REVO POP SERIES 3D SCANNERS

Advanced Scanning Tips

V 3.0

2022.04

REVOPOINT

Revo POP Series 3D Scanners

Visit our official website www.revopoint3d.com for the latest software and documents.

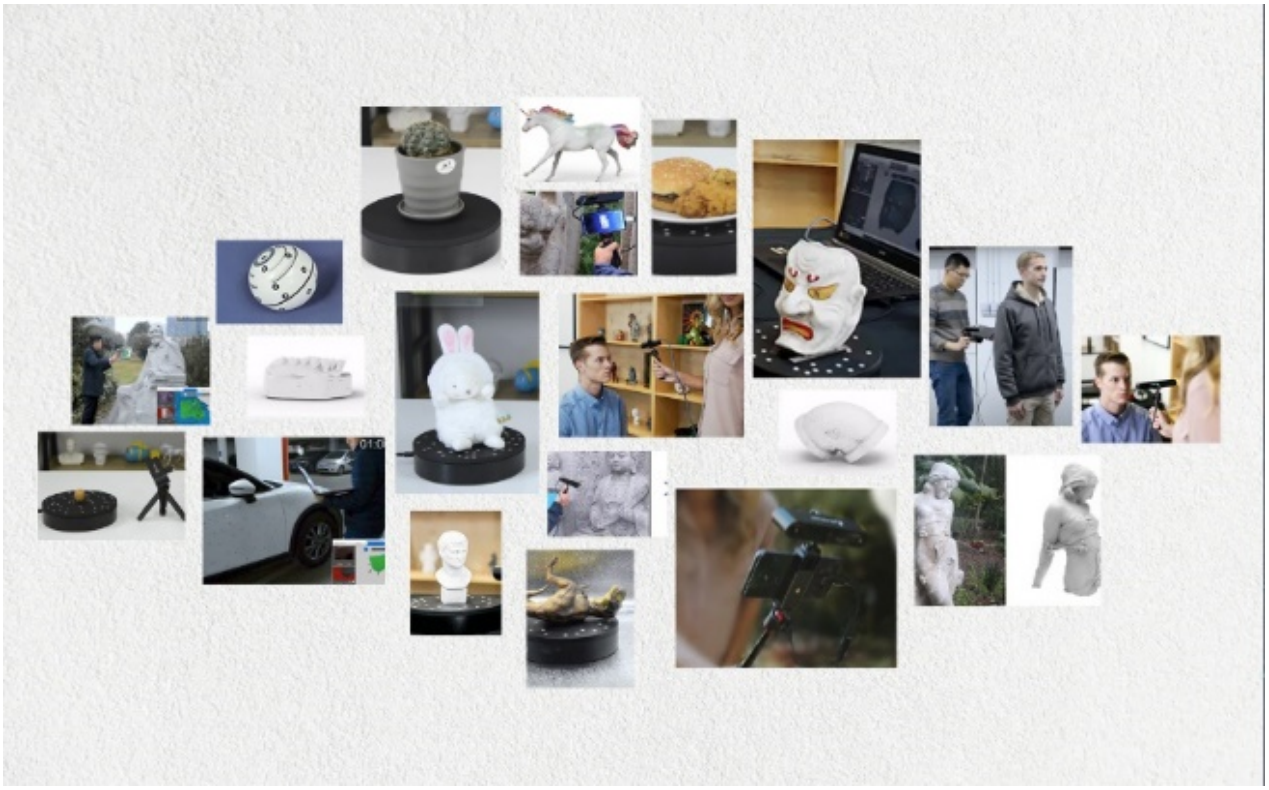
⚠ The operating temperature of this product is 0°C to 40°C. It does not meet the standard operating temperature for military-grade application, which is required to endure greater environment variability. Operate the product appropriately and only for applications that it meets the operating temperature range of that grade.

Content

What Can Scan and What Can't Scan

1. What Can Scan

(1)Objects with plenty of geometrical features and complex shapes.



(2)Objects with simple geometric features (scan with Markers)；

2. What Can't Scan

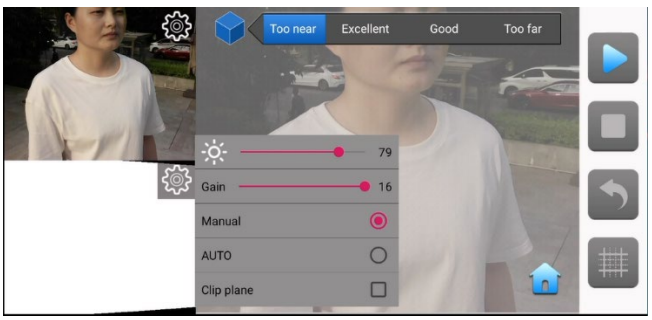
Revo POP Series 3D scanners are optical devices, not suitable to scan glass, transparent or reflective objects; in case scanning them, further processing is needed. The following are objects that can’t be scanned directly:

（1）Transparent objects(cups, glasses etc.); ✖

（2）Shining objects with metal/plating surfaces; ✖

（3）Objects easily deformed (soft bags, etc.); ✖

(4) When the sun beats down. ✖



3. How to Process Unscannable Objects

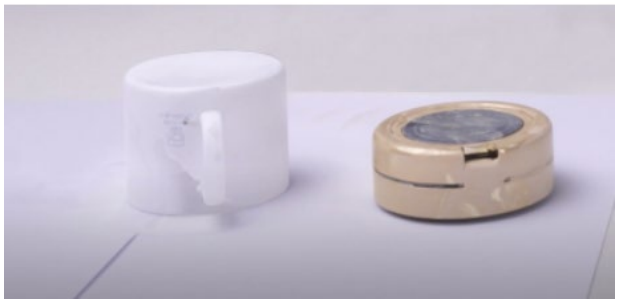
(1) Spray scanning spray:



(2) Apply powdery substances (liquid foundation, flour, etc.);

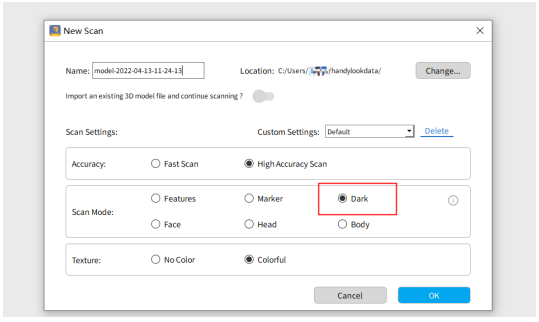


Examples for processed objects:

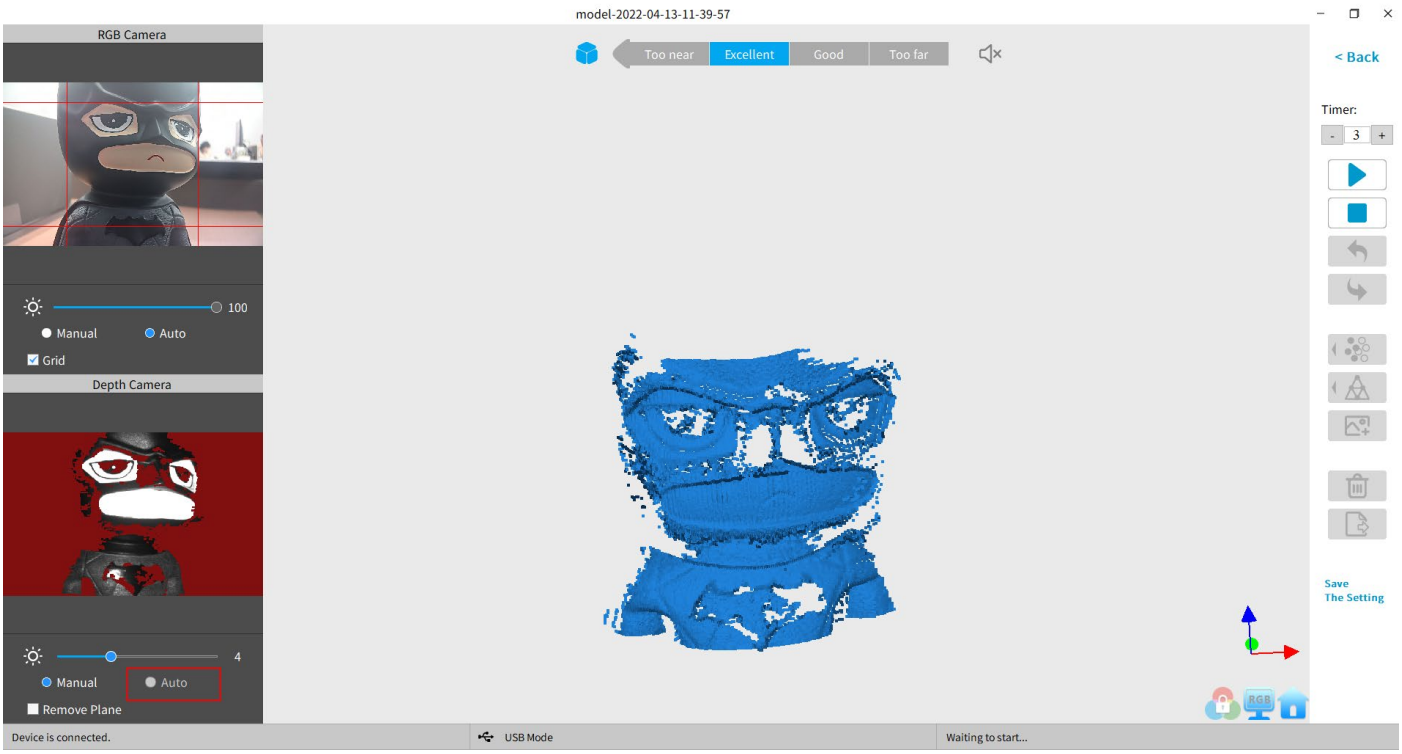


How to Scan Black Objects

When scanning black objects, the " Dark" mode is recommended.



