SHINING 3D

EINSTAR

V1.2.1.1

User Manual

Table of Contents

> ## Measurement Tool

- Save

> ## Save Data
>
> ## Share Data

- Support Center

Overview

About the User Manual

This user manual (hereinafter referred to as "the Manual") introduces the hardware configuration, software installation and software usage process of the Einstar Handheld 3D Scanner (hereinafter referred to as "the Scanner").

Symbol Convention

Signal	Meaning
	**Note**: Additional information for particular situation.
	**Caution**: Improper actions or conditions that may damage the product, and consequently void your warranty or service contract or lose the customer data or system data.
	**Warning**: The safety instructions that you must precisely follow to avoid injury. Failure to observe can cause damages to your product, or result in personal injuries.

Compliance

Symbol	Description
CE	**LVD/EMC Directive** This product complies with the European Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.
	**WEEE Directive-2012/19/EU** The product this manual refers to is covered by the Waste Electrical & Electronic Equipment (WEEE) Directive and must be disposed of in a responsible manner.
	This device complies with "IEC 60825-1:2014 Safety of laser products Part 1: Equipment classification and requirements". Wavelength:940nm Pulse width:9ms Maximum light power:0.7W
UK CA	The UKCA marking is the product marking used for products being placed on the market in Great Britain(England, Scotland and Walse).

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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Device Introduction

Einstar is a cost-effective, professional-grade handheld 3D scanner developed independently by SHINING 3D based on years of accumulated 3D visual technology and market demand.

It offers a fast and smooth 3D scanning experience, excellent data quality, simple and efficient operation, and strong adaptability to various scenarios, allowing users to break free from the high professional threshold of 3D modeling and truly achieve digitalization of all things.

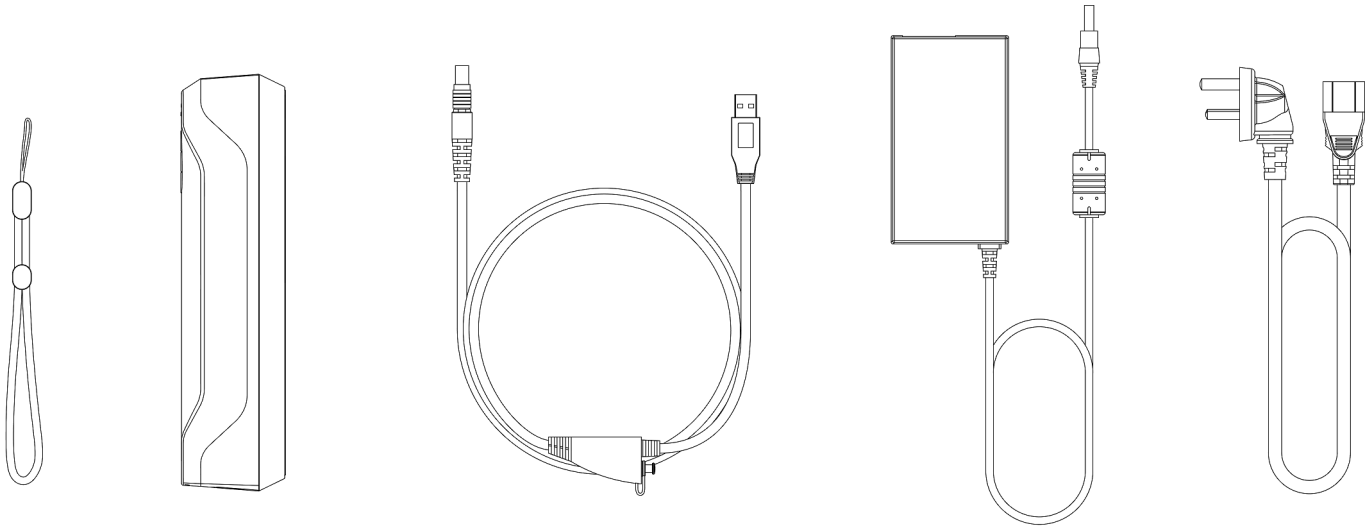
Appearance

Serial Number	Description
①	Working distance indicator
②	Scanner status indicator
③	Zoom in / Brighter (press ▷ button on the back of the device twice to switch the function)
④	Preview / Scan / Pause
⑤	Zoom out / Darker (press ▷ button on the back of the device twice to switch the function)

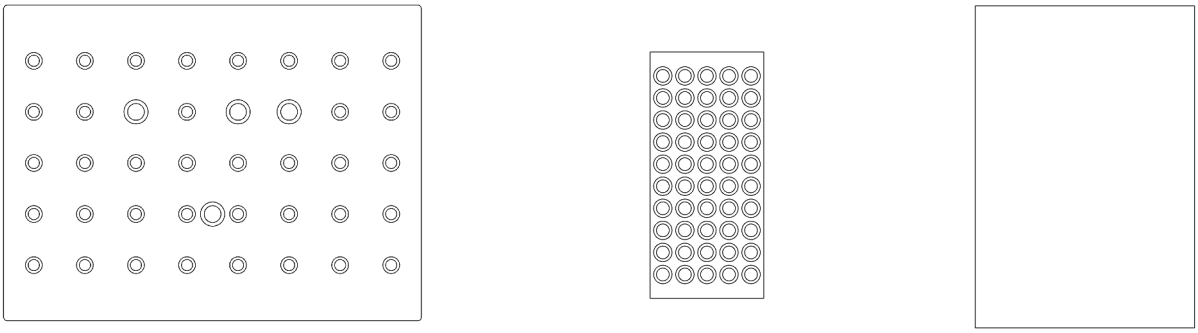
Note

During the scanning process, you can long press ▸ button on the back of the device to bring up a shortcut window, where you can delete data, calibrate, fit view, F11 start full-screen display.

Component



① ② ③ ④ ⑤



⑥ ⑦ ⑧

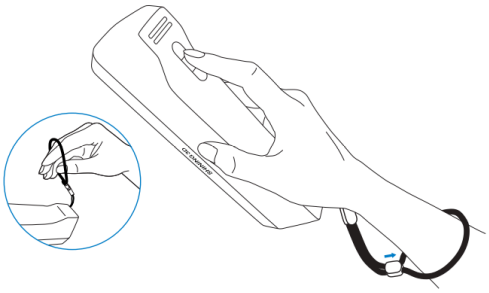
Serial Number	Description
①	Wrist strap
②	Scanner body[1]
③	USB cable
④	Power adapter (12V / 5A)
⑤	Power cable
⑥	Calibration board
⑦	Markers
⑧	Quick start guide

Caution

- Make sure you are using the correct power adapter (12V / 5A).
- Please install the software before using the device.

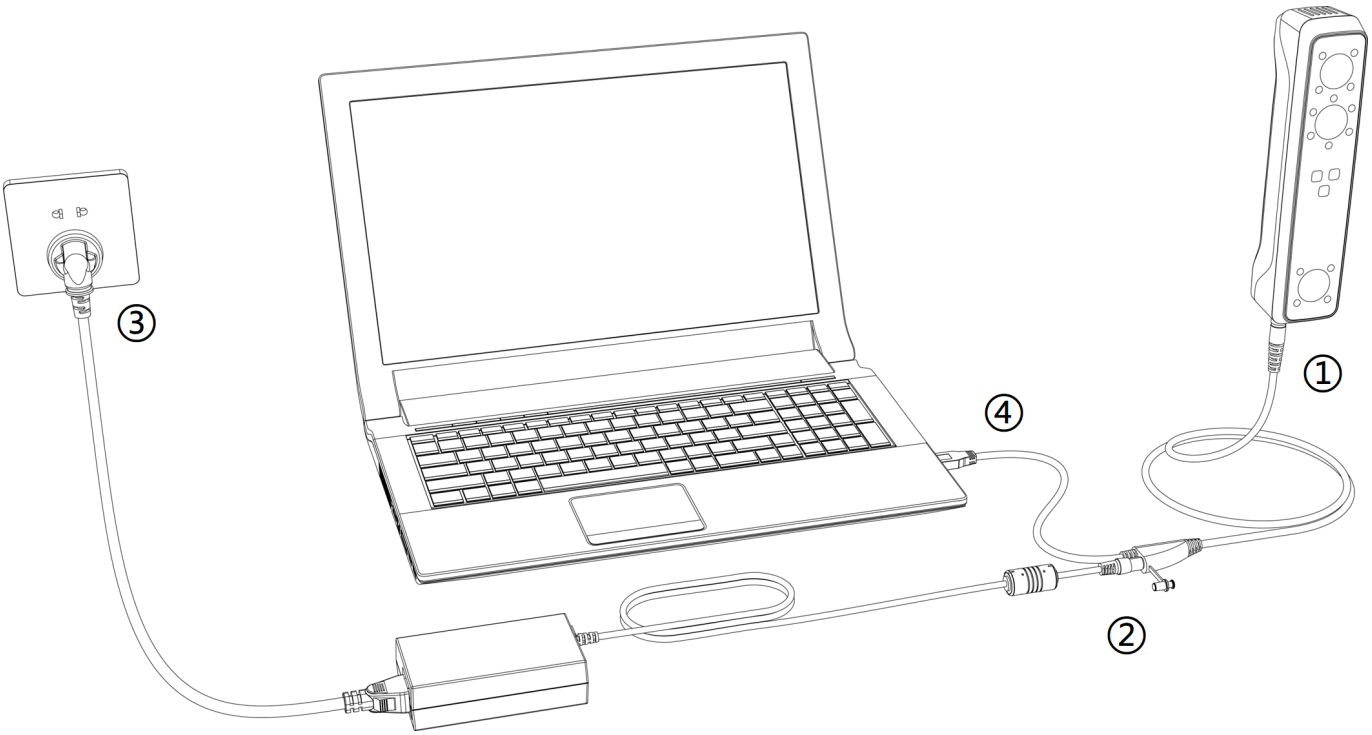
Warning

How to hold the device:
Please put on and tighten the ① wrist strap, and hold the scanner securely as shown in the picture.



