SHINING 3D

EinScan SE & SP V2

User Manual

V3.2.0.4

Table of Contents

Post Processing

> **Mesh model**
>
> - Mesh type
> - Mesh optimization
>   - Operation
>
> **Mesh editing**
>
> - Left panel
> - Bottom toolbar
> - Right toolbar

Measurement

> **Measurement**
>
> **Create features**
>
> **Align**
>
> **Measurement**

Save

> **Save data**
>
> **Date sharing**

Contact us

Overview

Welcome

Safety instructions

Signal	Meaning
	Additional information for particular situation.
	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.
	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.

About the document

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

- SHINING 3D Tech Co., Ltd. (hereinafter referred to as "the Company") owns complete intellectual property rights for the contents of this document and, without the written consent of the Company, it's not allowed to copy, transmit, publish, reedit, compile or translate any contents of this document for any purpose or in any form.
- The document is a guidance for installing, operating, and maintaining the product, including the Device, software, or other products provided by the Company, to which the document is applicable. The document doesn't serve as the quality guaranty for the product. While the Company makes all efforts to ensure the applicability of the content of the document, it reserves the right to interpret and modify the content of the document and possible errors and omissions therein. The contents of the document are subject to changes without further notice.
- Images and diagrams in the document are presented to provide convenience to readers. In the event that any images or diagrams are inconsistent with the physical product, the later shall prevail.
- It's recommended that professionals or technicians shall operate and/or use relevant Products. The Company shall not be held responsible for any damages and/or losses caused by negligence, environmental factors, or improper maintenance and use, or any other factors other than due to the quality of the Product.
- Disputes arising from the document and related Products thereof shall be governed by the laws of the People's Republic of China.
- In the event of any ambiguity and/or any advice on the contents of the document, please contact us.

Device

The EinScan SE/SP V2 are desktop 3D scanners developed by SHINING 3D, featuring an extensive scanning range for various-sized objects. They offer one-click scanning, automatic calibration, and support color scanning for highly detailed 3D models with colored textures. Compatible with 3D printers, they produce watertight 3D data. The scanners use visible white light, ensuring safety for human eyes. Efficient, user-friendly, and precise, they cater to diverse applications.

Appearances

EinScan SE V2 3D Scanner

A powerful companion for educators and individuals:

- Easiest 3D scanning experience for non-technical users
- Dual scan modes: Turntable Scan and Fixed Scan
- Easy to operate and great price-to-performance ratio

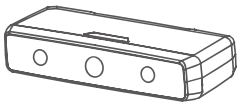
EinScan SP V2 3D Scanner

The expert's choice for enhanced experience:

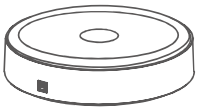
- Precise calibration in a simple way, achieving high accuracy of better than 0.05 mm
- Faster scanning speeds
- Multiple alignment modes
- Enables high-resolution 3D modeling even for common users

Checklists

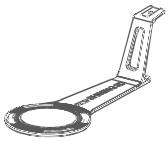
EinScan SE V2

① 

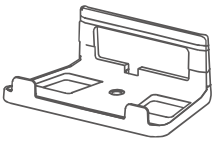
Scanner Head

② 

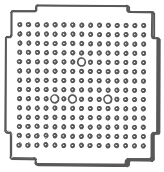
Turntable

③ 

Scanner Stand

④ 

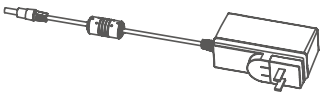
Scanner Bracket

⑤ 

Calibration Board

⑥ 

Calibration Board Holder

⑦ 

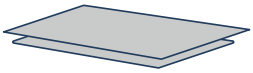
Power Adapter

⑧ 

USB Cable A

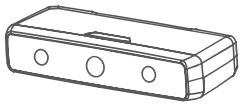
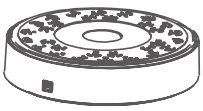
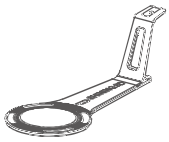
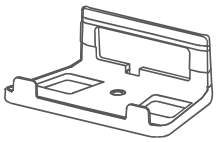
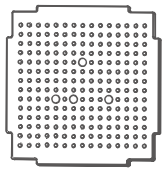
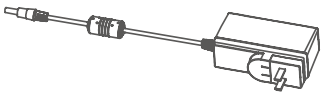
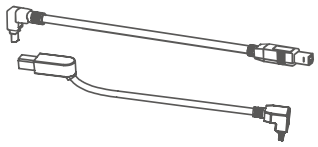
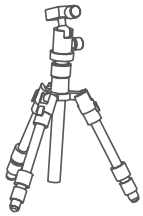
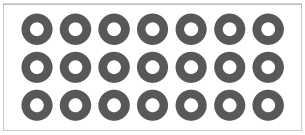
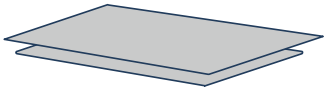
⑨ 

USB Cable B

⑩ 

Quick Guide

No.	Part
1	Scanner Head
2	Turntable
3	Scanner Stand
4	Scanner Bracket
5	Calibration Board
6	Calibration Board Holder
7	Power Adapter
8	USB Cable A
9	USB Cable B
10	Quick Guide

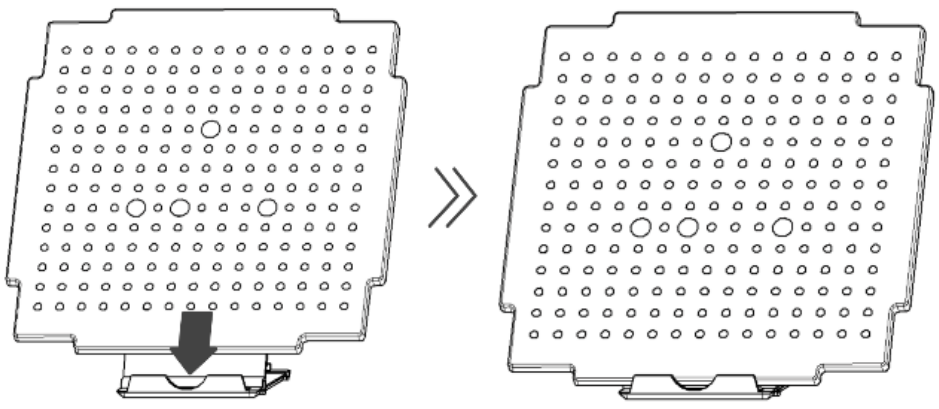
①  Scanner Head	②  Turntable	③  Scanner Stand
④  Scanner Bracket	⑤  Calibration Board	⑥  Calibration Board Holder
⑦  Power Adapter	⑧  USB Cable A	⑨  USB Cable B
⑩  Tripod	⑪  Makers	⑫  Quick Guide

No.	Part
1	Scanner Head
2	Turntable
3	Scanner Stand
4	Scanner Bracket
5	Calibration Board
6	Calibration Board Holder
7	Power Adapter
8	USB Cable A
9	USB Cable B
10	Tripod
11	Markers
12	Quick Guide

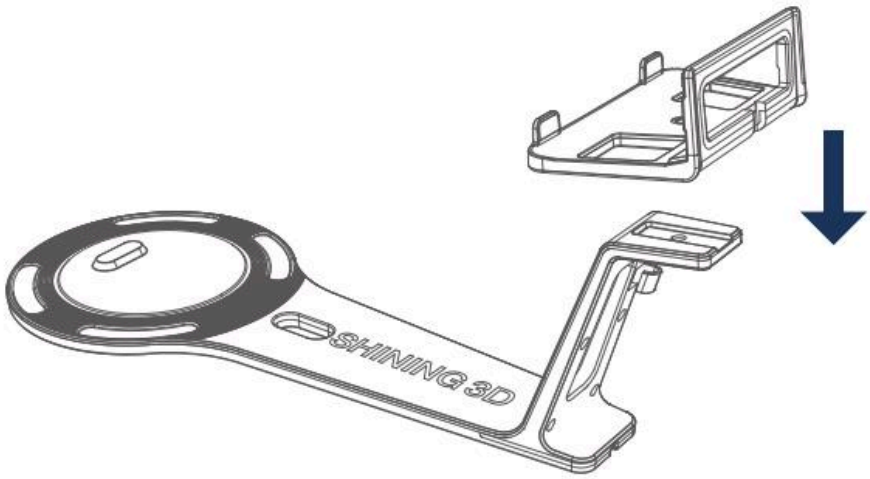
Connection

Steps

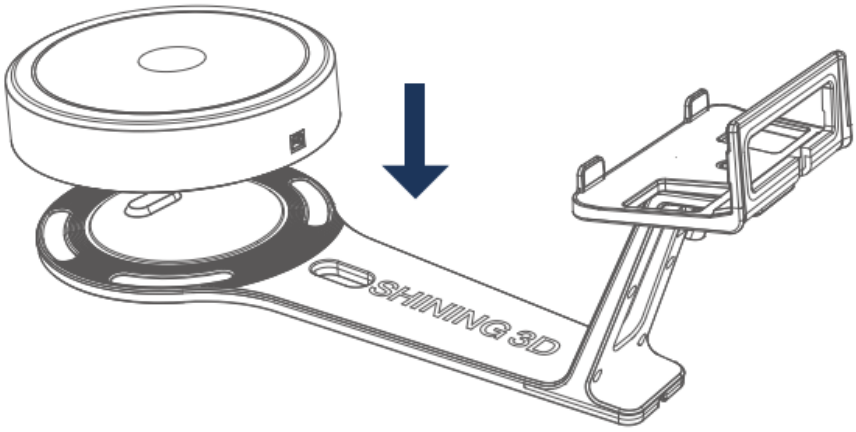
1. Insert calibration board onto the board holder.



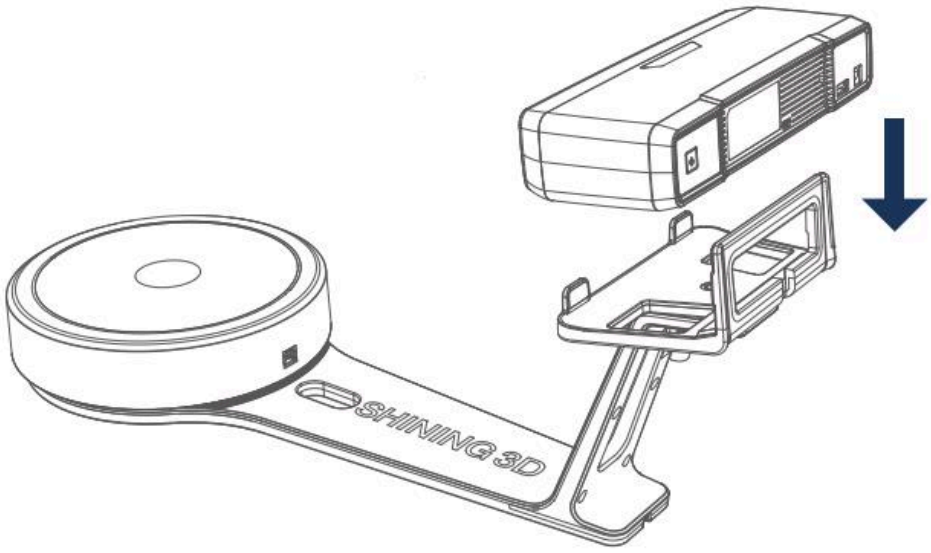
2. Screw the bracket tight to the stand.

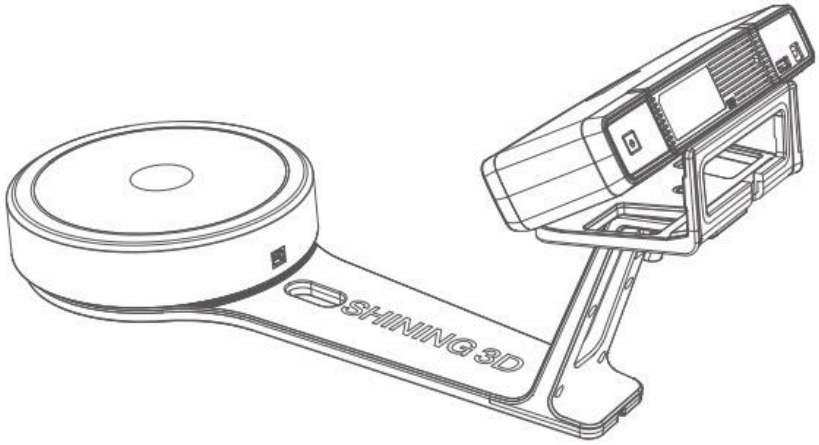


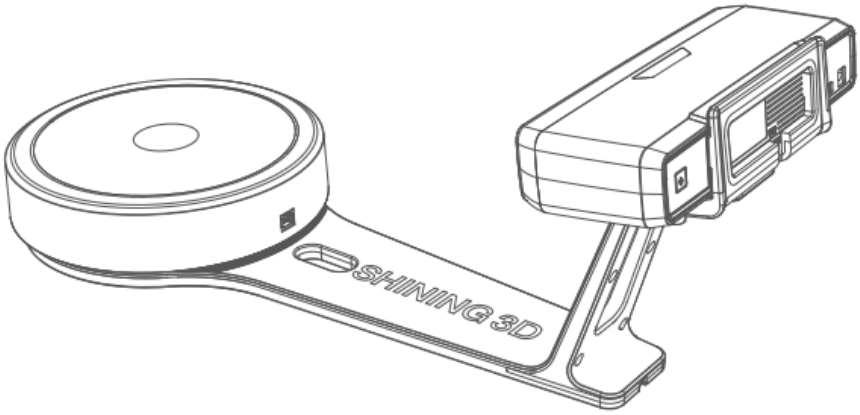
3. Mount the turntable securely onto the stand.