In “Dark” mode, the "Auto" is invalid. Please adjust the brightness manually based on default values.



1. Scan Objects with Black but Diffuse Surfaces

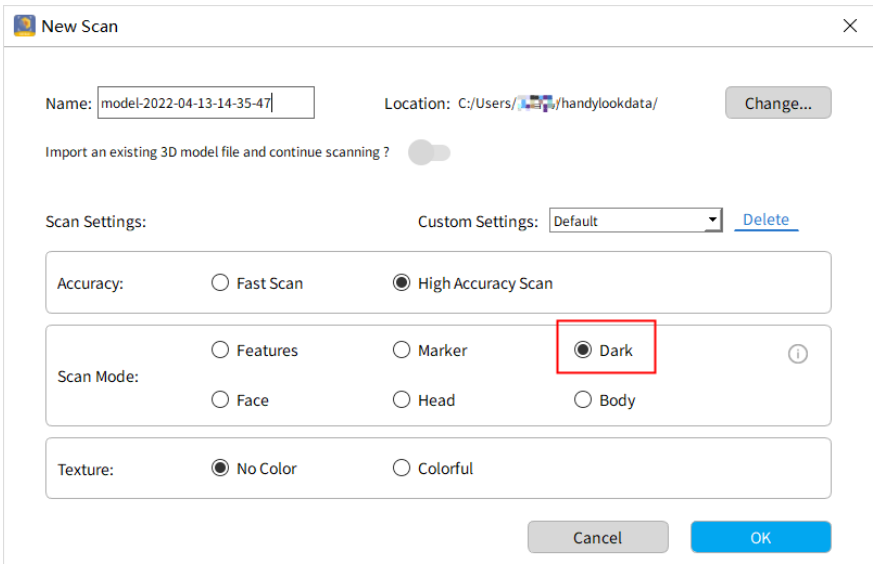
a. Click “New Scan”;
b. Select "**Dark**" mode;
c. Click “OK” in New Scan page;
d. Adjust the distance to be Excellent.
e. Adjust the Sun Icon to display a proper brightness in the preview window of the RGB camera and depth cameras;
f. Start to scan.
g. Complete scanning and export the scanned 3D model.

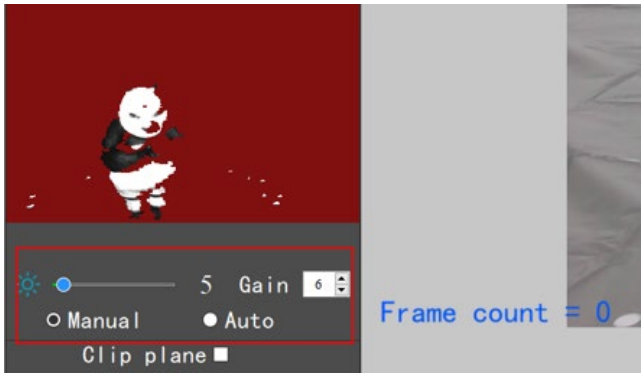
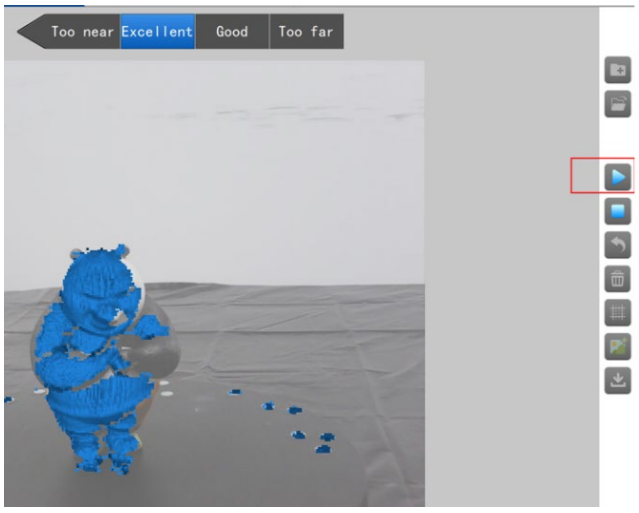
2. Scan Objects with Black but Highly Reflected Surfaces

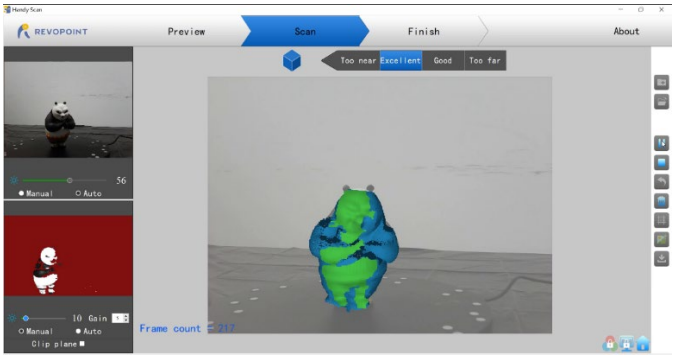
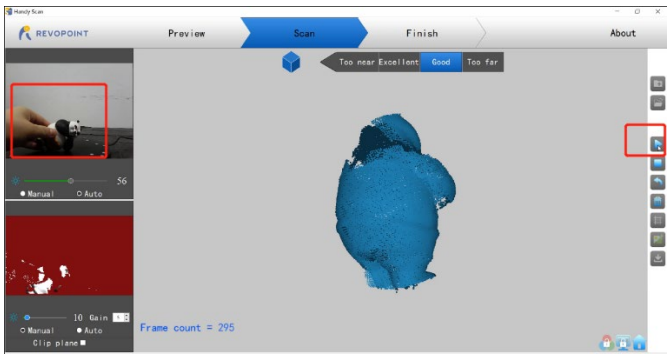
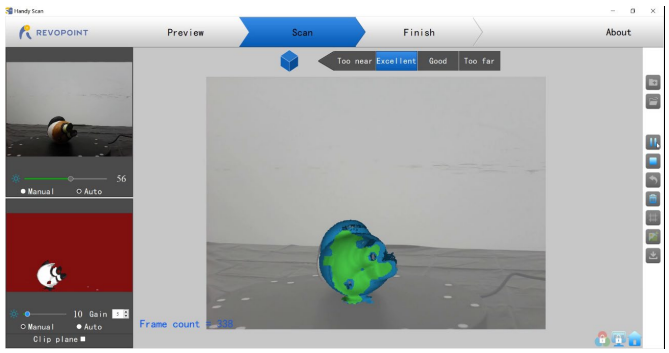
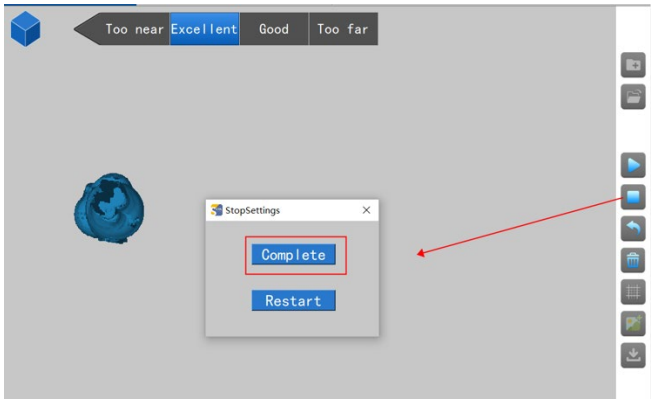
a. Apply a scanning spray to process the surfaces into a **diffuse-reflection ones**;
b. Select "**Dark**" mode in New Scan popups;
c. Adjust the distance between the object and the scanner to be in Excellent;
d. Adjust the Sun Icon to display a proper brightness in the preview window of the RGB camera and depth cameras;
e. Start to scan.
f. Complete scanning and export the scanned 3D model.

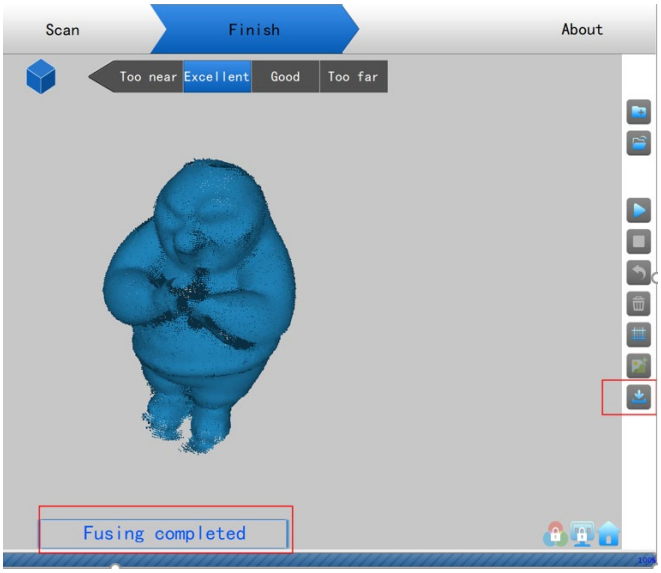
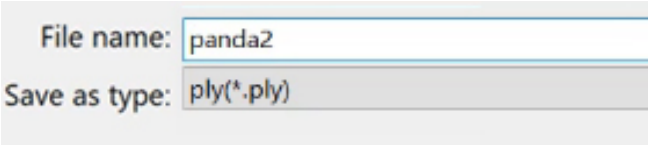
3. Scan Objects in Black and White

When scanning objects in black and white or objects in dark color, it's recommended to select "Dark" mode to complete it. Here we will scan a black-and-white Panda as the example:

a. Select "Dark" mode in New Scan popups.	

b. Adjust the distance between the Panda and the scanner in "Excellent";	
c. Adjust the brightness for the RGB camera and depth cameras;	
Note: Make sure more points (both black and white areas) shown in the depth camera window.	
d. Start to scan;	
e. Scan Panda;	

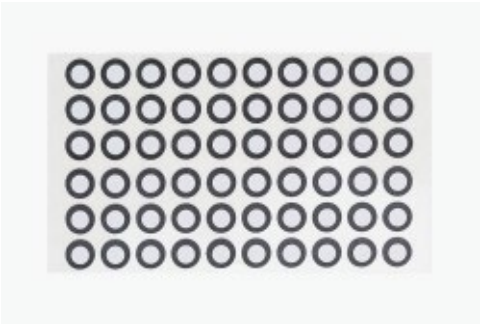
1) Scan for the first **rotation;**	
2) **Press "Pause"** to turn over Panda;	
3) Scan for the **second** rotation;	
4) Complete scanning; (if it's necessary, you can mesh and texture map the model after completing scanning.)	