Connect the Cable

Overview:

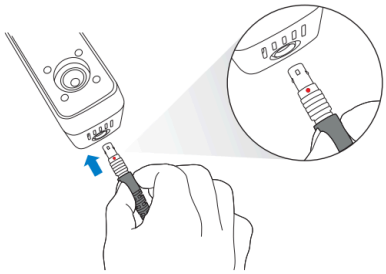


Steps:

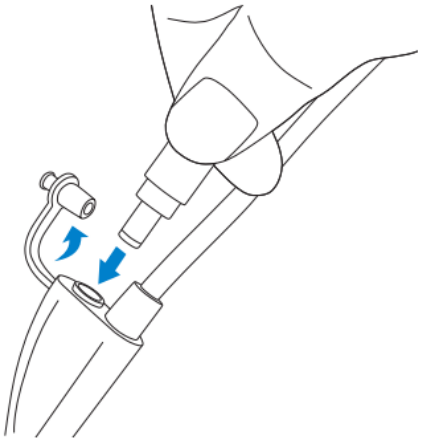
1. Plug USB cable into the bottom of Scanner (as shown in **overview** ①).

⚠**Caution**

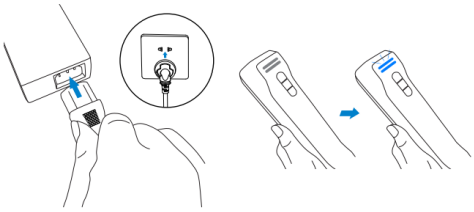
Please note that the red dot should be consistent with the front side of the scanner.



2. Plug the power cable into the USB cable (as shown in **overview** ②).

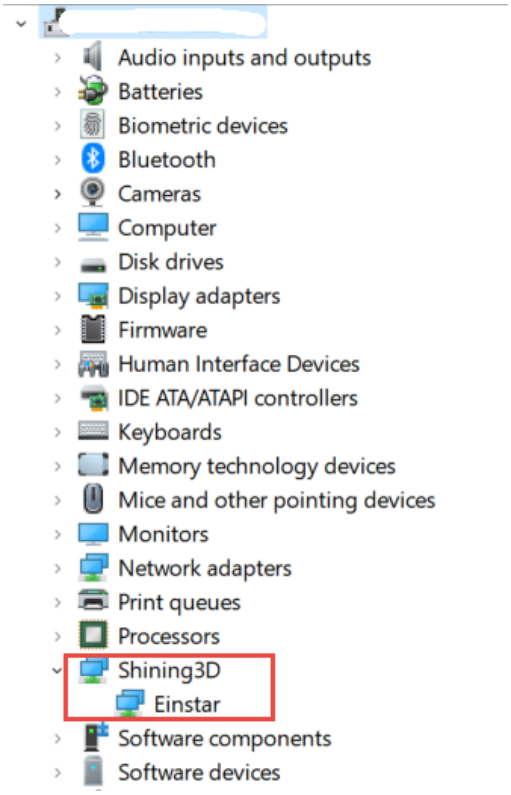


3. Power on (as shown in **overview** ③); if the ② LED indicator shows blue, it indicates the power-on status.



4. Plug the other side of USB cable into the USB port of computer (as shown in **overview** ④).

5. Now you can see our device in your Device Manager.



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1. The scanner comes with a protective cover when it leaves the factory. It is recommended not to remove it when using the scanner. ↩

Software Installation

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

Environmental Requirements

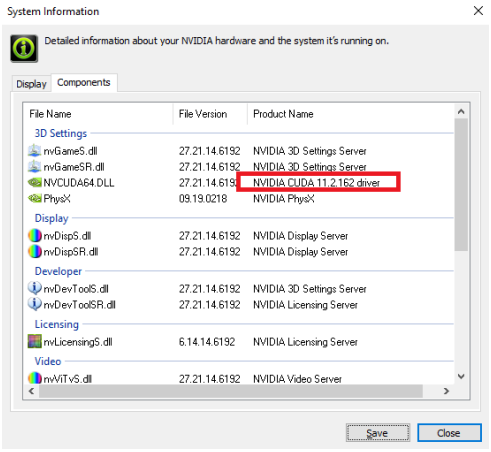
Configuration	Recommendation
Operating System	Window 10 (64-bit) and Window 11 (64-bit).
Processor	Intel® Core™ i7-11800H or above.
Graphics Card	NVIDIA GTX 1050 or above, for more see GPU.
VRAM	2 GB or above.
RAM	32 GB or above.
Interface	USB 2.0.

GPU

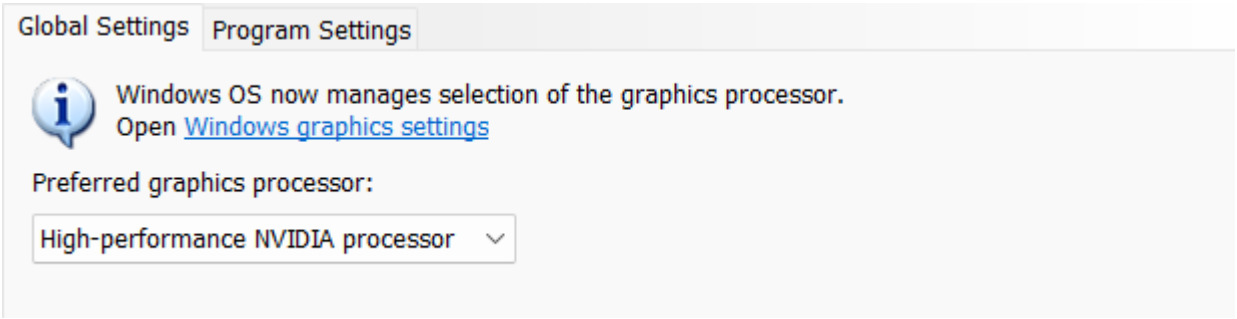
It is highly recommend to use a NVIDIA[1] discrete graphics card for better and smoother scanning experience; but the NVIDIA discrete graphics card should support **CUDA10.2** or above (for specific steps to get the CUDA version, please expand the "Note" section below).

Note

Launch **NVIDIA Control Panel**, go to **Help** > **System information** > **Components** to get the current CUDA version.



- **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**: Launch **NVIDIA Control Panel** on your laptop; go to **3D Settings** > **Manage 3D Settings** > **Global Settings**, select **High-performance NVIDIA processor** and **Apply**.



Software Installation

1. Download software from: **www.einstar.com** > **Support** > **Software download**.
2. Click and follow the installation wizard of EXStar.

Caution

- Administrator rights are required for the installation of the software.
- 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 achieve better scanning experience.

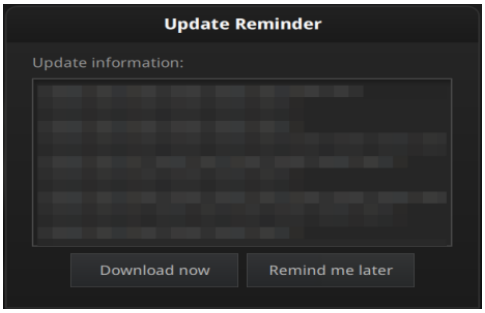
Software / Firmware Upgrade

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.

> ⚠ **Caution**
>
> Please do not use the mismatched software, firmware, and scanner, as it may affect your scanning experience. If you have any questions, please contact your supplier or our technical support.

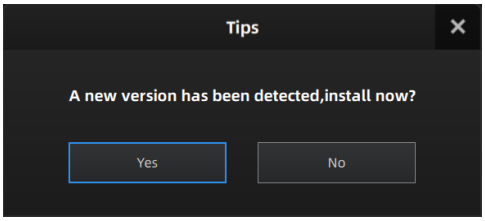
Software Upgrade

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.