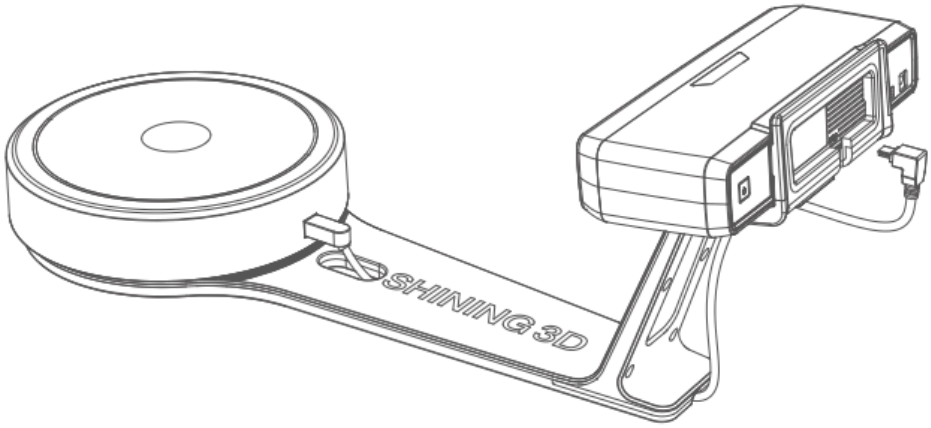
4. Attach the scanner head to the bracket.



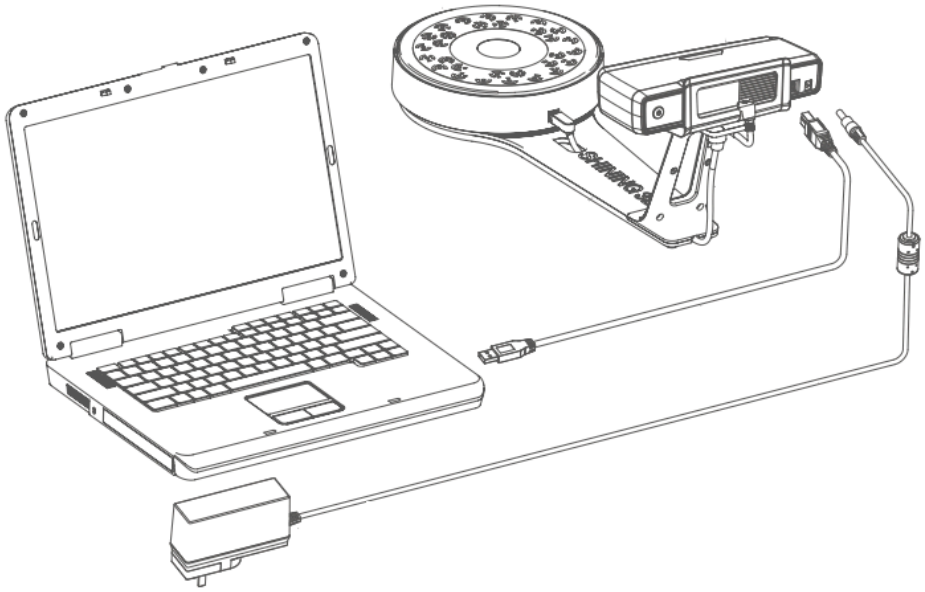




5. Connect the turnable to the scanner.



6. Plug the power adapter into the scanner's power input port, and then connect the other end to a power outlet. Then connect one end to an available USB port on your computer and the other end into the USB port on the scanner head.



Installation

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

Recommended configuration

MacBook Air (2020、2022)

Component	Minimum Requirement
CPU	Apple M1 or better
GPU	7-core GPU or better
Memory	8 GB RAM or more
Storage	At least 800MB available
Operation system	macOS Ventura (macOS 13) or later
USB port	USB 3.0

MacBook Pro(2021、2022)

Component	Minimum Requirement
CPU	Apple M1 or better
GPU	8-core GPU or better
Memory	8 GB RAM or more
Storage	At least 800MB available
Operation system	macOS Ventura (macOS 13) or later
USB port	USB 3.0

iMac(2020)

Component	Minimum Requirement
CPU	Apple M1 or better
GPU	8-core GPU or better
Memory	8 GB RAM or more
Storage	At least 800MB available
Operation system	macOS Ventura (macOS 13) or later
USB port	USB 3.0

Get installation package

To download the software, go to our website: https://www.einscan.com/support/download/

Run the installer

To install the software, locate the .pkg file on your computer, double-click the file, and then follow the on-screen instructions. Once the software is installed, the system will prompt you to delete the software package file.

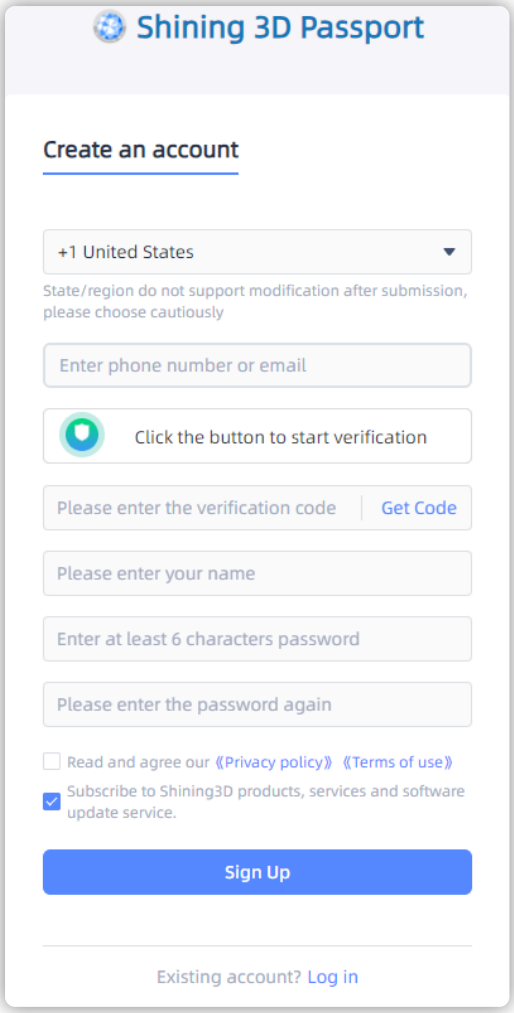
Activation

You need a SHINING 3D User Account before activating the device.

Register

For new users, you need to register a SHINING 3D Passport first, click **Register** in the pop-up window when launching the software, or click **Register a new account** in our SHINING 3D Passport website:

https://passport.shining3d.com/signup



Note

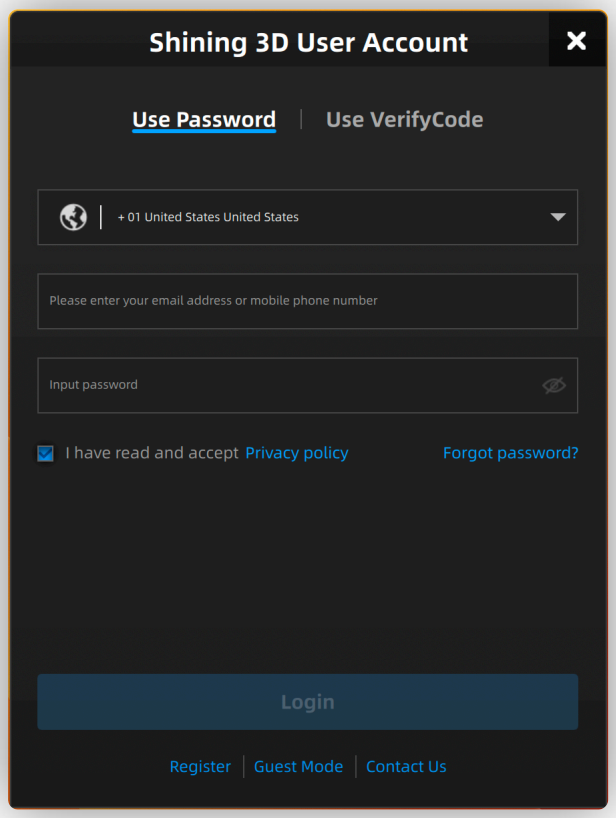
- You need to enter valid email or phone number to get verify code for registration.
- Please enter correct user information for better service.
- Please read and then check **Privacy Policy** and **Terms of use**.

Log in

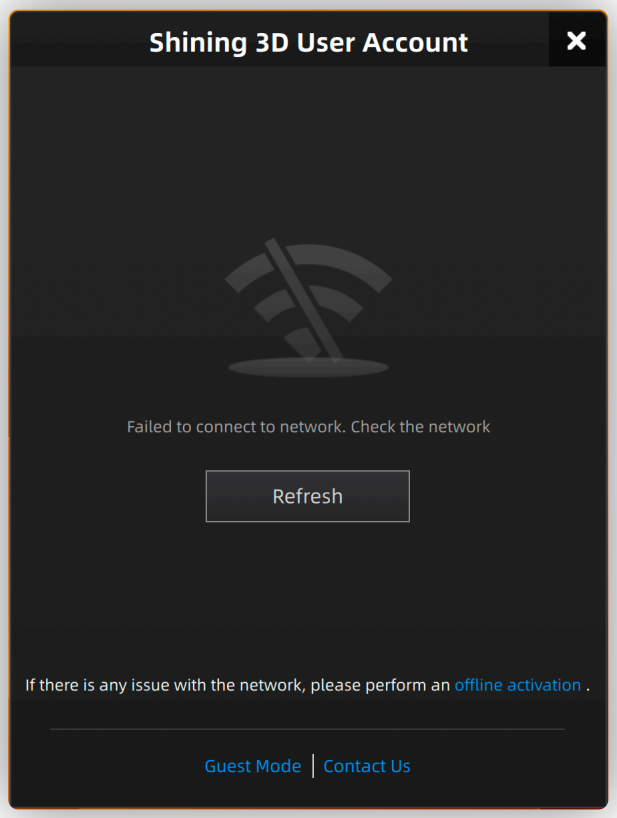
Log in SHINING 3D User Account from the pop-up window when launching EXScan S.

If your computer failed to connect to the network:

- Check the network connection and click **Refresh** to reconnect to the network. It will jump back to the login interface after successfully connecting to the network.
- If your computer can not connect to the network successfully, click **offline activation** to directly perform the offline activation.



Passport



Network Not Available

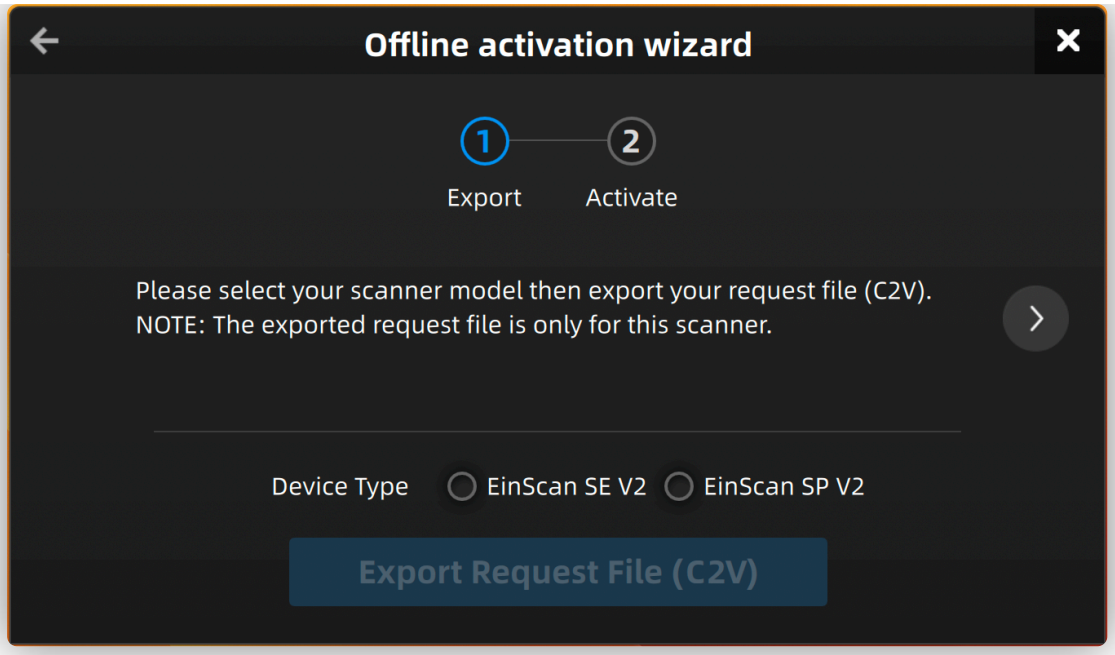
Activation

Online activation

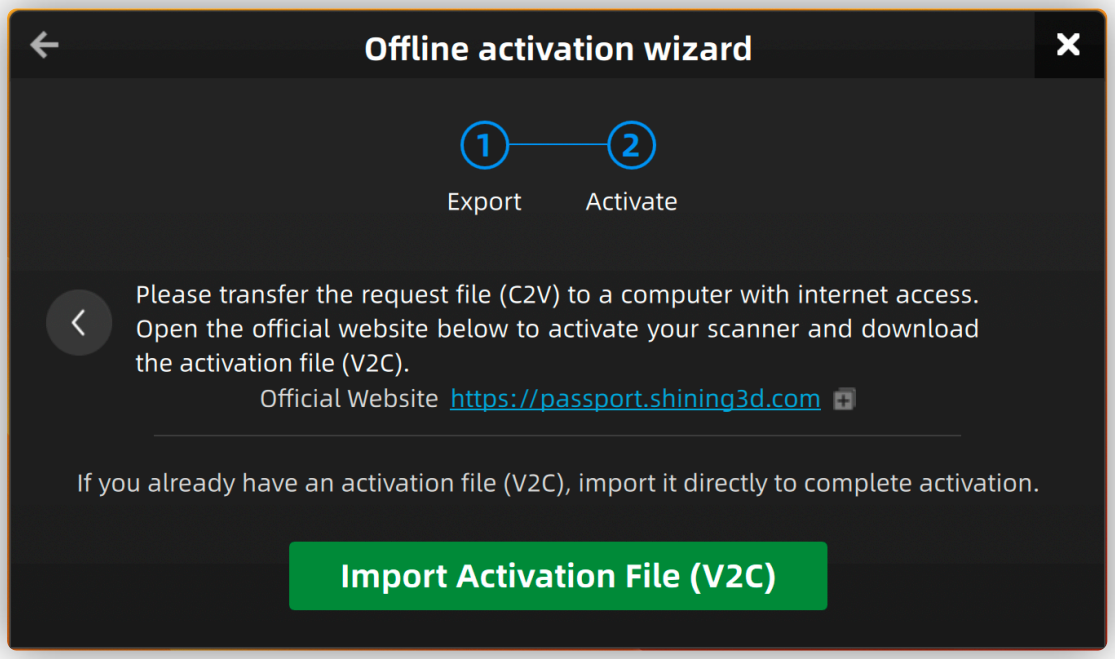
If the computer is connected to the Internet, the activation will be processed automatically after you login SHINING 3D User Account.

