INSPIRE 3D Scanner

Tutorials and Tips

V1.0

REVOPOINT

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Scanning Workflow

Connect an INSPIRE 3D Scanner → **Parameter Settings** → **Preview the scan** → **Start/Pause Scanning** → **Model Editing**

Connect to Revo Scan via USB or Wi-Fi on a compatible Windows, macOS, Android, or iOS device.	Select the correct Scan Settings for your object.	Start to scan after checking and adjusting the RGB and Depth cameras' exposure.	Click the "Start/Pause" button to start or pause the scan.	Edit the scan to generate point cloud, mesh, and texture mapping models.

1. Connecting to an INSPIRE 3D Scanner

Here's an example of how to connect to an INSPIRE 3D scanner using a USB cable.

1.1 USB Cable Connection

Revopoint INSPIRE 3D scanner can connect to Windows and macOS devices with its 2-meter-long USB cable.

Use the Type-A to Type-C Adapter if there is no Type-A port on your PC.

Plug into the PC's USB 3.0 port.

Plug into the INSPIRE's Type-C port.

1.2 Wi-Fi Connection

Revopoint INSPIRE 3D scanner can also connect to Windows and macOS devices over Wi-Fi.

Step 1: Power on the 3D scanner.

Power on the 3D Scanner via the *Power Bank Handle or a power outlet.
(Minimum Power requirements: 5V,1A)
*Power Bank Handle sold separately

• Do not plug it into your PC, or it will be in USB mode by default.

• To use the Wi-Fi connection the scanner must be powered by a power bank or power outlet.

• When the power indicator turns solid green, the scanner is successfully powered.

Step 2: Connect the 3D scanner to your PC via Wi-Fi.

• Find the label on the scanner's bottom, and locate the Scanner Model and its SN.

• Go to your Wi-Fi setting, search for the network called: Model + REVO + the first eight characters.

For example: INSPIRE-REVO-A2340025
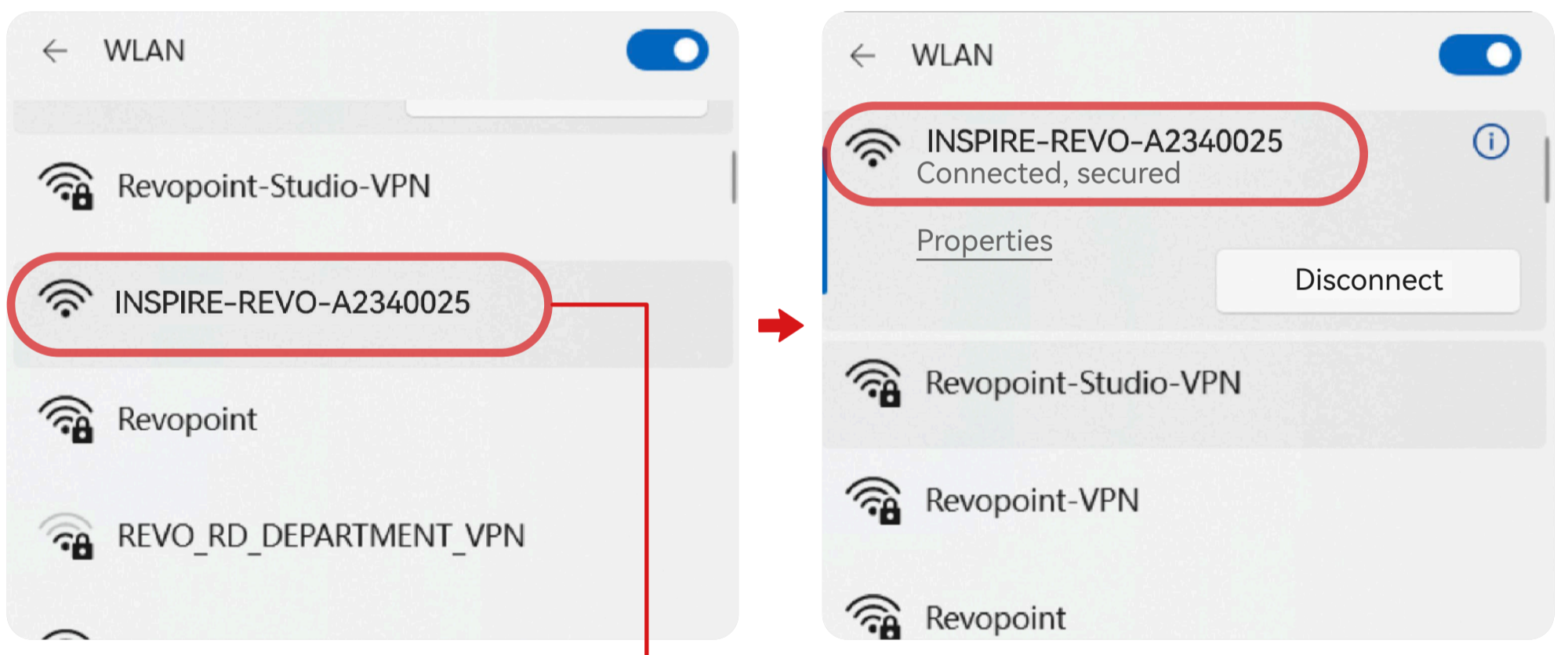
Click the network and wait for it to connect to the PC. (No password is required)

**If using the Wi-Fi connection on your PC, please consider the following:**

1. Check if your PC has Wi-Fi before connecting the scanner wirelessly. Older desktops may not support Wi-Fi.

2. Your PC won't have internet access when connected to the scanner's Wi-Fi. Disconnect from the scanner's Wi-Fi network if you need to go online.

3. If your PC fails to connect to the scanner's Wi-Fi, check if other devices (including mobile devices) are connected to the scanner or if your PC is linked to another scanner via USB. If none of these scenarios apply, try restarting the scanner or contact our Customer Service Team for further assistance.

1.3 LED Indicators

INSPIRE 3D Scanner	
Connection Indicator	Power Indicator
No light: Not Connected	No light: Not Powered
Solid blue light: Connected	1.Flashing red light: Starting (Lasts about 5s to 30s) 2.Solid red light: The scanner failed to start. Please try it again.
Flashing blue light: Working correctly	Solid green light: Powered successfully.

2. Setting Up a Scan

2.1 How to Use the Tripod
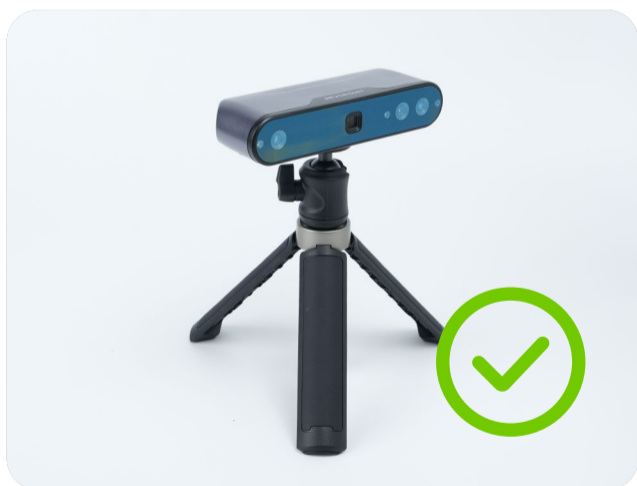
Image 1: Clip the scanner to the top and extend the tripod's support legs. Put it onto a desk for fixed scanning.

Image 2: Hold the tripod for handheld scanning.

Image 3: The tripod can extend up to 30 cm.

2.2 How to Place an Object (Using the Agrippa Bust as an Example)

1) Incorrect Examples

Cluttered Background

Don't hold the turntable by hand, as the object will be unstable.

Incorrect Color Scans
– Dim lighting conditions are bad for color scanning.

Incorrect Color Scans
– Uneven illumination will affect texture mapping.

2) Correct Examples

The surroundings are clear of any clutter and consistently lit.

Using Magic Mat or black bin bag as the background, and ensuring consistent and even illumination.
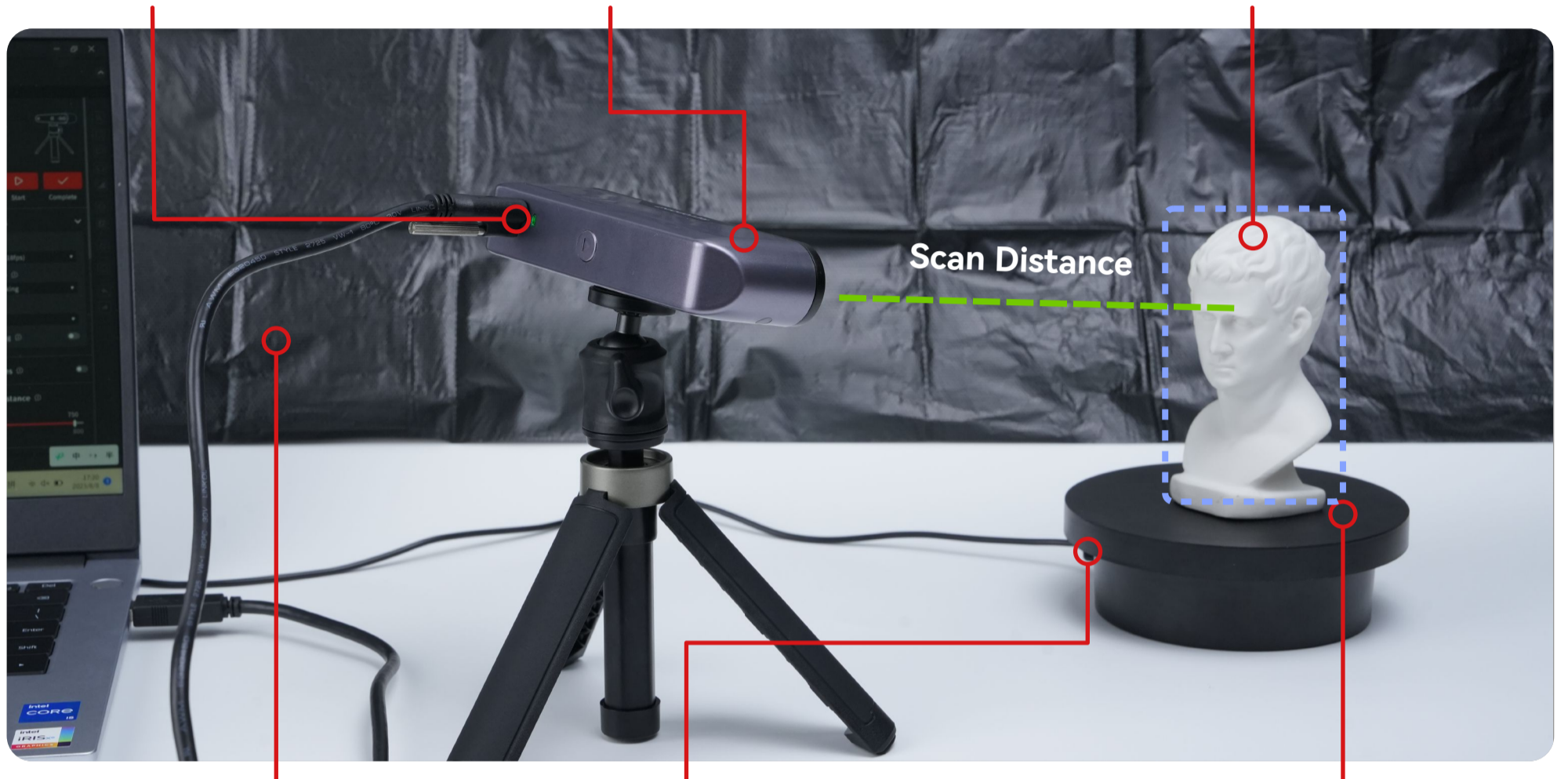
2.3 How to Setup the Scanning Environment

Connect the scanner to a PC and attach it to its tripod. Angle the scanner toward the Agrippa and slightly above it.

