# User Guide

## Handheld 3D Scanner

2020.3.30

# Contents

## 1. Product overview

### 1.1 Product profile

The handheld 3D scanner adopts proprietary 3D camera module and embedded AI chip to deliver accurate and fast 3D scan. This handheld 3D scanner is designed compact and portable, and it is flexible and easy to use with its one-click scan and simple software operation, ideal for product development and prototyping.

### 1.2 Packing list

| No. | Item | Unit | Qty. | Description | Note |
|---|---|---|---|---|---|
| 1 | Handheld 3D scanner | pcs | 1 | / | |
| 2 | Power cable | pcs | 1 | 5V-2A >3M | |
| 3 | Data cable | pcs | 1 | USB3.0 MICRO 3M | |
| 4 | Manual turntable | pcs | 1 | Φ200x13mm | |
| 5 | USB flash drive | pcs | 1 | / | |
| 6 | Product certificate | pcs | 1 | / | |
| 7 | | | | | |

## 1.3 Specifications

| | |
|---|---|
| Product model | Handheld 3D scanner |
| Technology | Dual camera infrared structured light |
| Single capture accuracy | Max 0.1mm |
| Accuracy level | Normal accuracy and high accuracy |
| Volumetric accuracy | Normal accuracy mode: 0.5mm/m;<br>High accuracy mode: 0.3mm/m |
| Single capture range (mm) | 290 x 214 |
| Working distance (mm) | 300±50 |
| Minimum scan volume (mm) | 100x100x100 |
| Depth of field (mm) | ±50 |
| Scan speed | 10fps |
| Laser | Infrared (eye-safe) |
| Alignment | Feature alignment, marker alignment |
| Output format | STL、PLY、OBJ、ASC、3MF |
| Texture scan | Yes |
| Special object scanning | For the transparent and highly reflective objects, please spray powder before scanning |
| Outdoor scanning | Cover is needed to avoid interference of strong light |

| | |
|---|---|
| Scanner weight | ⩽600g |
| Dimensions (mm) | 215x120x33.6 |
| Printable data output | Able to export 3D model directly to 3D printing |
| Required computer configurations | Windows 10, 64-bit |
| Note | *The accuracy above is acquired in standard lab environment, which might vary subject to actual operating environment. |

1.4 Computer configuration requirements

Recommended config:

Graphics card: video memory >2GB; i7-6700 processor; 32GB RAM, high speed USB3.0

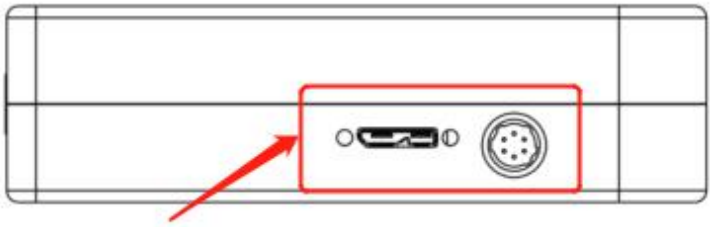
Minimum config:

Graphics card: video memory>1GB; i5-6400 processor; 16GB RAM; high speed USB3.0

## 2. Hardware

### 2.1 Hardware overview

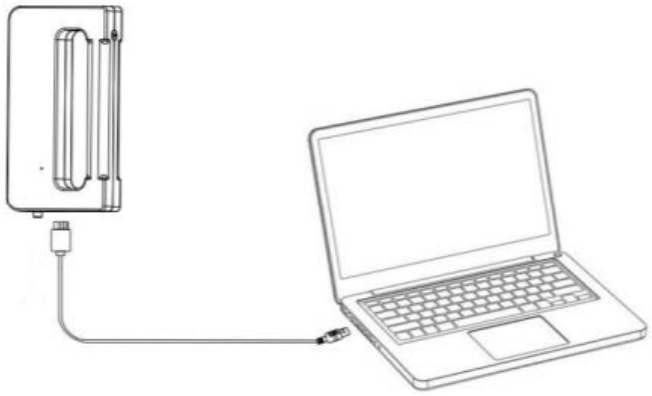
“Start/pause” button



Power supply port and USB data port

(Support USB powered scan)

2.2 Hardware installation



After connecting the power cable of the handheld 3D scanner, connect the USB data cable.

Or you can just connect USB data cable to supply power to the scanner.

Connect the USB data cable to the USB 3.0 port of the computer (the USB3.0 port has a *SS* mark next to it).

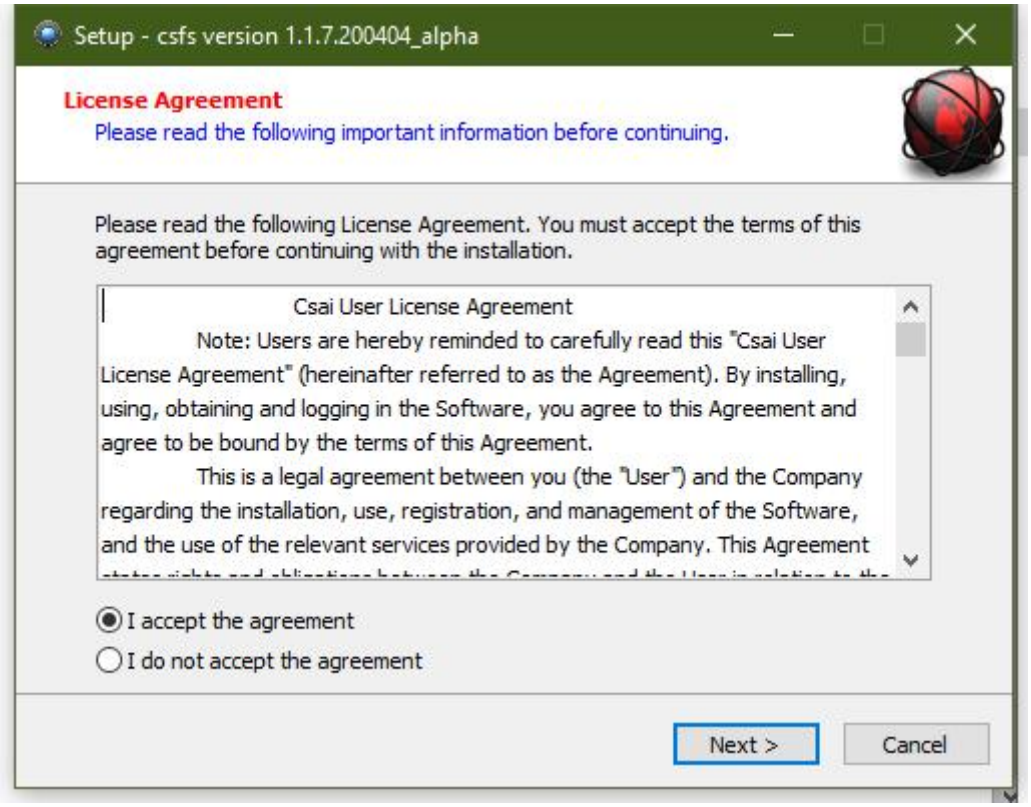
## 3. Software

3.1 Obtaining software

Find the software installation package (Handyscan.exe) in the USB flash drive, or contact your distributor to obtain it.

## 3.2 Software installation

Double-click the Handyscan.exe installation package.




Read the agreement and click beside the “I accept the agreement”, and then click “Next” to finish installing the software.