Offline activation

1. Choose the device type: EinScan SE V2 / EinScan SP V2
2. Connect scanner to the computer with no network, export C2V file.



3. Copy the C2V file to the other computer which is connected to Internet.
4. On the computer with network, go to https://passport.shining3d.com/login , upload your C2V file in **offline activation** page, complete the information then click **Activate** button to go to download page.
5. Copy the V2C file to the computer with no network, import the file into the software.



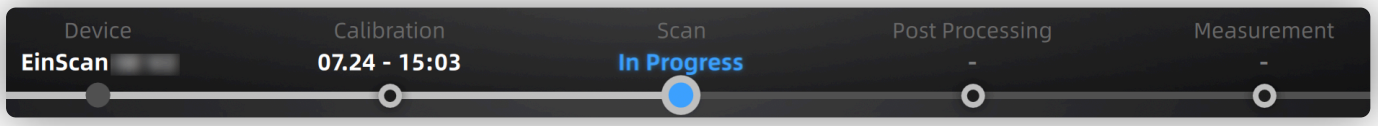
Note

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

Interface

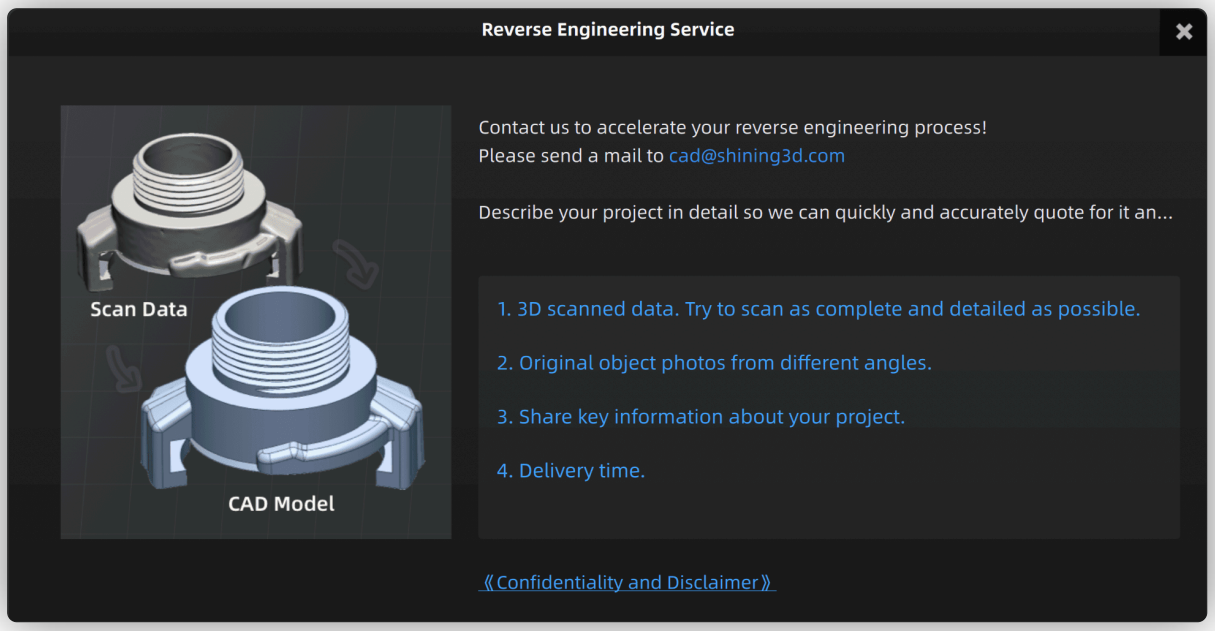
Overview

Navigation bar

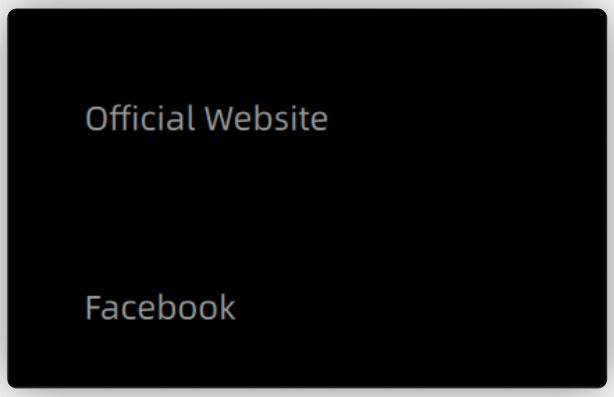


Button	Description
Device	To display the device status: online / offline. Device online: to show the device name. Device offline: click  to reconnect the device.
Calibration	Click  on the corresponding position in the navigation bar to start calibration.
Scan	Click  on the corresponding position in the 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.

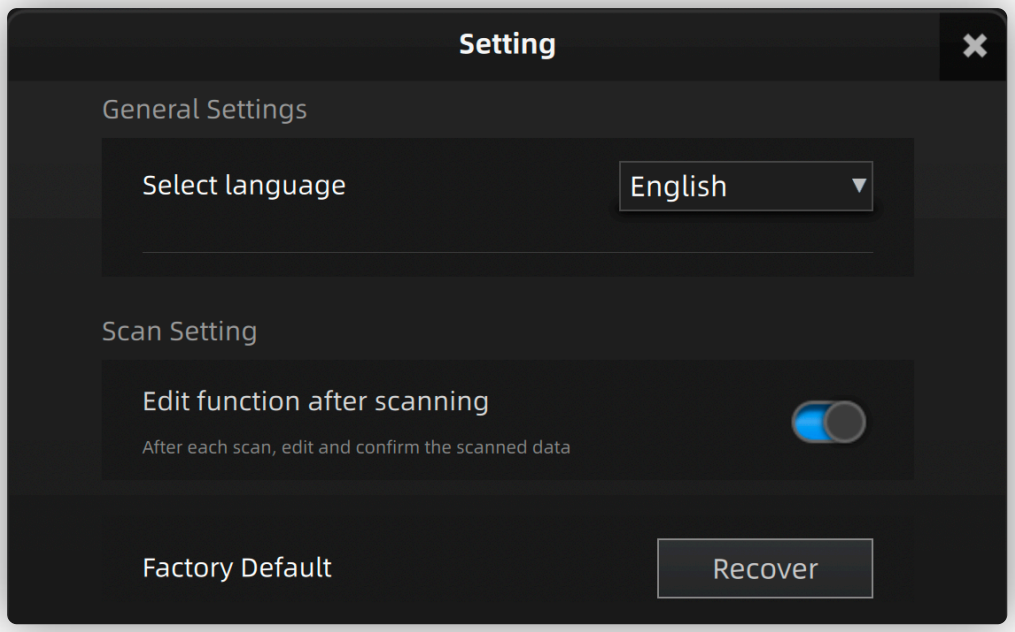
Settings and feedback



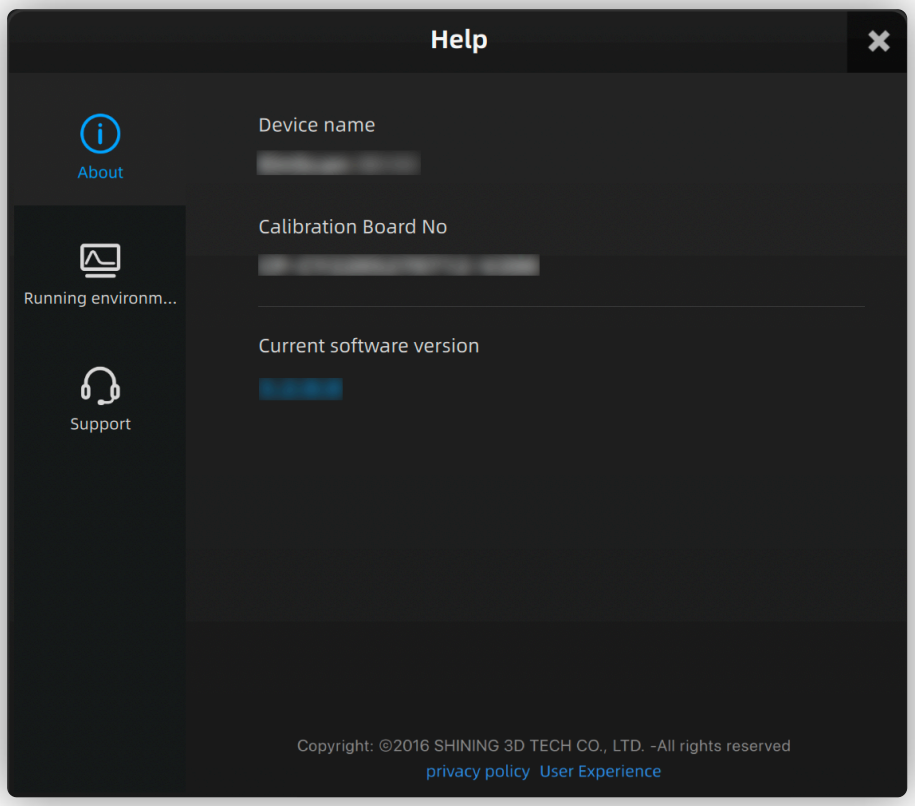
Reverse engineering service



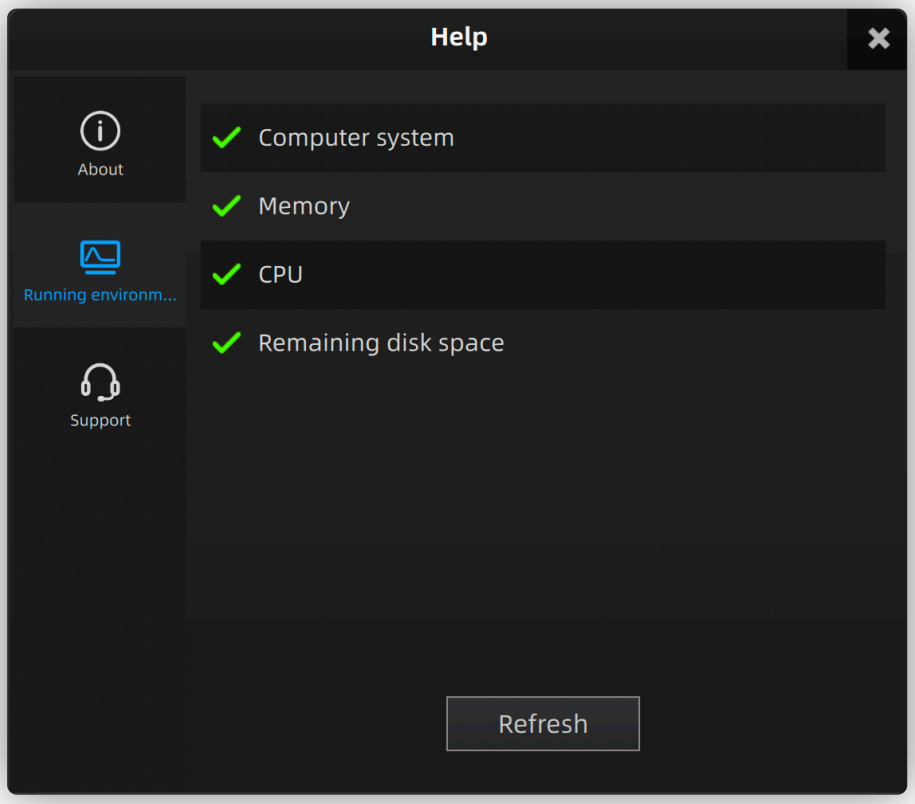
Function	Description
Official Website	Open the official website of SHINING 3D to learn about the company's products and information.
Facebook	Enter SHINING 3D's Facebook to view product introduction and other operations.