The scanner is angled down towards the object at a distance of about 25 cm.

Check the bust to ensure that there are no shadows on its surface and that the overall lighting is even and bright.

Scan Distance

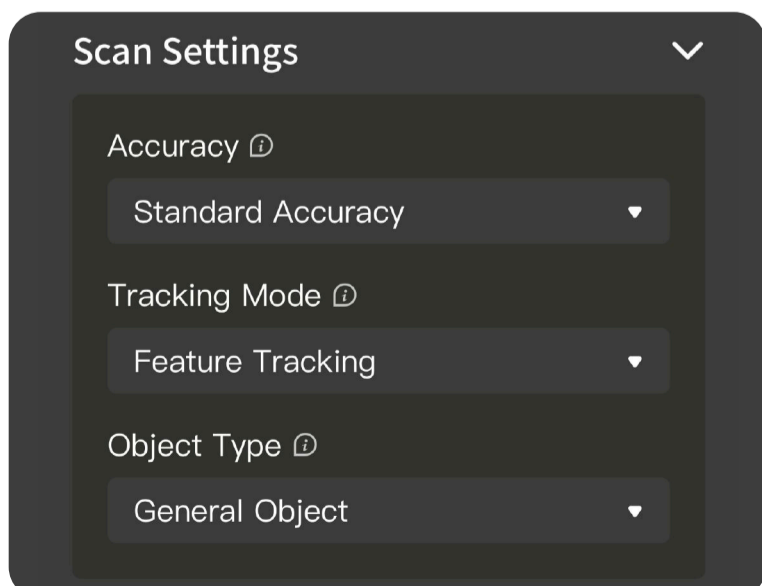Use the Magic Mat or black bin bag as the background.

Power on the turntable and adjust it to its maximum speed.

Put Agrippa on the turntable.

Note: Working distance of INSPIRE is 250–500 mm.

3. Scan Settings

Before scanning, please ensure that the correct settings have been selected for your object.

Scan Settings

Accuracy ⓘ
Standard Accuracy ▼

Tracking Mode ⓘ
Feature Tracking ▼

Object Type ⓘ
General Object ▼

3.1 Scan Accuracy

3.1.1 Standard Accuracy

1) In Standard Accuracy mode, the post-processing time will be longer, but the results are more suitable for applications needing more detail.

2) Object Type Supported in Standard Accuracy Scans

General Object, Dark Object, and Face (Refer to the Object Type section for more details)
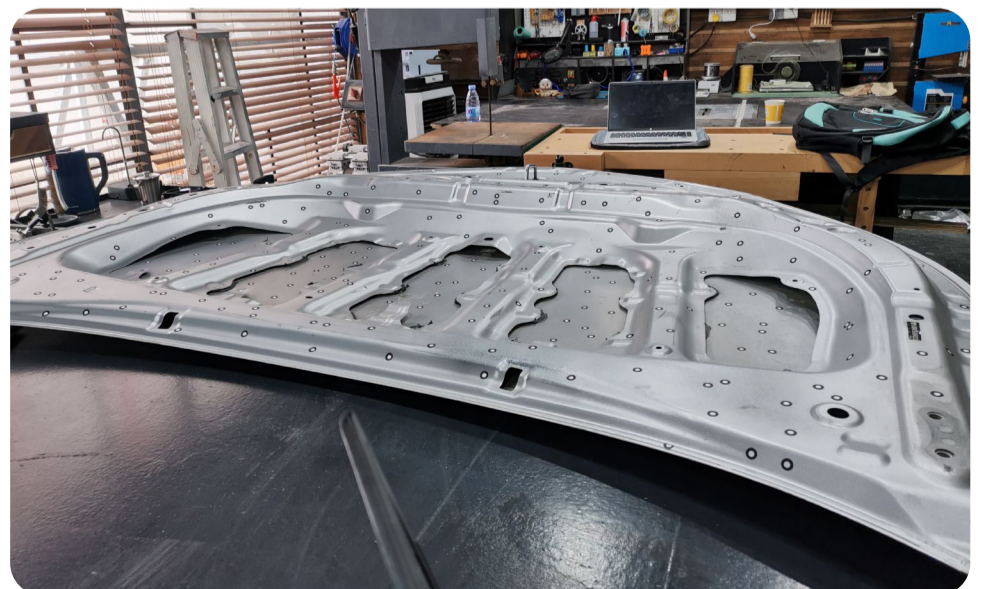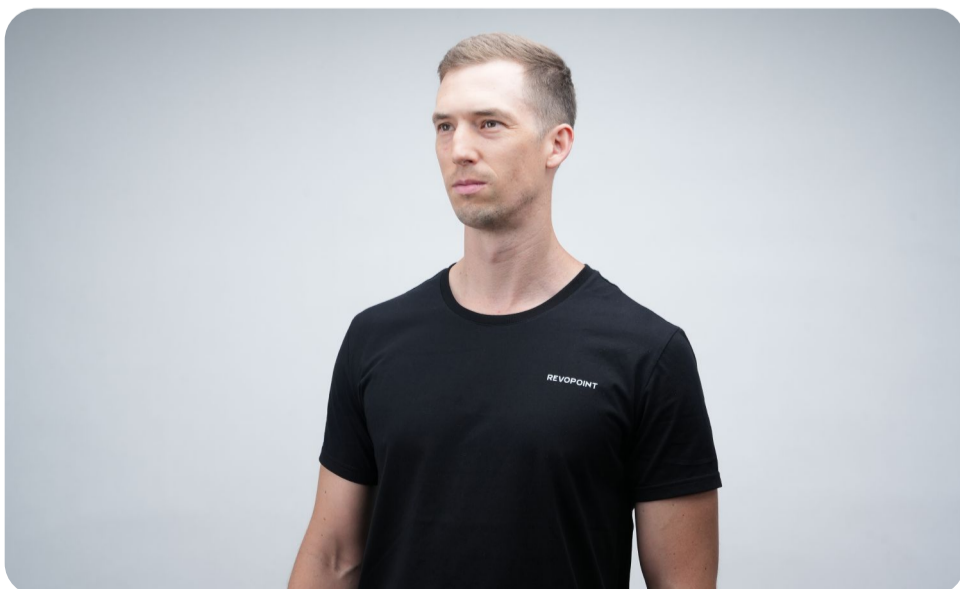
3) Advantages and Disadvantages

Advantages:

1. High scanning accuracy.

2. Captures much more of the object's details.

Disadvantages:

1. A lower scanning frame rate leads to lower scanning efficiency.

2. The scanned model takes up a lot of memory, and post-processing takes a long time.

3.1.2 High-speed(18 fps)

1) In High-speed(18 fps) mode, the scanning speed can be up to 18 fps and is suitable for scanning large objects and people.

2) Object Type Supported in High-speed(18 fps) Scans

Human, Large Object (Refer to the Object Type section for more details)

3) Advantages and Disadvantages

Advantages:

1. High scanning frame rate for better scanning efficiency.

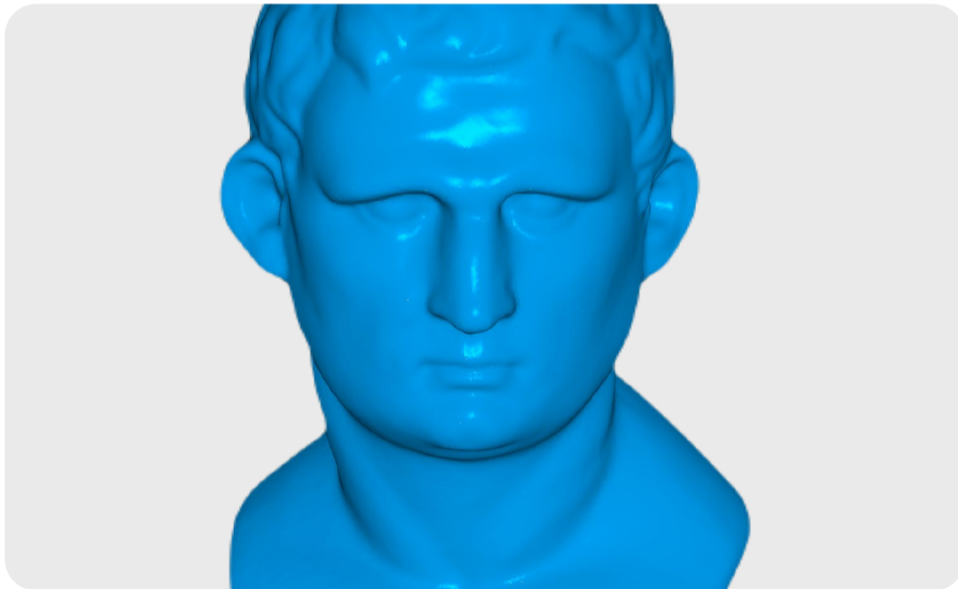2. Uses less memory and has fast post-processing times.

Disadvantages:
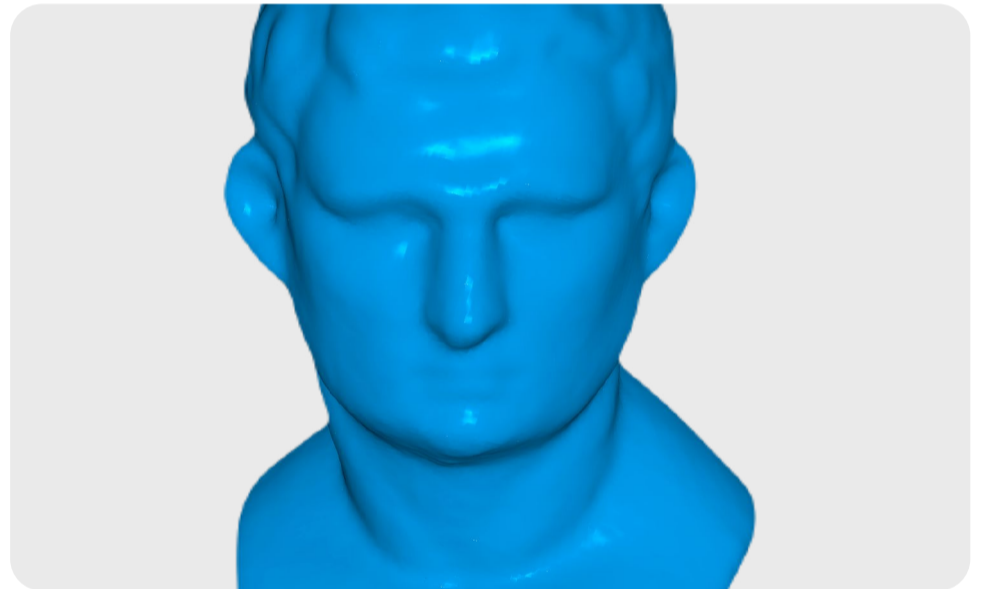
1. Lower accuracy.