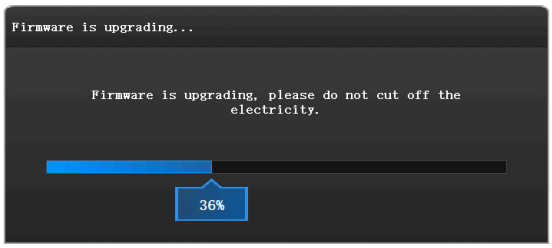


> **Caution**
>
> - During the downloading process, you can continue using the software; if you close the software before the process completes, the process will pause automatically and continue itself the next time you open it.
> - The software will be closed during upgrading, so **please save your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

Firmware Upgrade

The firmware[1] will be upgraded for fixing bugs or optimizing its performance, 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.



> **Caution**
>
> Please make sure that the device is powered on during the upgrade, and avoid the interruption of the upgrade caused by power cuts.

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

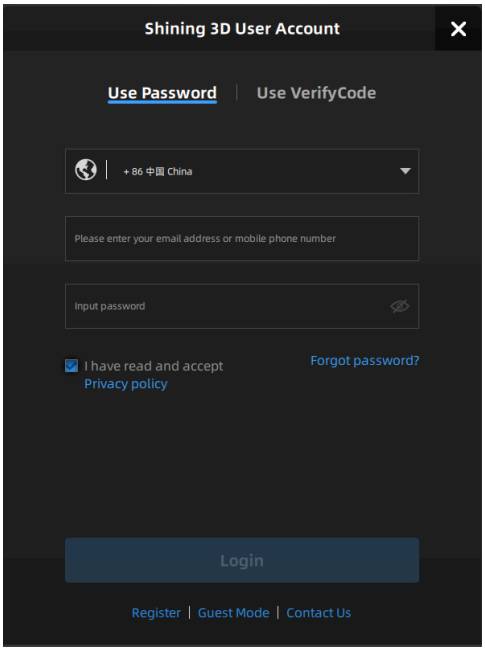
Device Activation

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

> **Note**
>
> - If you cannot do registration, please visit support.einstar.com and submit a ticket.
> - After activation, you can also use the account to login to passport.shining3d.com for accessing Einstar learning material and the latest software.

Online Activation

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

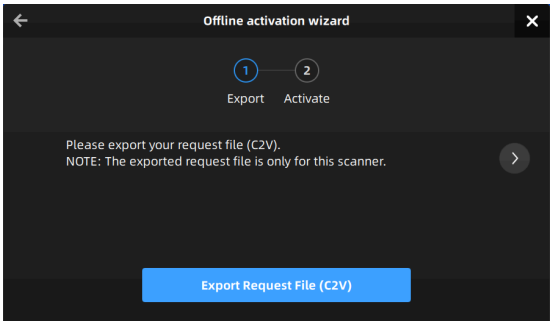


> **Note**
>
> - Please read and then check **Privacy Policy** and **Terms of use**.
> - If the computer is not connected to the Internet, you can choose Offline Activation.

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.

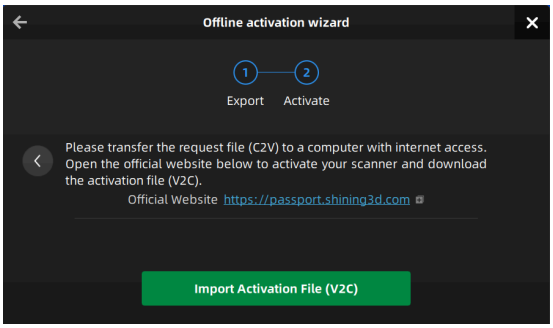


2.Copy the C2V file to the other computer connected to Internet.

3.Log in SHINING 3D Passport official website, upload your C2V file in **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.

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

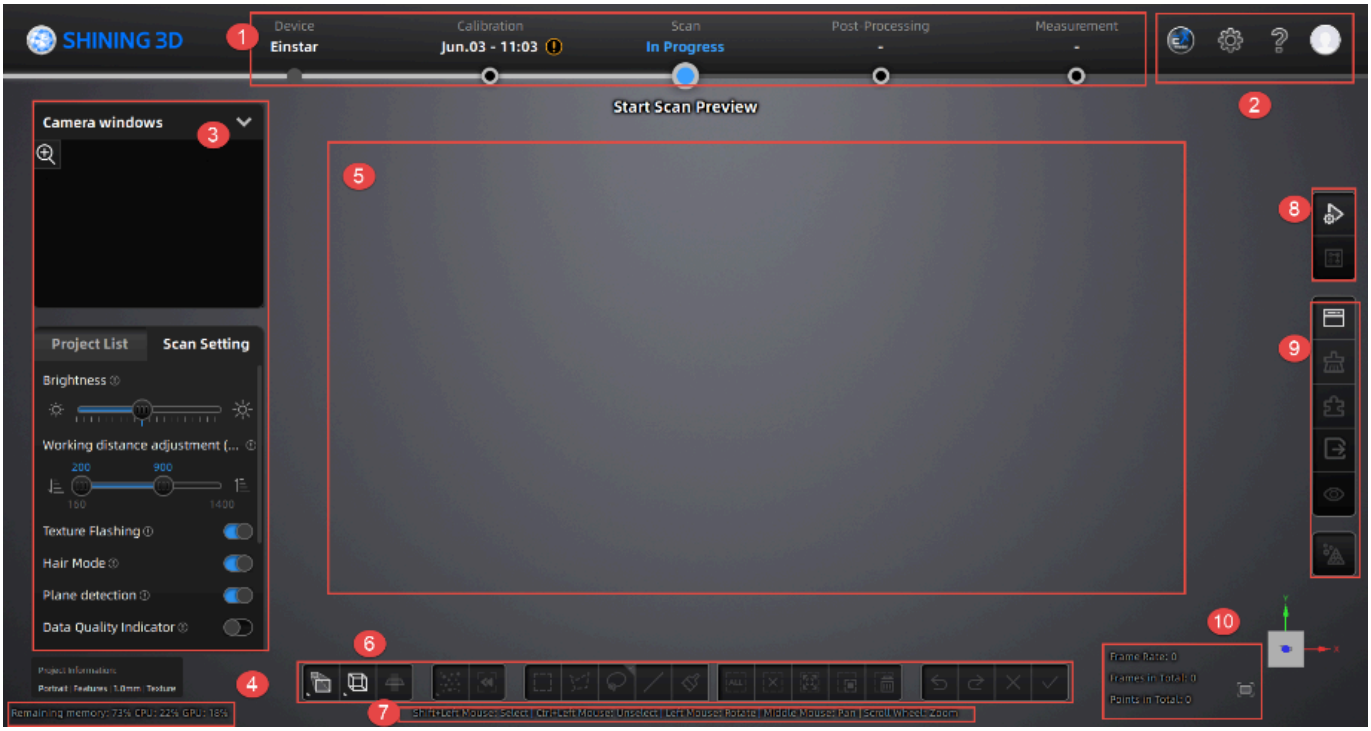


> **Note**
>
> If you fail to activate the device in neither way, please contact your supplier or our support team.

Software Interface

After installing, opening the software, and start scanning, you can see the software interface as shown in the following figure.

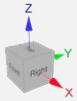
> **Note**
>
> If an error occurs during the software usage, it is recommended that you should contact technical support and provide the error code for assistance.



Serial Number	Function	Description
1	Navigation Bar	• **Device**: To display the device status: online / offline. Device online: to show the device name. Device offline: click to reconnect the device. • **Calibration**: Click on the corresponding position in the navigation bar to start calibration. • **Scan**: Click on the corresponding position in the navigation bar to start scanning. • **Post-Processing**: Once the scanning is completed and the point cloud is generated, click to enter the post-processing workflow. You can mesh the model, and then proceed with mesh editing. You can also click on the corresponding position in the navigation bar to switch to the post-process interface to perform mesh editing on the mesh data. • **Measurement**: Click on the corresponding position in the navigation bar to switch to measure interface. You can measure your model here.

2	Settings and Feedback	**EXModel**:
		View the relevant information for EXModel and our technical support contact.
		If you have not installed the EXModel, click in the top-right corner and choose the corresponding version on the pop-up window to get it.
		If you have installed the EXModel, click to directly switch to it.
		If you have installed the EXModel and you are in the post-processing or measurement interface with mesh data, click to switch to the EXModel and import the data into it; if there is no mesh data, clicking this button will only switch to the EXModel.
		Click here to download and learn how to activate EXModel.
		Click here to learn how can I get access to EXModel.
		Settings
		• General Settings:
		  • Select language: Select the needed language for software.
		  • Compatible with 3Dconnexion CadMouse: Open (default) to support connect and use of 3Dconnexion CadMouse and related functions, including rotation axis and shortcuts.
		  • 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. **Help** • 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. **SHINING 3D Passport** • Reverse engineering service: By sending us the scanned project files and specific information, we can assist you with reverse engineering. • Provide the entrance to log in / log out, **My SHINING 3D account**, Official Website, official Facebook account page and SHINING 3D Digital Cloud.
3	Scanning Settings	• Camera Window: Accurately adjust the parameters by previewing the actual scene through the camera window in the scanning process. • Project List: Project group management module, refer to **Project and Project Group** for more information. • Scanning parameters: Set scanning parameters, refer to Scanning Settings for more information.
4	Remaining Memory/CPU/GPU	• **Remaining memory**: To display the percentage of remaining memory. • **CPU**: The software program provides a prompt message indicating the amount of computer's CPU resources it occupies during runtime. • **GPU**: 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.
5	Previewing/Scanning Window	Window for viewing the pre-scan results and the scanned model effects in this window.