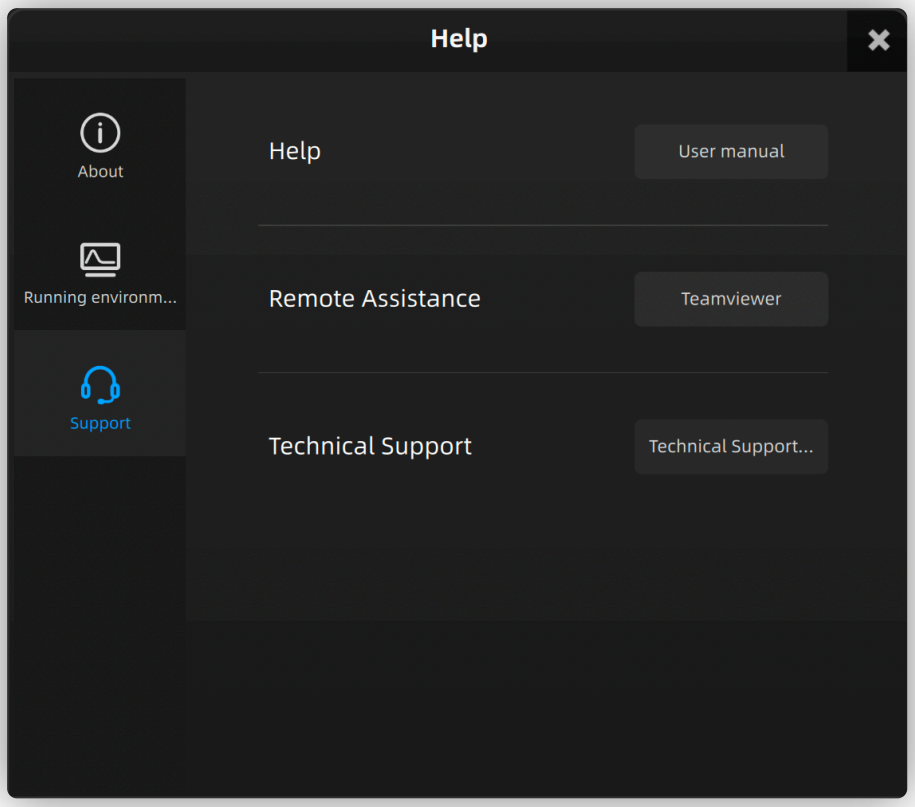
Function	Description
Language	Choose the software language.
Data editing after scanning	After each scan, edit and confirm the scanned data.
Factory Default	All settings can be restored to the initial settings, and the software will automatically restart.



Display the device name, calibration board number and current software version

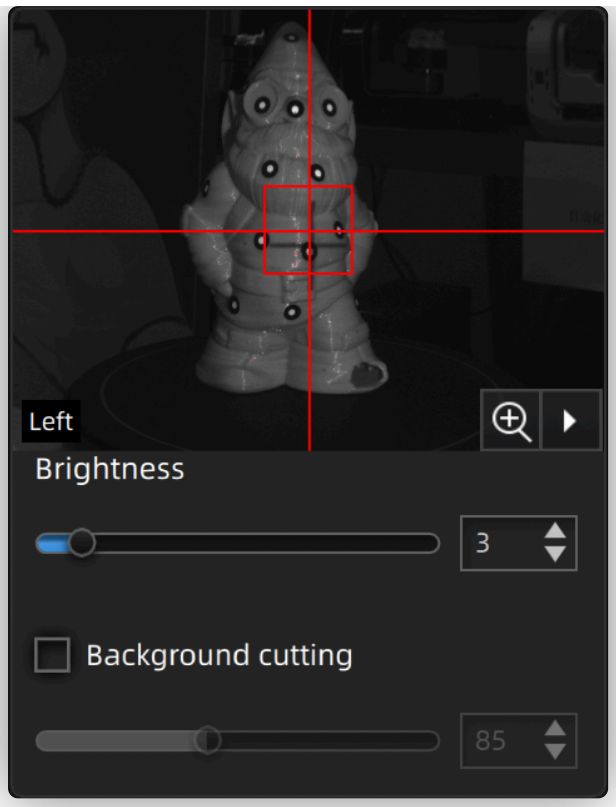


Check whether the configuration meets the requirement

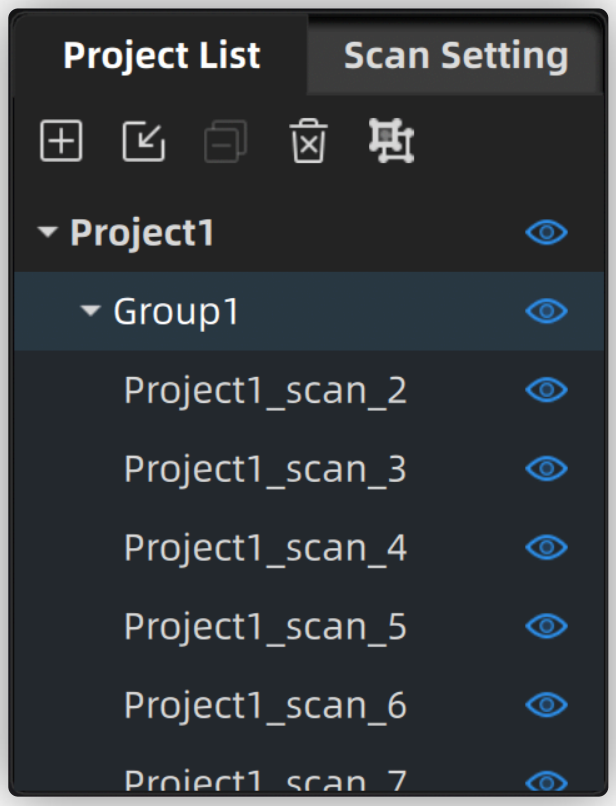


Function	Description
User Manual	Open user manual in default browser.
Teamviewer	The quick access for remote assistance. Send the ID and password in the pop-up window to our support team for remote assistance.
Technical support	Open our support website in default browser.

Other modules

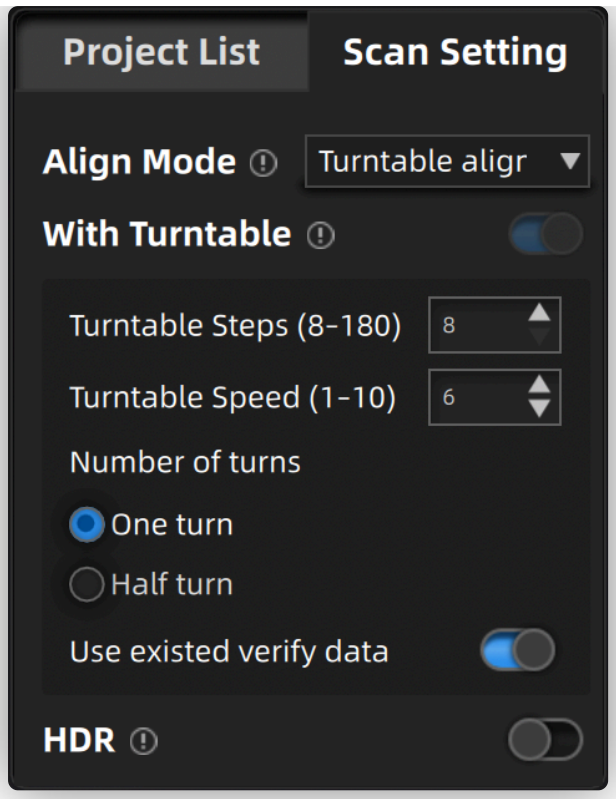


Preview one camera in real time.
Click to zoom in or ▶ to open the preview of other camera.
Brightness and background cutting are scan-related settings.



Manage project group.
Please refer to the detailed instructions for use:

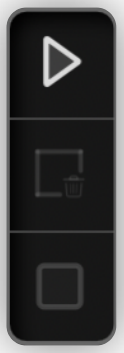
→ Project and project group



Set up scan-related settings. Please refer to the detailed instructions for use:

→ Scan settings

Side toolbar



Start Scanning | Pause & Delete | Global Optimization

→ Get Started

Before and after scanning, you can perform some functions.

→ Other functions

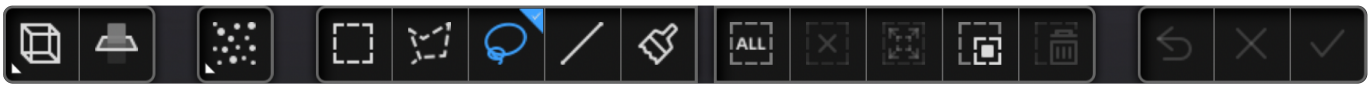
Bottom toolbar

EinScan SE V2

Various tools are available to edit 3D data and obtain accurate 3D point cloud data.

→ Edit scanned data

EinScan SP V2



Various tools are available to edit 3D data and obtain accurate 3D point cloud data.

→ Edit scanned data

Performance monitor

Index	Description
Remaining Memory	If the available memory is extremely limited, it may cause the system to become sluggish, or even lead to crashes or errors.
CPU Usage	When the running program consumes a significant portion of the CPU's processing power, it may result in system slowdowns or response delays. It's advisable to close other non-scanning software and wait patiently.
GPU Usage	When the Video Random Access Memory (VRAM) usage approaches or exceeds the VRAM capacity limit, it can lead to performance degradation, graphics card crashes, or program failures.

Keyboard shortcuts

Keyboard shortcuts	Description
`Space`	Start to scan
`⇧ Shift` + `Left Button`	Select
`⌘ Cmd` + `Left Button`	Deselect
`Left Button`	Rotate
`Middle Button` or `Right Button`	Pan
`Scroll Wheel` (General mouse) `⌥ Option` + `Srcoll Wheel` (Apple Magic Mouse)	Zoom in or out
`Double Click`	Select the data

Trackpad gestures

Gesture	Function
Tap and slide	Rotate
Tap with two fingers and slide	Pan
Pinch with two fingers	Zoom in or out

Quick guide

Step 1

Ensure device accuracy and scanning quality.

→ Calibrate

Step 2

Create or open a project group.

→ Create a project

Step 3

Configure the project setting.

→ Set up

Step 4

Scan the object and obtain the data.

→ Scan

Step 5

Edit scanned data.

→ Edit

Step 6

Save scanned data.

→ Save

Calibration

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

Note

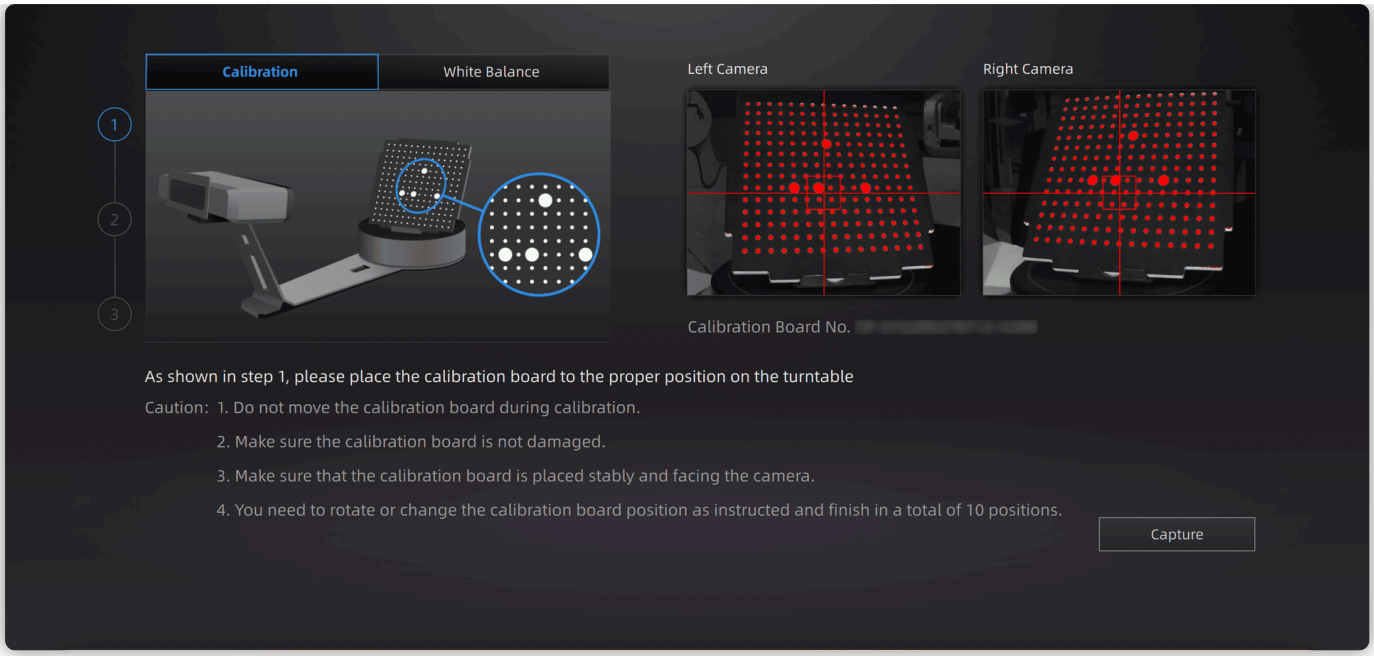
Calibration is required under the following conditions:

- 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.

Warning

- The calibration board is matched to the device. Doing the calibration with an wrong 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 to 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.

Interface



Steps

1. Place the calibration board to the proper position on the turntable, facing the 3D scanner.
2. Follow the prompts on the screen to position the calibration board, ensuring that the center crosshair is aligned with the calibration board in both the left and right camera views.
3. Click **Capture** to start the calibration process. Please don't move the calibration board during the capture.
4. After capturing from the current direction, rotate the calibration board in the way shown on the screen.