2. Less details captured.

3.1.3 Accuracy Comparison

Check the details of the lower eyelids, mouth corners, hair temples, cochlea, etc, for comparison between Standard Accuracy and High-speed(18 fps) modes.

(Agrippa bust scanned with an INSPIRE 3D scanner.)

Standard Accuracy   **High-speed(18 fps)**

3.2 Tracking Modes

3.2.1 Feature Tracking

**1)** Use **Feature Tracking** for objects with detailed, distinct surface features and no repeating patterns.

2) How does the Feature Tracking Work?

Feature tracking identifies and tracks an object's distinctive surface features. It works by extracting feature points from the data, matching them across different viewpoints, calculating their relationships, and using this information to reconstruct a 3D model of the object.
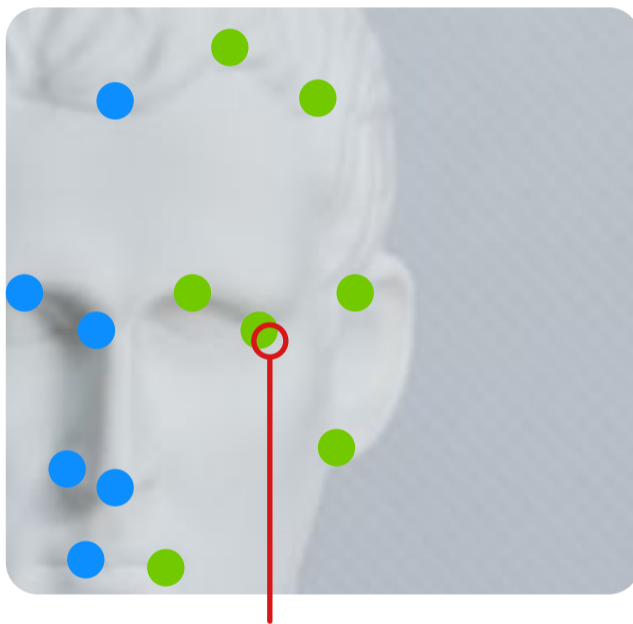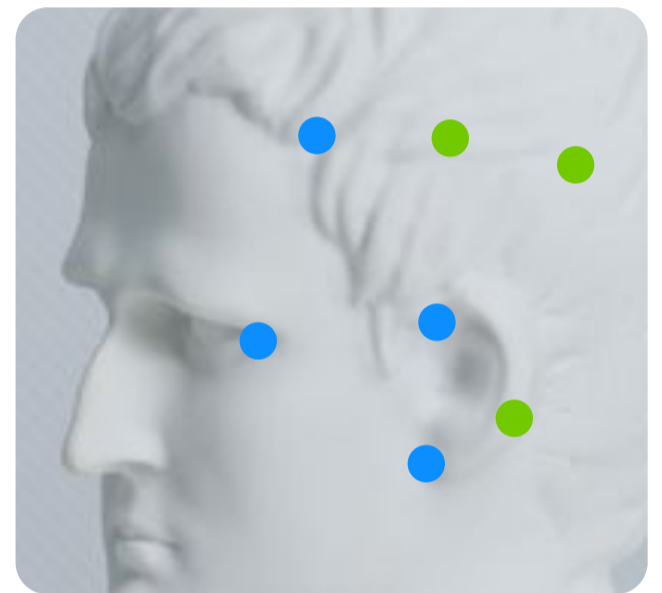
The First Frame	The Second Frame	The Third Frame
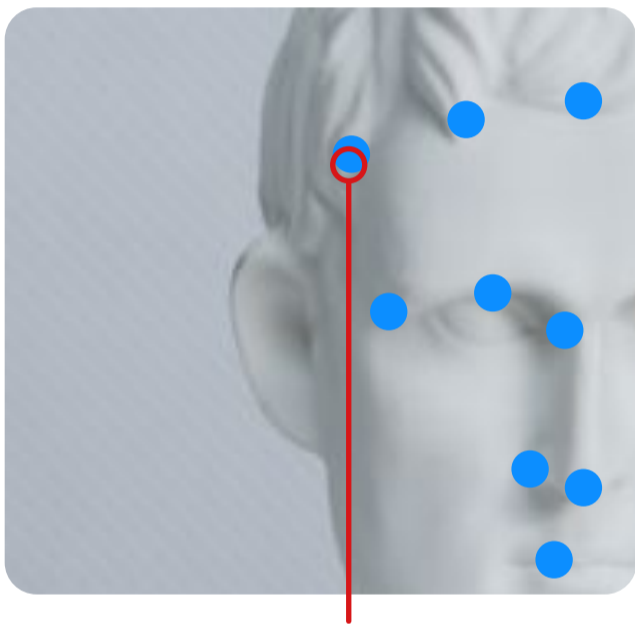
Features

The algorithm completes alignment according to the features captured in the previous frame.

3.2.2 Marker Tracking

1) Marker Tracking requires marker stickers placed on or around the object, or place Magic Mat under the object. Use it for objects that have large flat areas with no distinct surfaces. At least 5 markers must be in view for each frame during scanning.

2) What is a 3D Marker?

3D Scanning Marker is a small sticker with a black or white dot printed on it.
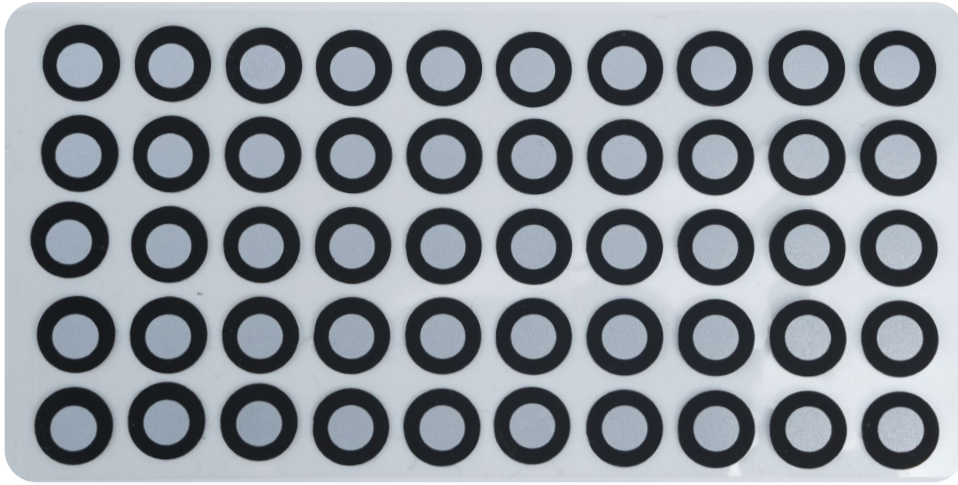
3) What's the function of a marker point?

Marker points work as reference points for the 3D scanner to track, so it knows where the frames should be stitched.

4) How to place marker points?
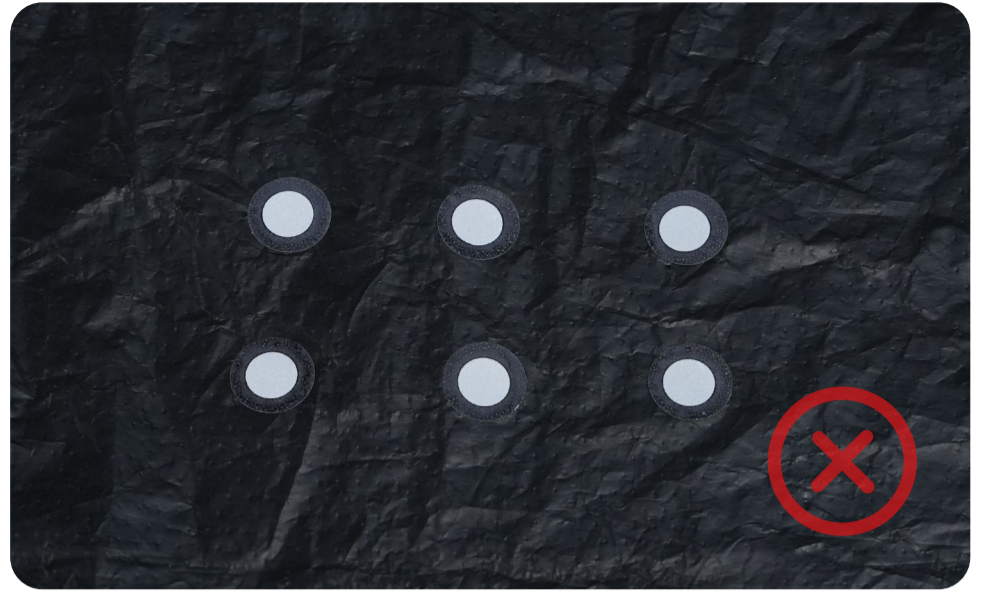
Product Name	INSPIRE 3D scanner	
Space between Markers	3–5 cm	
How to place	Don't place them in geometric shapes or patterns. Place them irregularly.	
Position	Placed on or around the objects' surface.	

Correct and Wrong Placement Examples:
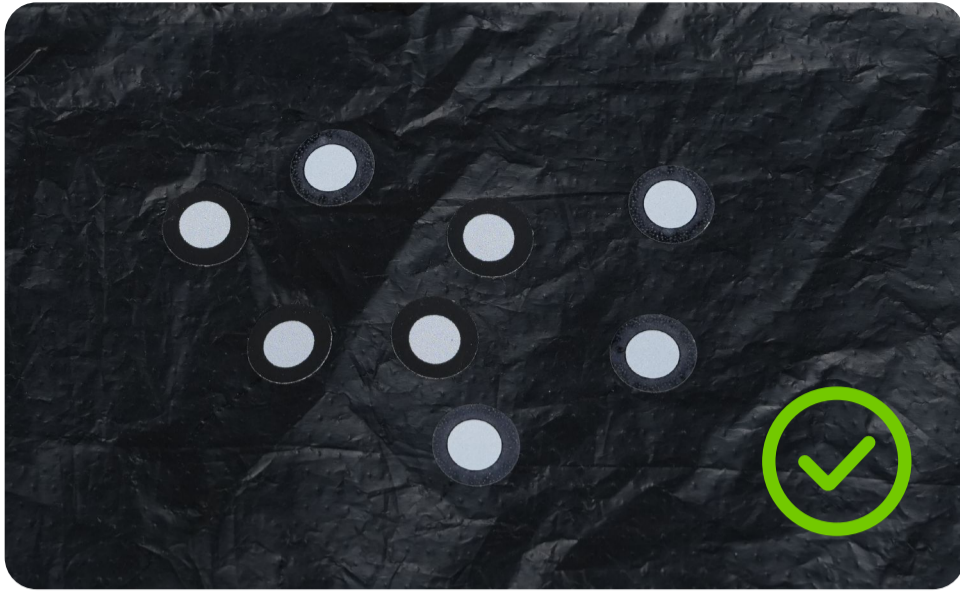
Place markers irregularly

Do not place markers in geometric patterns

3.3 Object Type

Select the correct **Object Type** based on the object to be scanned.

