and are not meshed yet.
Line-Plane Intersection	1. Click an existing feature line or choose a line in the drop-down list. 2. Click an existing feature plane or choose a plane in the drop-down list. 3. Click the **Create** button to create a feature point.	• The feature line can not be in the feature plane. • The feature line can not be parallel with the feature plane.

Feature Line

Creation Method	Description	Note
Point-Point	1. Click the data to select the points. 2. Click the **Create** button to create a feature line. **Note** You can tick the checkbox before **From** or **to** and re-select the feature points.	/
Marker to Marker	1. Click existing markers to select markers. 2. Click the **Create** button to create a feature line. **Note** You can tick the checkbox before **From** or **to** and re-select the feature points.	You can select this method to create a feature line for model data that only have markers and are not meshed yet.
Plane-Plane Intersection	1. Click existing feature planes or choose planes in the drop-down list. 2. Click the **Create** button to create an intersection of two non-parallel planes.	The feature planes can not be parallel to each other.

Feature Plane

Creation Method	Description	Note
3 Points Fit	1. Click the data to select the point. 2. Click the **Create** button to create a feature plane. **Note** You can tick the checkbox before **Point1**, **Point2** or **Point3** and re-select the points.	The three points can not be in a line.
Point-Line Fit	1. Click existing feature lines or choose lines in the drop-down list. 2. Click the data to select the point. 3. Click the **Create** button to create a feature plane.	The point can not be in the line.
Best Fit	When there are selected data, click the **Create** button to create a feature plane that has the smallest deviation from the selected area. **Note** You can use editing tools or shortcuts to select the data.	/
Three Markers	1. Click existing markers to select markers. 2. Click the **Create** button and create a feature plane. **Note** You can tick the checkbox before **Marker1**, **Marker2** or **Marker3** and re-select the markers.	• You can select this method to create a feature plane for model data that only have markers and are not meshed yet. • The three markers can not be in a line.

Creation Method	Description	Note
Marker Point-Line Fit	1. Click an existing feature line or choose a line in the drop-down list. 2. Click an existing marker to select the marker point. 3. Click the **Create** button to create a feature plane.	• You can select this method to create a feature plane for model data that only have markers and are not meshed yet. • The feature point can not be in the feature line.
Marker Best Fit	When there are at least three selected markers, click the **Create** button to create a plane that has the smallest deviation from the selected area. **Note** You can use editing tools or shortcuts to select the data.	You can select this method to create a feature plane for model data that only have markers and are not meshed yet.

Alignment

Alignment tools can be used to adjust the spacial coordinates of the scanned data, so as to facilitate post-processing or reverse engineering.

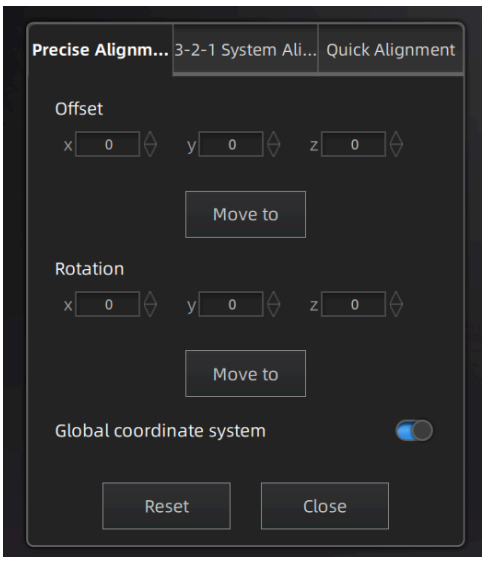
On the right panel of **measurement**, click  and an **Align** window will pop up on the left.

Note

You can import the un-meshed data in **Measurement**, align the data and return to the Scan step to update data changes.

Precise Alignment

Use precise coordinates to align the scanned data.



- **Input value and adjust coordinates**: Input values in **Offset** or **Rotation**, and click **Move to** to align model center with input coordinates and axis direction with rotation value.
- **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.

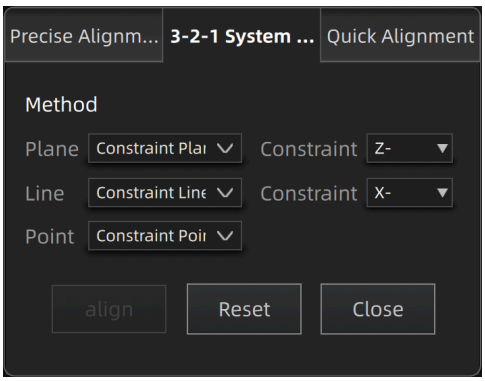
- Click **Reset** to cancel all movements in Precise Alignment.
- Click **Close** to save the movement and quit the alignment.