6	Data Editing Toolbar	Please refer to **Data Editing**.
7	Shortcuts	Quickly move the model, adjust the angle and select scanning data through shortcut keys.
8	Scanning&Generating Point Clouds	Please refer to **Scan**.
9	Side Toolbar	Please refer to right function panel.
10	Other Information	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 views conveniently, as shown in the figure below. 

3D Mouse

This software is compatible with the 3Dconnexion CadMouse. You can use the 3D mouse to quickly rotate, pan, zoom, and perform other shortcut operations on the model in a 3D scene.

> **Note**
>
> Please refer to 3Dconnexion user manual for more information.

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

Mouse 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 driver.
3. Download and install the latest version of the 3Dconnexion software.
4. Run the software and click **Trainer** for quick training and guide.

Software Interface

Icon	Description
	Click to open the 3Dconnexion quick training and guide.
	Click to view the 3Dconnexion product user manual.
	Click to view the 3Dconnexion product user manual.
	Click to view the 3Dconnexion product user manual.
	Create high-resolution image collages using 3Dconnexion Collage with SpaceMouse.
	Practice using this software and mouse operations with sample models.
	Watch instructional videos.
	Provide feedback to 3Dconnexion.

Button Description

Main Panel

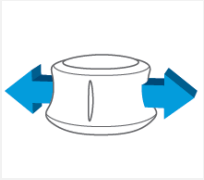

3Dconnexion Keys
Control Cap
Keyboard Modifiers
Menu Button
Color Display
CustomView Buttons
Rotation Toggle Button
QuickView Buttons
Fit Button

Button	Description
Color Display Screen	/
Number Buttons	12 additional programmable function buttons. You can customize their functions using the 3Dconnexion settings. Refer to **Number Buttons** for specific operations.
Custom View Button	In this scanning software, long press to save the current view of the model (angle, position, zoom, etc.), or single click to switch to the saved view.
Control Buttons	Used to manipulate the 3D model through actions like pushing, pulling, and twisting. Refer to **Control Buttons** for specific operations.
Rotation Toggle Button	Press once to lock rotation around all axes.
Keyboard Modifiers	Eight keyboard modifier buttons that function similar to their counterparts on a regular keyboard.
Quick View Buttons	Five quick view buttons that help you switch the drawing or 3D model to desired views. These buttons also have secondary functions that can be accessed by long press. You can customize the long press and short press functions in the 3Dconnexion settings.
Menu Button	Quickly brings up the menu for customizing button functions.
Fit Button	Automatically fits the 3D model to the center of the screen.

Number Buttons

Icon	Shortcut	Function
1	^ Ctrl + M	Toggle selection of markers/point clouds (only works in **Scan**).
2	^ Ctrl + G	Toggle selection of penetration/non-penetration (only works in **Post-processing**).
3	^ Ctrl + T	Toggle selection mode for data. For more selection modes, please refer to **Data Editing**.
4	^ Ctrl + A	Select all data.
5	^ Ctrl + C	Cancel selection.
6	^ Ctrl + R	Connected components.
7	^ Ctrl + I	Invert selection.
8	⌦ Del	Delete selection.
9	^ Ctrl + Z	Undo.
10	^ Ctrl + ⇧ Shift + Z	Cancel editing.
11	Enter ⏎	Confirm editing.
12	^ Ctrl + H	Show/hide texture.

Control Buttons

Icon	Description
	Tilt left or right button to adjust the model on the Z-axis.
	Rotate button to adjust the model on the Y-axis.
	Tilt forward or backward button to adjust the model on the X-axis.
	Push forward or pull backward button to zoom in or out the model.
	Push up or push down button to move the model up or down.
	Push left or push right button to move the model left or right.

Quick Guide

Step 1

If this is your first time to use the scanner, please do the calibration first.

→ Calibration

Step 2

Before scanning, you need to select a path to create a project group.

→ Project and project group

Step 3

After creating the project group, you can start up the scanning process, including setting scanning parameters, acquiring data, editing scanning data, generating point cloud and aligning multiple projects (optional).

Step 4

Mesh the scanning data and save data.

Calibration

Quick Calibration

With **calibration**, the scanner parameters are recalculated, which not only ensures the accuracy of the scanner, but also improves the quality of scanning. Thus, it is recommended that you calibrate the device before each use.

Calibration is required under the following conditions:

- When the scanner is used for the first time or there are more than 7 days since last calibration.
- 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 completing calibration, 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, a yellow exclamation mark 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

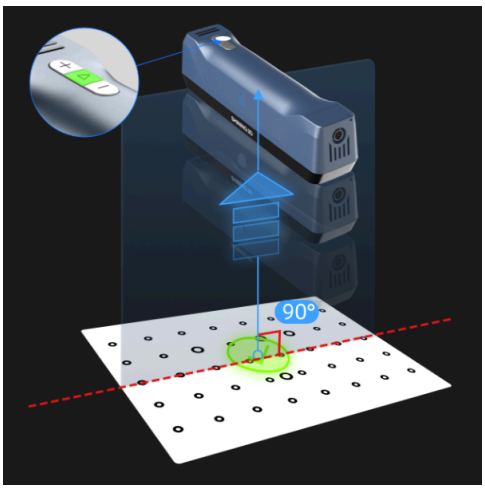
- The calibration board is matched to the device. Doing the calibration with an incorrect calibration board will fail to generate good scan data or optimum accuracy.
- Always make sure that both sides of the calibration board are clean and free of scratches.
- Do not place heavy objects or sundries on 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.

Specific calibration steps are shown as follows:

During the calibration process, please follow the software guide to hold the device in five different angles and capture five images.

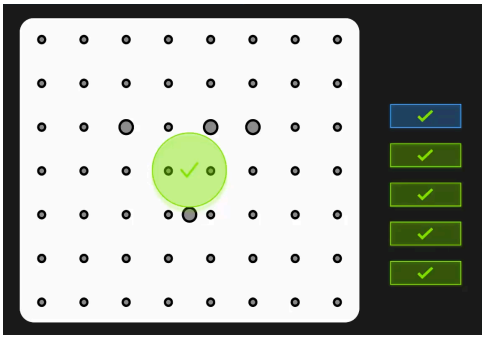
1.Place the calibration board with the front side (white background with black dots) facing up, flat on the table.

2.After picking up the scanner, move it above the calibration board. The scanner should be positioned vertically, facing directly towards the table, in the same direction as shown in the figure. Ensure that the blue circle (indicating the scanner's focus) is positioned within the grey circle (indicating the center of the calibration board) and turns green in the software.



3.Press ▸ on the back side of the scanner to start collecting images.

4.During the data collection process, you need to move the scanner up and down (ensuring that the projected circle remains green) until the distance indicator on the software interface shows all green. Once the data collection is complete, the software will automatically exit the data collection mode, proceed to the next stage.



Note

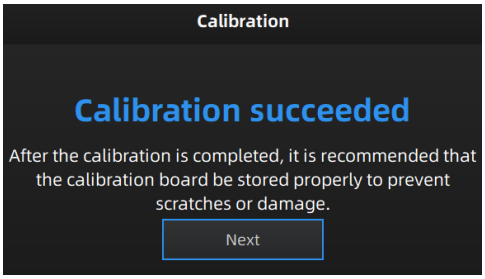
During the collection process, if the interface prompts "Please ensure the target circle green," you need to adjust the angle of the handheld device; if the interface prompts "Too close," you need to pull the scanner away; if the interface prompts "Too far," you need to push the scanner closer.

5.Please continue to follow the instructions provided by the software to complete the subsequent steps.

Warning

You need to press ▸ button on the back side of the device again to start collecting the image for the new position.

6.Check the calibration result, click **Next** to enter the **White Balance** step.



Note

- If the calibration fails, please click **Redo calibration**.
- If you cannot get the pass result anyway, please contact your supplier or our support team .

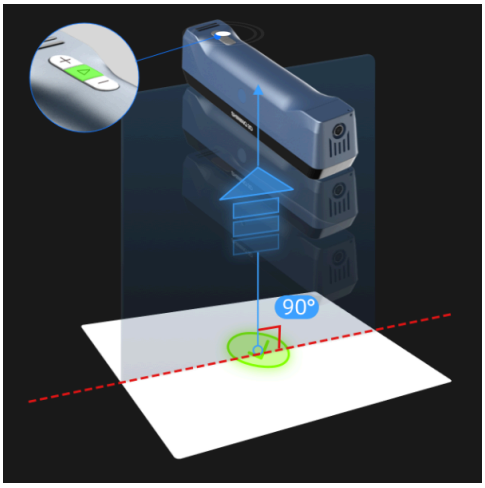
White Balance

If the Texture Scan is selected, you need to calibrate white balance, in order to calibrate the texture camera for the first use; when the texture scanning effect is not satisfactory in the subsequent scan, it is recommended that you calibrate again.