Scan Accuracy	Tracking Mode	Object Type
Standard Accuracy	Feature Tracking	General Object
		Dark Obejct
		Face
	Marker Tracking	General
High Speed(18 fps)	Feature Tracking	Body
		Large Object

3.3.1 General Object

This mode is used to scan most objects with distinct geometric features.

3.3.2 Dark Object

1) This mode is used to scan objects with a black or dark surface, such as black or dark gray clothes, shoes, black boxes, etc.

2) Objects with Black & Reflective Surfaces

When scanning an object with a black reflective surface, the high-gloss surface needs to be treated first to make it diffused so the scanner can see it. When scanning, increase the exposure of the RGB and Depth cameras.

3.3.3 Face

Includes the face and neck.

3.3.4 Body

This encompasses the entirety of the body, from the upper and lower regions to the limbs and hair. (Apply dry shampoo to scan black hair.)

3.3.5 Large Object

This mode is for scanning objects that are equal to or larger than the size of a human body. The object's main physical features and shapes are captured in this mode at a fast scanning speed.
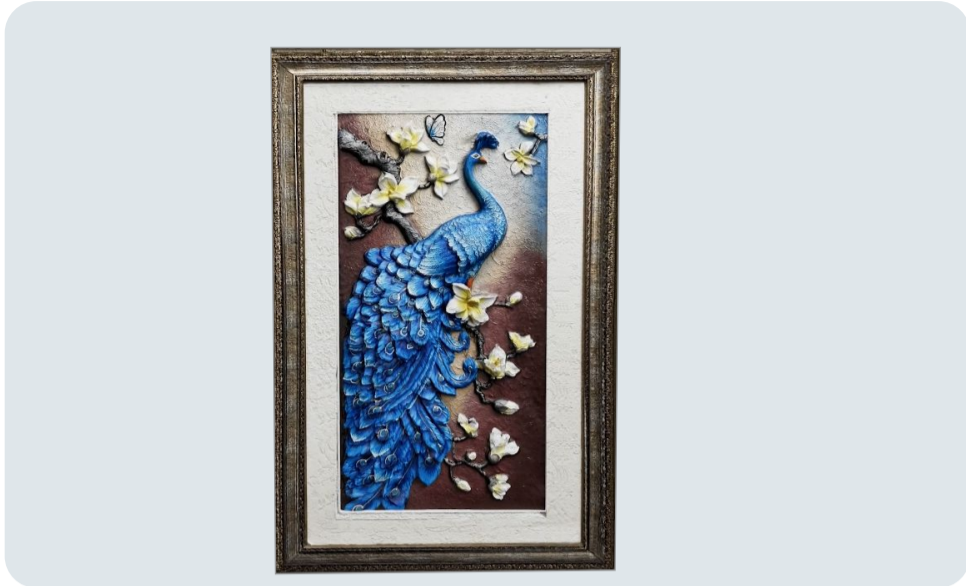
4. Depth and RGB Cameras' Exposure Settings

4.1 Depth Camera

A scanner's Depth Cameras are infrared cameras that capture the 3D point cloud data. Take care adjusting the Depth Cameras' exposure as this directly determines the quality of the 3D model obtained.
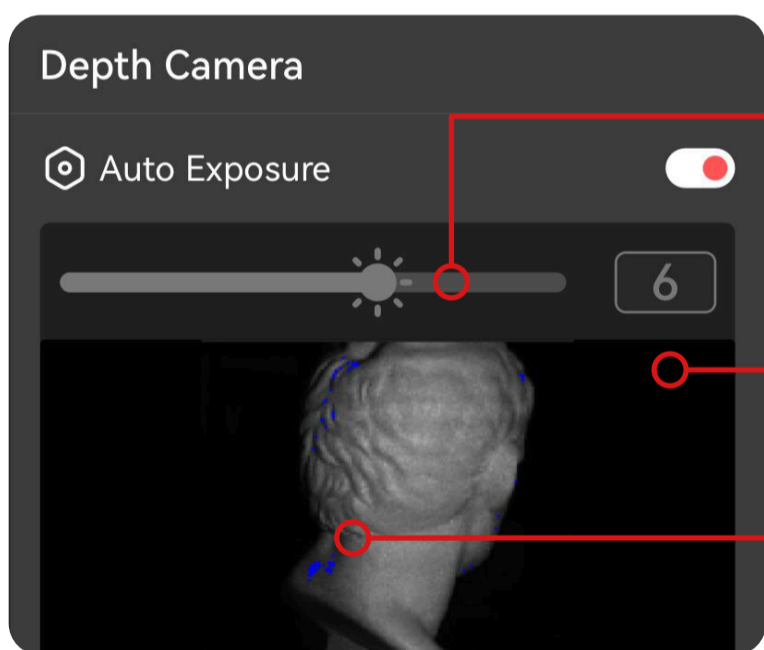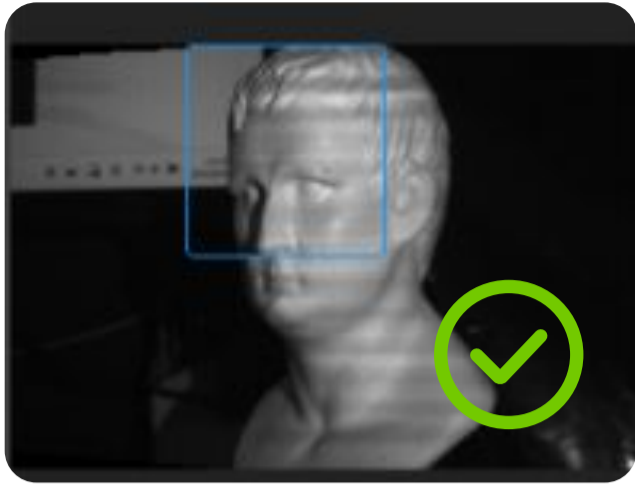

Displays the exposure setting slider and exposure value. Drag the slider bar to decrease or increase the exposure.

This is the Depth Cameras preview window. It shows if an object is underexposed or overexposed with the current exposure settings.

Red areas: Overexposed
Blue areas: Underexposed

Exposure Guidelines

Correct Exposure :
No obvious blue and red areas on the object, and the details are clear.

Underexposed :
Large blue areas on the object and some details can't be seen, so the exposure value needs to be increased.

Overexposed :
Large red areas on the object and some details can't be seen, so the exposure value needs to be decreased.

4.2 RGB Camera

The RGB camera captures the object's color information during a scan. In the RGB Camera window, you can see if the object is overexposed or underexposed.
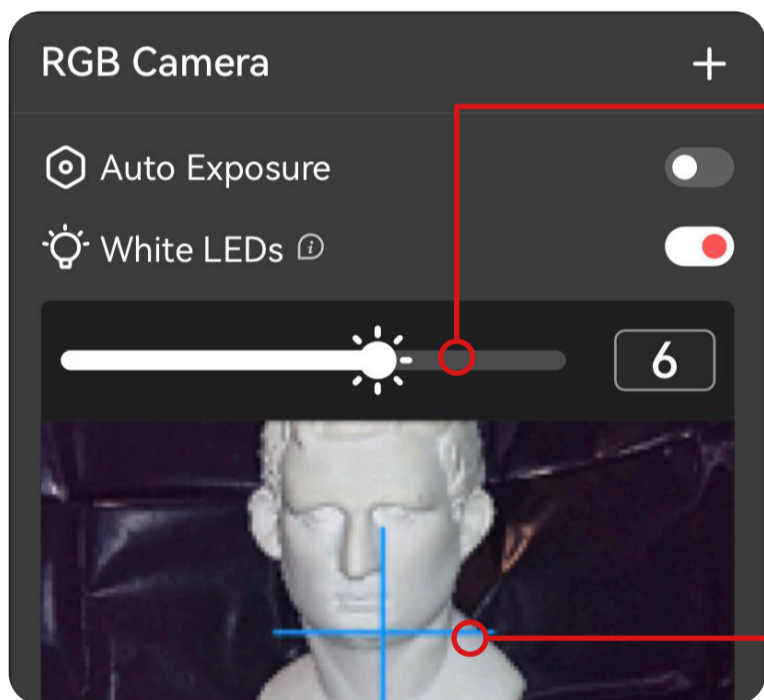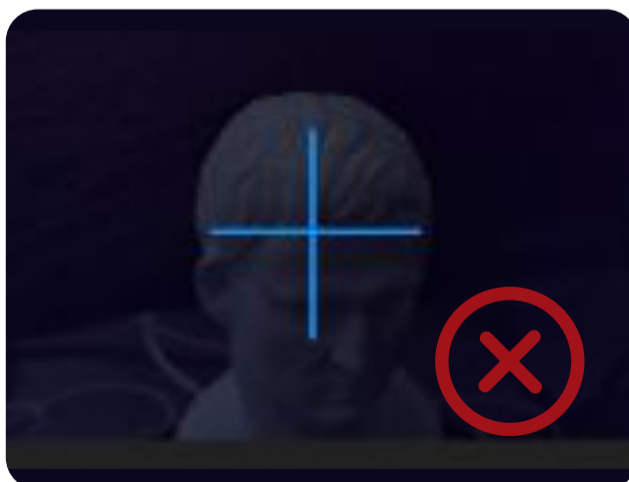

Displays the exposure setting slider and exposure value. Drag the slider bar to decrease or increase the exposure.