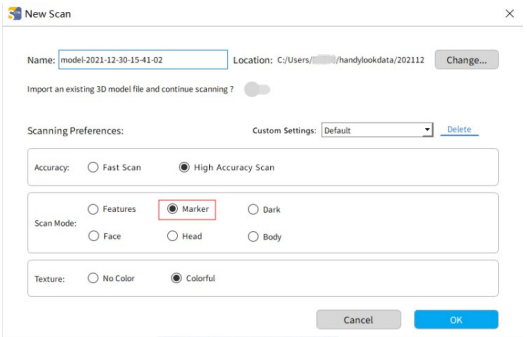
f. Export scanned 3D model;	
g. Name the model and select a file format (ply. Obj. or stl.).	

How to Scan with Markers

Introduction

Objects with geometrical features and complex shapes, scan with "Feature" mode directly.
However, when scanning objects like cups or boxes with simple geometric features, scan with markers. And select "Marker" mode.





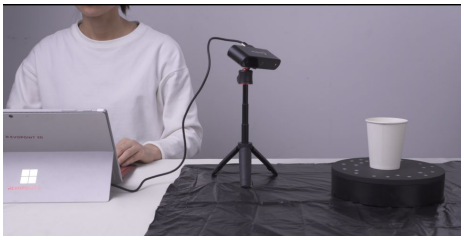
Scanning Methods

There are **three scanning methods**:

1. Stick markers on the surface of an object;

Here follows a car scanning video: https://www.youtube.com/watch?v=2GPHCrbNdhE

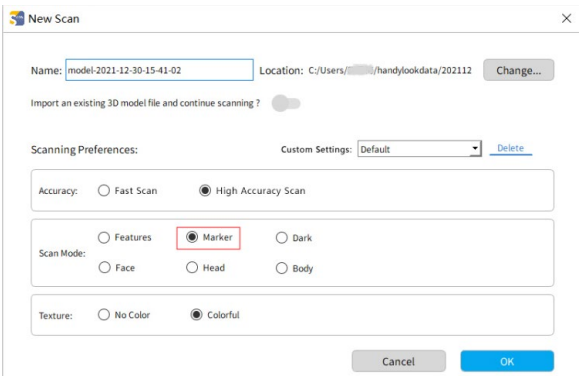
2. Place an object on the desk with markers.
3. Place an object on a turntable with markers.

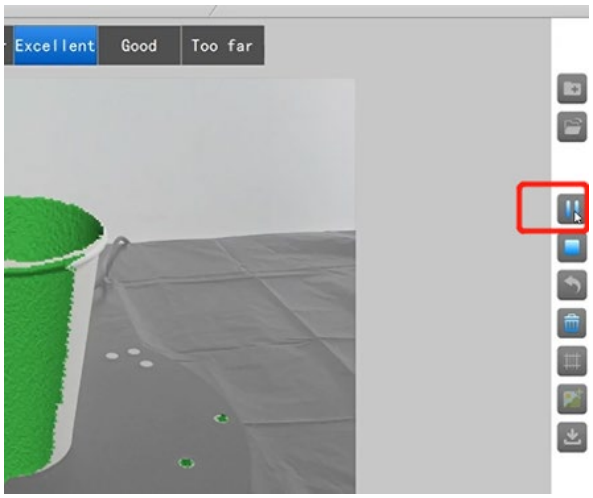
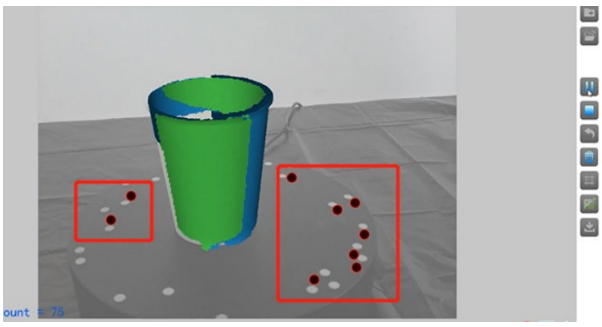
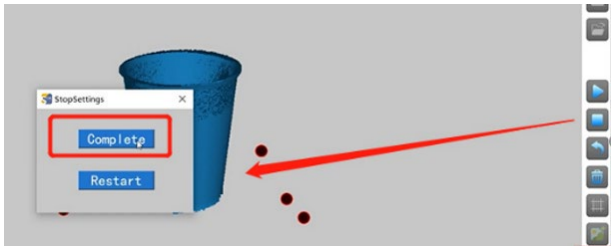
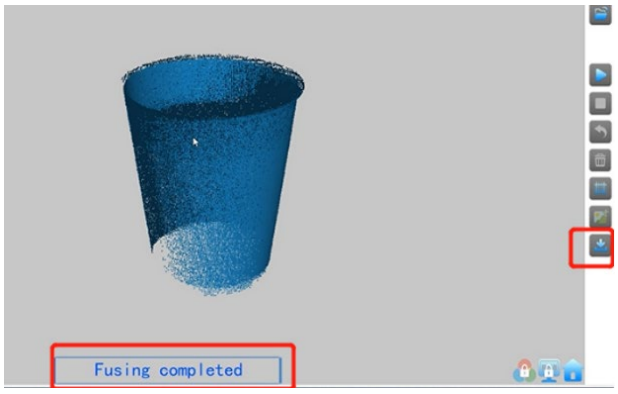


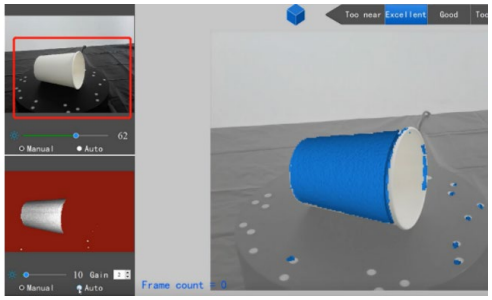
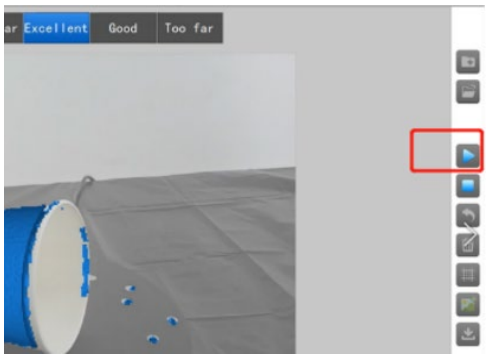
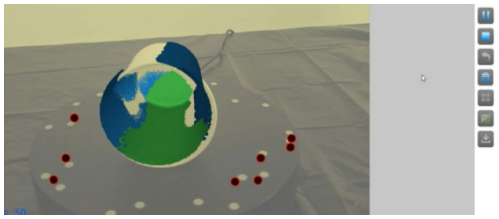
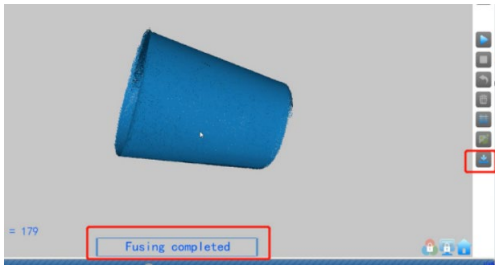
In the 2 &3 methods, the relative position of an object and a turntable/desk **cannot change.** To ensure that, you shall export several models of an object to merge a complete 3D model.

Scan an Object with the Markers on a Turntable

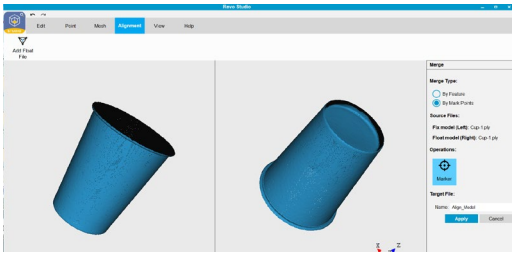
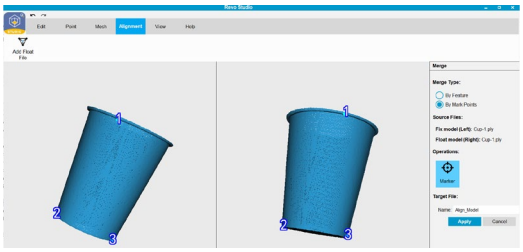
For example, we scan a cup (with simple feature):

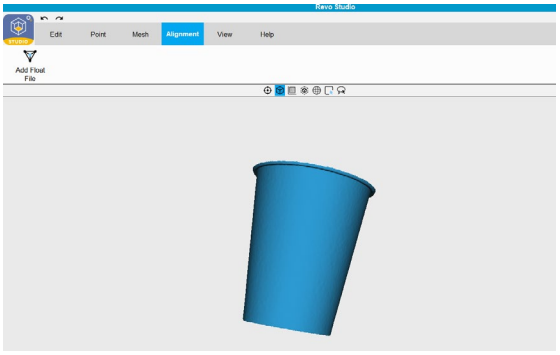
a. Raise the tripod to make the POP and markers being approximately 45°-60°;	
b. Select "Marker" mode;	
c. Adjust an "Excellent" distance;	
d. Adjust the brightness in preview windows of RGB camera and depth cameras;	
e. Scanning;	
The First Model Scanning	

1) Start to scan;	
2) Make sure Markers valid (more than five red dots in the center window);	
3) Complete scanning;	
4) Export 1st model;	
5) Name the model Cup 1, save in ply., obj., or stl.;	
The Second Model Scanning	

1) Turn the cup over;	
2) Start to scan;	
3) Scan the 2nd rotation; Note: Make sure Markers valid (more than five red dots in the center window);	
4) Export the 2nd model in ply., obj., or stl.;	

f. Merge the two models in Revo Studio;

1)Models imported in **Revo Studio**;	
2)Mark on models; The number of mark points shall be more than 3.	