Specific white balance calibration steps are shown as follows:

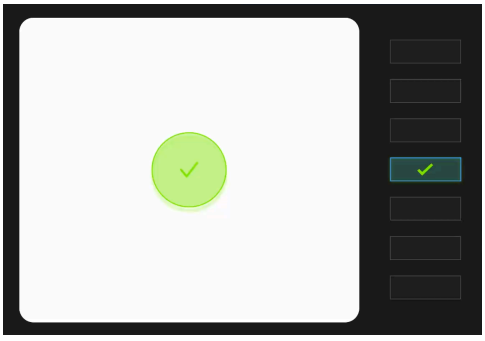
1.Place the calibration board with the white side facing up, flat on the table.

2.After picking up the scanner, move it above the calibration board. The scanner should be positioned vertically, facing directly towards the table, in the same direction as shown in the figure. Ensure that the blue circle projected by the scanner is positioned within the grey circle at the center of the calibration board and turns green.

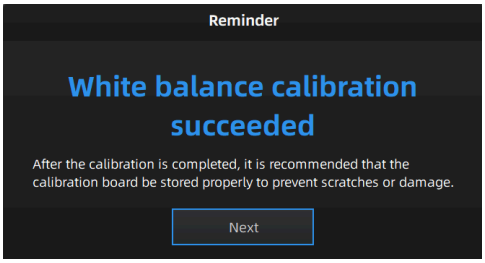


3.Press ▸ on the back side of the scanner to start collecting the image.

4.Move the scanner up and down (ensuring that the projected circle remains green) until one box is ticked.



5.Check calibration result; click **Next** to enter the **scanning** step.



Note

- Please do not do the white balance calibration under strong or uneven light, or it my result in color cast and other issues.
- If the calibration fails, please repeat step 2 ~ 4.
- If you cannot get the pass result anyway, please contact your supplier or our support team .

Scanning

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 Special Objects

Note

Not recommend to scan following objects:

- Soft material object that cannot be hung.
- Lattice structures with many small deep holes.

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 alignment** mode. • Mark/draw on the surface to add features and select **Texture alignment** mode.	Scan as normal after preparations.
Thin wall objects	Select **Markers** alignment 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 **Markers** alignment mode, and align projects, for more see scan for small objects.	Scan as normal after preparations.

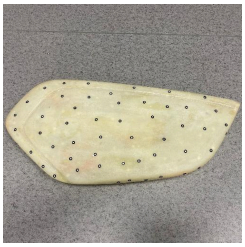
Scan for Thin-wall Objects

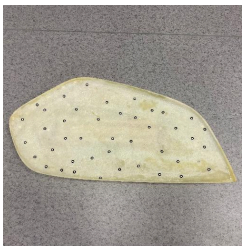
To scan thin-wall objects without distinct features, as shown in the follows:

It is recommended that you select **Global Markers** alignment 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).

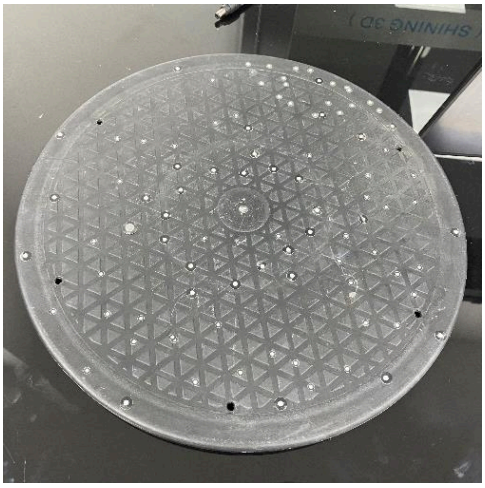
4.During the scanning process, the markers on both sides of the auxiliary objects should be scanned to complete the transition between the front and back side, then scan the lateral sides, and scan the left data after removing the auxiliary objects.

Scan for Small Objects

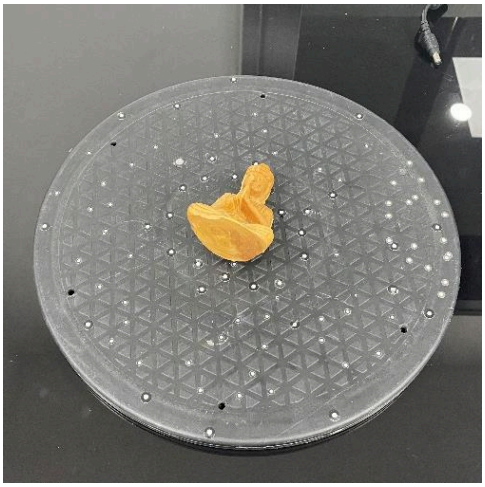
To scan thin-wall objects without distinct features, as shown in the right figure:

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 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).

Project and Project Group

Project Group

Create or open a **project group** before scanning.

> **Note**
>
> Project group is the standard file structure of the software. It contains one project or more. Each project contains the scan data of its own.

Project group is mainly used in the following scenarios:

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

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

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 on **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 sidebar. 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 a number (if it is the first time, the default name is ProjectGroup_X). 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\EXScan`).
> - If the remaining disk space in the selected path is less than 50GB, it is recommended that you switch to another save path to avoid potential issues during subsequent scans.

Additionally, you can also **create an individual project within a 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.

 Open Project Group

> **Note**
>
> The current project group (if there is) will be saved automatically.

- In the navigation bar, enter the **Scan Mode** step and click on **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 sidebar. In the pop-up window, click **Open project group**. The following steps are the same as mentioned above.

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, including alignment mode, resolution and texture.

> **Note**
>
> For **Object Scan** mode, it supports setting the **object size**.

Portrait Scan

Select alignment mode

Alignment Mode	Description
Feature alignment	Use objects' geometric features for auto aligning during scanning. Suitable for objects with rich surface features.
Texture alignment	Use objects' surface texture features for auto aligning during scanning. Suitable for objects with rich surface patterns, but lacking rich and variable geometric features.

Note

Alignment mode supports multi-selection, namely mixing feature and texture alignment.

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.

Texture Scan

You can enable or disable texture scan, but it can not be disabled under the **Texture alignment** mode.

Note

Texture switch cannot be changed once the project group has been created.

Object Scan

Object size

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

Select alignment mode

Alignment Mode	Description
Hybrid alignment	Support selecting one or multiple modes among features, texture and markers alignment modes. If the scanned object has rich and variable geometric or texture features, it is recommended that you select features or texture alignment mode.
Global markers alignment	After selecting this alignment mode, open global markers file or scan global markers directly in scanning settings to assist scanning and aligning.

Note

- The global markers alignment mode or hybrid alignment mode (including markers) also supports open a global markers file in scanning settings.
- The frame rate is relatively low under the texture alignment mode, which could affect the fluency of scanning, thus it is recommended that you select this mode only when needed.

Select resolution

Resolution	Description
High	• Medium and large object: 0.2 mm. • Small object: 0.1 mm.
Medium	• Medium and large object: 0.5 mm. • Small object: 0.2 mm.
Low	• Medium and large object: 2.0 mm. • Small object: 0.5 mm.

Note

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

Texture Scan

You can enable or disable texture scan, but it can not be disabled under the **Texture alignment** mode.

Note

Texture switch cannot be changed once the project group has been created.

Start Scanning

Scanning Settings

After entering the **Scan** step interface, you can perform scan settings on the left side of the interface.

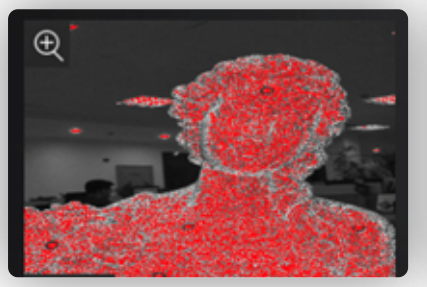
Portrait Scan

- **Camera Window**

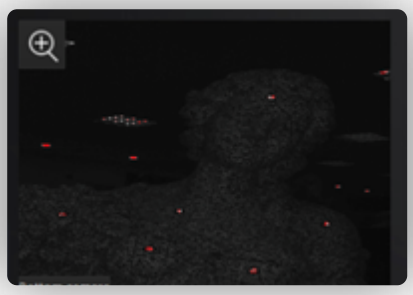
  Preview the real-time image captured by the scanner camera. Previewing the effect through the camera window can assist in scanning data.

- **Brightness**

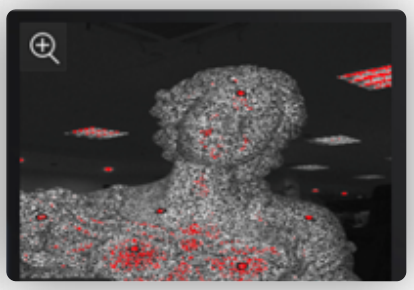
  Drag the slider to adjust the brightness for different material or color of the object to get better scanning data. Please ensure that the object is clearly visible within the camera window and that there is no excessive red color displayed on the object.