The blue crosshair can be used as a reference to aim at the object to avoid it being out of frame.
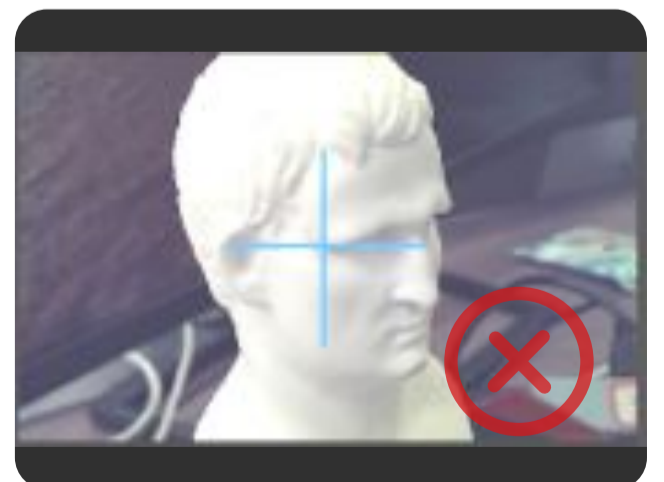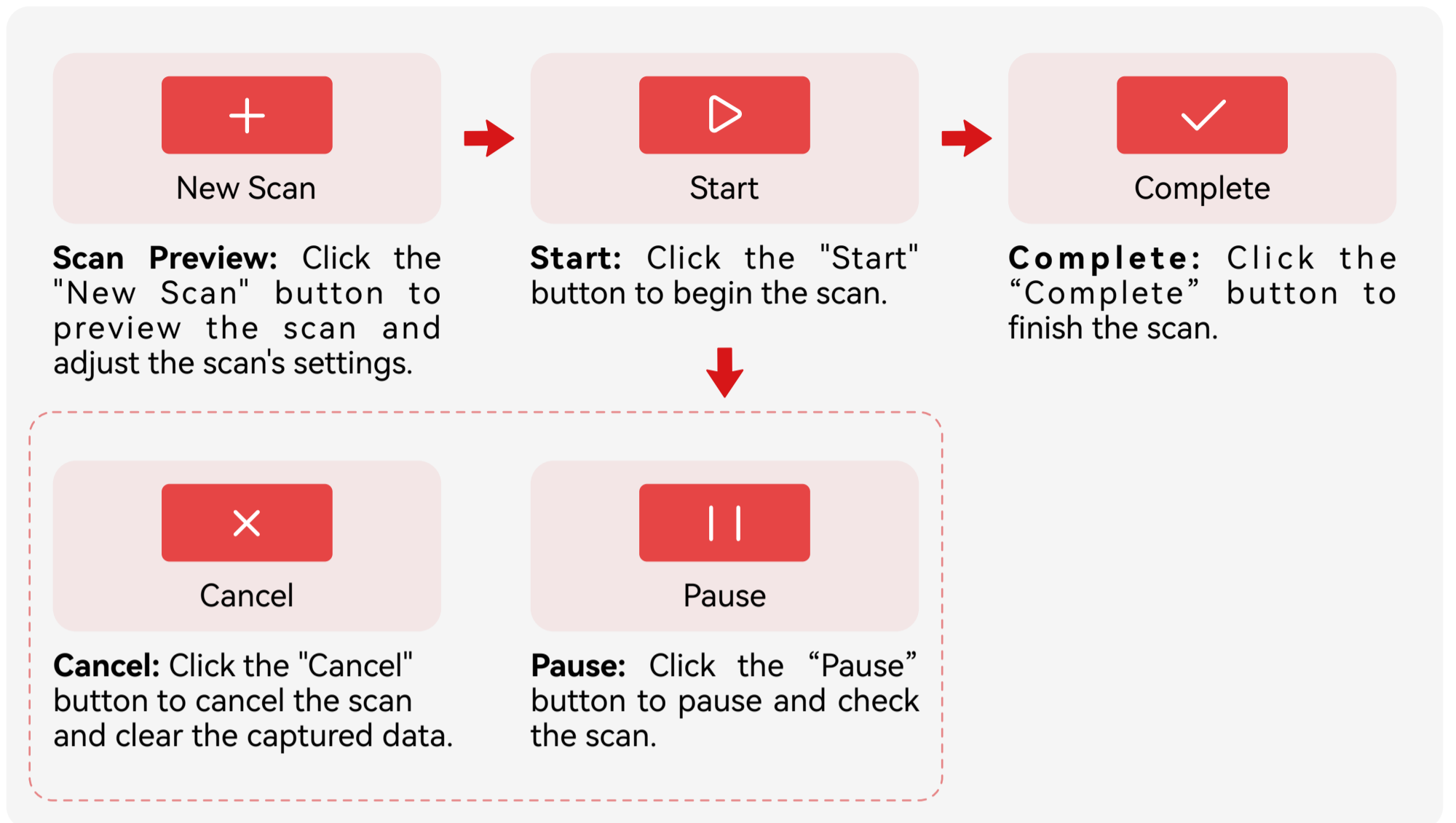
RGB Exposure Guidelines
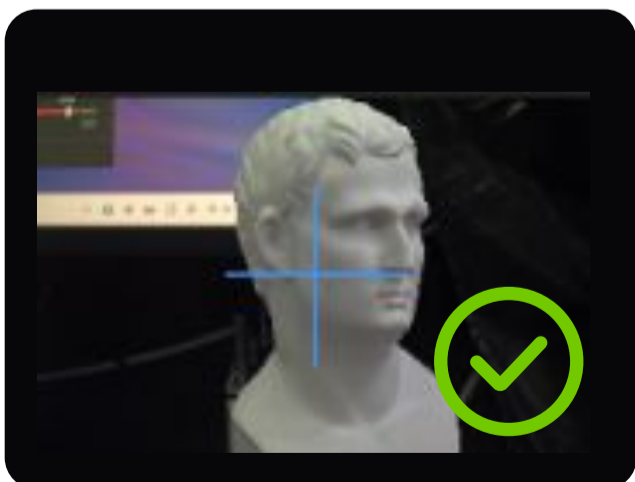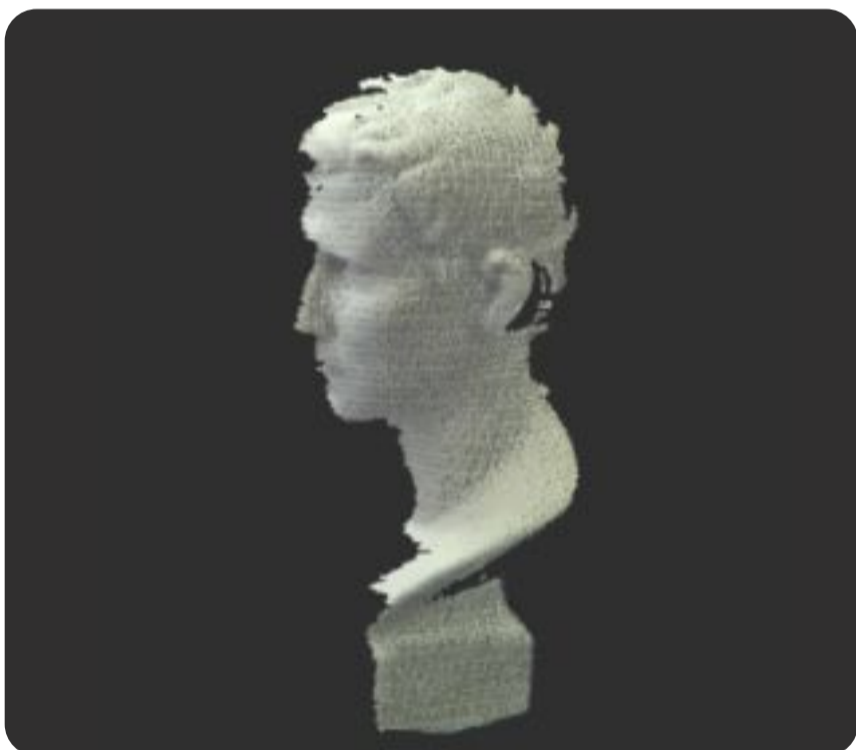

Correct Exposure

Underexposed

Overexposed

5. Scan Controls

+ New Scan	**▷** Start	**✓** Complete

Scan Preview: Click the "New Scan" button to preview the scan and adjust the scan's settings.

Start: Click the "Start" button to begin the scan.

Complete: Click the "Complete" button to finish the scan.

✕ Cancel	**❙❙** Pause

Cancel: Click the "Cancel" button to cancel the scan and clear the captured data.

Pause: Click the "Pause" button to pause and check the scan.
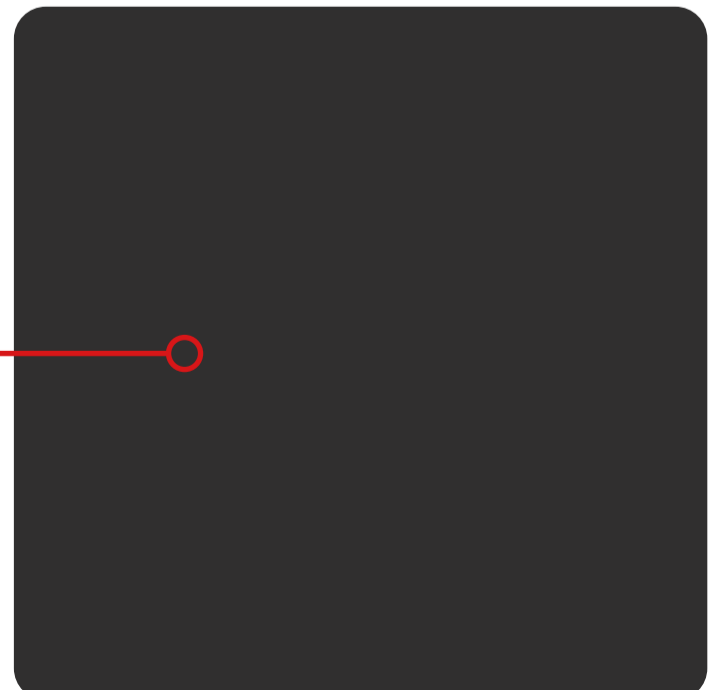
5.1 Scan Preview

+

Click the "New Scan" button to preview the scan and adjust the scan's settings.

Error Display
If there are no point clouds or very few point clouds in the preview window, please check whether it is a scanner failure, the depth camera is underexposed, or the scanner is not aimed at the object.
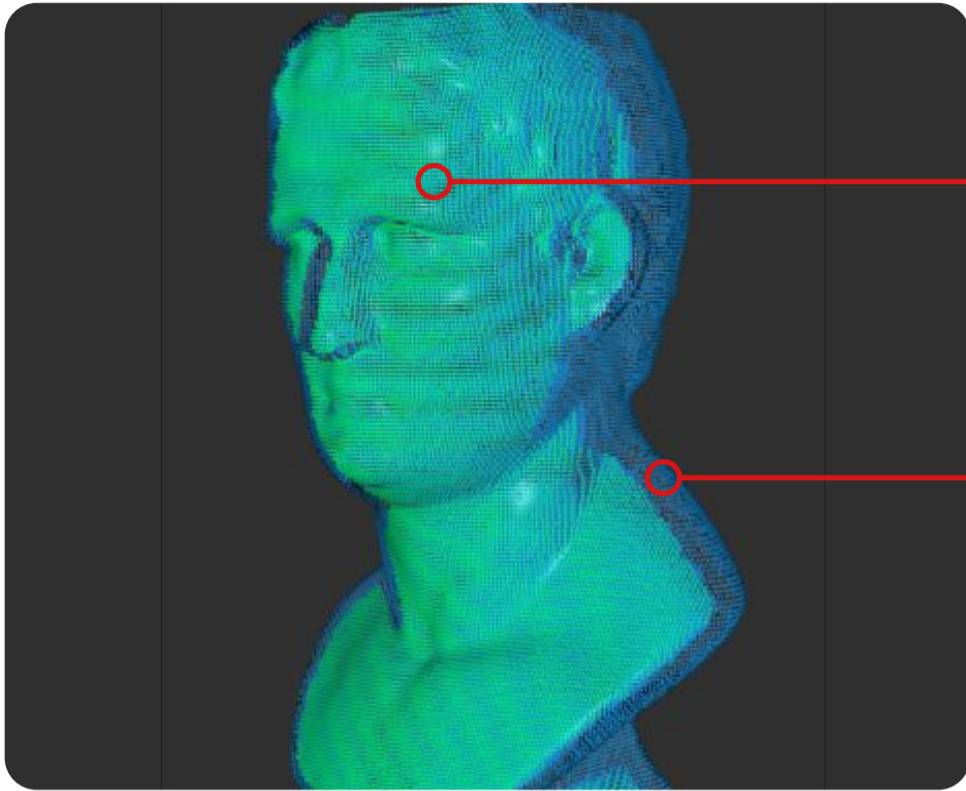
Blank preview window with no visible point clouds.