After the installation is finished, two software shortcuts will be generated, one is the scanning software: Handyscan 

, and the other is the post-processing software: 3DModelProcess 

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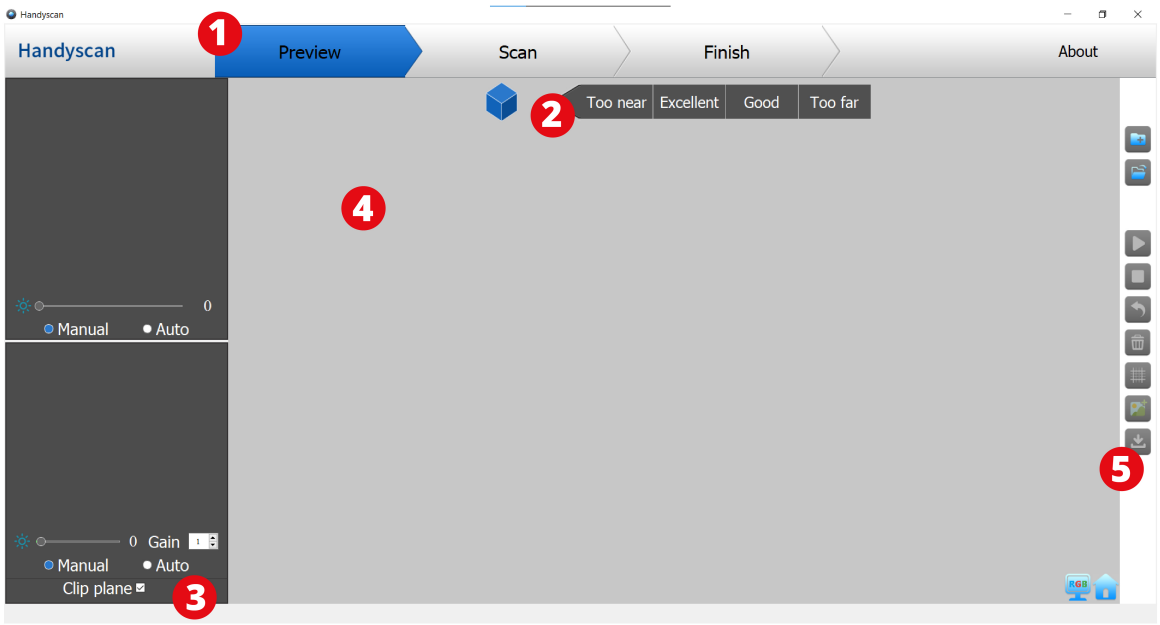
## 3.3 Software update

The scanning software Handyscan can be updated online. When the system

detects a new version of the software, it will push notification. Follow the instructions to update the software to the latest version.

## 3.4 Software interface




① Top navigation bar includes: Status (Preview-Scan-Finish), Settings and About buttons;

② Scanning distance prompt (Scanning distance color bars include: green-light yellow-yellow-red, when the scanning distance is appropriate, green color will be displayed; when it is too close or too far, red color will be displayed. Adjust to the optimal scanning distance according to the prompt.);

③ RGB image display and infrared image display;

④ Real-time scan data display;

⑤ Function buttons: New, Open, Start/Pause, Stop/Complete, Undo, Delete,

Mesh, Texture, Export;

Left mouse button: Rotate the 3D model  Wheel: Zoom in/out

## 4. Scanning preparations

4.1 Object handling

A single-frame scanning range of the handheld 3D scanner is 290mm x 214mm, and the scannable object size is from 100x100x100 (mm) to 4m.

Hair or flakes cannot be scanned directly. When scanning some objects (such as human face), you need to keep the objects still.

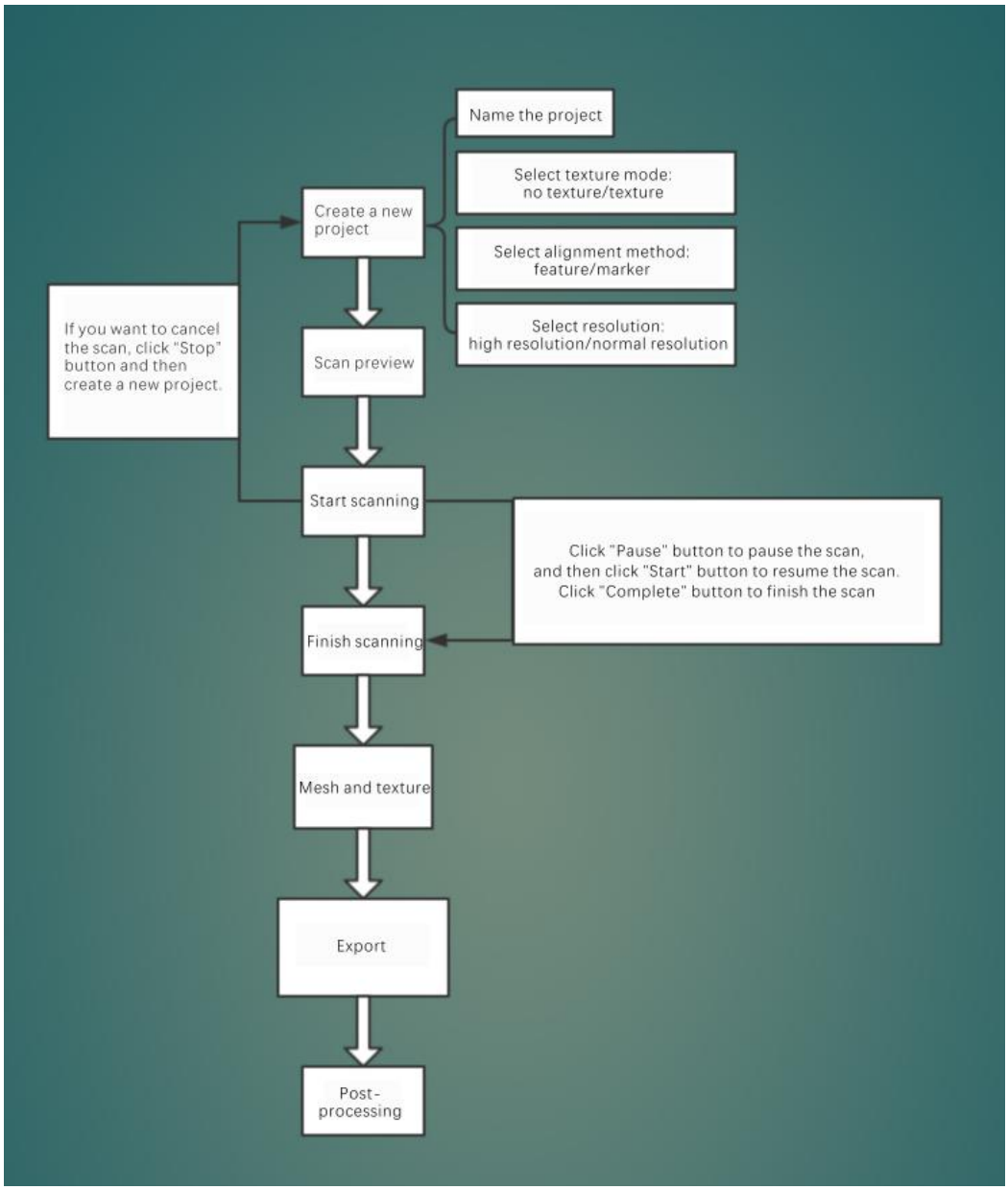
If the scanned object doesn't have enough features, you can stick marker points on its surface for alignment.