3)Click “Apply” to merge the two models into one;	

Note:

1) Scanning repeatedly can't help the accuracy, and only a closer distance can improve it.
2) If necessary, you can scan more than 2 models to merge them into a complete one.

How to Scan Small Objects

Scan Small Objects

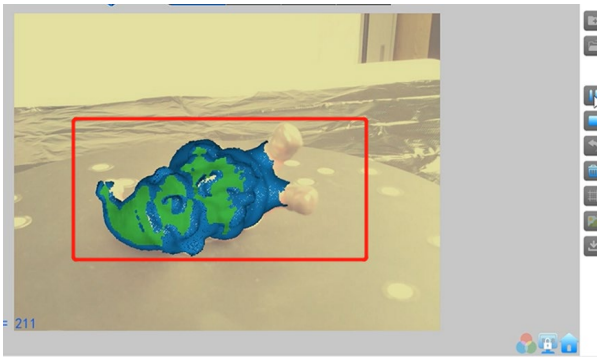
Keep a closer distance while scanning small objects.

Note: Scanning repeatedly couldn't help the accuracy, and you can improve it by adjusting to a closer distance.

The following are scanning steps:

1. Scan at a proper distance in the range of Excellent;**(100-250mm)**
2. Adjust the brightness in RGB and depth camera display area ("Auto" first, then to "Manual").
3. Scanning
   a. Scan for the first rotation.
   b. Press "Pause".

   c. Turn it over, scan the top and bottom areas;



d. Scan the 2nd rotation

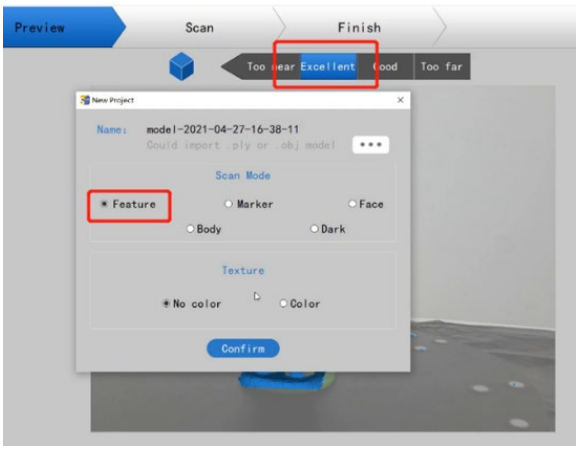
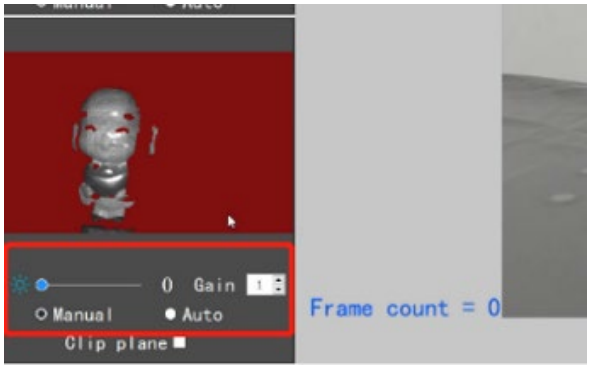
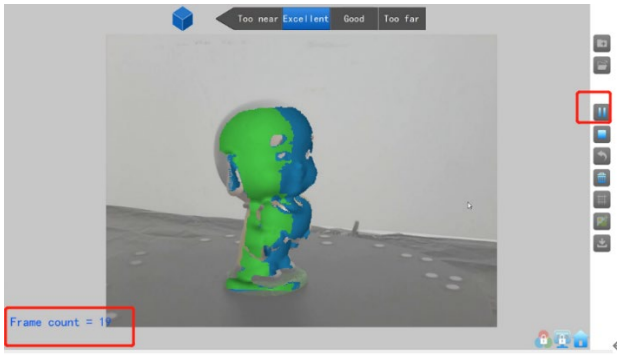
e. Complete scanning.

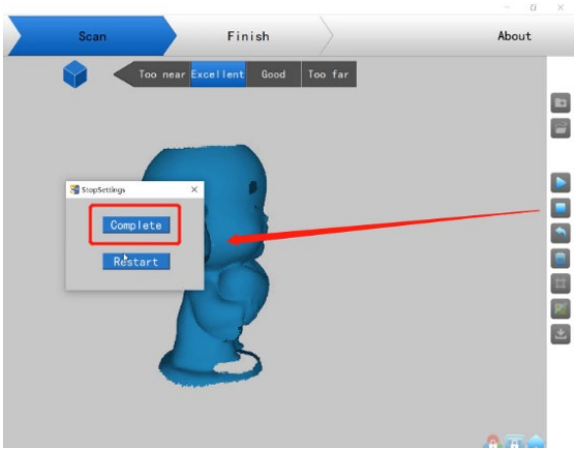
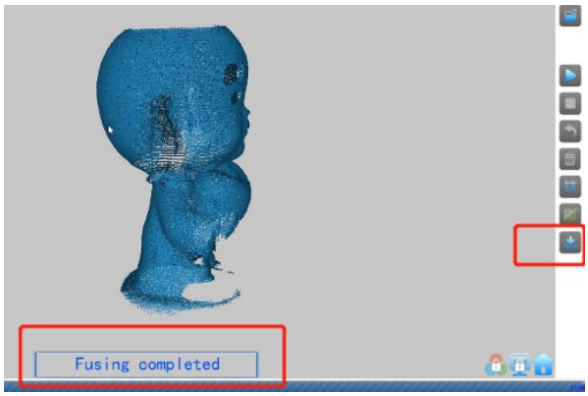
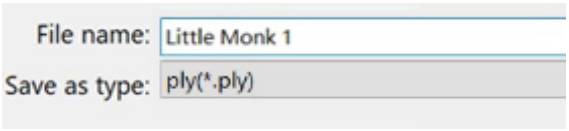
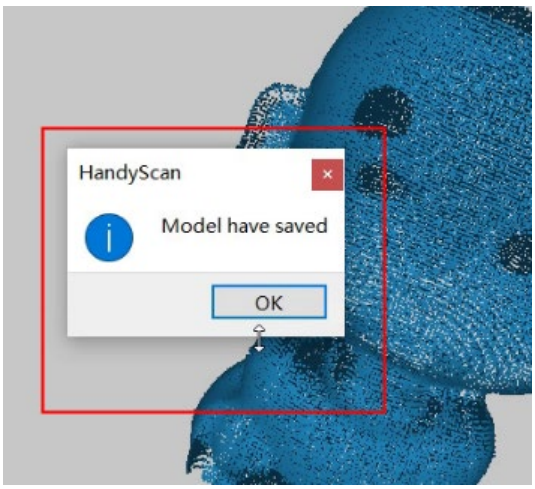
4. Export the model in ply., obj., or stl.

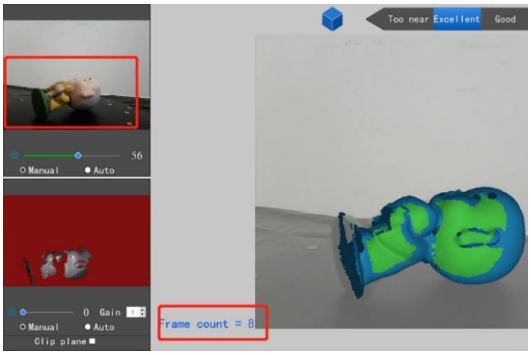
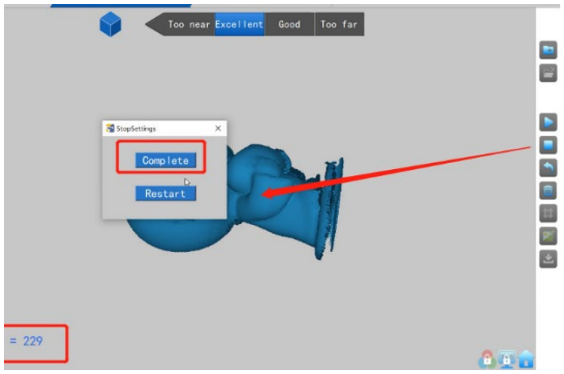
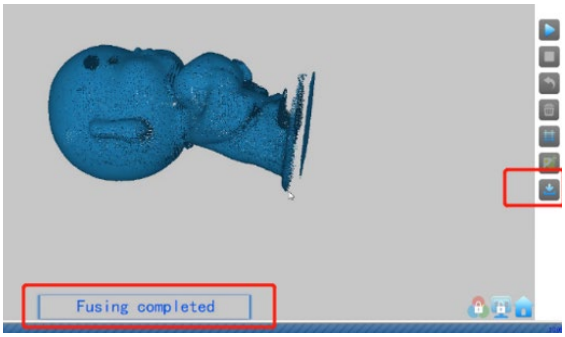
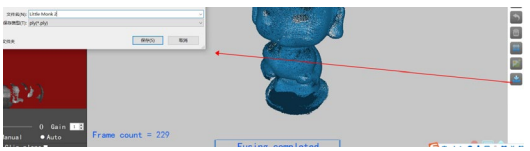
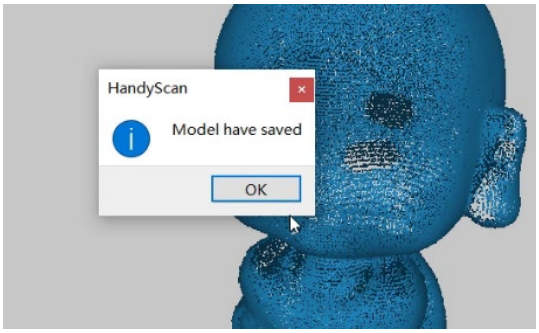
Multiple Scans of a Small Object