5.2 Start/Pause Scanning

Click the "Start" button to start acquiring point cloud data. Click it again to pause the scan.
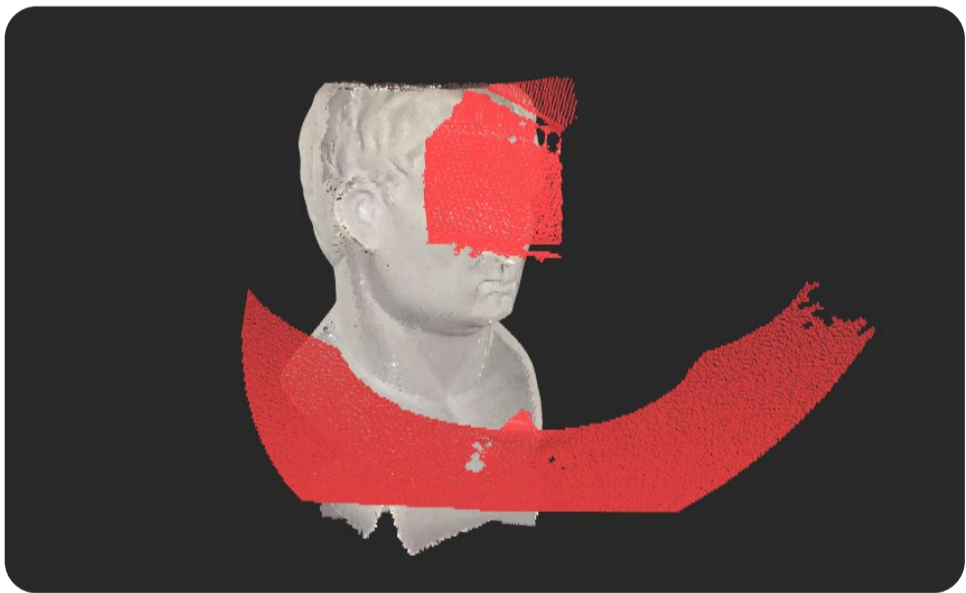

Green Areas:
This is the portion of the object currently seen by the scanner.

Bule Areas:
These are the previously-scanned areas of the object.

Scanning Errors:

Shown in Red

Red indicates tracking lost. When a "Tracking Lost" warning is displayed, re-target the scanner to a previously scanned area (blue) and keep it still for several seconds so that the scanner can re-acquire tracking. When the red portion of the display changes to green, scanning can resume.
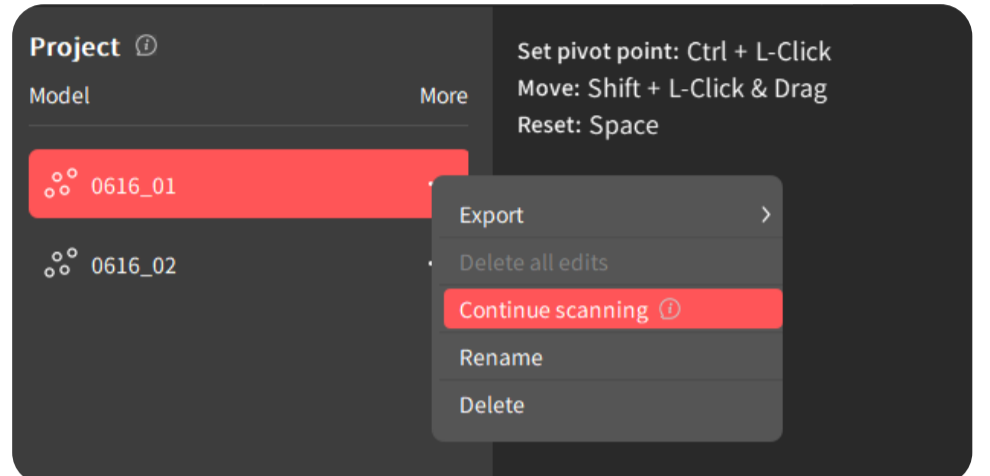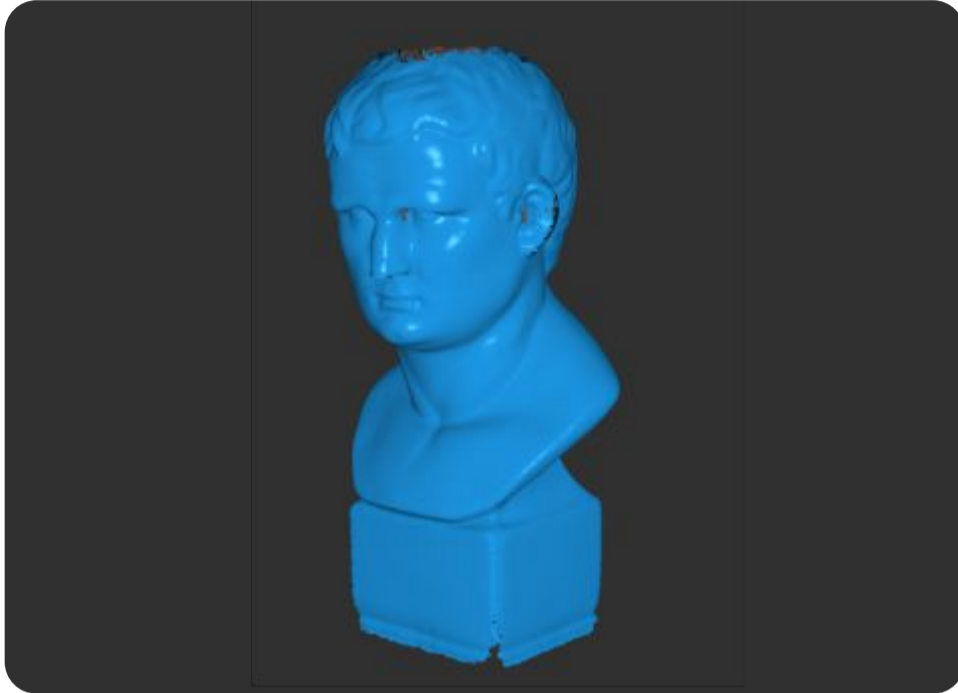
Shown in Yellow

Yellow indicates the captured data is aligning. If the yellow is shown for only a short time, continue to capture data. If it doesn't disappear, the software has frozen and will need to be restarted.

5.3 Completing the Scan

Click the "Complete" button to finish acquiring point cloud data. After fusing the captured point clouds, you can edit the scan.


Project ⓘ

Model   More

Set pivot point: Ctrl + L-Click
Move: Shift + L-Click & Drag
Reset: Space

0616_01

Export   >

Delete all edits

0616_02

Continue scanning ⓘ

Rename

Delete

If you are not satisfied with your scan or missing some important data, find your model on the Project Panel to continue scanning.

6. Scanning Tips

6.1 Aim at the Object

Please make sure to keep the scanner facing the object you are scanning and maintain a suitable distance during the entire scanning process.
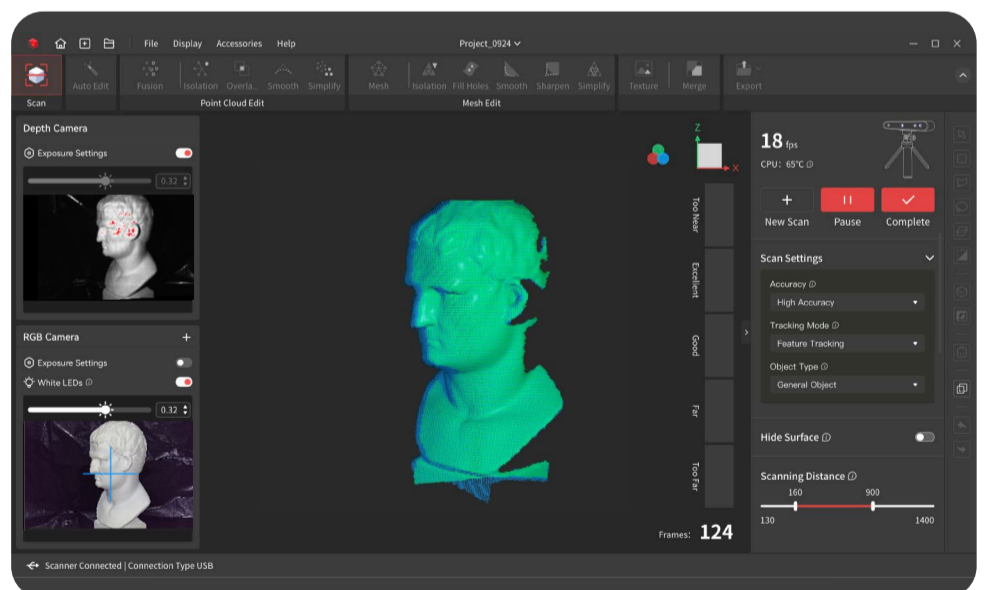
6.2 Slow and Stable Movement

• Slowly and steadily move the scanner around the object, maintaining a consistent distance.

• Ensure that you scan all the outer surfaces of the object by moving the scanner over them.

• Avoid scanning the same areas repeatedly.

6.3 Scan Distance

The scanning distance indicator bar in Revo Scan 5 lets you know if the scanner is at the correct distance from the object being scanned.

• **Green:** Excellent distance.

• **Yellow:** Indicates the scanner should be moved slightly closer or away from the object.

• **Red:** Indicates that the scanner is too far or too close to the object.

Too Near		
Good		
Too Far		

Excellent distance   A bit of further or closer   Too close or too far
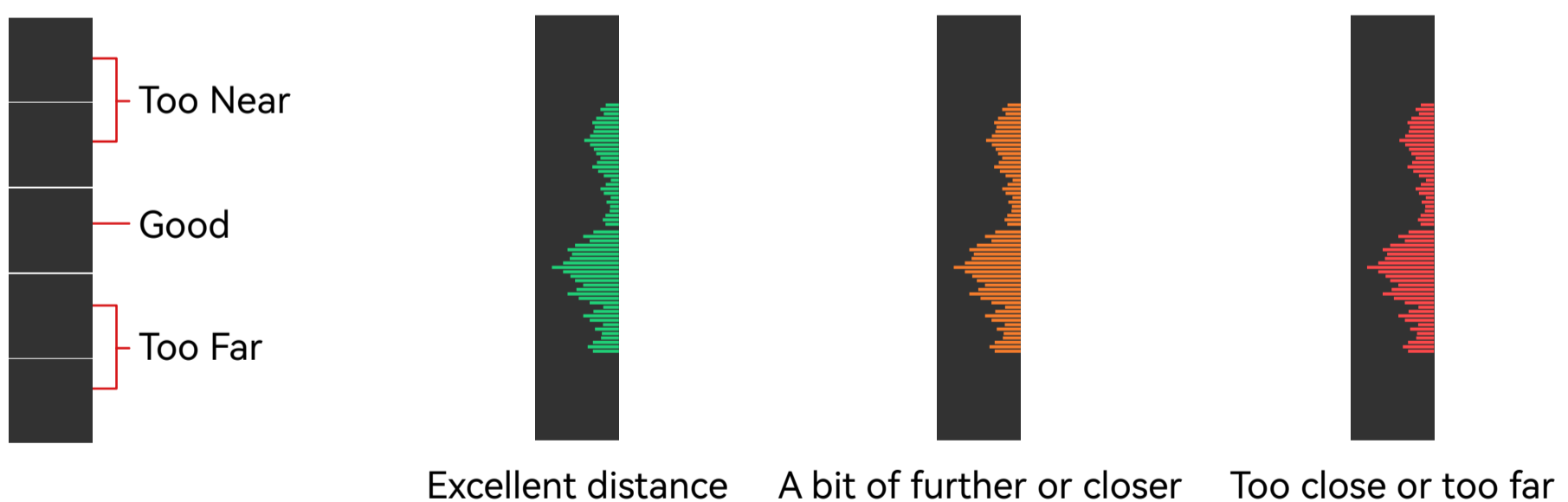
7. Troubleshooting Scanning Errors