Note

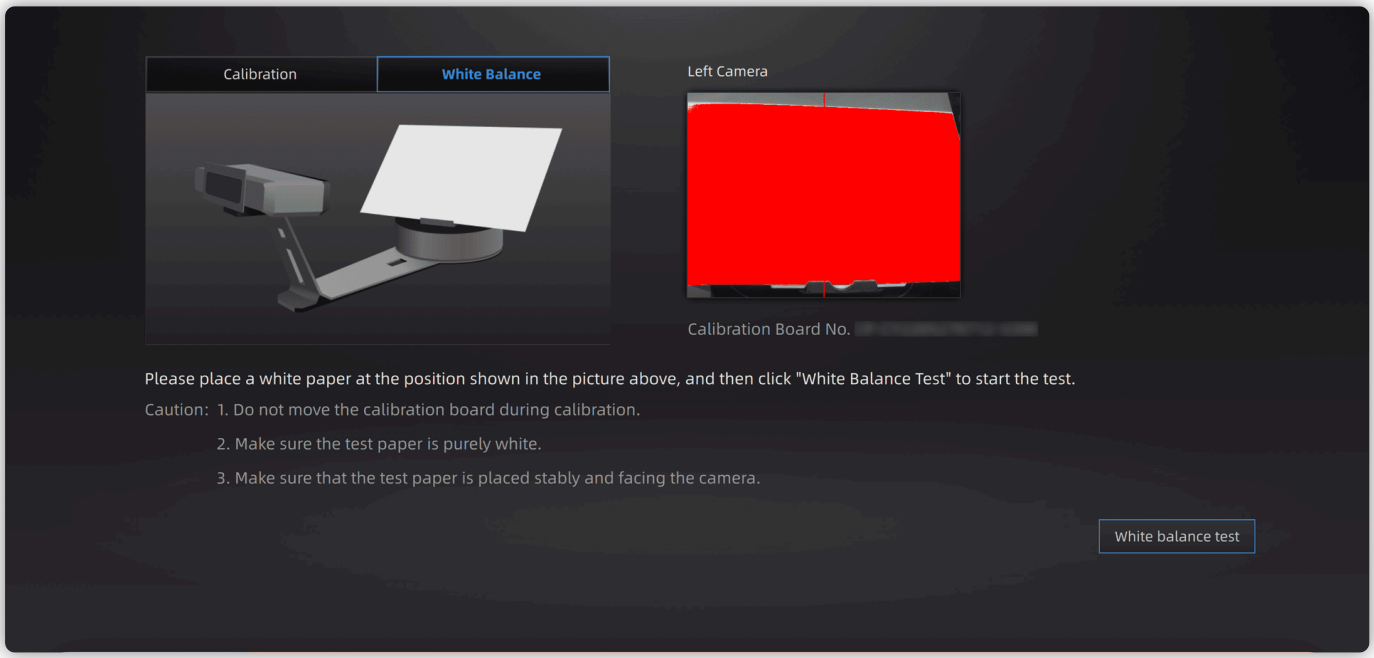
- If the calibration fails, please try it again from step 1.
- If you cannot get the pass result anyway, please contact your supplier or our support team.

White balance

To ensure the accuracy of the texture data, it's recommended to adjust the white balance whenever there is a change in ambient brightness.

> ⚠ **Caution**
>
> - Don't move the calibration board during calibration.
> - Don't adjust the white balance or scan under strong light, it may cause color deviation.

Interface



Steps

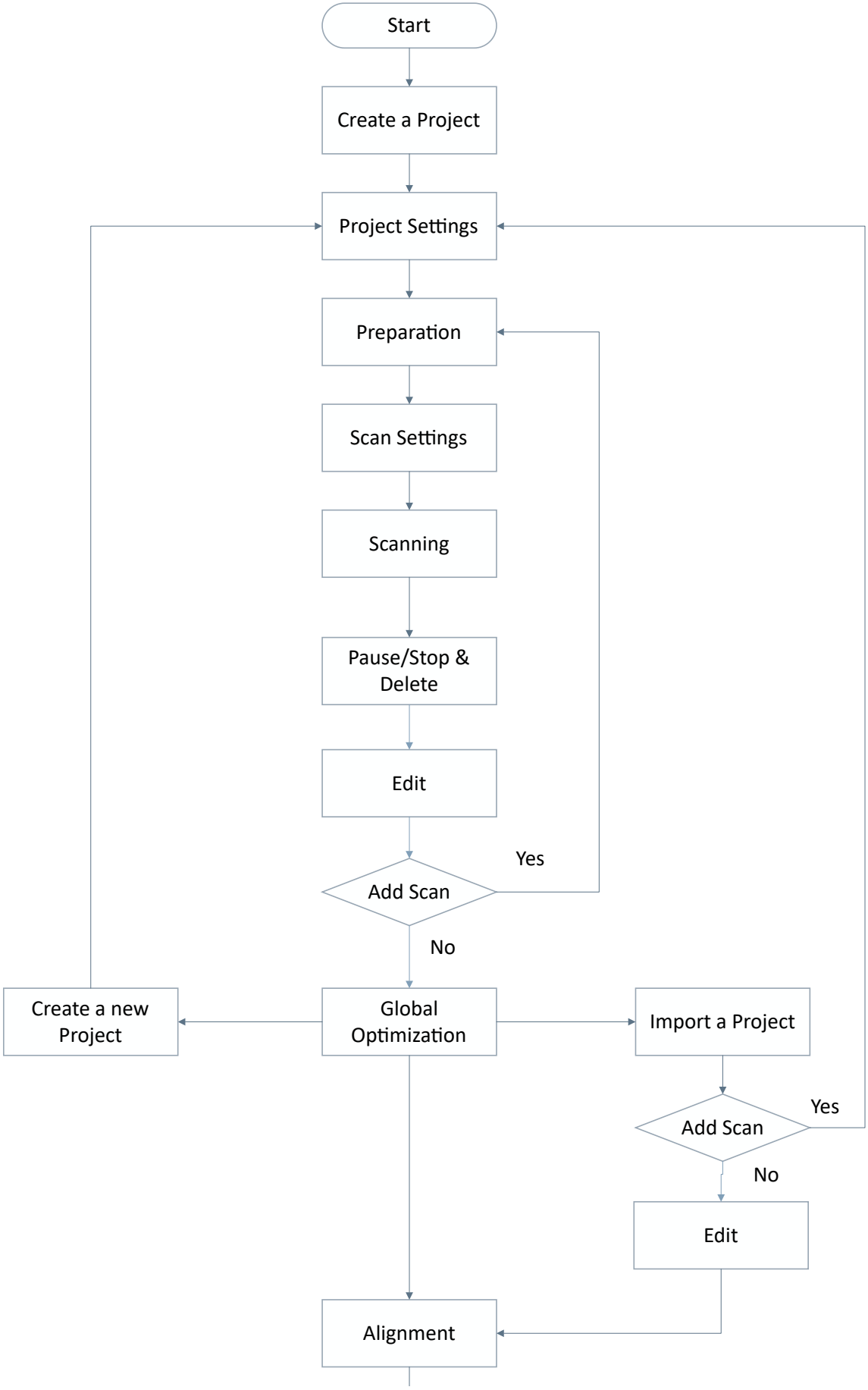
1. Please place a white paper at the position of calibration board as shown on the screen.
2. Make sure the test paper is purely white and placed stably. Then Click **White balance test**.
3. Wait a seconds and the software will prompt you **White balance calibration successful** if succeed.

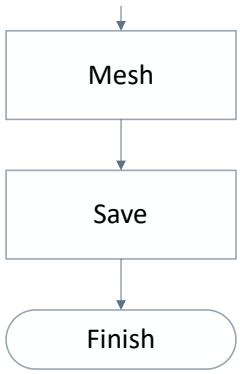
Note

- If white balance fails, please recalibrate the white balance.
- If you cannot get the pass result anyway, please contact your supplier or our support team .
- After successfully calibrating the white balance, click **Next** to create or open a project group.

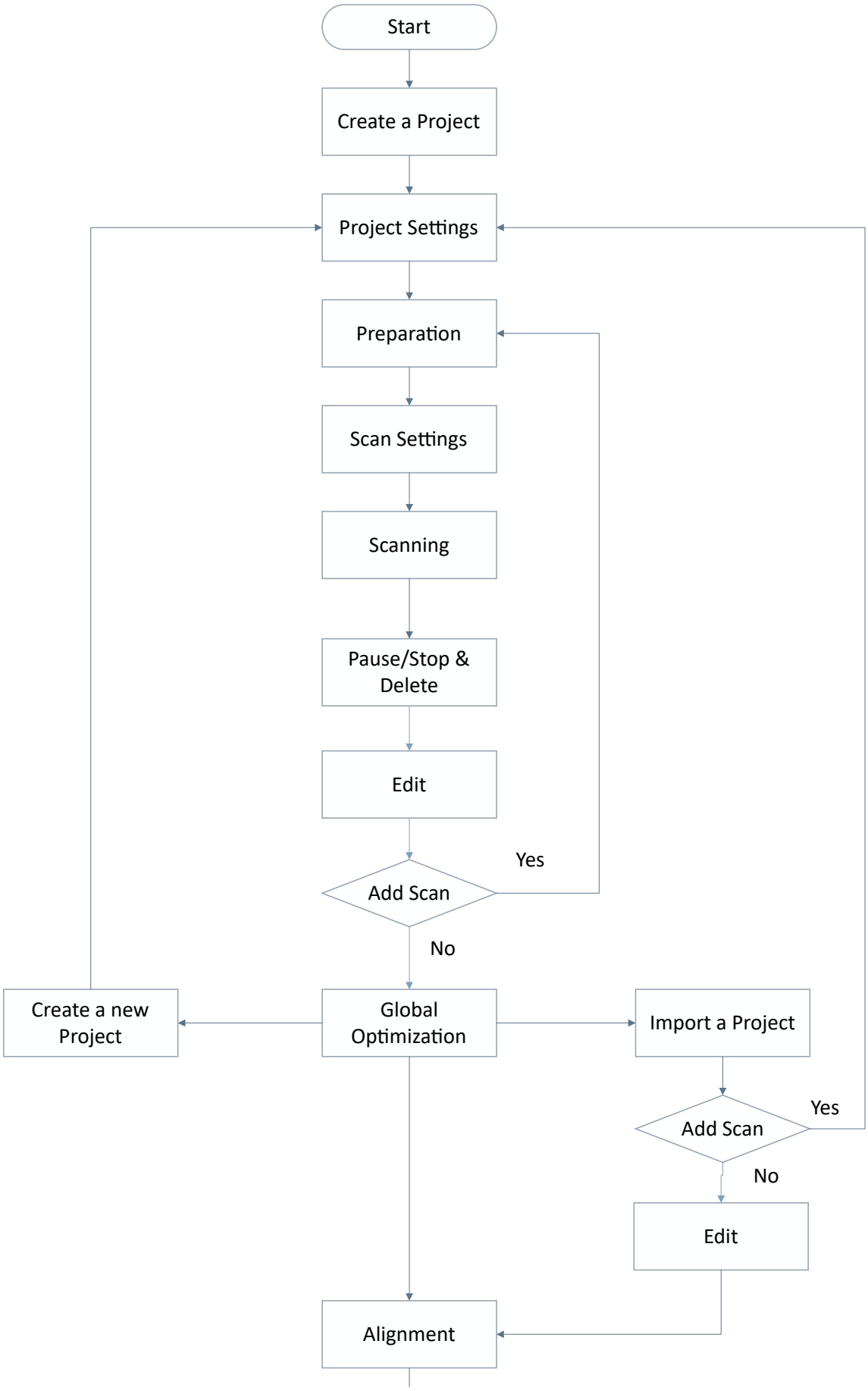
Scan

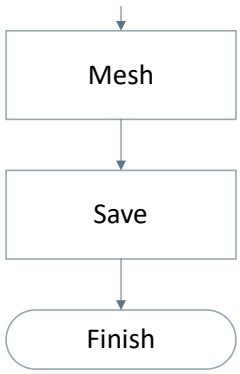
Basic Scanning Workflow



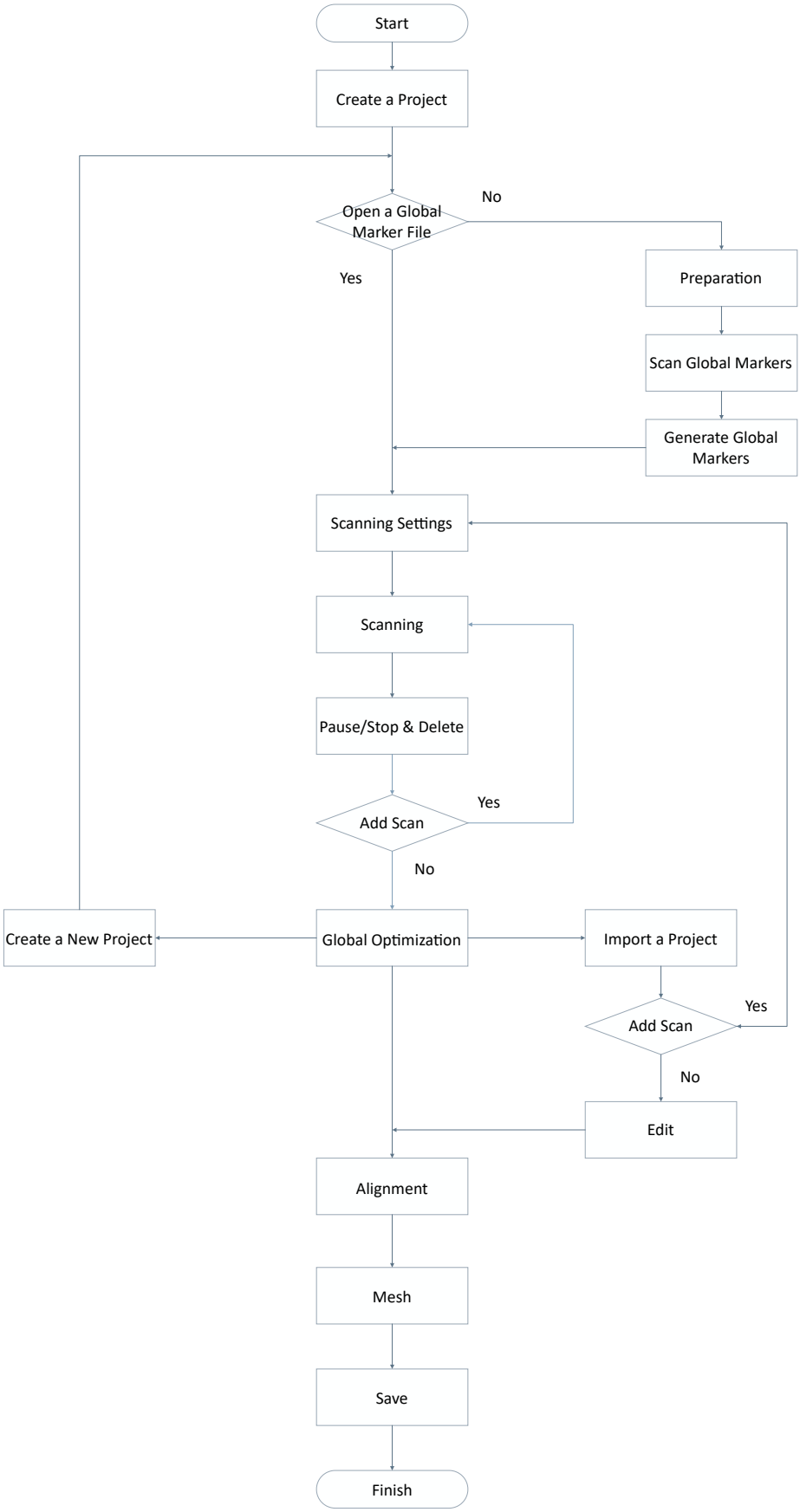

Mesh
Save
Finish

Basic Scanning Workflow




Mesh
Save
Finish

Global Markers Scanning Workflow



Preparation

Some preparatory work is required to scan easily and fast with good quality.