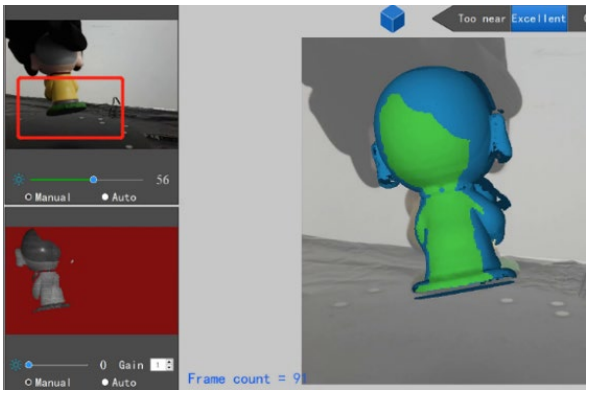
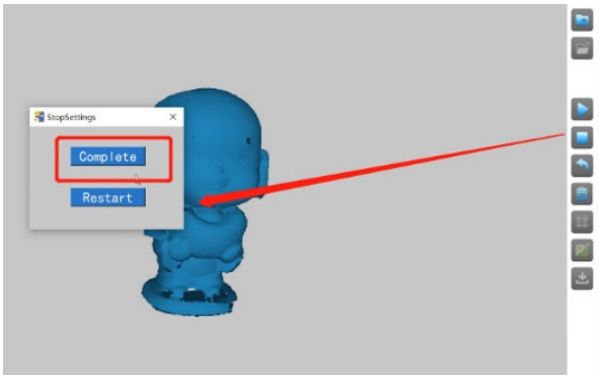
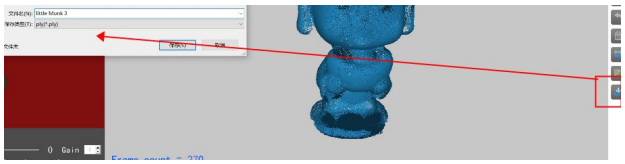
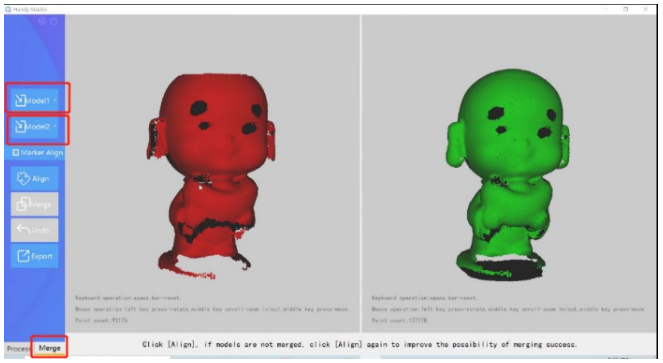
When scanning a small object with complex shape features, scan piece by piece and get several models to merge them into a complete one.

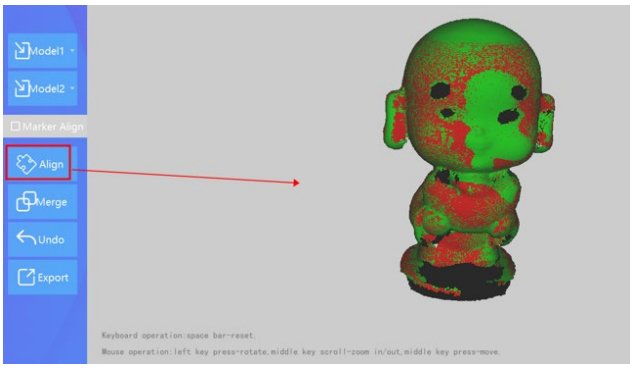
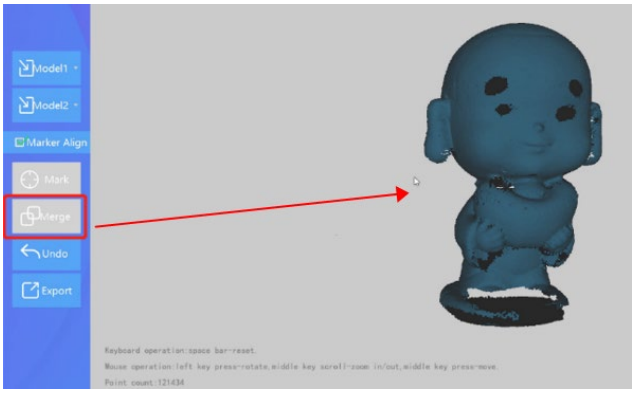
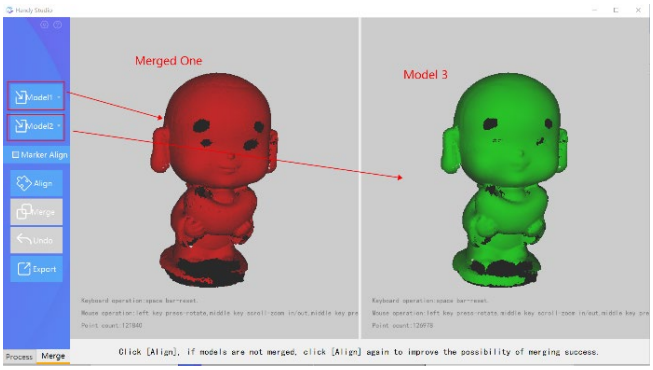
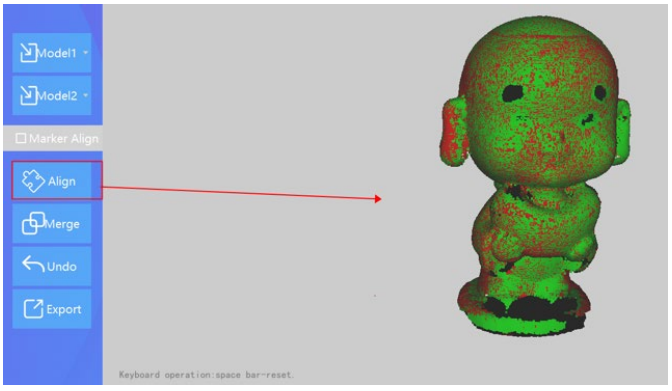
For example:

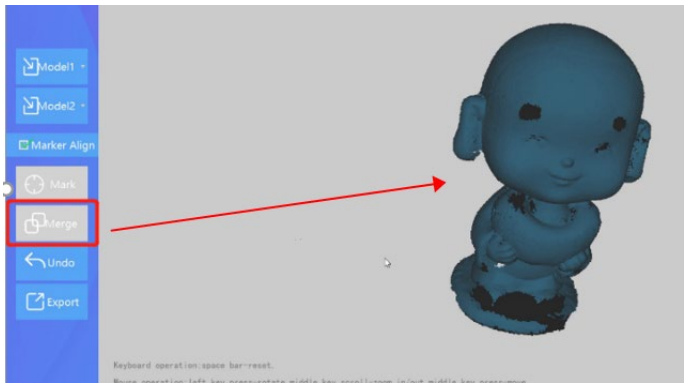
<table>
<tr><td colspan="2">One: Models Scanning</td></tr>
<tr><td colspan="2">1. Preparation of scanning;</td></tr>
<tr><td>a. Distance and scan mode selecting;</td><td> 
</td></tr>
<tr><td>b. Adjust the brightness of the RGB camera and depth camera preview windows (Auto first, then Manual);</td><td> 
</td></tr>
<tr><td>2. Scan the first rotation to get the model 1;</td><td> 
</td></tr>
</table>

3. Complete the 1st model scanning;	
4. Export the model named Model 1 in ply. Format;	  

5. Scan the second rotation to get the Model 2;	
6. Complete the 2nd model scanning;	
7. Export the model named it as Model 2 in ply. Format.	  