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 160 mm ~ 1400 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 for better texture scanning, so as to avoid the dark texture of the scanning model due to the lack of external light.

> **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 without distinct features.

  > **Note**
  >
  > - If you need to scan objects that are flat or have few features, it is recommended that you paste markers for helping alignment.
  > - If the plane where the object is located can be scanned and affect the alignment effect, it is recommended that you use the **Auto Cutting Plane** feature.

- **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.

- **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.

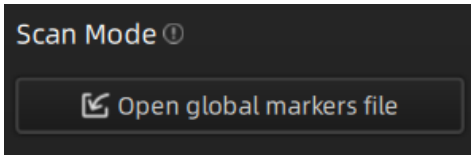
Object Scan

- **Camera Window**

  Preview the real-time image captured by the scanner camera. Previewing the effect through the camera window can assist in scanning data.

- **Scan Mode**

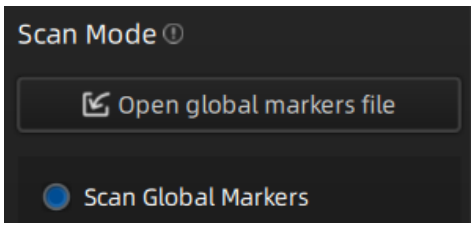
  Hybrid alignment mode (including markers):
  Click **Open global markers file** button to import local global markers file.



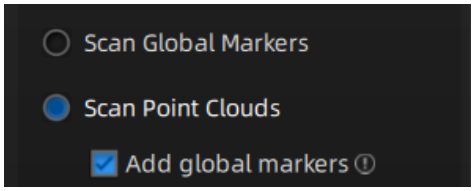
Note

- 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**.



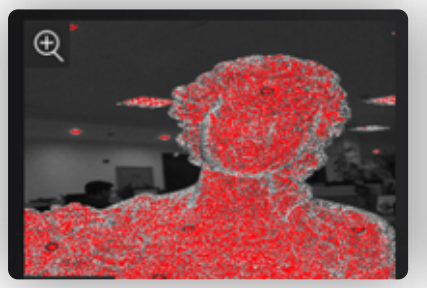
After switching to **Scan Point Clouds**, you can click **Add global markers** and new recognized markers can be added to global markers.



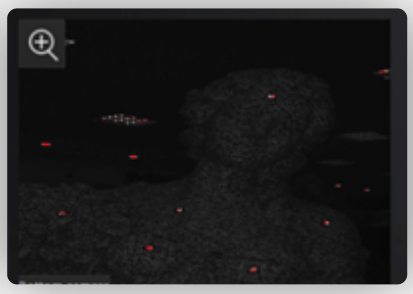
> **Note**
>
> - **Add global markers** switch can not be changed during the scanning process.
> - If you click **Open global markers file** button when a global markers file already exists in the current project, you will be prompted with a message "Are you sure to clear current data and rescan?".
> - 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**

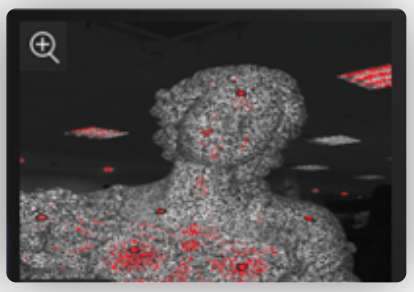
  Drag the slider to adjust the brightness for different material or color of the object to get better scanning data. Please ensure that the object is clearly visible within the camera window and that there is no excessive red color displayed on the object.



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 160 mm ~ 600 mm (160 mm ~ 250 mm for small objects); 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.

- **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**
  >
  > - If you need to scan objects that are flat or have few features, it is recommended that you paste markers for helping alignment.
  > - If the plane where the object is located can be scanned and affect the alignment effect, it is recommended that you use the **Auto Cutting Plane** feature.

- **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 point distance is too small, it may result in insufficient memory for generating the mesh model or point cloud. It is recommended that you modify the point distance based on the prompts in the pop-up window.

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 create feature, alignment or measurement.

Switch Scanning Status

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

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.
	Delete Your Scan	After starting scanning, click this button to clear all point cloud data.

Generate Point Cloud

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.

Function	Icon	Description
	Optimize & generate point cloud	Optimize then generate point cloud, suggest choosing this option when you have higher accuracy requirement or when there is layering problem caused by accumulated aligning errors during scanning.
	Generate point cloud	To generate point cloud directly without any optimization, will be fast and less memory been used.

Note

- The time it takes to generate point cloud depends on the data size of your project and the hardware configuration of your PC.
- The **Portrait Scan** mode does not support generating point cloud directly.

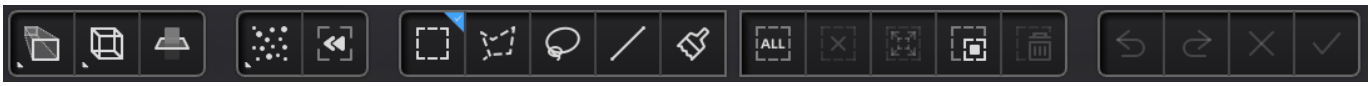
Data Editing

When you start Scanning, you can conduct Data Editing in **Scan** to generate accurate point clouds. You can also use other functions.

Bottom Panel

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.



Icon	Function	Instruction
	Perspective View	The object appears larger when closer, and smaller when farther away, which is consistent with the rule of normal human eyes to observe the 3D world. You can click this button to switch to orthogonal view.
	Orthogonal View	The object does not appear larger when closer, and smaller when farther away; Also known as "isometric view", the size of the object displayed in the view is independent of the current viewpoint distance; You can click this button to switch to perspective view.
	Multi View	Observe the data from 6 different views.
	Cutting Plane	Create a Cutting Plane to do quick cut.
	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. • 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. • Multiple undo or redo operations are supported.
		To select (highlighted in red) the scanning data corresponding to a specific

	*Rewind*	frame, drag the progress bar. Clicking **Confirm** will delete the corresponding data. Clicking **Exit** will discard the current operation and 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/Deselect a rectangular area. The selected area is displayed in red.
	Polygon	Select/Deselect a polygon area.
	Lasso	Select/Deselect the area by using the Lasso tool.
	Straight line	Move the cursor to draw a straight line to select/deselect the area.
	Brush	Hold down `⇧ Shift` or `^ Ctrl` and a red circle will appear. At this time, roll the mouse wheel will zoom in and out of the circle. Move the red circle to select/deselect the area to be edited.
	Select All	Select all of the data.
	Unselect	Cancel All Selected Areas.
	Connected Domain	Click the button after selecting a patch of data and all connected region to the selected data will be picked.
	Invert	Revert the selection.
	Delete Selected Data	Delete selected data.
	Undo	The last deletion will be undone.
	Redo	The last operation will be redone.

	Redo	The last operation will be redone.
	Cancel Edit	Undo all edits, and exit the edit mode.
	Apply Edit	Click the button or space bar to apply the edit, and exit the edit mode.

Right Panel

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

Icon	Function	Instruction
	Generate Point Cloud	After completing scanning, generate the point cloud directly. You can click the button to expand the list to switch functions.
	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 / open a project group. About project group, please refer to Project Group.
	Clean Data	Clean the current point cloud data to redo scan.
	Align	Align the data as you need, please refer to Align.
	Export the Scan	Save the scanned data in the specified format locally.
	Show Texture	To show / hide texture on screen.
	Mesh	Will move to next step **Post-processing** to mesh model.

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 the left mouse 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 **texture camera window** will show at the left side.

Shortcut

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

Cutting Plane

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

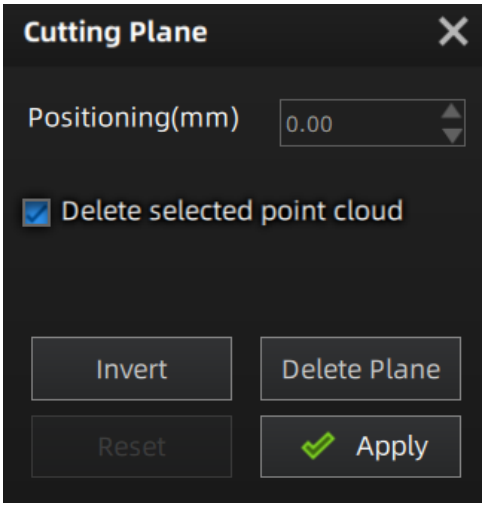
By setting up a cutting plane, the data below the plane will not be captured.