7.1 Insufficient Point Clouds Captured



Not enough point clouds captured
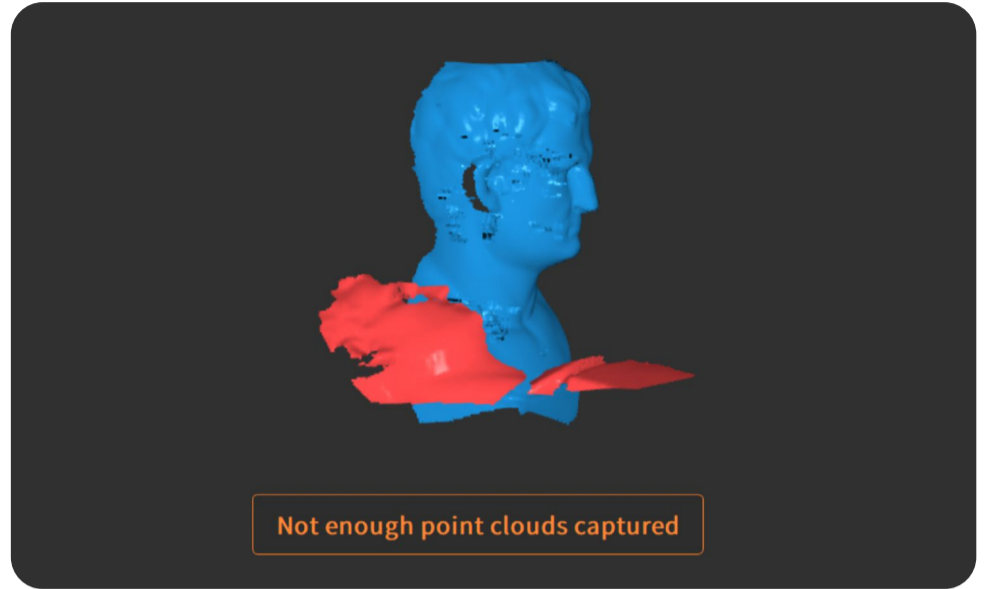
Step 1: Check if the object is fully in the scanner's field of view.

Step 2: Check the object's surface characteristics, including its smoothness, reflectivity, color (particularly dark, black, or transparent shades), and material composition, particularly if it is made of glass. If any of these are true, then scanning spray is necessary.

**Step 3:** Check the Depth Camera's exposure.
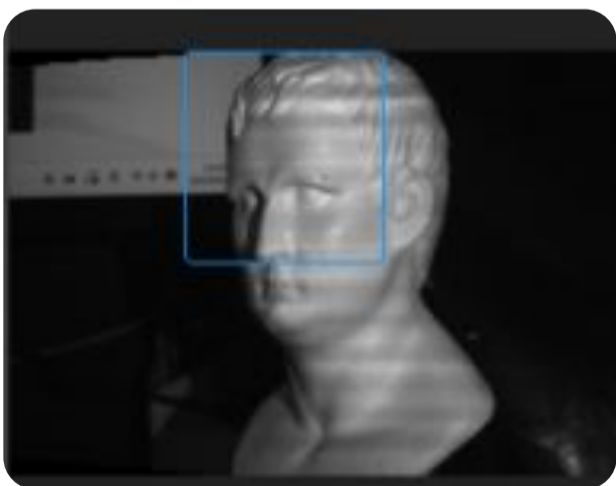
| Proper Exposure | Underexposed | Overexposed |

Check the depth cameras' preview window. If there are large areas in blue or red, adjust the exposure settings.

Step 4: Ensure that the scanner is positioned directly in front of the object. Also, ensure that the scan distance is within the appropriate range, indicated by the distance bar showing green.
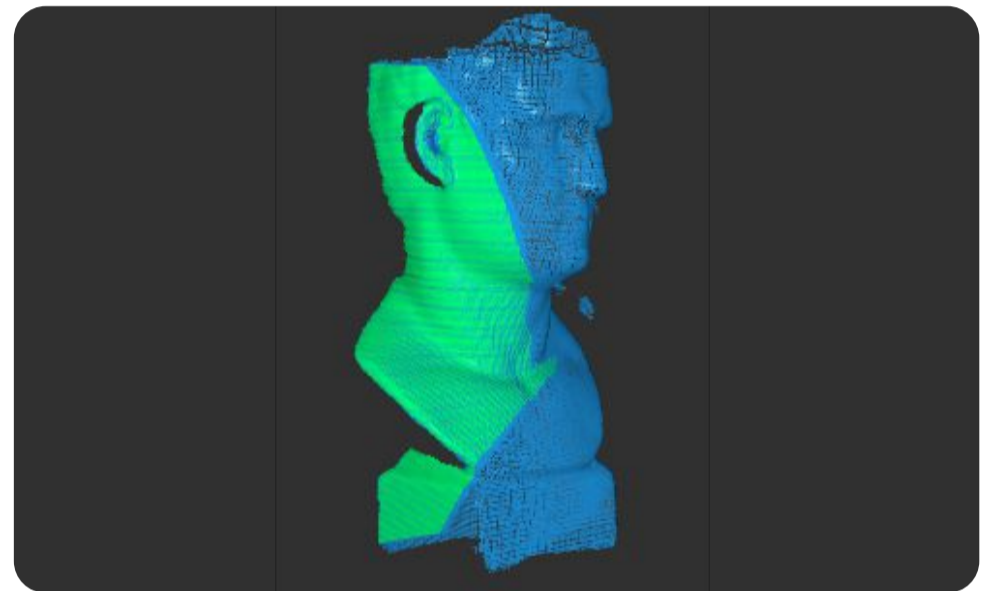

Too Near

Good

Too Far
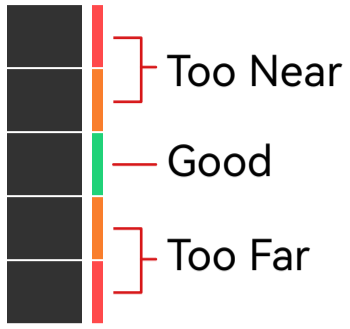
7.2 Tracking Lost

If a "Tracking Lost" notification appears during scanning:

Tracking Lost
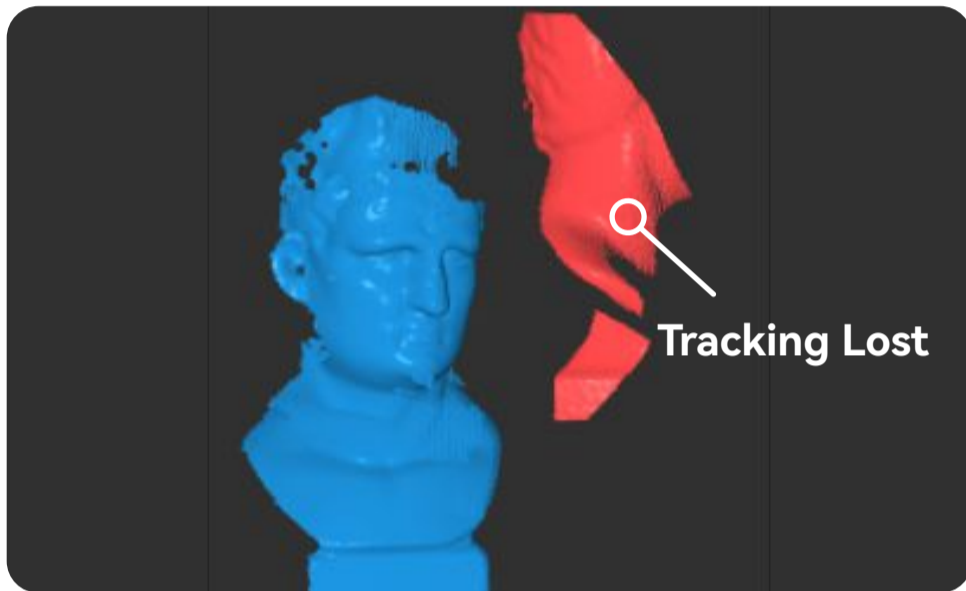
Re-target the scanner to a previously-scanned area (blue) with plenty of distinct features, and keep it still for several seconds to re-acquire tracking

When the red portion of the display changes to green, resume scanning

7.3 Noise and Holes on the Model

Occasionally, a captured model may contain noise and holes. There's no need to worry, as you can fix this issue by editing the model afterward.
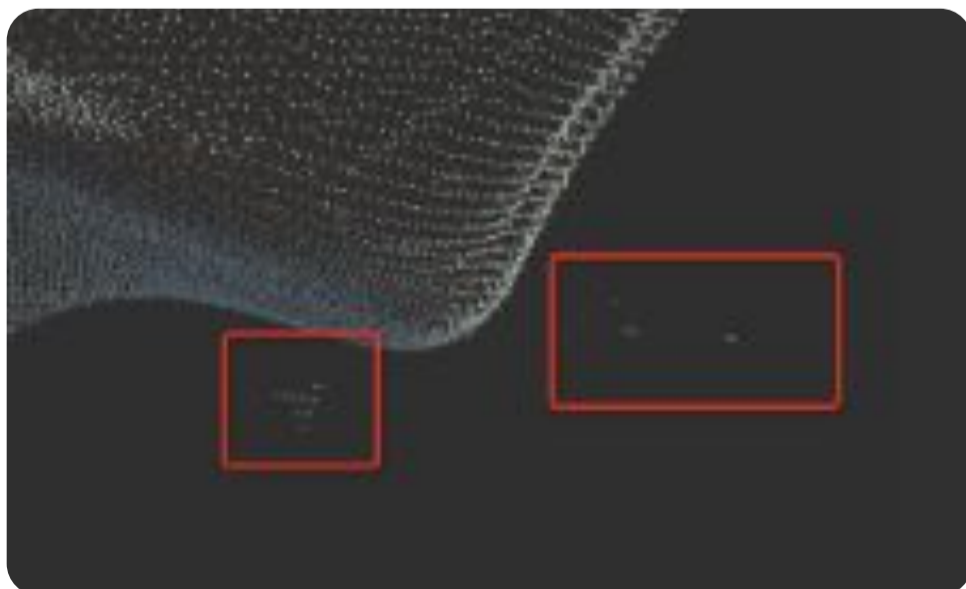
Isolated points around the model