Object preparation

Scanning with turntable

Objects with a weight of less than 5 kg.
Objects with dimensions greater than 30 x 30 x 30 mm³ and less than 200 x 200 x 200 mm³.

Scanning without turntable

Objects with dimensions greater than 30 x 30 x 30 mm³ and less than 700 x 700 x 700 mm³.

> ⚠ **Caution**
>
> If the size or weight of the object isn't within the suitable scanning range, please don't use the turntable.

Objects not recommended for scanning:

- Moving or vibrating objects, which cause the shape of object changed during scanning process.
- Soft material object, such as plush toys.
- Lattice structures with many small deep holes, such as Eiffel Tower souvenirs.

Objects difficult to scan:

- Transparent objects, such as glass.
- Objects with reflective surfaces, such as metal parts.
- Dark-colored objects, such as a black keyboard.
- Thin-walled objects, such as paperclips.

Solutions:

Object	Preparation	Notes while scanning
Transparent, shiny, reflective surface objects	Use a washable or vanishing scanning spray	Scan as normal.
Thin wall objects	Place markers on and around the objects	Choose **global marker** in align mode.

Markers preparation

If the features of the scanned object aren't rich enough, markers can be pasted on the object for scanning alignment.

Scanning Range	Marker Size
290—480 mm	3 mm

Please pay attention to the following details when pasting the markers:

- Attach the markers evenly and randomly.
- Four markers are required for the alignment at communal areas.
- Ensure that the device's camera can scan at least 4 markers within the normal scanning range.
- Please attach small markers on the edges or at small facets of the model.
- Don't attach the markers on the surface with high curvature.
- Don't use damaged or incomplete markers.
- Don't use greasy, dusty, or dirty markers.

Project and project group

Create or open a project group before scanning.

Project group

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 can be scanned with many align modes.	The align mode can't be switched in a project if the project align mode is global markers.
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 to create multiple projects within one project group when scanning the large object and mutiple objects as well as scanning with multiple alignment modes. After scanning, you can align these projects one by one.

Create a project group

Two ways to create a project group:

- If the device has been calibrated, open the software and wait for it to fully load. Then, click **create project group** in the interface.
- On the scanning interface, click the project group button in the sidebar, and then click **create project group** in the pop-up window.

In the pop-up window, name the project group and **new** to the path you choose, all the scan data will be saved to the folder with the name you just set.

Open a project group

> **Note**
>
> Current project group will be saved automatically.

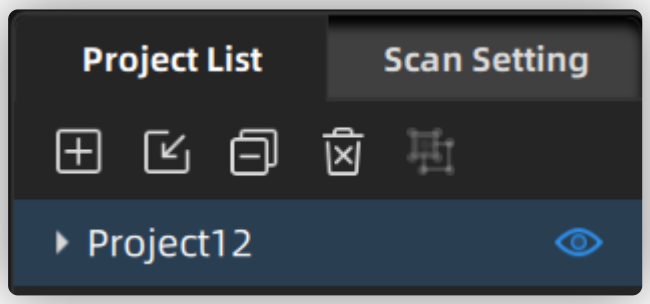
Two ways to open a project group:

- If the device has been calibrated, open the software and wait for it to fully load. Then, click **open project group** in the interface.
- On the scanning interface, click the project group button in the sidebar, and then click **open project group** in the pop-up window.

In the pop-up window, select the project group file and then click **open**.

Project

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



icon	function	instruction	note & warning
	Create new project	Two ways to create a project: 1. A project will be created automatically when you create a project group. 2. In scan window, click  to create a new project.	You can create project only when scanner connected.
	Open project	Two ways to open project: 1. When opening a project group, all project(s) of this group will be loaded to the software. 2. Click to open the project of one project group.	You can't import a project in which the object isn't scanned by the current device model.
	Remove project	Click  to remove selected project from the project tree.	The data won't be deleted, you can open the project when needed.
	Delete project	Click  to delete the project from the project tree, and delete all the data of this project.	This operation will delete the scan data from the computer permanently.
	Create/split group	Click  to create a group in the project.	/
	Visible/Invisible	To display or hide the scanned data.	/

Project setting

Texture

Option	Description
Texture scan on	Capture texture data.
Texture scan off	Unable to make texture adjustment.

Note

- Texture scanning takes a long time and needs to set the correct white balance.
- After creating the project, this option can't be changed.

Scanning

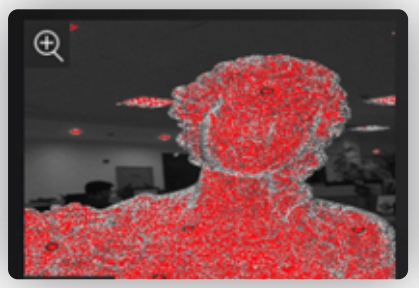
Scan setting

Following parameters can be set when scanning.

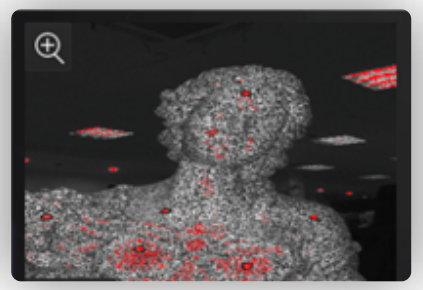
Camera window

Brightness

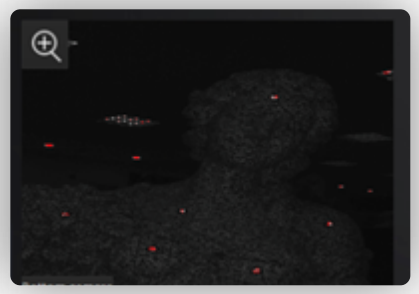
Adjust the brightness for different material / color of the object to get better scan data.



Too high



Proper



Too low

Background cutting

When this function is turned on, the background of the scanned object will be automatically shielded. The larger the value is set, the larger the shielding range.

Align mode

Select the suitable scan mode for different scanned objects.

EinScan SE V2

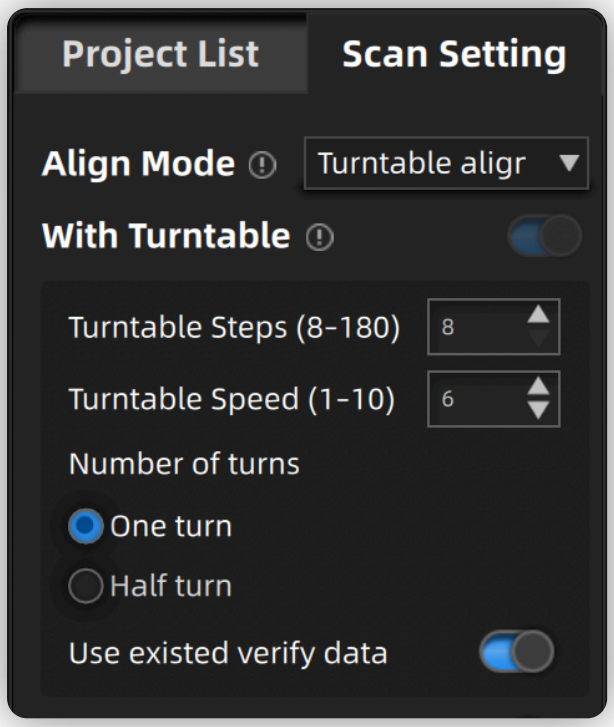
Align Mode	Description
Turntable	After connecting the turntable, you can set the turntable steps, speed, and number of turns of the turntable.
Features	Automatically complete the alignment by the surface geometric features of the scanned object. This mode is used for objects that can't paste markers and have rich surface features.

EinScan SP V2

Align Mode	Description
Turntable	After connecting the turntable, you can set the turntable steps, speed, and number of turns of the turntable.
Turntable Coded Targets	Using coded markers on turntable to align. Make sure the objects do not move on turntable during scanning.
Hybrid	Align with both features and markers. Paste markers on area without rich features.
Markers	Markers need to be pasted on the object before scanning. This mode is used for scanning objects with high accuracy requirements.
Global Markers	● Markers:Only scan the markers data on the surface of the object. By collecting the markers, the global markers data of the object can be quickly obtained. ● Point Cloud: Scan point cloud data directly and it supports loading global markers data（.p3、.txt、.asc）. ⚠**Caution** The scanning method can't be switched after scanning the point cloud data. If you need to scan global markers, please use the markers mode first.

With turntable

EinScan SE V2

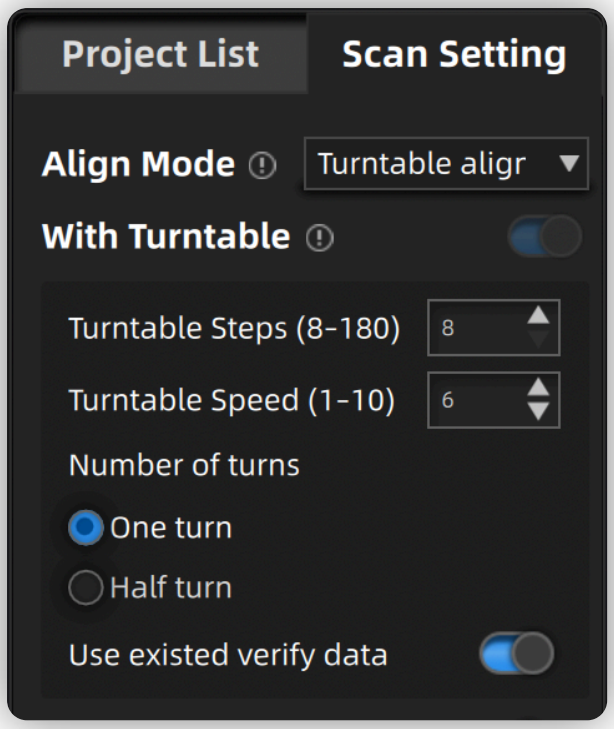


- Turntable Steps: Before scanning, you can set the number of times (8—180) for one circle of the turntable through this item, and the default value is 8.
- Turntable Speed: Before scanning, you can set the turntable speed (1—10) through this item, and the default value is 6.
- Turntable Turns: You can set the one turn or a half turn of the turntable before scanning.
- Use existed verify data: Use existing axis calibration data. After enabling it, the existing axis data will be used for stitching directly. If not enabled, recalibration is required before scanning and stitching. If the scanning object or turntable isn't moved, this function can be turned on. If the scanning object or turntable has been moved, please turn off this function and recalibrate the data.

Caution

- The turntable is disabled under the features align mode.
- When you select the turntable in the align mode, the default is to use the turntable for scanning.

EinScan SP V2



- Turntable Steps: Before scanning, you can set the number of times (8—180) for one circle of the turntable through this item, and the default value is 8.
- Turntable Speed: Before scanning, you can set the turntable speed (1—10) through this item, and the default value is 6.
- Turntable Turns: You can set the one turn or a half turn of the turntable before scanning.
- Use existed verify data: Use existing axis calibration data. After enabling it, the existing axis data will be used for stitching directly. If not enabled, recalibration is required before scanning and stitching. If the scanning object or turntable isn't moved, this function can be turned on. If the scanning object or turntable has been moved, please turn off this function and recalibrate the data.

Caution

- The turntable is disabled under the hybrid align mode.
- When you select the turntable in the align mode, the default is to use the turntable for scanning.
- The **Use existed verify data** option is disabled under the turntable coded targets, markers, global markers align mode.

HDR

It's recommended to enable this function when scanning black and white objects. After it's turned on, the software scans with the preset brightness, and the scanning brightness can't be manually adjusted at this time.

Caution

This option isn't available under the global markers align mode.

Scanning

Start scan / Pause scan / Stop & Delete

You can switch the scanning status by clicking the button in the software.

Function	Icon	Description
Scan		Scanned data will be stored. Click this button or press the space bar on the keyboard to start scanning.
Pause		If scanning with turntable, click this button to pause the scanning and then you can edit the scan data or change the view angle.
Stop & Delete		If scanning with turntable, click this button to end the current scanning and delete the scanned data.

Note

If the data can't be collected in the markers align mode with the turntable:

1. Please check whether the number of markers in each scanning area isn't less than 4;
2. Change the align mode.

Global optimization

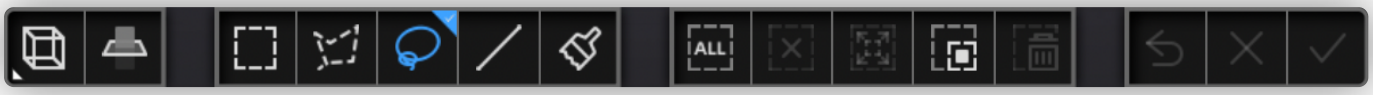
When you finish the scan, you can do **Global Optimization** to optimize and align the data.