8. Scan the third rotation to get the Model 3;	
9. Complete the 3rd model scanning;	
10. Export the model and name it as Model 3 in ply. Format;	
Note: if necessary, you can continue to scan other aspects of the object.	
Two: Models Processing	
1. Import Model 1 and Model 2 in Merge UI;	

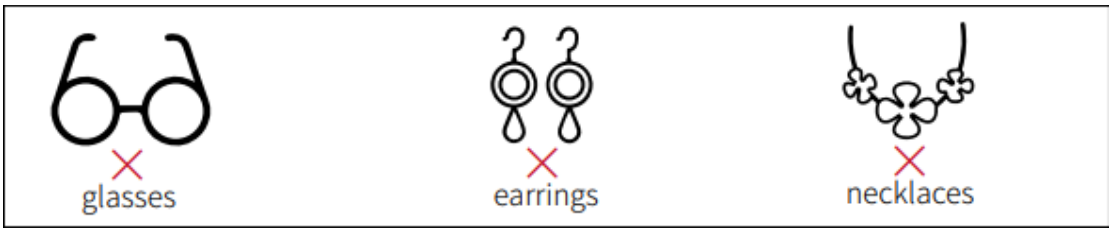
2. Align the two models;	
3. Merge the two models in one model.	
4. Import Model 3 in Model 2 position;	
5. Align the two models;	

6. Merge the two models in one:	
7. Process the merged model in Process UI; (Mesh--→Fill holes--→Smooth…)	
8. Export the models named Model 4 in ply. Format;	

Human Face Scanning

Preparation

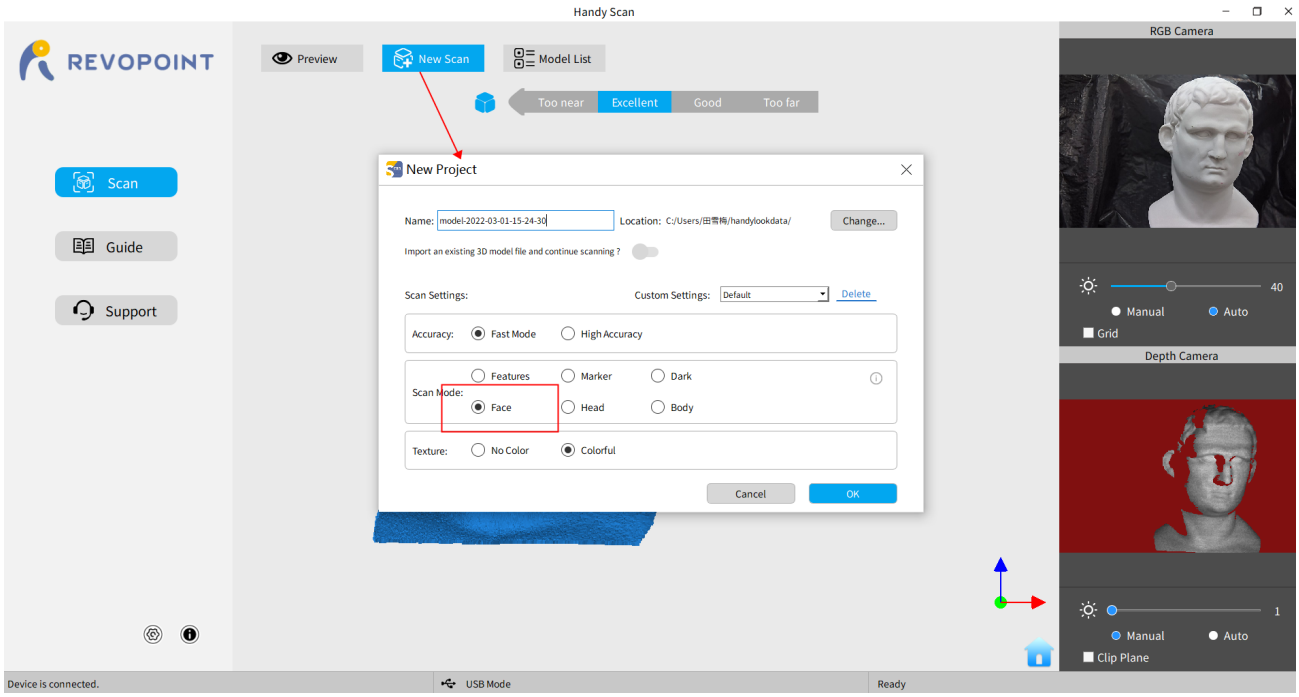
Remove all glass, transparent and reflective objects:



Select “Face” in Scan Mode

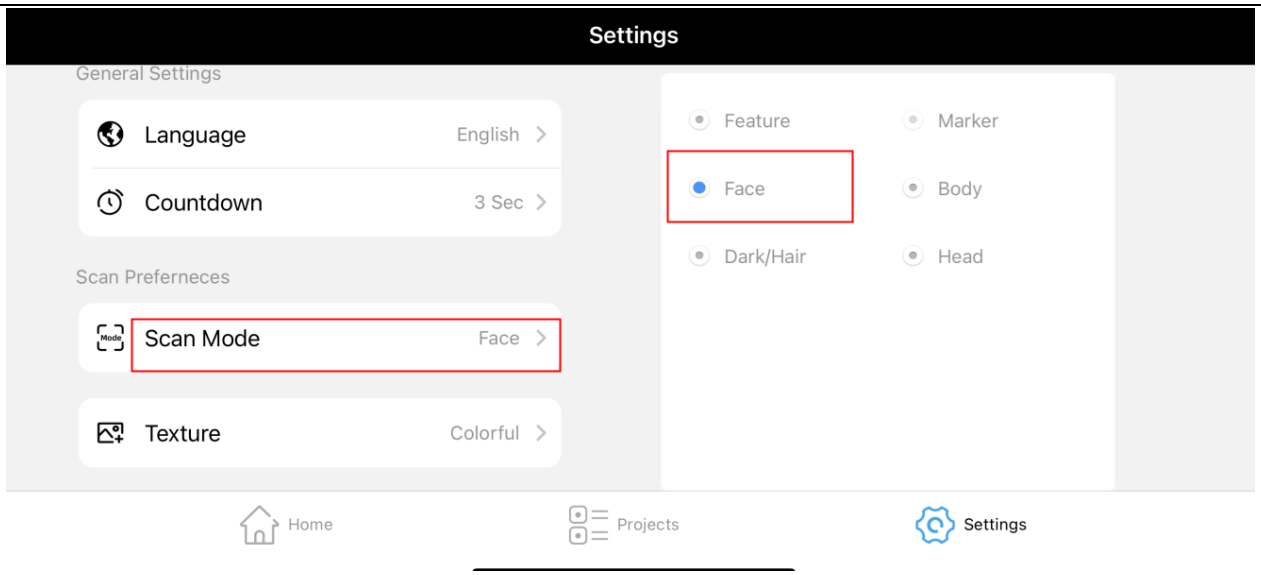
1. PC-Windows and Mac:

Select the “Face” Scan Mode in the New Project popup menu. Refer to the image below:



2. Smartphone- Android and iOS:

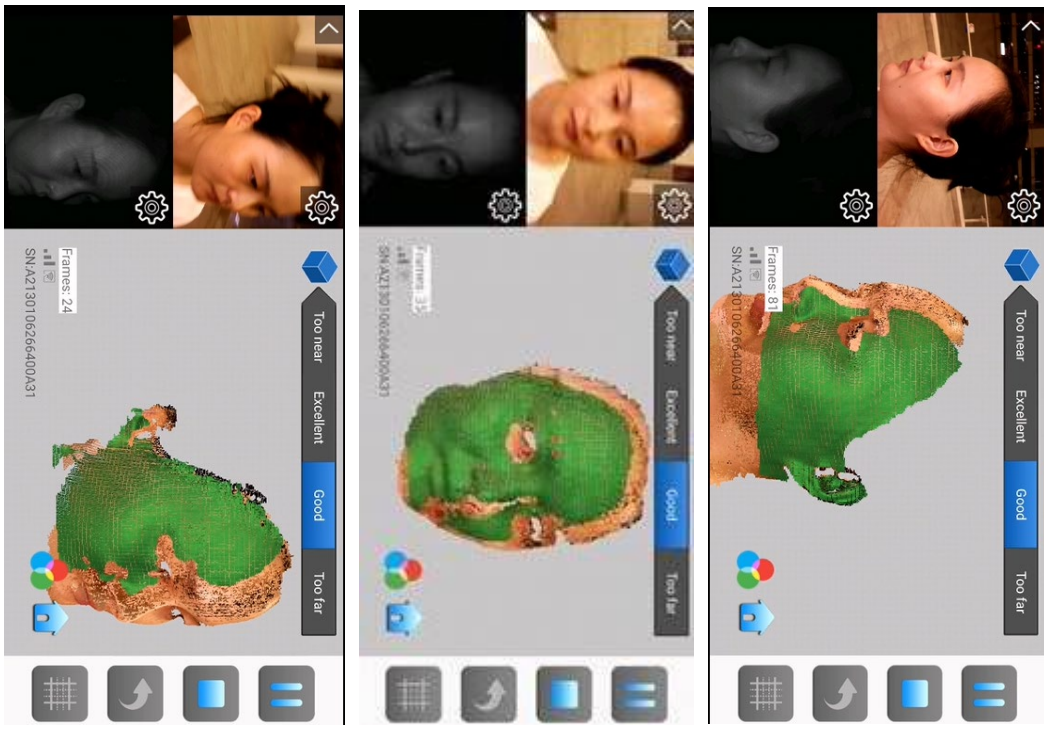
Select the “Face” Scan Mode in the Scan Preferences screen. Refer to the image below:



Face Scanning

1. Scan Face

Start scanning from one side to the other, moving slowly and steadily.



Once scanning has started, the target person must remain still and the facial expression cannot change. Scan the face once and do not scan the same area again unless it is from a different angle to capture new data or to re-acquire tracking.

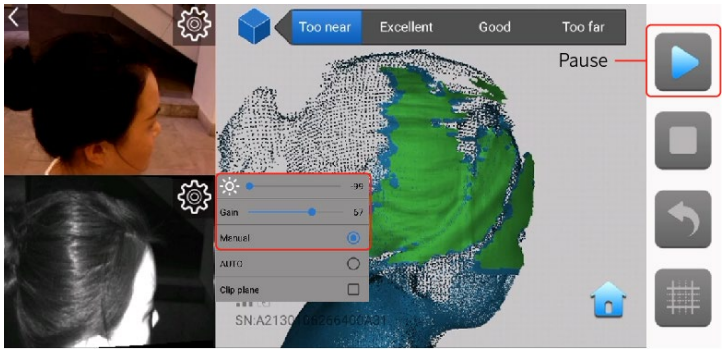
As much as possible while scanning, move the scanner slowly and steadily in one continuous scan. If the “Lost track” warning occurs, re-position the POP scanner to an area with many features that has already been scanned and wait for

tracking to be re-acquired. Usually, the front of the face will be the best point to re-acquire tracking.