> **Note**
>
> The global coordinate system is disabled by default and needs to be enabled manually. Specifically, red points to positive X-axis, green points to positive Y-axis and blue points to positive Z-axis; if the global coordinate system does not appear on the interface, roll the mouse wheel to zoom out the model.

3-2-1 System Alignment

Use planes, lines and points as constraints to align the scanned data.

> **Note**
>
> Before alignment, you need to create feature points, lines, and planes, in which the feature line should not be perpendicular to the plane, or a window will pop up prompting failure.



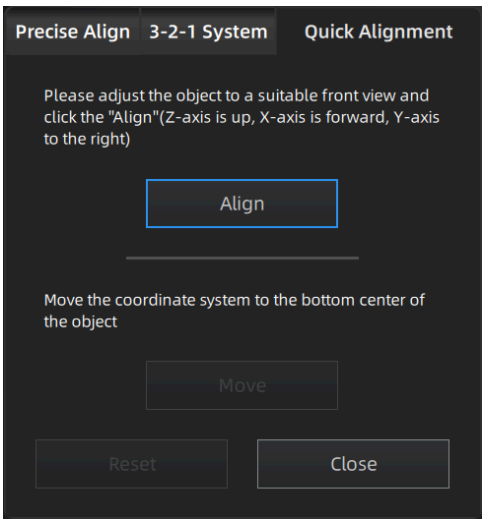
- **Plane**：Select a feature surface in the drop-down list, and select an axis in corresponding constraint drop-down list. The arrow on the plane corner indicates the positive direction of the plane, and the selected axis direction will be consistent with the plane direction.
- **Line**：Select a feature line in the drop-down list, and select an axis in corresponding constraint drop-down list. The arrow of the line indicates the positive direction of the line, and the direction of the selected axis will be consistent with that of the projection of the line on the selected plane.
- **Point**：Select a point in the drop-down list, of which the position is (0,0,0).

- Click **Align** to move coordinate axes. When the feature line is perpendicular to the plane, the movement fails and a window pops up prompting failure.
- Click **Reset** to cancel all movements.
- Click **Close** to save the movement and quit the alignment.

> **Note**
>
> About the global coordinate system, the red points to positive X-axis, green points to positive Y-axis and blue points to positive Z-axis; if the global coordinate system does not appear on the interface, roll the mouse wheel to zoom out the model.

Quick Alignment

Move the coordinate frame to align the scanned data.



- Click **Align** and move the coordinate frame to the center of the object, with its X-axis perpendicular to the screen, Y-axis parallel to the screen and pointing rightward, and Z-axis parallel to the screen and pointing upward. The object remains its position.
- Click **Move** and move the coordinate frame to the bottom center of the object.
- Click **Reset** and restore the frame to its original state(before alignment).
- Click **Close** to save the model frame and close the dialog box.

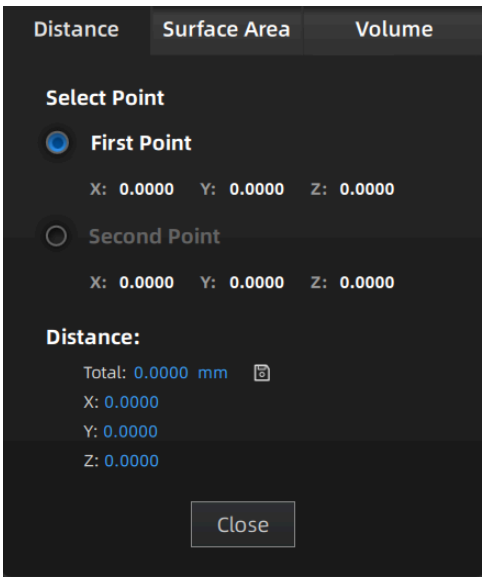
> **Note**
>
> About the global coordinate system, the red points to positive X-axis, green points to positive Y-axis and blue points to positive Z-axis; if the global coordinate system does not appear on the interface, roll the mouse wheel to zoom out the model.

Measurement Tools

Measurement tools can be used to calculate the distance, surface area and the volume of the watertight model.

On the right panel of **Measurement**, click  and a **Measurement** window will pop up on the left.

Distance



Calculate the distance between two points or markers on the surface of the scanned data.

When two points of the data are selected, the distance will show itself with a unit of mm.

Click **Close** to close the front window.

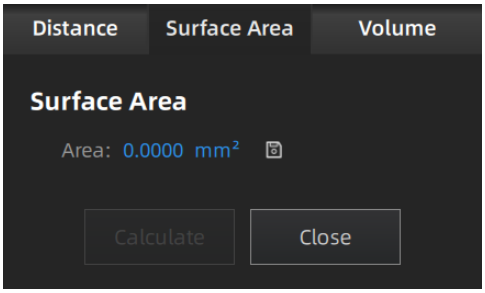
Note

● You can tick the checkbox before **First Point** or **Second Point** and re-select the point.