Data edit

You can edit the scanned data when you pause or complete the scanning process.

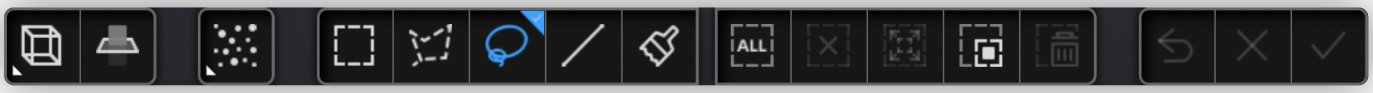
Edit scanned data

EinScan SE V2



Icon	Function	Instruction
	Multi View	6 different view angles to choose.
	Cutting Plane	Create a plane to do quick cut. For more, see Scan Data Edit.

EinScan SP V2



Icon	Function	Instruction
	Multi View	6 different view angles to choose.
	Cutting Plane	Create a plane to do quick cut. For more, see Scan Data Edit.

Icon	Function	Instruction
	Point Cloud Edit	Edit the selected data area in the point cloud edit mode.
	Markers Edit	Click Point cloud Edit again to switch to Markers Edit. Select the data area and the mark points in this area will be shown in red. The red mark points can be deleted at this time.

Icon	Function	Instruction
	Rectangular	Select/Deselect a rectangular area. The selected area is displayed in red.
	Polygon	Select/Deselect a polygon area.
	Lasso	Select/Deselect the area by using the Lasso tool.
	Straight line	Hold down `⇧ Shift` + `Left Button` and move the cursor to draw a straight line to select/deselect the area.
	Brush	Hold down both `⇧ Shift` + `Left Button` and a red circle will appear. At this time, scroll 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.

Icon	Function	Instruction
	Undo	The last deletion will be undone.
	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.

Keyboard shortcuts

Shortcut	Function
`⇧ Shift` + `Left Button`	Select the area of data
`⌘ Cmd` + `Left Button`	Deselect the area of data
`Left Button`	Rotate
`Middle Button` or `Right Button`	Pan
`Scroll Wheel`	Zoom in/Zoom out
`Space`	Apply the edit
`⌦ Del`	Delete the selected data

Context menu

Function	Keyboard shortcut	Description
Select all	⌘ Cmd + A	The function is the same as the function on editing bar.
Unselect	⌘ Cmd + C	The function is the same as the function on editing bar.
Connected Domain	/	Click the button after selecting a patch of data and all connected region to the selected data will be picked.
Invert	⌘ Cmd + I	/
Delete selected data	⌦ Del	/
Fitting View	⌘ Cmd + D	The data on the interface is displayed in the center according to the appropriate size.
Sampling Display	/	For data with many point clouds, this function can be used to display the data according to the selected scale.
Set Rotate Center	/	The rotation center can be set on the data by the left mouse button.
Reset Rotate Center	/	After reset, the center of rotation is at the data center.

Cutting plane

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

Create a cutting plane

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

EinScan SE V2

Method	Instruction
Fitting Point Cloud	Press ⇧ Shift + Left Button to select data, and then click **Generate Plane**. The direction of the plane will be calculated by the software according to the direction of point cloud.
Creating Straight Line	Press ⇧ Shift + Left Button to draw a line, and generate the cutting plane according to the line.

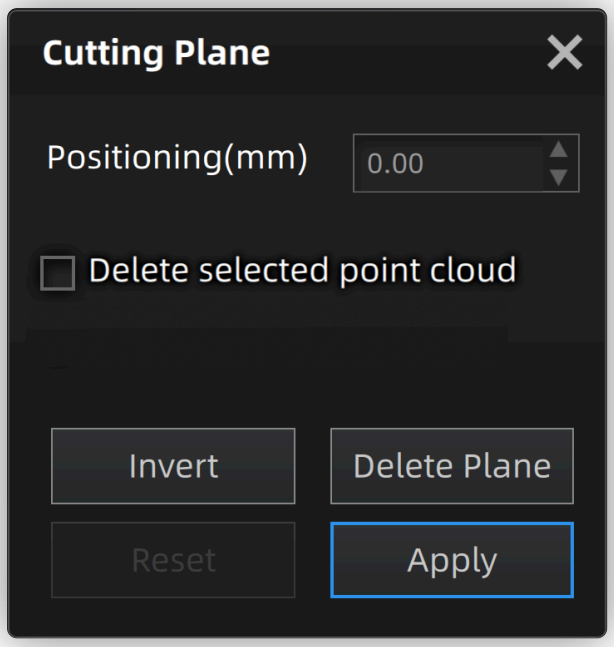
EinScan SP V2

Method	Instruction
Fitting Point Cloud	Press ⇧ Shift + Left Button to select data, and then click **Generate Plane**. The direction of the plane will be calculated by the software according to the direction of point cloud.
Creating Straight Line	Press ⇧ Shift + Left Button to draw a line, and generate the cutting plane according to the line.
By Markers	Press ⇧ Shift + Left Button to select markers. **Note** 3 markers or more are required to generate the cutting plane.

3. Click **Create Plane**.

Set the cutting plane

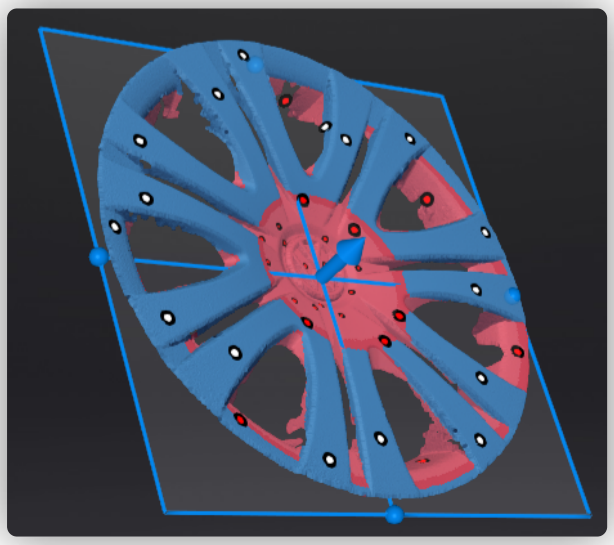
EinScan SE V2



- Delete selected point cloud: Data in the reverse direction will be shown in red after checking the box. The red data will be deleted after clicking **Apply**.

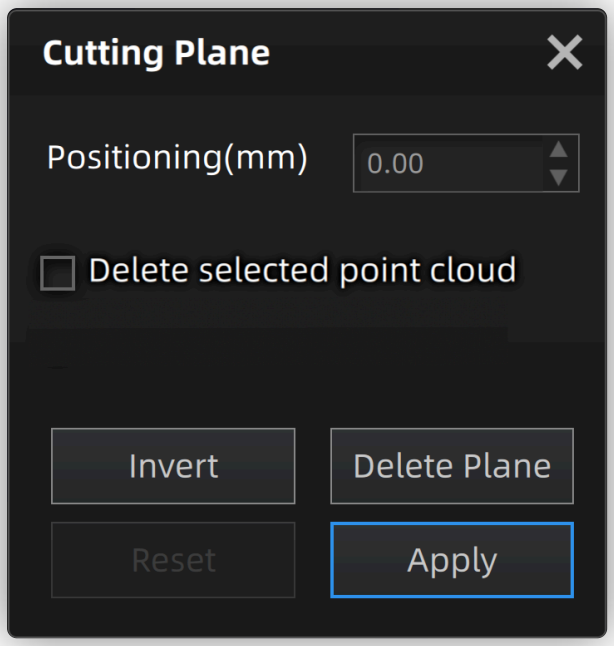
  Note

  You can not delete all point cloud data.
- Invert: Inverse the normal direction of the cutting plane.
- Delete Plane: Delete the created cutting plane.
- Reset: Reset all operations after creating the cutting plane.
- Apply: Apply all edits.



- Positioning: After generating the plane, fill in a number in the positioning box or drag the cutting plane normal arrow  to pan the cutting plane.
- Rotate the cutting plane: Cutting plane can be rotated around the axis by dragging the blue ball  .

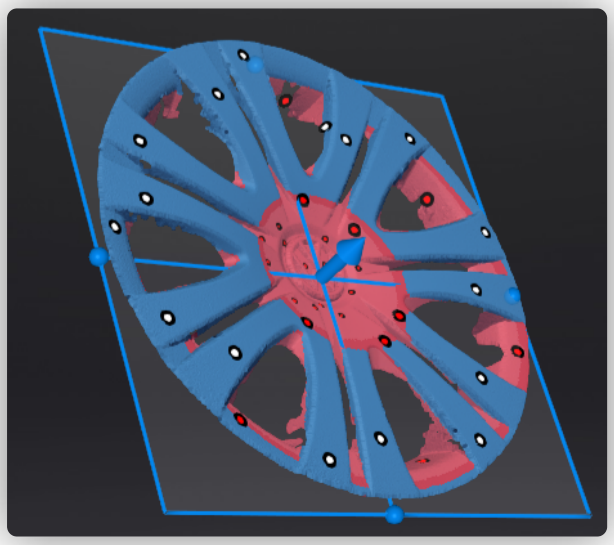
EinScan SP V2



- Delete selected point cloud/markers: Data/markders in the reverse direction will be shown in red after checking the box. The red data will be deleted after clicking **Apply**.

  Note

  - You can not delete all point cloud data.
  - Please keep at least 4 or more markers on the front of the cutting plane.
- Invert: Inverse the normal direction of the cutting plane.
- Delete Plane: Delete the created cutting plane.
- Reset: Reset all operations after creating the cutting plane.
- Apply: Apply all edits.



- Positioning: After generating the plane, fill in a number in the positioning box or drag the cutting plane normal arrow  to pan the cutting plane.
- Rotate the cutting plane: Cutting plane can be rotated around the axis by dragging the blue ball  .

Other functions

Before or after scanning, you can access the other scan functions through the sidebar function buttons.

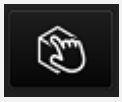
Icon	Function	Instruction
	Project Group	Create / open a project group. About project group, please refer to Project Group.
	Align	Align the data as you need, please refer to Align.
	Save Data	Save scan data.
	Display/hide the texture	/
	Mesh	Generate the mesh.

Alignment

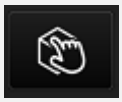
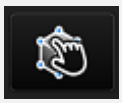
This is how you align multiple projects in one project group.

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

EinScan SE V2

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.	Regular shaped objects (circular objects and square objects included) or small sized objects aren't suitable for this mode.
 **By Manual**	1. Choose **By Manual**. 2. Manually choose at least 3 common points on the data in the fixed window and the floated window respectively. 3. Click **Apply** to align.	• The chosen points shouldn't in a line. • Manual alignment is a supplement to feature alignment, which can solve the problem of feature alignment failures such as some areas with few common areas or extremely similar areas.

EinScan SP V2

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.	Regular shaped objects (circular objects and square objects included) or small sized objects aren't suitable for this mode.
 **By Manual**	1. Choose **By Manual**. 2. Manually choose at least 3 common points on the data in the fixed window and the floated window respectively. 3. Click **Apply** to align.	• The chosen points shouldn't in a line. • Manual alignment is a supplement to feature alignment, which can solve the problem of feature alignment failures such as some areas with few common areas or extremely similar areas.
 **By Markers**	If the currently selected project is a marker project, the marker alignment can be performed. The software will automatically align according to the mark points.	The two projects have no less than 3 common markers each other.
 **By Manual Markers**	Manually choose at least 3 common markers on the data in the fixed window and the floated window respectively and click **Apply** to align.	The chosen markers shouldn't in a line.

Post Processing

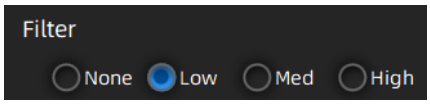
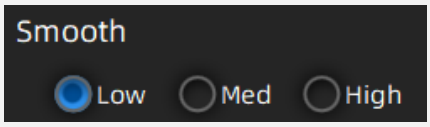
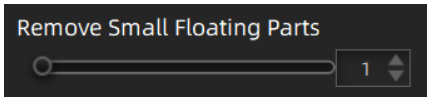
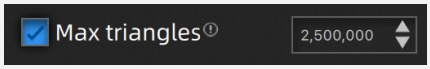
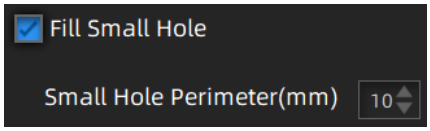
Mesh model

Meshing is to convert the point cloud into a triangular mesh surface. 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's scanned. Processing time is quicker than Watertight.
	Watertight	All holes will be filled automatically. The data can directly be 3D printed. Only watertight mesh can set model quality.

Mesh optimization

Optimization	Instruction	Note
Filter	Optimize the data and improve the clarity of the data. The higher the level, the less the small details . 	- None: No optimization - Low: 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.
Smooth	Smooth the possible noise on the surface of the scan data. 	
Remove small floating parts	Remove small floating parts on the model. 	
Max triangles	Set max plate number to get mesh model's triangle plate number is within configured plate number. 	
Fill small hole	Auto fill the small hole when mesh. 	Small holes with a perimeter less than or equal to 10 mm (by default) will be automatically filled. You can set the hole-filling perimeter.
Remove spike	Remove spike-like data on the image edge. 	
Markers hole filling	Fill in the surface of the object thats not scanned to the pasting marker.	

Optimization	Instruction	Note
Recommended parameters	When turning on, it will automatically use the recommended parameters for meshing.	

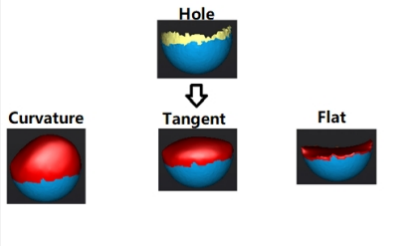
Operation

Click **Preview** to confirm the settings and start meshing.
Click  to restore.
Click **Confirm** to confirm the mesh result.