Transparent and highly reflective objects cannot be scanned directly, you need to spray powder before scanning.

4.2 Procedures

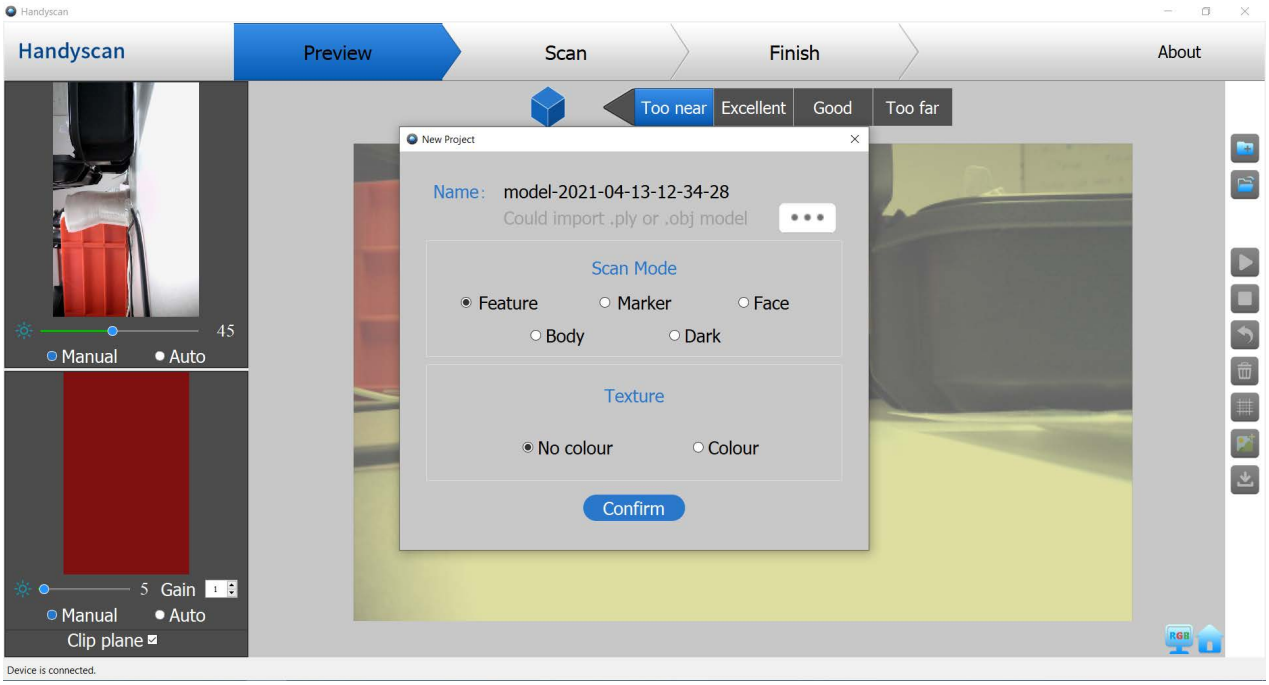
Install the hardware -- > open the scanning software -- > prepare the object -- > start scanning

## 4.3 Scanning workflow



## 5. Start scanning

5.1 Create a new project 

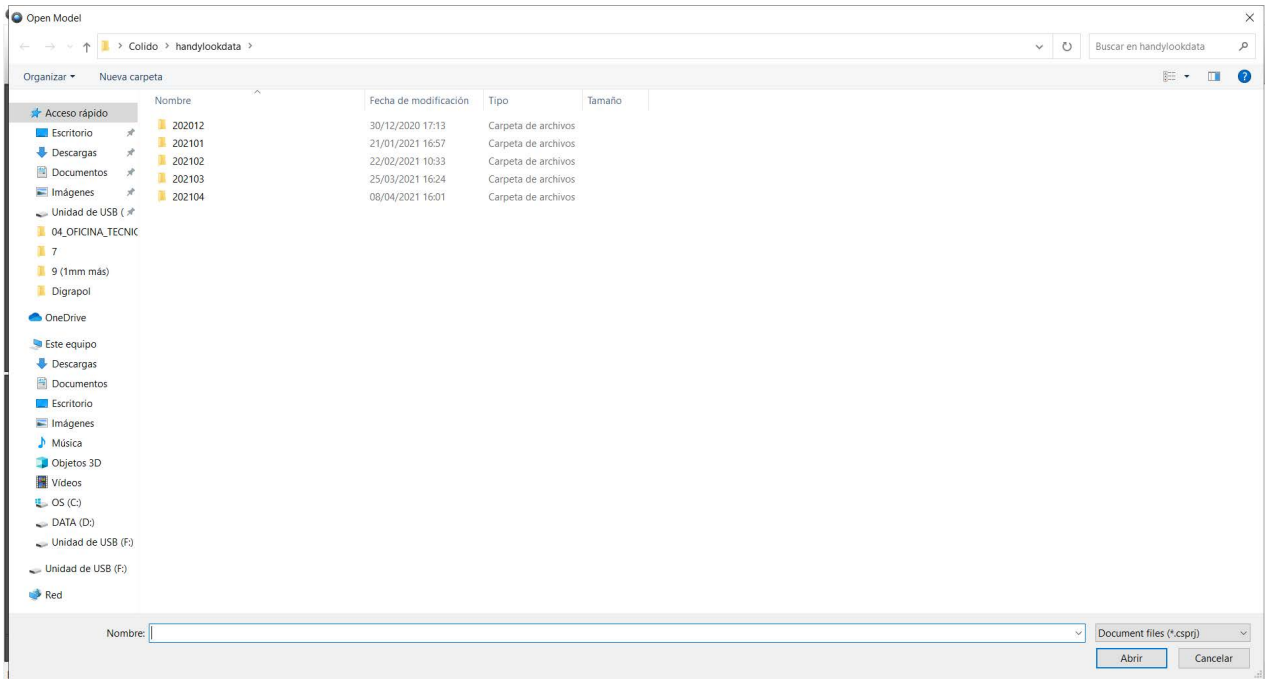



Name the project or import a model.

Select texture mode: no texture (without texture) / texture (with color texture).