Small holes on the model

7.4 Deleting a Scan or Re-scanning
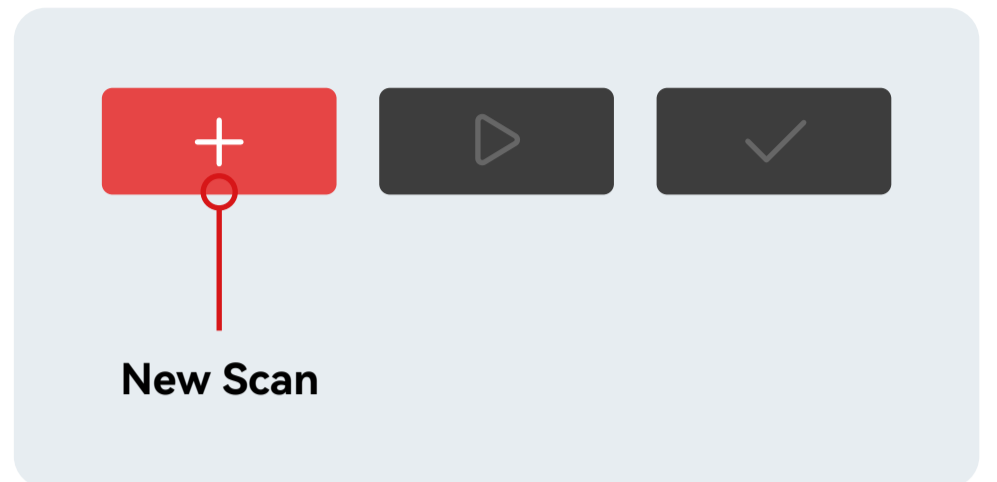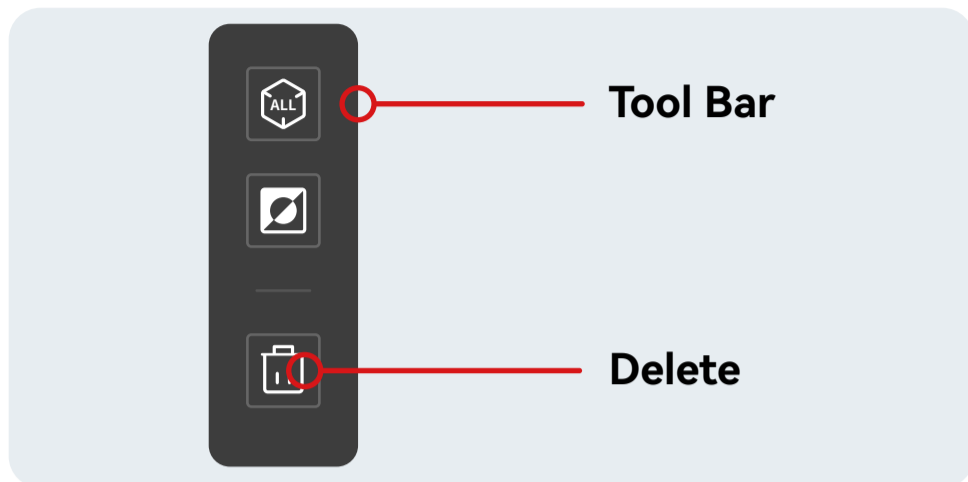
In case of a significant area of misalignment in the captured data or if you are dissatisfied with the scanned model, you have two options. You can either click "Complete" to initiate a fresh scan or use the delete icon on the toolbar to remove the existing data and start a new scan.

Tool Bar

Delete

New Scan

7.5 Frequent Tracking Failures

Step 1: Verify whether the object has many geometric features. Take note of any curved, flat, or symmetrical surfaces, as these can potentially impact the scanning process.

Symmetrical
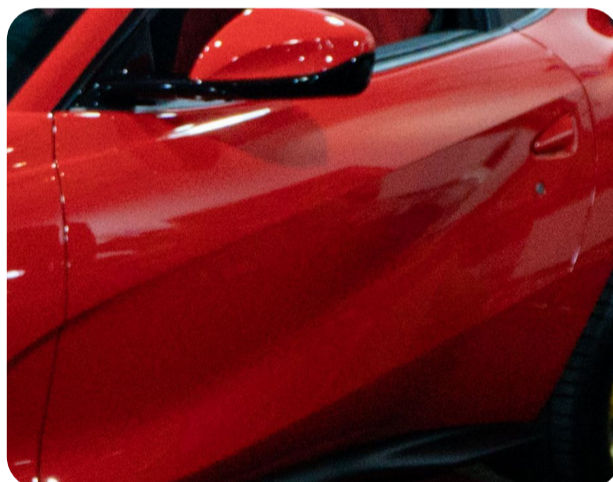
Curved

Flat

Step 2: Use Markers.

If an object doesn't have many distinct geometric features, please use marker points to help with scanning.

Using a disposable cup as an example.

Stick the marker dots on the cup

Stick the marker dots around the cup

While scanning, the markers will appearas red dots as the scanner detects them.

8. Model Editing

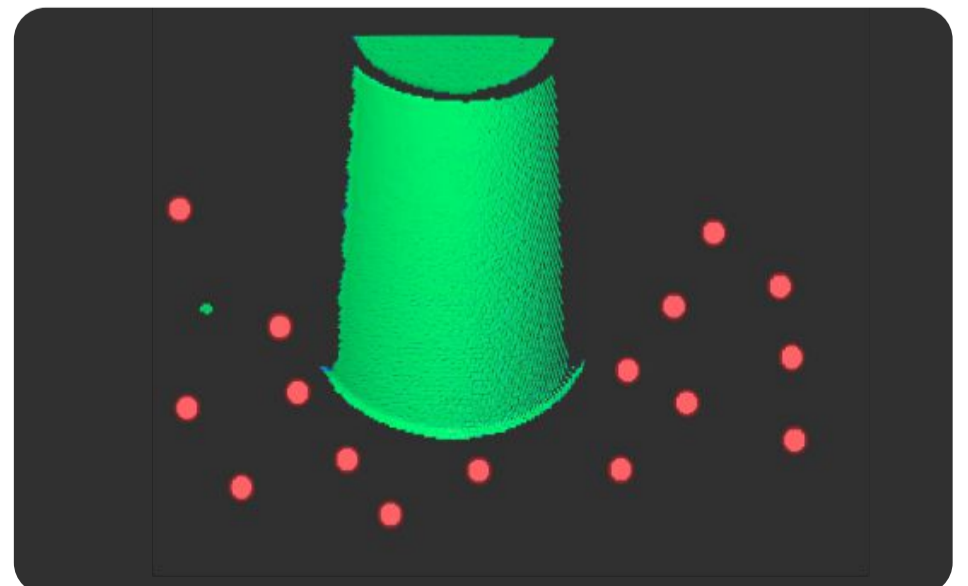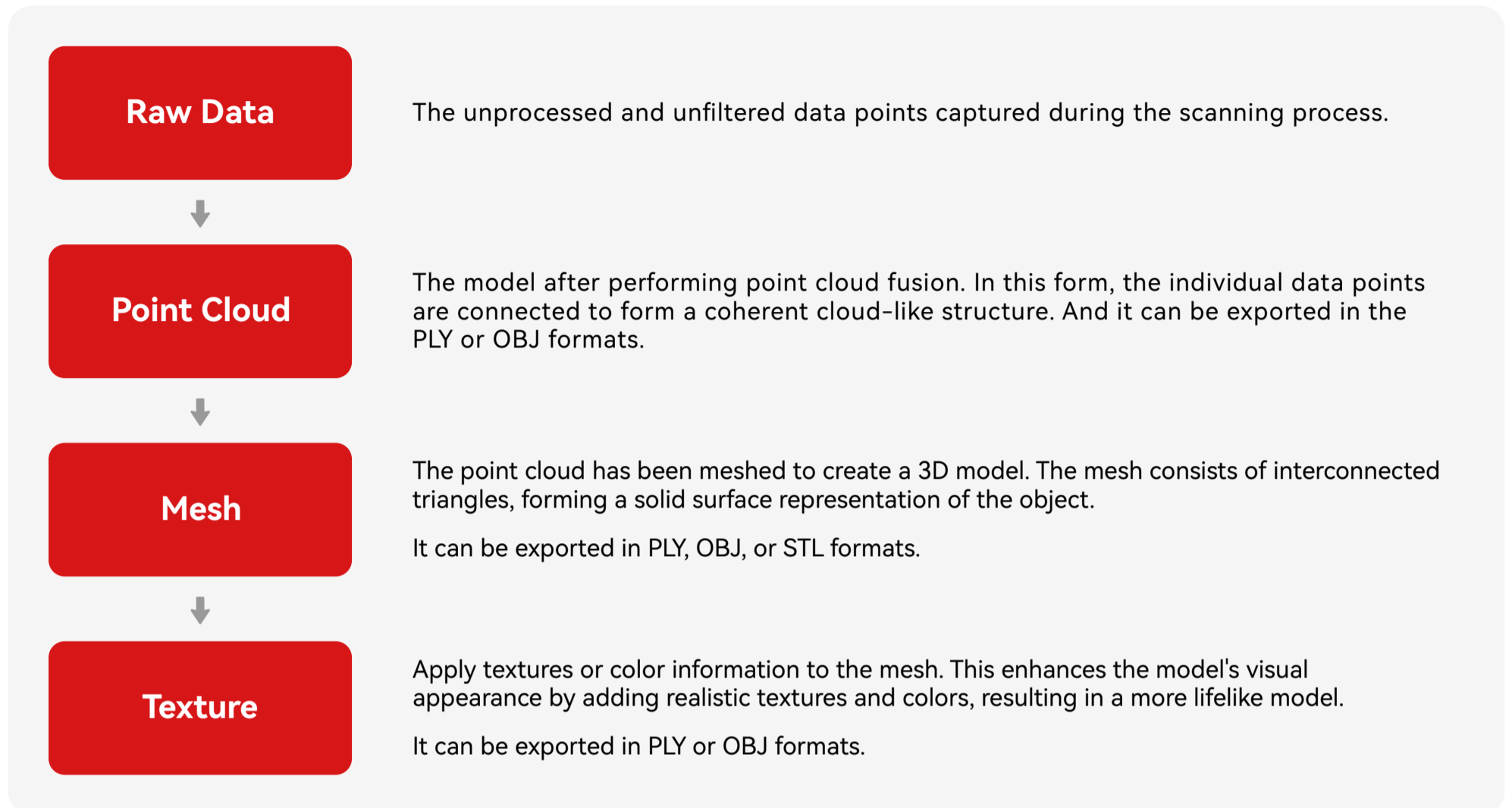After completing the scan, the model can be post-processed into a unified point cloud (fusion), a 3D model (meshing), and, finally, textured.

Raw Data

The unprocessed and unfiltered data points captured during the scanning process.

Point Cloud

The model after performing point cloud fusion. In this form, the individual data points are connected to form a coherent cloud-like structure. And it can be exported in the PLY or OBJ formats.

Mesh

The point cloud has been meshed to create a 3D model. The mesh consists of interconnected triangles, forming a solid surface representation of the object.

It can be exported in PLY, OBJ, or STL formats.

Texture

Apply textures or color information to the mesh. This enhances the model's visual appearance by adding realistic textures and colors, resulting in a more lifelike model.

It can be exported in PLY or OBJ formats.

To learn more about these processes read about post-processing in the Revo Scan manual.

ONLINE SUPPORT

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Contact
Revopoint Customer Support

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