Mesh editing

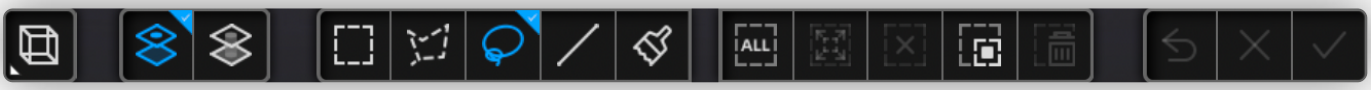
Left panel

Click ✚ to open each function.

Function	Instruction	Note
Texture	**Brightness** and **Contrast** can be adjusted.	**Confirm** to apply, **Cancel** to restore
Simplification	After simplification, the polygon numbers, file size and detail of data will be reduced universally.	High level may cause detail loss. Set the ratio from 1 to 100, the default is 0.
Mesh optimization	Mesh optimization can optimize the quality of the data by adding more triangles to curvature regions.	
Smooth	Smooth the possible noise on the surface of the scan data.	It might remove some small details or smooth some sharp edges at the same time. Set the ratio from 1 to 100, the default is 0.
Remove small floating parts	Remove small floating parts in the scan data.	From 0 to 100% where 100% is the size of the largest mesh island. Smaller islands will be removed. 0 means no operation, 100 is the maximum. The maximum value is the square of the diagonal length of the floating part/10, MAX= $(L/10)^2$.
Auto hole filling	Auto fill every hole with a smaller perimeter than the number input. 	Choose Curvature, Tangent or Flat before filling hole. - **FLAT**: calculates the solution for the hole filling considering the point position on the boundary. - **TANGENT**: calculates the solution considering the point position and the normal of the last row of triangles forming the boundary. - **CURVATURE**: calculates the solution considering the point position and the normal of the 2 last rows of triangles forming the boundary.
Manual hole filling	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.	Choose Curvature, Tangent or Flat before picking a hole.

Function	Instruction	Note
Flip normal	To redefine the front direction of the scanned data in reversal design.	Texture mapping will be unavailable after flip Normal
Cutting plane tool	Define a plane by drawing a straight line. Delete the selection and close the mesh at the intersection. Use the cutting plane to align the mesh to the CSYS.	
Mirror	Mirror the mesh through a plane defined by a straight line.	After mirroring, texture remapping can't be performed.

Bottom toolbar



Icon	Function	Instruction
	Select Visible	To select 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 toolbar

Icon	Function	Instruction
	Open file	Open a file (STL, OBJ, PLY) for post processing.
	Save Data	Save scan data.
	Sketchfab Upload	Use your Sketchfab account to share the model.
	Texture remapping	After the post-processing, hole filling on texture scanned data will affect the texture render. By doing the texture remapping, the texture information will be reapplied on the mesh.
 	Display/hide the texture	Display/hide the color of scanned object appearance.

Measurement

Measurement

When you complete the mesh editing, click  on the corresponding position in the navigation bar 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.

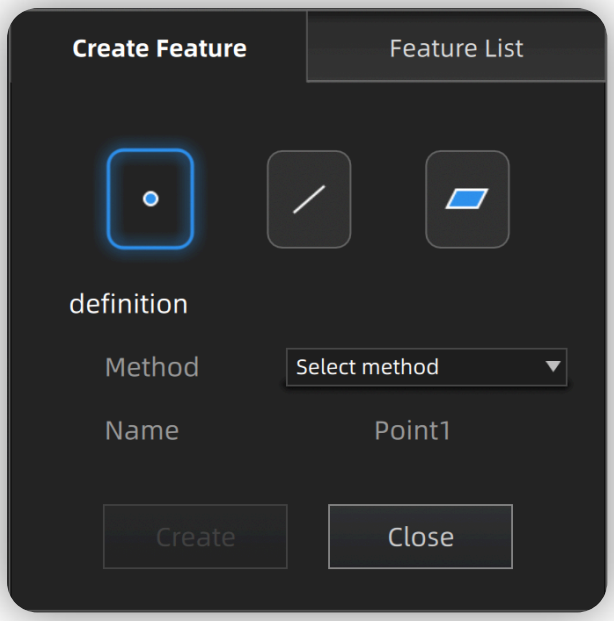
Additionally, it also supports clicking  in the right-side function bar to import models (including third-party 3D models).

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

Create features

You can measure on the model you just scanned, or you can open a model file to do the measurement.
Select the file to be measured or directly drag the file (STL, OBJ, PLY) to the measurement interface.

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



Point

Creation Method	Description	Note
Selected Points	• Click on the data to select a point. • Click **Create** to create a point.	/
Line-Plane Intersection	• Click on the created line, or select it on the dropdown. • Click on the created plane, or select it on the dropdown. • The point generated is the intersection between the non-parallel line and plane.	Line and Plane should be created in advanced. The line should not be parallel to the plane.

Line

Creation Method	Description	Note
Point-Point	• Pick 2 points. • Click on the data to select a point or click on a feature point previously created. • In the Choice list select one of the points to redo it. • The line generated is define as point from to point to point.	/
Plane-Plane Intersection	• Click on the plane previously created, or select it on the dropdown, repeat for the second plane. • The created line is the intersection between the 2 non-parallel planes.	2 planes should be created in advanced. The planes should not be parallel to each other.

Plane

Creation Method	Description	Note
3 Points Fit	• The plane is generated by 3 points not co-linear. • Click on the data to select one point or click on a previous created feature point. • In the Choice list select one of the points to reselect it. **Feature creation failed! Error code 6**: the points selected are co-linear.	The 3 points can't be on the same line.
Point-Line Fit	• The plane generated includes the point and the line (The line should be created in advanced). • Click on the line previously created or select it from the drop-down. • Click on the data to select a point or click on a feature point previously created.	Line should be created in advanced.
Best Fit	• The plane generated is the position with the smallest deviation from the selected area. **Note** Press ⇧ Shift + Left Button to select an area. Press ⌘ Cmd + Left Button to deselect. Press ⌘ Cmd + C to deselect all data.	/

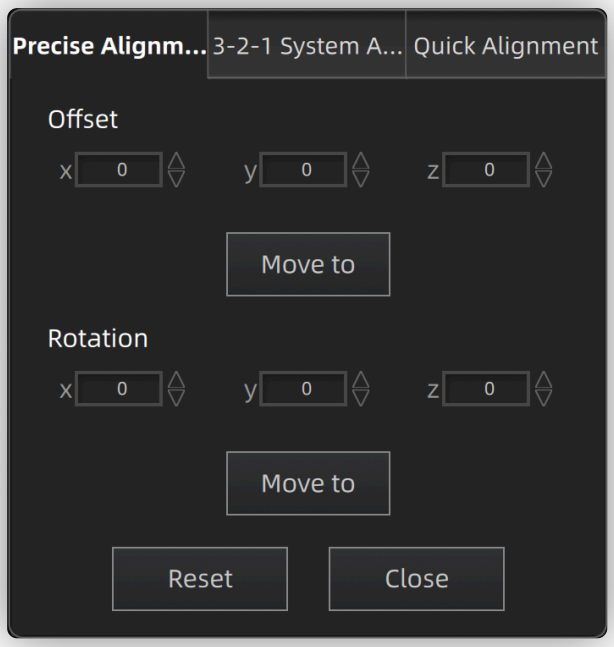
Align

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

> ⚠ **Caution**
>
> - The shape and accuracy of the model won't be changed by the movement.
> - After the movement and exiting, the changes are irreversible so you can only reset the model by reloading the original file.

Click the button to enter the movement interface. Click it again to exit.

Precise Alignment



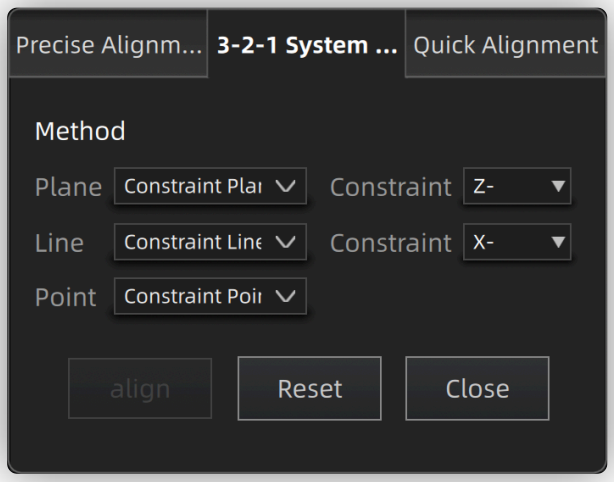
Click **Move to** to align the model center with the input coordinates, and the axis direction is adjusted to match the input rotation angle.

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

Click **Reset** to cancel all the transformation in the precise alignment interface.
Click **Close** to save the results and exit.

3—2—1 System Alignment

3-2-1 system alignment aligns data by selecting the point, line and plane. Before movement, create feature points, lines and planes. The feature lines created are not perpendicular to the plane.
The coordinate system on the interface represents the global coordinate system: Red=X+, Green=Y+, Blue=Z+.

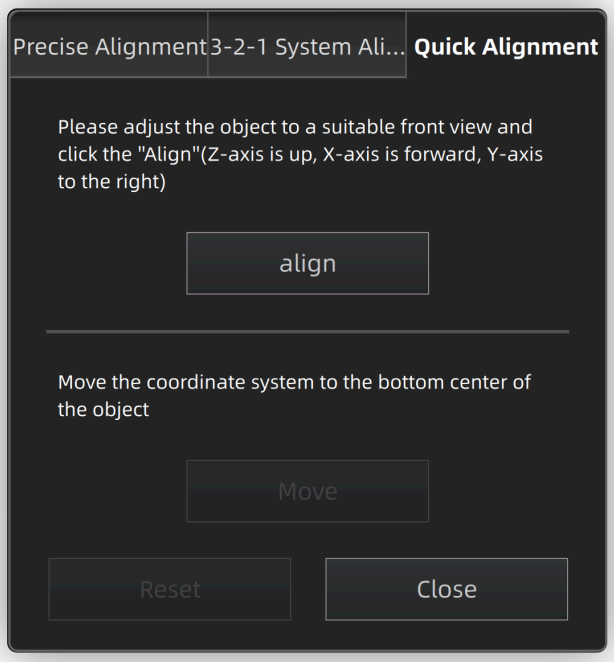


- Select a feature surface in the plane drop-down menu, and select an axis in the corresponding constraint drop-down menu of the plane. The arrow on the plane corner indicates the positive direction of the plane, and the selected axis direction will be consistent with the plane direction.
- Select a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

Click **Movement** to start the coordinates transformation. When the lines are perpendicular to the plane, the transformation fails, so the movement fails.
Click **Reset** to cancel all the transformation in the 3-2-1 system alignment interface.
Click **Close** to save the results and exit.

Quick Alignment

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



Click **Align** to move the coordinate frame to the center of the object, and the position of the coordinate frame is that the Z axis is parallel to the screen and faces upward, the X axis is perpendicular to the screen and the Y axis is parallel to the screen and faces to the right.
Click **Move** to move the coordinate frame to the center of the bottom of the object.
Click **Reset** to restore the coordinate frame to its original state (before opening the function).
Click **Close** to apply the adjusted coordinate frame and exit.

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

Measurement

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

Distance

Calculate the distance between two points on the surface of the model.

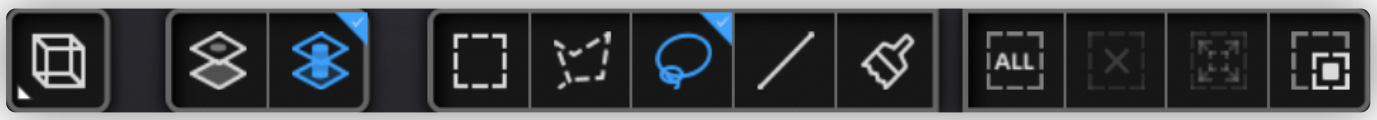
- **Total** is the 3D distance.
- **X**, **Y** and **Z** are the projection of the segment to the respective planes.

Click on the surface of the model to pick two points, the calculation will be done automatically.

Surface Area

Calculate the surface area value.
You can measure the model by keyboard shortcuts or toolbar.

- Press `⇧ Shift` + `Left Button` and move the cursor to select an area.
- Press `⌘ Cmd` + `Left Button` and move the cursor to unselect.
- `⌘ Cmd` + `A` to select all.
- Press `⌘ Cmd` + `C` to deselect all the data.



> **Note**
>
> Please refer to Data edit and Post processing for tool's function.

Volume

Calculate the volume of the **watertight mesh**.
It returns the volume in mm³ and the coordinates of the bounding box.

Save

Save data

You can save the scanned data.

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

Format	Data Type	Saved as	Application
ASC (whole piece)	Optimized cloud points	Scan.asc	• 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.

Date sharing

You can upload the encapsulated data to Sketchfab .

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

> ⚠ **Caution**
>
> The files uploaded are in STL format.

Contact us

Email: einscan_support@shining3d.com
Support platform: https://support.einscan.com

SHINING 3D Offices
APAC Region & Headquarters
SHINING 3D Tech Co., Ltd.
Hangzhou, China
Phone: +86 571 82999050
Add: No. 1398, Xiangbin Road, Wenyan, Xiaoshan, Hangzhou, Zhejiang, China, 311258

EMEA Region
SHINING 3D Technology GmbH.
Stuttgart, Germany
Phone: +49 711 28444089
Add: Breitwiesenstraße 28, 70565, Stuttgart, Germany

Americas Region
SHINING 3D Technology Inc.
San Leandro, United States
Phone: +1415 259 4787
Add: 2450 Alvarado St #7, San Leandro, CA 94577