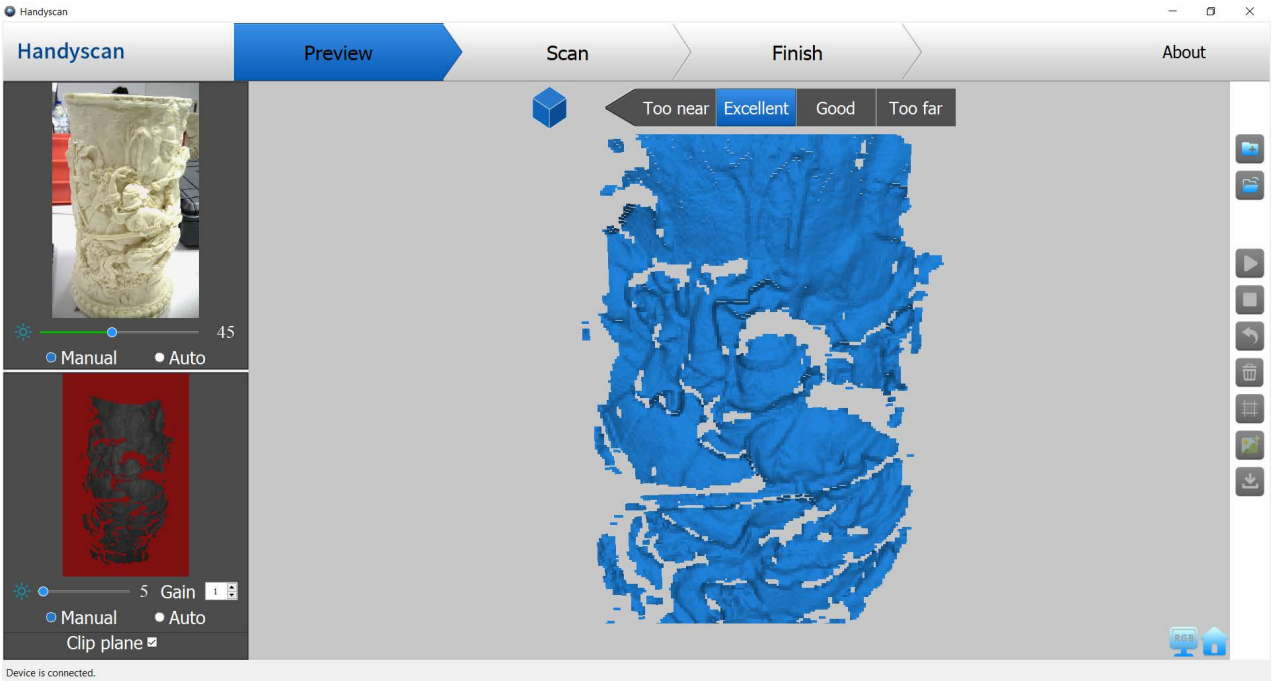
Select alignment method: feature alignment (suitable for object with rich features on the surface) / marker alignment.

## 5.2 Open a project 




You can import a project file that has been scanned before and capture a second scan.

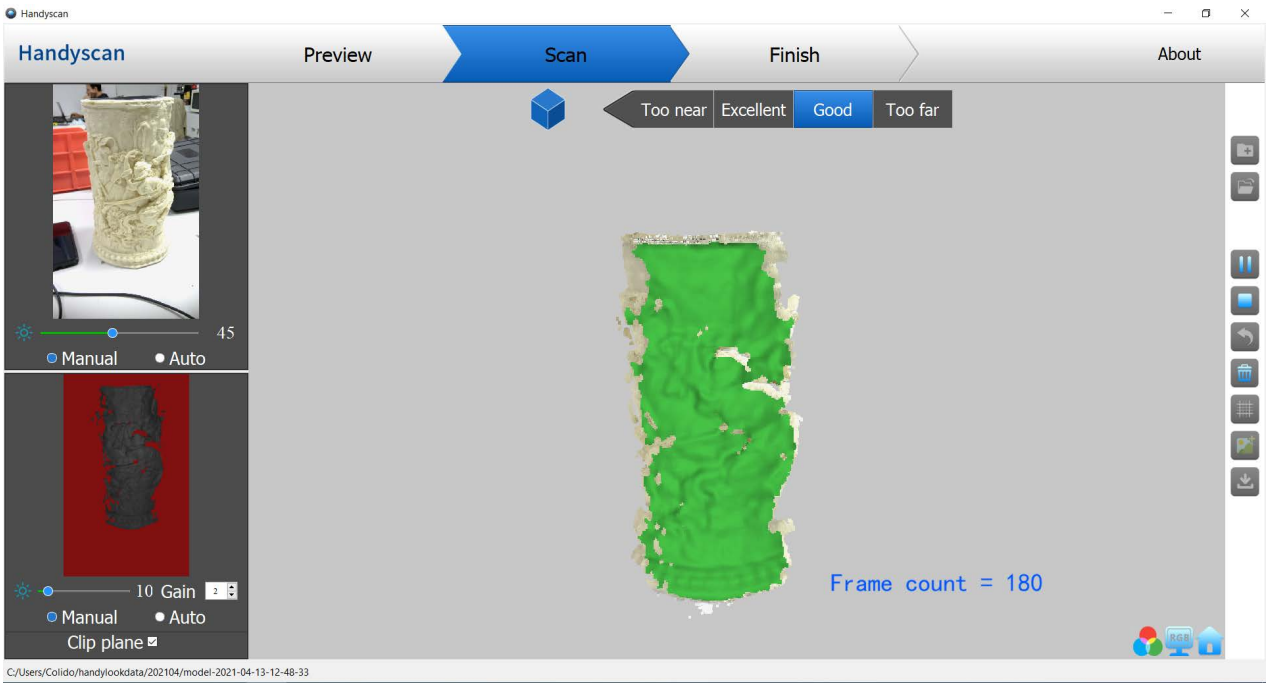
## 5.3 Scan preview



## 5.4 Start scanning

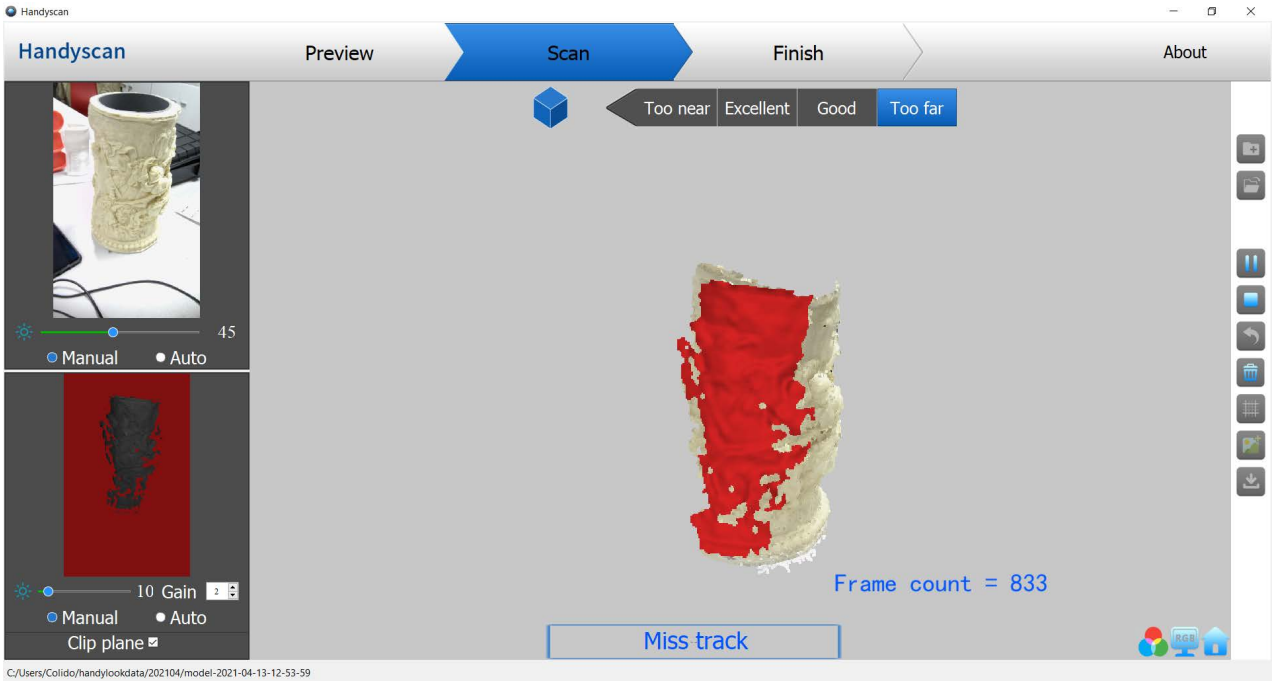
Click the "Start" button  to start scanning. If you want to pause the scan, click the "Pause" button  . To cancel the scan, click the "Stop" button  and create a new project to start another scan.