Create a Cutting Plane

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

Edit the Cutting Plane

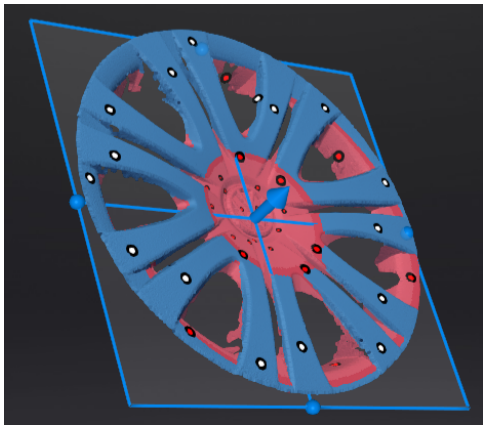
- **Delete the selected point cloud data or markers**: When ticked, the selected point cloud data or markers will be highlighted in red. **Apply** the edit to delete the highlighted point cloud data or markers.
- **Invert**: Use this button to reverse the selection of data by flipping the cutting plane.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

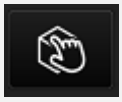
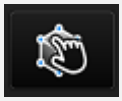
- **Translate the cutting plane**: after generating the plane, you can enter numbers in the editing box or drag the arrow of the cutting plane's normal  to translate the cutting plane.
- **Rotate the cutting plane**: you can drag any of the four small balls on the edges of the cutting plane  to rotate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



Alignment

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

Click  on the right panel of the **Scan** step interface and start project alignment.

Mode	Description	Note
 **Auto Feature Alignment**	1. Choose **Auto Feature Alignment**. 2. Select the project to be aligned in the fixed window and the floated window. 3. Click **Apply** to align them.	Objects with repeated features, like a round or a ring, or that with small size are not suitable for this mode.
 **Manual Feature Alignment**	1. Choose **Manual Feature Alignment**. 2. Manually choose at least 3 common feature points on the data in the fixed window and the floated window respectively. 3. Click **Apply** to align them.	• The chosen points should not be in a line. • Manual feature alignment is a supplement to auto feature alignment, and can be used when it fails.
 **By Markers**	1. Choose **By Markers**. 2. Select the project to be aligned in the fixed window and the floated window. 3. Click **Apply** to align them.	The two projects should have at least 3 markers in common.
 **Manual Markers Alignment**	1. Choose **Manual Markers Alignment**. 2. Select the project to be aligned in the fixed window and the floated window. 3. Manually choose at least 3 common markers on the data in the fixed window and the floated window respectively. 4. Click **Apply** to align them.	The chosen markers should not be in a line.

Note

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

Post Processing

Mesh Model

After generating point cloud, it is allowed to convert the point cloud into a triangular mesh surface through meshing.

Click  in the right sidebar of **Scan** interface to enter **Post processing**.

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

Mesh type

Icon	Function	Instruction
	Unwatertight	Unclosed model stays the way it is scanned. Processing time is quicker than Watertight.
	Semi-watertight	Some holes will be filled.
	Watertight	All holes will be filled automatically. The data can directly be 3D printed. Only watertight mesh can set **model quality**: **High**, **Med**（default）, **Low**.

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:**  	/
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.	This function is unavailable for watertight models.
Remove spike	Remove spike-like data on the image edge.	/
Marker hole fill	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.

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

Operation

1. Click **Preview** to preview the settings and start meshing.

   > **Note**
   >
   > If there is insufficient memory during meshing, please choose to simplify the data according to the prompt.

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

Note

Click  to restore the mesh.

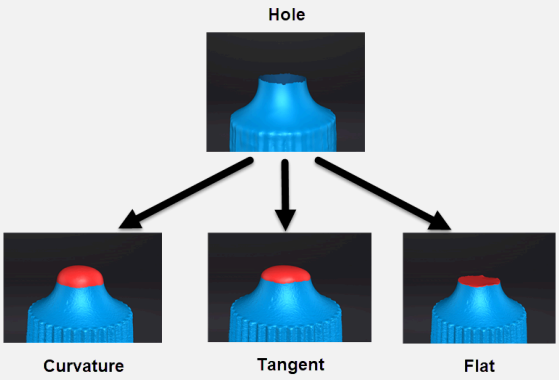
Mesh Editing

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

Mesh Editing

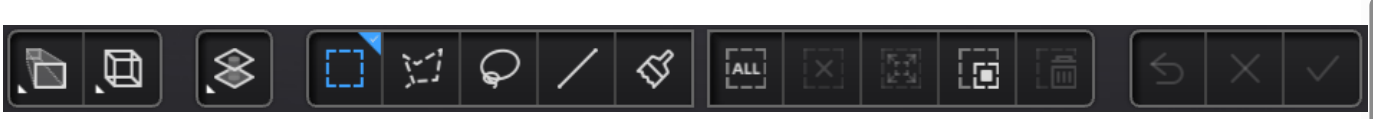
In the **Mesh Editing** window on the left side of the interface, click **+** to unfold the function panel.

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 reapply 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	• Click to reset the value to default. • Click **Preview** to preview.

	the ratio from 1 to 100. The default is 0, indicating no smooth.	• Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.
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, the holes within the specified perimeter will be filled automatically. The default value is 80, and the range is 10 ~ 100000. **Hole filling types:** 	• 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.
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.	• The post-processing data needs to be saved manually. • Click **Confirm** to confirm and save. This action is irreversible. • Click **Cancel** to restore and exit.
Flip Normal	To redefine the front direction of the scanned data in reversal design. Hold `⇧ Shift` + `left mouse button` to select areas to	• Texture remapping should be performed first as it is not accessible after flip

	be flipped.	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.
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 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.

Bottom Panel



Icon	Function	Instruction
	Select visible	To select visible data on the front view only.
	Select through	To select data all through.

Note

The other editing functions are the same as point cloud editing

Right Panel

Icon	Function	Instruction
	Open file	Open a file (STL, OBJ, PLY) for post processing.
	Export the scan	 : Save the scanned data in the specified format (ASC, STL, OBJ, PLY, 3MF) locally.  : If you have installed the EXModel and you are in the post-processing or measurement interface with mesh data, click  to switch to the EXModel and import the data into it.
	Share data	• Use your  Sketchfab account to share the model. • Upload your model to  Shining3D Digital Cloud .
	Texture remapping	After the post-processing, hole filling on the scanned texture data will affect the texture render. By doing the texture remapping, the texture data will be reapplied on the mesh. **Note** • If hole filling or simplification has been applied, it is recommended that you remap the texture before saving the data. • You can click **Texture Layout Optimization** to create an optimized arrangement for the texture file, which will make the texture manual editing much more convenient if you are going to process the texture in a third-party software.
	Show / hide texture	To show / hide texture on screen.
	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	Instruction
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** It is accessible after clicking **Preview** during meshing.

Note

For the introduction to other functions, please see data editing.

Shortcuts

Please see data editing.

Measurement

Measurement

When you complete the mesh editing, click  on the corresponding position in the navigation bar to switch to the measurement interface or you can scan some data and click  to switch to the measurement interface. Then you can perform operations such as creating features, alignment, and measurements here.

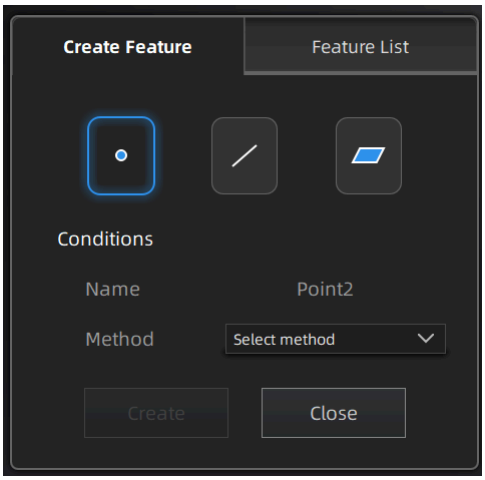
> **Note**
>
> - On the **Measurement** interface, you can use multi view.
> - On the **Measurement** interface, you can operate by right mouse button and shortcuts.

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

> **Note**
>
> - Support opening files in the type of STL, OBJ and PLY.
> - 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 **Create** to create a feature point.	/
Markers	1. Click existing markers to select the point. 2. Click **Create** to create a feature point.	You can select Markers to create feature points for model data that only have markers and are not meshed yet.
Line-Plane Intersection	1. Click the existing feature lines or choose lines in the drop-down list. 2. Click the existing feature planes or choose planes in the drop-down list. 3. Click **Create** to create feature points.	• The feature line can't be in the feature plane. • The feature line can't be parallel with the feature plane.

Feature Line

Creation Method	Description	Note
Point-points	1. Click the data or existing feature points to select the point. 2. Click **Create** to create a line.	You can tick the checkbox before **From** or **to** and re-select the feature points.
Marker to Marker	1. Click existing markers to select feature points. 2. Click **Create** to create a line.	• You can tick the checkbox before **From** or **to** and re-select the feature points. • You can select Markers 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. After selecting two planes, click **Create** to create an intersection of two non-parallel planes.	• Create two feature planes in advance. • The feature planes can't be parallel to each other.