2. Scan Dark Hair

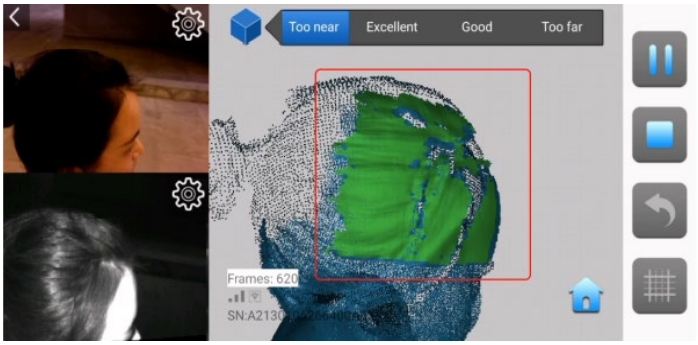
1） After face scanning is complete, click "Pause" so that the scan parameters can be changed.

2） Set exposure parameters: Increase the Depth Camera sensor's Brightness setting (lower left) so that dark objects will be captured.



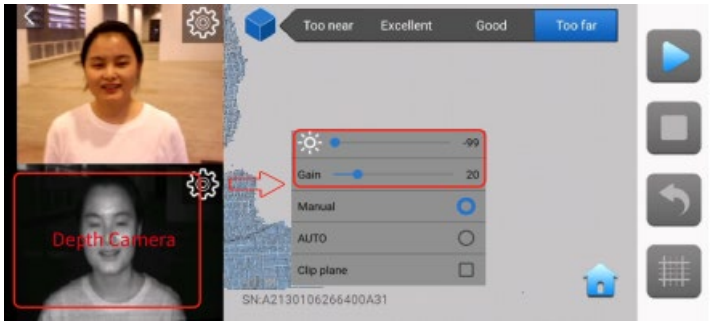
3） Align along the hairline

After the current scanning frame turns green, move the scanner from one side to the other along the forehead slowly. Few facial areas are necessary for easy alignment, so do not scan too much of the face.



4） Scanning Tips

Adjust Parameters:

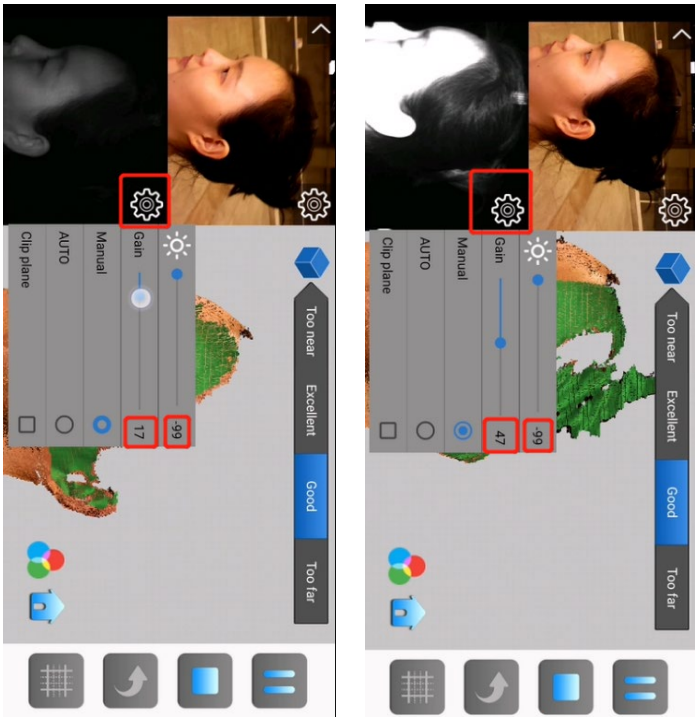


The lower left area is the Depth Camera display window:

In Android, click the gear icon to adjust depth camera parameters for scanning dark objects.

Increase the Brightness setting so that darker objects can be captured (e.g. the dark area will be displayed in the central window).

Comparison of before and after adjusting the Brightness setting:



Before After

Note:

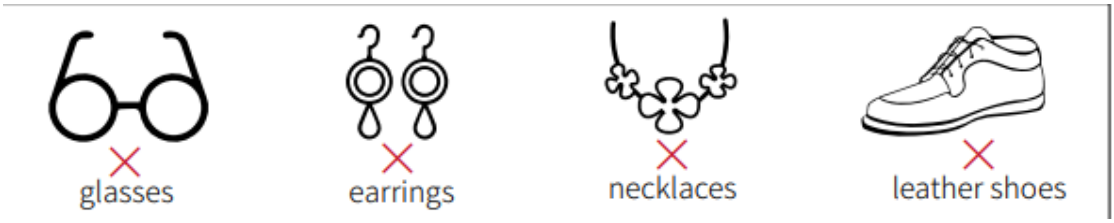
Do not scan eyes directly!

The Revopoint POP uses a safe Class 1 Infrared Laser, but caution should always be exercised because retinal damage is cumulative.

Human Body Scanning

1. Preparation

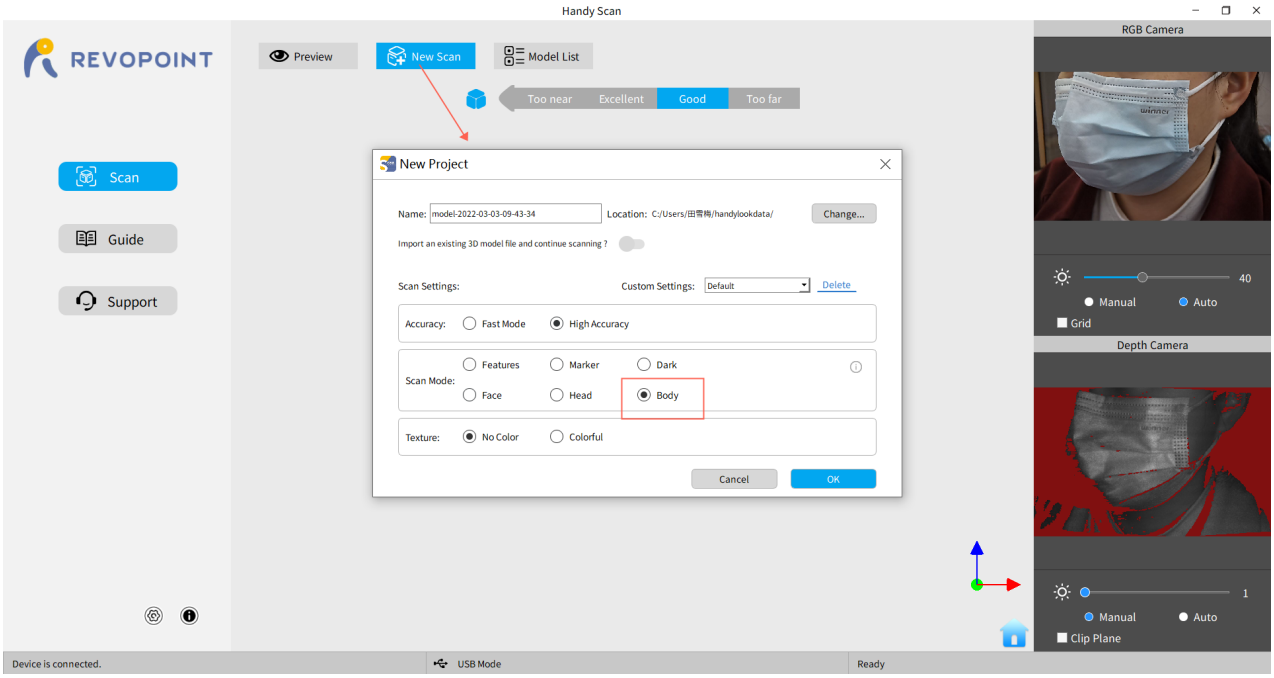
1) Remove all glass, transparent and reflective objects.



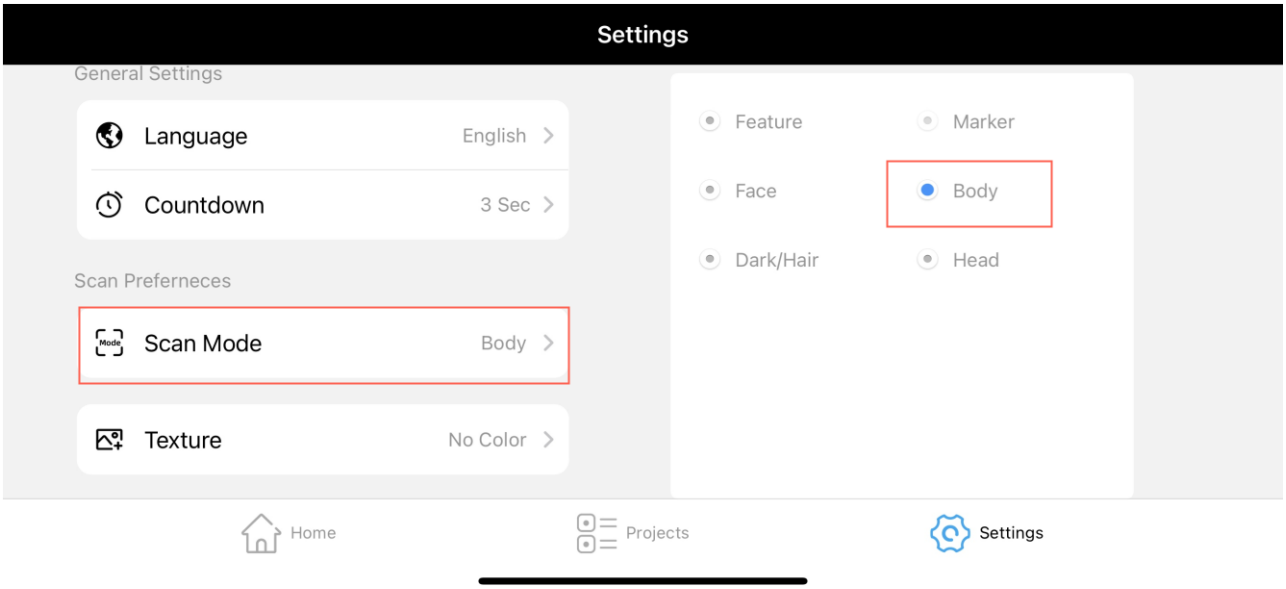
2) Request your model to adopt a posture that can be maintained for several minutes and keep still during scanning.