At the beginning of scanning, point the scanner to the object for 3 seconds, and then slowly move the scanner around the object to start scanning. The captured data (shown in blue) and the forming data (shown in green) will display. In order to improve scanning efficiency, it's better to move the scanner slowly and stably during scanning.



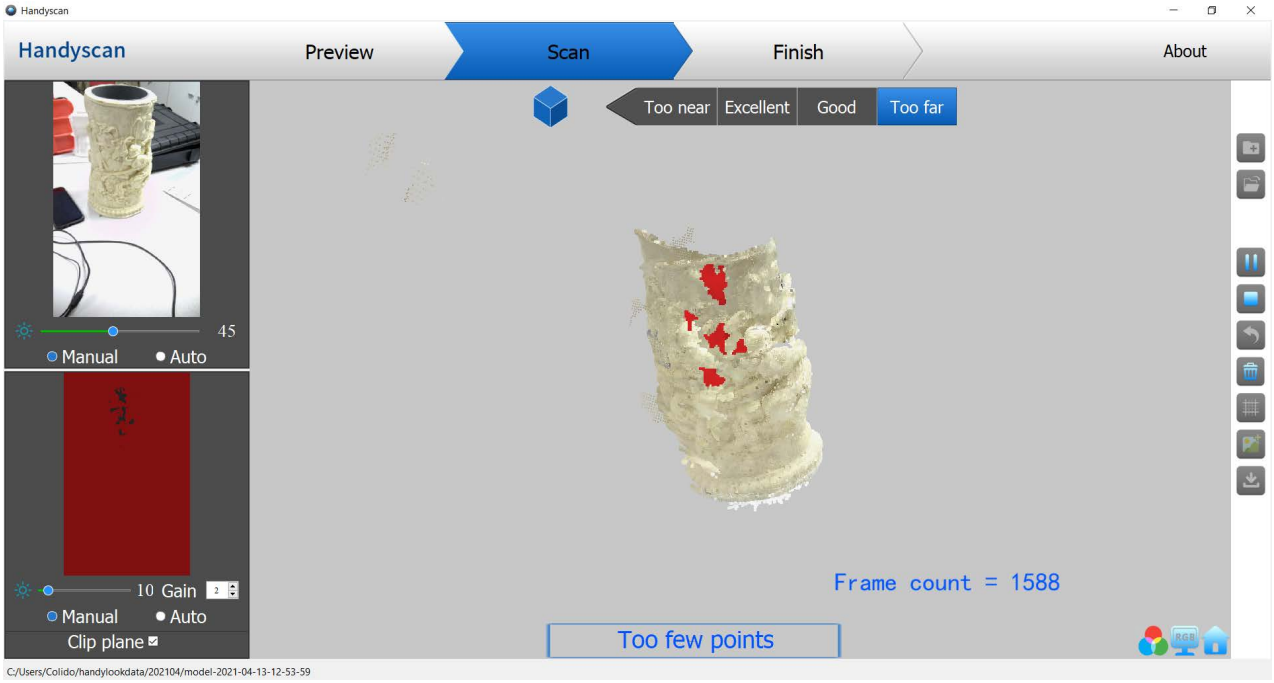

Frequently encountered problems:

① Miss track




When this prompt appears, you need to return to the scanned area and re-align the model to continue the scan.

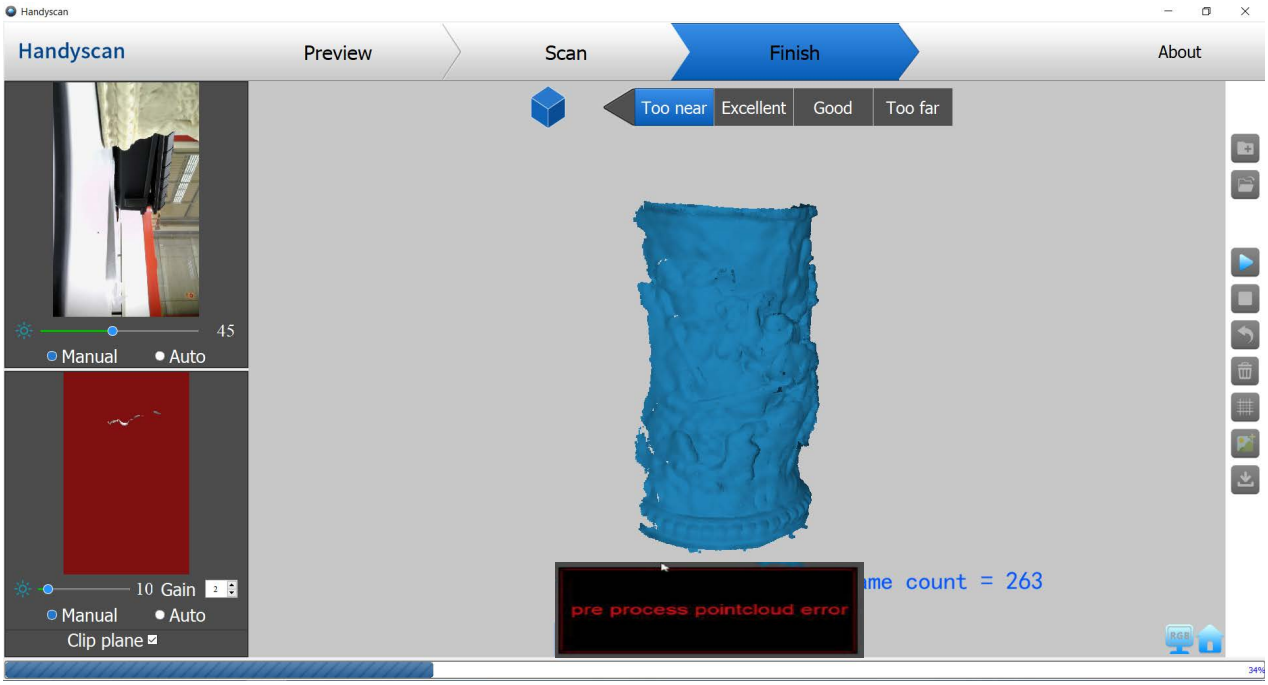
② Point amount few




When this prompt appears, check whether the distance between the scanner and the object is too close or too far, adjust the distance to the appropriate

range before scanning.