 **Feature Plane**

Creation Method	Description	Note
3 Points Fit	1. Click the data or existing feature points to select the point. 2. Click **Create** to create a plane.	• The three points can't be in a line. • Tick the checkbox before the three points and re-select the point.
Point-Line Fit	1. Click existing feature lines or choose lines in the drop-down list. 2. Click the data or existing feature points to select the point. 3. Click **Create** to create a plane.	The point can't be in the line.
Best Fit	When there are selected data, click **Create** 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.	/
Three Markers	1. Click the data or existing markers to select the point. 2. Click **Create** to create a plane.	• You can select Three Markers to create a feature plane for model data that only have markers and are not meshed yet. • The three markers can't be in a line. • Tick the checkbox before the three points and re-select the point.
Marker Point-Line Fit	1. Click existing feature lines or choose lines in the drop-down list. 2. Click the existing feature points to select the point. 3. Click **Create** to create a plane.	• You can select Marker Point-Line Fitting to create a feature plane for model data that only have markers and are not meshed yet. • The feature point can't be in the feature line.
Markers Best Fit	When there are selected markers, click **Create** 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 Marker Best Fitting to create a feature plane for model data that only have markers and are not meshed yet.

Align

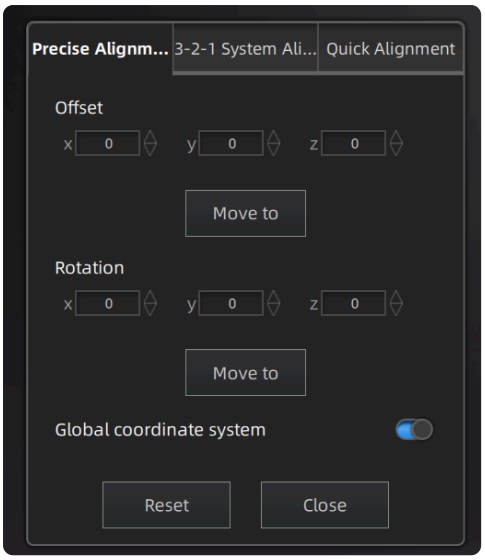
After scanning some data, you can click **Measurement** on the navigation bar, import the data, and select the data to carry out **Align** and so on.

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

> **Note**
>
> You can import the un-meshed data in **Measurement**, align the data and return to scan to update data changes.

> **Caution**
>
> - Alignment will not affect the shape or accuracy of the data.
> - It is recommended that you mesh the model after aligning it to a new position, or the model cannot be restored to its previous position after you quit the alignment.

Precise Alignment



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.

Note

Global coordinate system (disabled by default and need to be enabled manually) is the coordinate system on the right，in which 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.

Adjust coordinates by the object mover tool

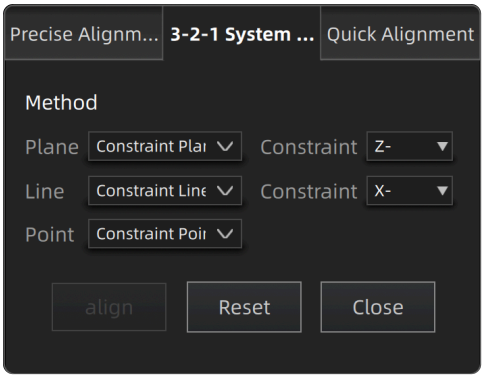
Hover the cursor on object mover tool. Once the object mover tool shines，hold Left Mouse Button or Middle Mouse Button to adjust the position and angle of model.

Click **Reset** to cancel all movements in Precise Alignment.

Click **Close** to save the movement and quit the alignment.

3-2-1 System Alignment

3-2-1 System Alignment (Plane-Line-Point Alignment) align data by choosing line and plane constraints. Before alignment, you need to create feature points, lines, and planes, in which the feature line is not perpendicular to the plane.



- **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）.

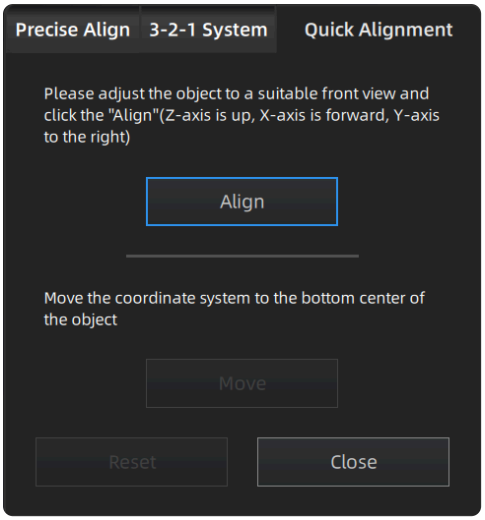
Note

Global coordinate system (disabled by default and need to be enabled manually) is the coordinate system on the right，in which 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.

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.

Quick Alignment

You can rotate the model to a wanted posture and a coordinate frame will show up.



- 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.

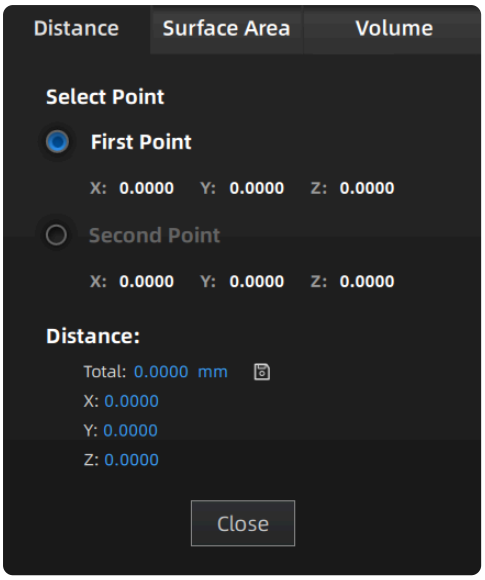
Note

You can re-adjust the posture and align the model again if the alignment is not satisfactory.

Measurement Tool

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

Distance



Calculate the straight-line distance between two points or markers on the surface of the scanned model.

When you select two points of the model, the distance will show itself at once.

Note

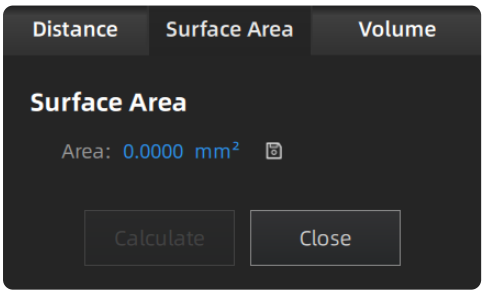
● You can tick the checkbox before **First Point** or **Second Point** and re-select the point.

● **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.

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

Surface Area



Calculate selected area of the scanned model.

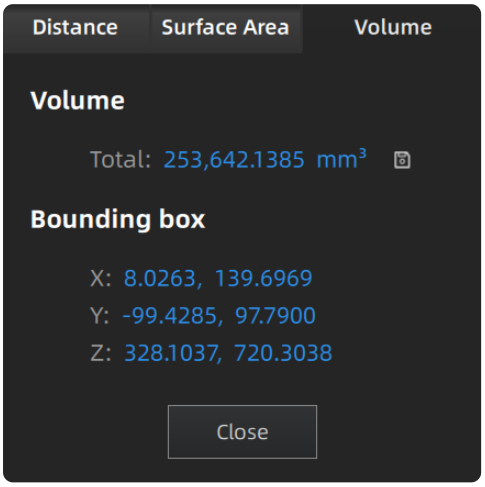
You can use edition tools or shortcuts on the bottom panel to select the area. Click **Calculate** and the area will show itself with a unit of mm².

Click **Close** and 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.

Note

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

Click and import the measurement result to local.

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 desktop if you have not set the path.

Save

Save Data

You can select the save path and the file format as well as enter the file name to save data locally by clicking  .

Interface	Save button
Scan interface	Click  in the right sidebar to save.
Post-Processing interface	Click  >  in the right sidebar to save.
Measurement interface	• When the current data is mesh data, click  >  in the right sidebar to save. • When the current data is point cloud data or markers data, click  in the right sidebar to save.

Format	Data Type	Saved as	Application
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.
PLY	Mesh Data	Scan.ply	• Compact file; • Easy for texture editing.
OBJ	Mesh Data	Scan.obj Scan.jpg Scan.mtl	• Used for artworks; • 3D rendering. **Note** Compatible with most post-processing software.
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.

In the interface of **Post-processing** or **Measurement** step, click  to upload the encapsulated data to Sketchfab, where the title, username and password are required to be provided. You can register an account on the Sketchfab to view the shared models.

> **Note**
>
> The files uploaded should be in the format of STL.

Support Center

If you have questions about using your SHINING 3D products, find common solutions in Support Center.

Or submit a Support Ticket to reach our support team.

Join Our Social Media Platform to Get More Information

Facebook | **Facebook group** | **Instagram** | **Youtube video list** | **Tik Tok**

Please Refer to the Portrait Mode Scanning for Adjustments and Scanning

Scan QR to get object mode demo

Scan QR to get portrait mode demo