● **Total** is the 3D distance; **X**, **Y**, and **Z** are the projection length of the segment to respective planes.

● You can select marker measurement for model data that only have markers and are not meshed yet.

Surface Area



Calculate selected area of the scanned model.

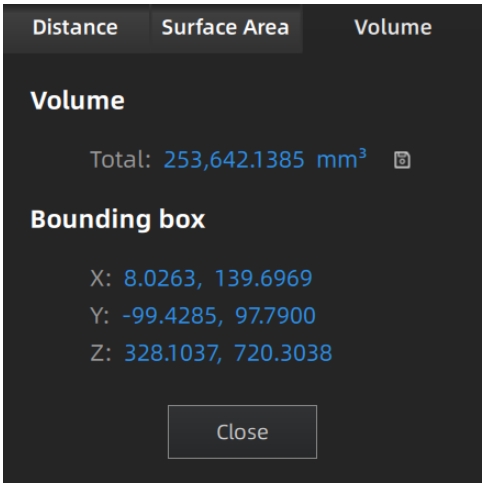
You can use edition tools or shortcuts on the bottom panel to select the area. Click **Calculate** and the area will show itself with a unit of mm².

Click **Close** to close the front window.

Note

This function is only available for meshed models.

Volume



Calculate the volume of **Meshed data** with a unit of mm³. When you switch to **Volume**, the volume of the scanned model and the coordinates of corresponding bounding box will show themselves.
Click **Close** to close the front window.

Note

This function is only available for **meshed** models.

Click and export the measurement result locally.

Note

- You can save the file as TXT or CSV or both.
- The storage path defaults to where you open the file last time, or to "C:\Users\shining3d" if you have not set the path.

Save and Export

Save Data

You can save the scanning data locally.

On the interface of **Scan** step, click in the right-side function bar, select the save path and the file format, enter the file name as well.

On the interface of **Post-processing** or **Measurement** step, click or > in the right-side function bar, select the save path and the file format, enter the file name as well.

Note

For the foot station alignment mode, you can choose to save the data of two feet, left foot or right foot, and support multiple choices.

Format	Data Type	Saved as	Recommended Application Scenario
ASC (whole piece)	Optimized cloud points	Scan.asc	• Check the data. • Quick export and no need for post-operation. • Use other software to post-process the data.
STL	Mesh data	Scan.stl	• 3D printing and reverse designing. • Compatible with most post-processing software. **Note** Compatible with most post-processing software.
OBJ	Mesh data	Scan.obj Scan.jpg Scan.mtl	• Used for artworks. • 3D rendering. **Note** Compatible with most post-processing software.
PLY	Mesh data	Scan.ply	• Compact file. • Easy for texture editing.
3MF	Mesh data	Scan.3mf	• Compact file. • Compatible with Microsoft 3D printing software.
P3	Global markers	Scan.p3	• Reuse the markers' position. • Can also contain the cutting plane.

Share Data

You can upload the encapsulated data to Sketchfab or Shining3D Digital Cloud after mesh.

On the interface of **Post-processing** or **Measurement** step, click in the right-side function bar to upload the encapsulated data to Sketchfab, where the title, username and password are required to be provided.

You can log into the website afterwards to view the shared models.

> **Note**
>
> - The files uploaded should be in the format of STL.
> - For the foot station alignment mode, you can choose to share the data of two feet, left foot or right foot, and support multiple choices.

Third-party Softwares

After the mesh, you can import scanned mesh data into the third-party software.

In the **Post-processing** or **Measurement** interface, click > to export the meshed data to EXModel:

- If you have not installed the EXModel, click this button and choose the corresponding version on the pop-up window to get it.
- If you have installed the EXModel, click this button to start up this software; and if you are in the post-processing or measurement interface with meshed data (STL, OBJ or PLY format), click in the upper right corner to import the data into it.

> **Note**
>
> - EXModel software can also be used by clicking in the upper right corner on the interface.
> - Click here to download and learn how to activate EXModel.
> - Click here to learn how can I get access to EXModel.

Or click to select the desired third-party software.

Icon	Name	Main Application Scenario
	Geomagic Control X (2023)	Metrology
	Einsense Q (1.3.2.3)	Metrology
	Geomagic Design X (2023)	Reverse Engineering
	Geomagic Essentials (2.0.1.3000)	Mesh Editing

Note

- The third-party software will be automatically launched and the meshed data will be imported if it is installed already. Otherwise, it will prompt "Failed to load the data to XX. Please confirm XX is installed in your computer."
- For the foot station alignment mode, you can choose to export the data of two feet, left foot or right foot.

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