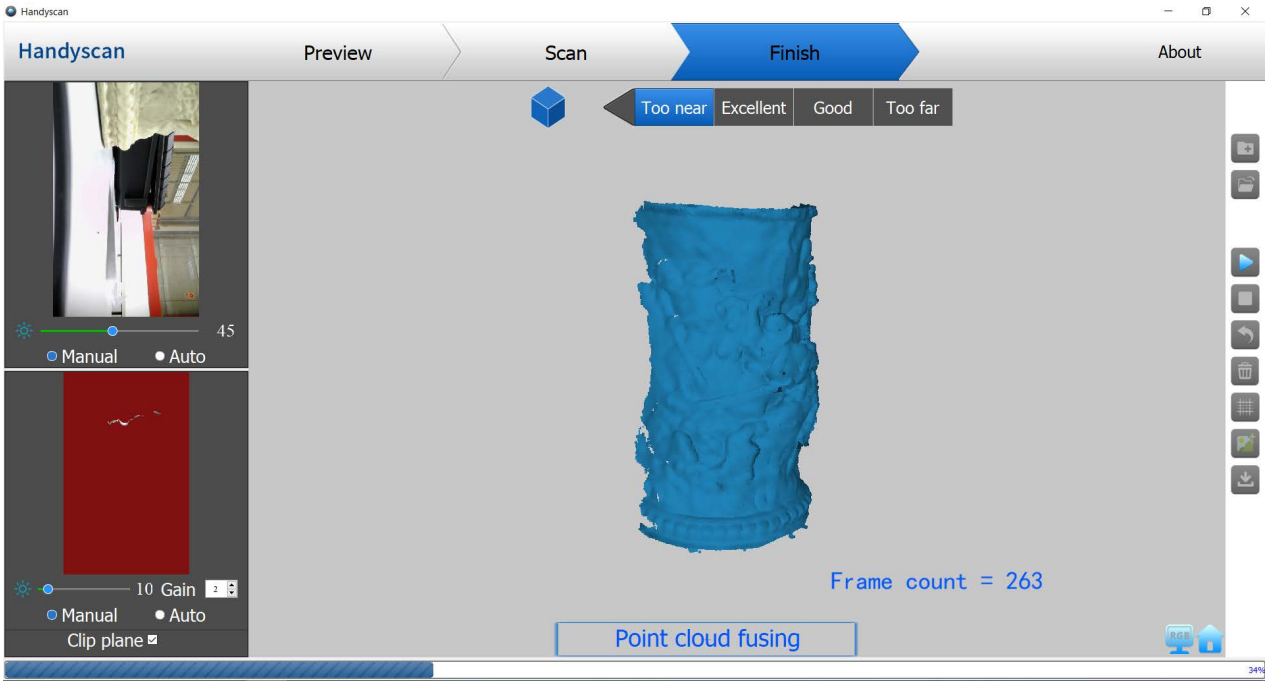
③ Pre-process point cloud error

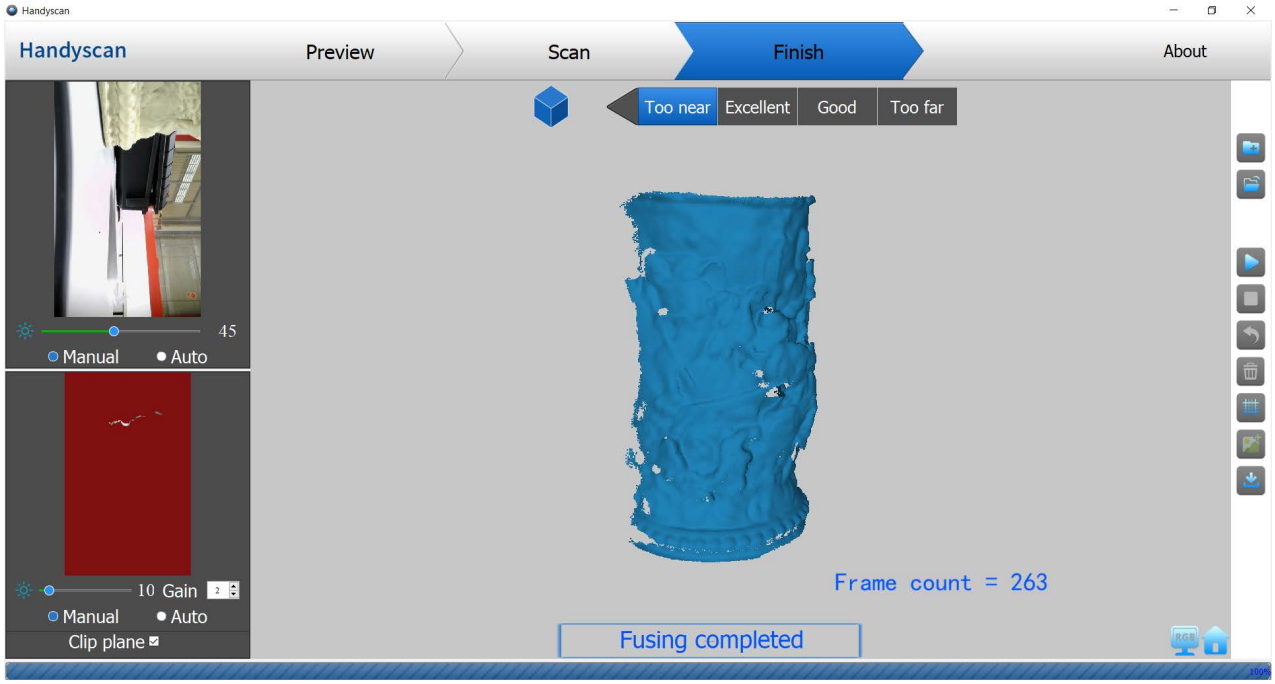



This prompt appears when alignment error occurs in the case of scanning planes or objects with few features. To solve this problem, you can use auxiliary object or attach marker points to the object surface, and select marker alignment mode before scanning.

## 5.5 Finish scanning

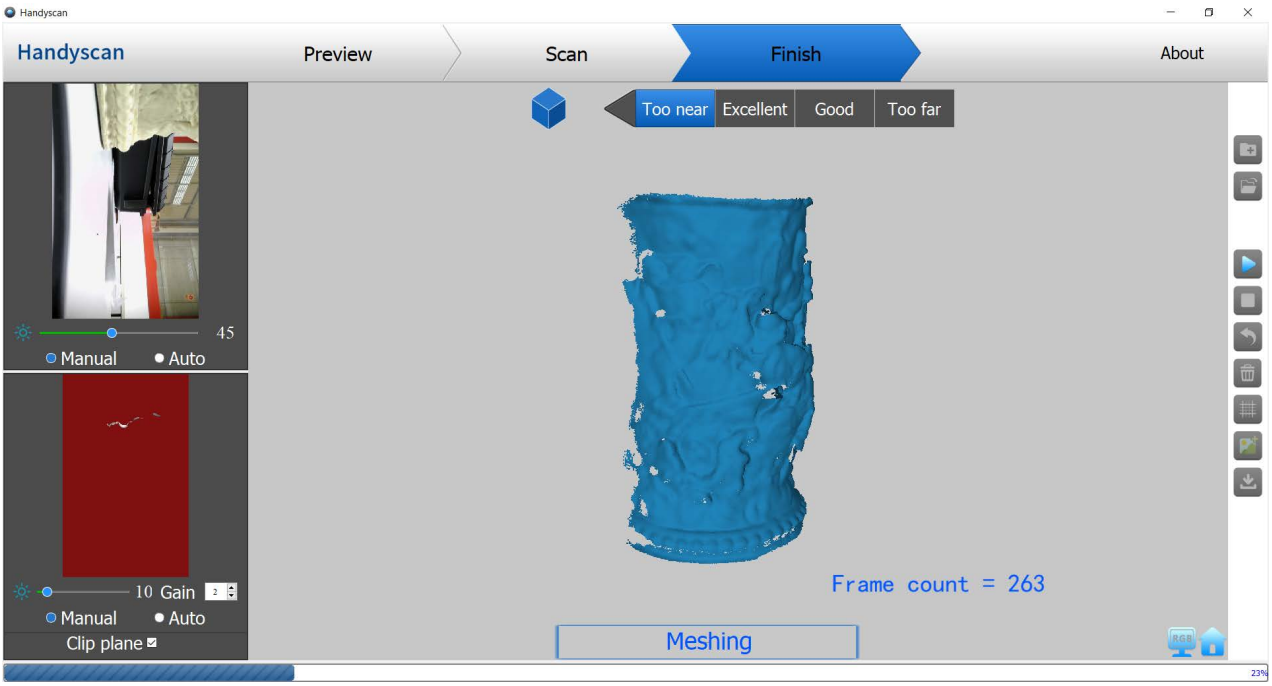
Click the "Stop" button  to complete the scan, and then the point cloud data will be fused by default.