2. Select the “Body” scan mode

2.1 Windows: Select “Body” Scan Mode in the New Project popup window. Refer to the Windows page below:



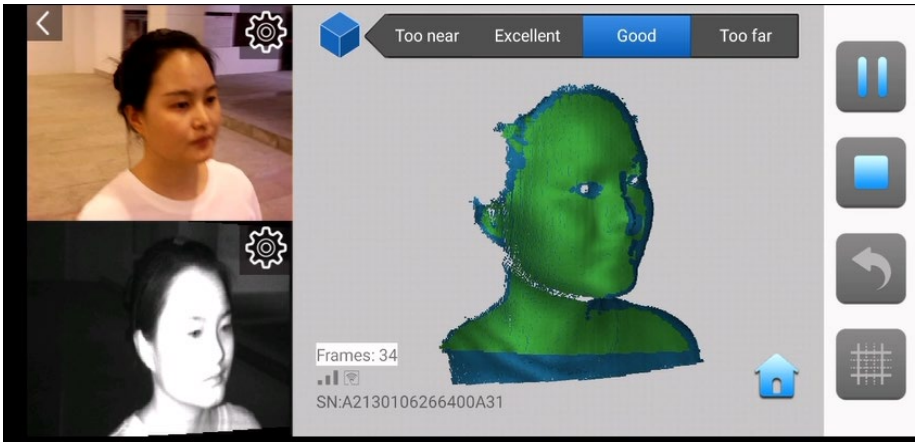
2.2 Android: Select “Body” Scan Mode in the Scan Preferences screen. Refer to the Android page below:



3. Scan

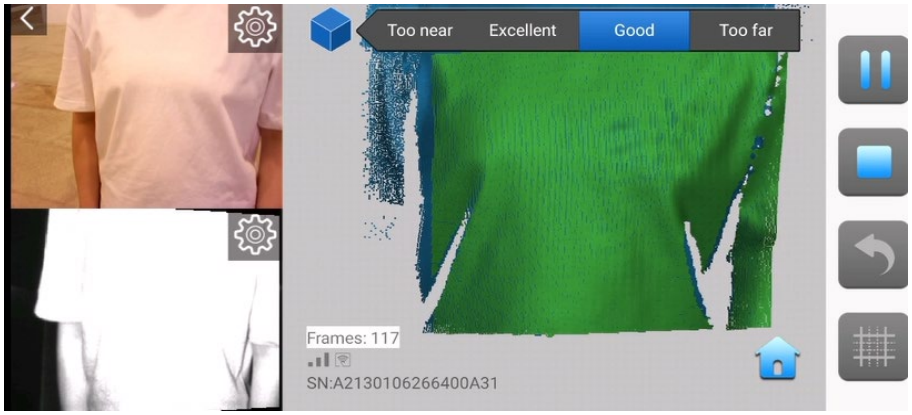
3.1 Scan the Face First

It's recommended to scan the face first because of the difficulty in keeping the exact same facial expression for any significant period of time. The purpose of this is to provide synchronization for aligning the scans later.

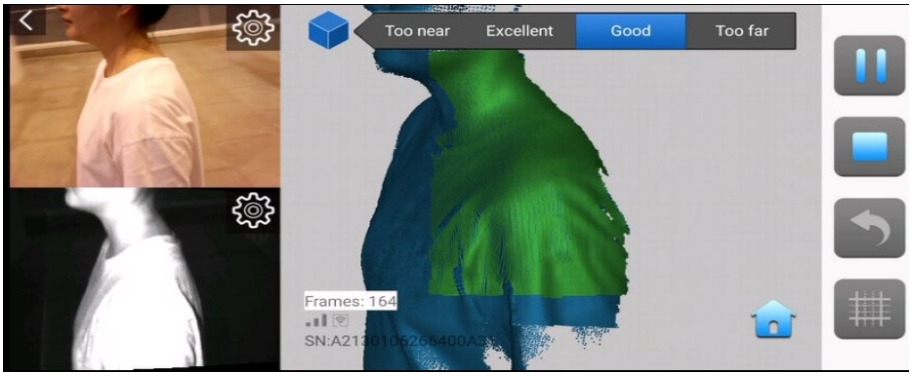


3.2 Scan the Body's Upper Region

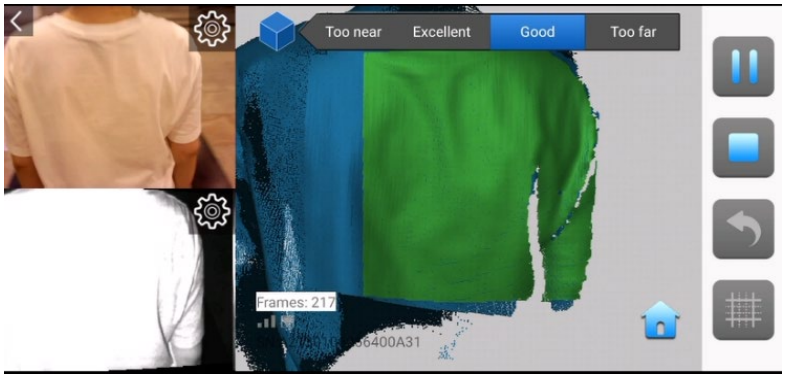
Scan the front of the body downward from the shoulders.



Move the POP to one side and scan upwards. Adjust the angle to get more of the arm.



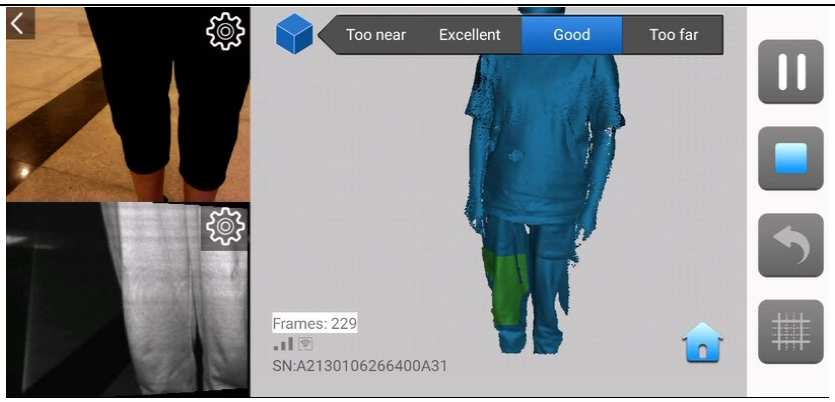
Move around to the back and scan downwards.



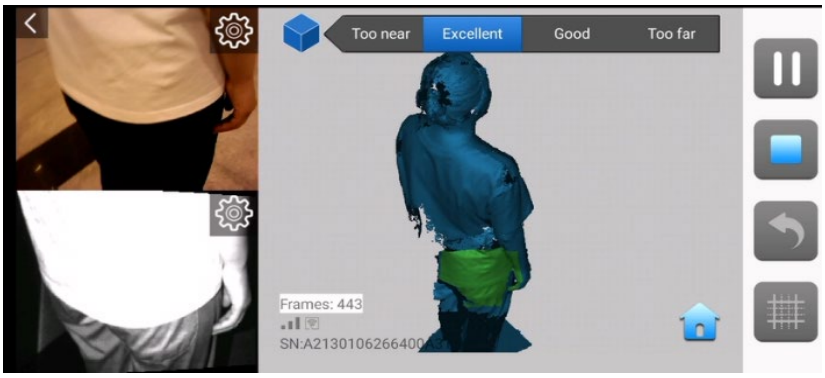
Move around to the unscanned arm and scan upwards. Adjust the angle to get more of the arm.

3.3 Scan the Legs

Continue around to the front of the body to scan the legs from top to bottom, then move to the side.



Scan upwards from the feet to the hip, then move to the back to scan downwards to the heels.

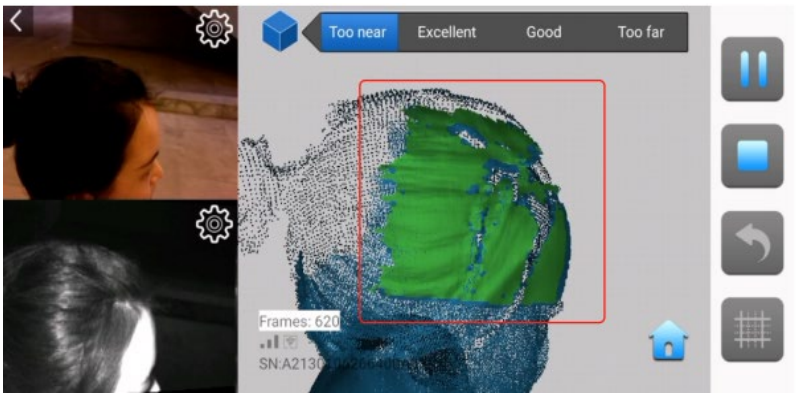


Move to the unscanned side and scan upwards to capture the remaining area.

3.4 Scan Hair

After scanning the legs and feet, we will continue by scanning the hair if it was too dark to capture.

Bring the POP closer to the head (a distance of about 350mm/14”), until black hairs can be scanned. After the current scanning frame turns green, move the POP from one side to the other along the forehead slowly. Try not to scan too much facial area.



Frequently Asked Questions (FAQ)

If you need any help, please visit our official website or official Forum:

www.revopoint3d.com/support/

https://forum.revopoint3d.com/

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