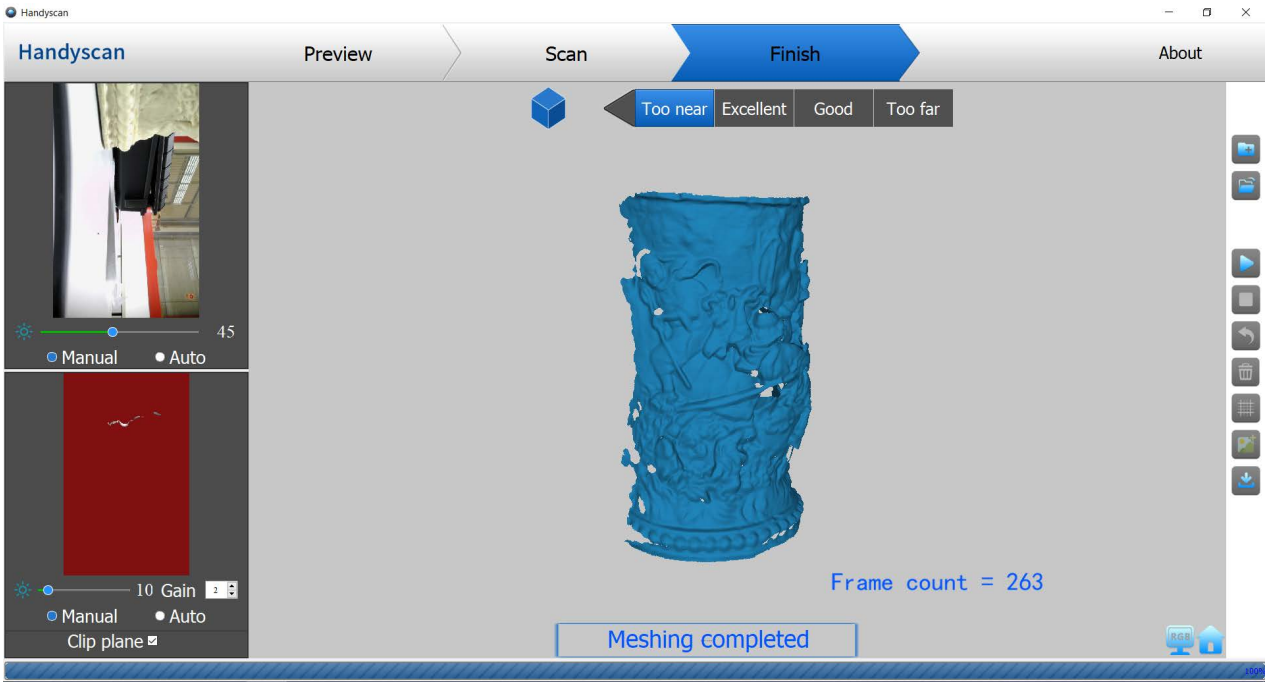


## 5.6 Mesh

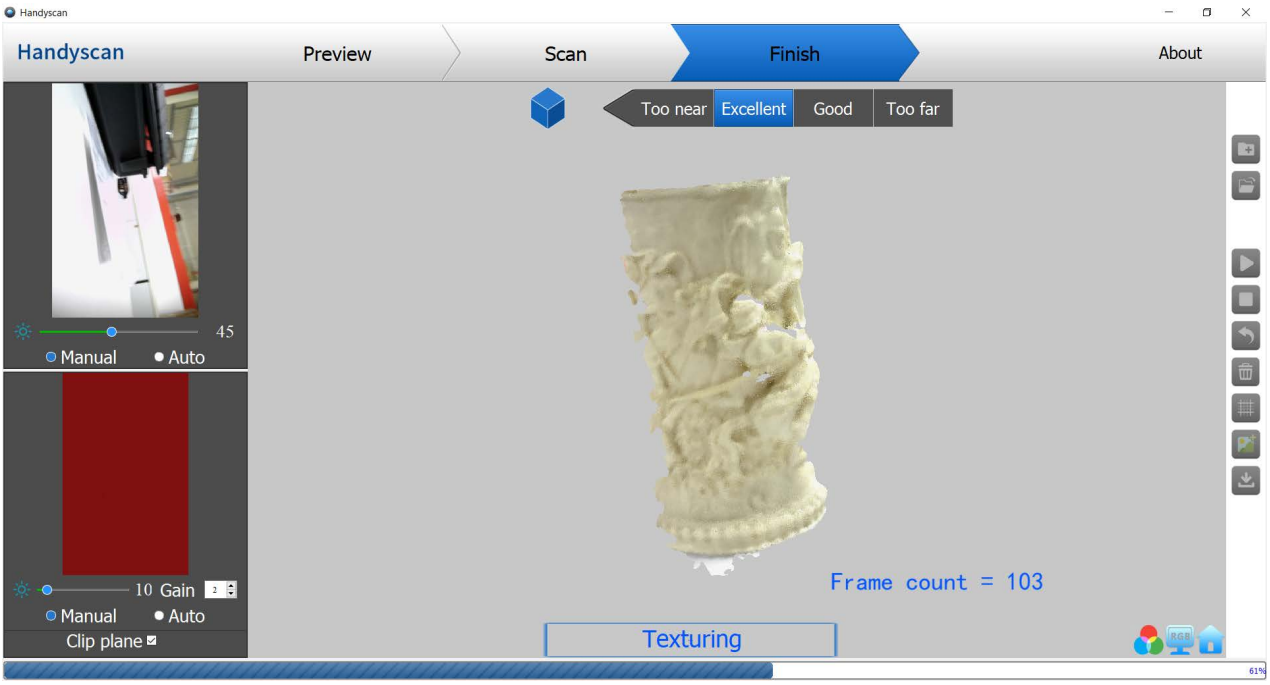
Click the "Mesh" button  to start converting point clouds into mesh.

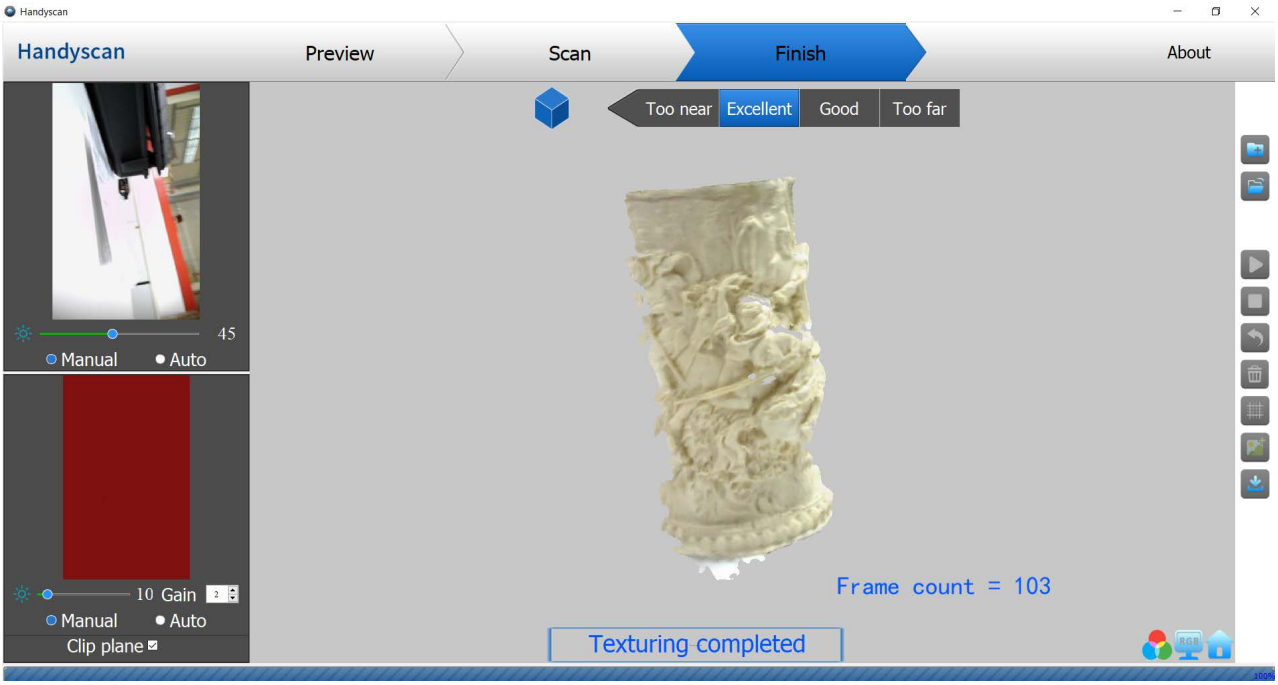


## 5.7 Texture

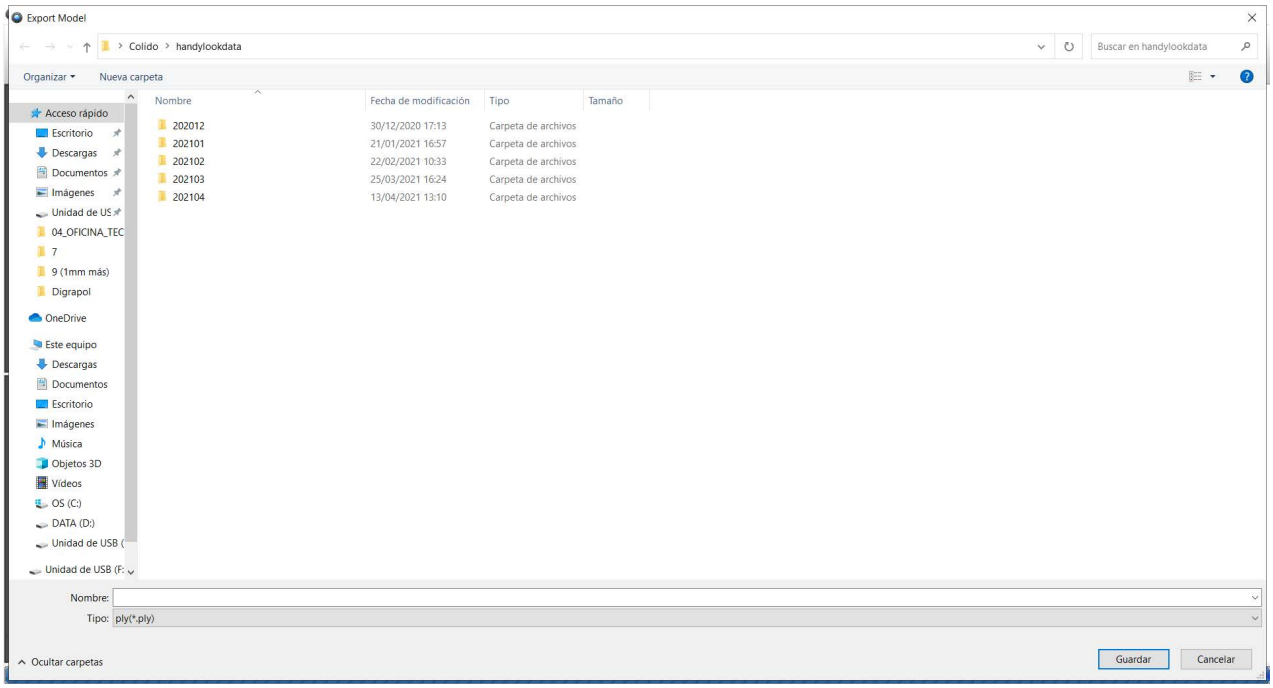
The texture function only applies to the texture scan mode. Click the "Texture" button  , the texture will then be generated. After the texture is successfully generated, the 3D model will contain color texture information.



5.8 Export

Click the "Export" button  , select the file type and a location for the files to be saved, and name the file, to export the 3D model data.



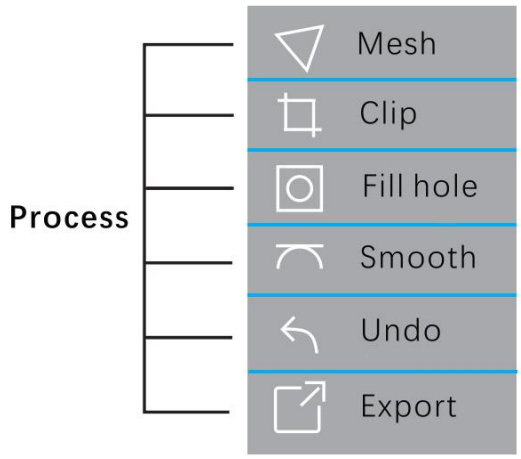

## 6. Post-processing

Double click to open the post-processing software：3DModelProcess

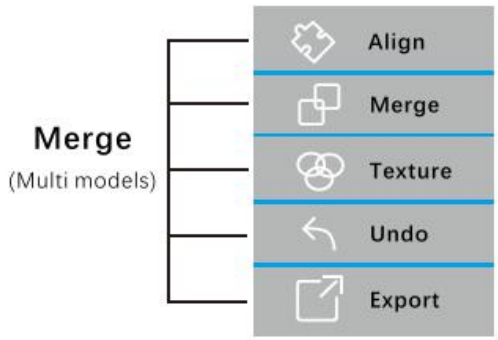
① Click the drop-down button next to "Model" button and select local model or cloud model;

② Model processing: single model and multi-model processing are supported;

③ The "Process" button at the bottom of the menu bar is for single-model processing, and the "Merge" button is for multi-model processing, you can select between the two;




**Mesh:** convert the point clouds into mesh.
**Clip:** clip the model plane.
**Fill hole:** fill holes on the model surface.
**Smooth:** smooth the flat/curved surface.
**Undo:** cancel the current operation and revert to the previous state.
**Export:** export models in PLY/STL/OBJ format.




**Align:** align two imported models.
**Merge:** merge aligned models into one model.
**Texture:** map texture onto the model.
**Undo:** cancel the current operation and revert to the previous state.
**Export:** export models in PLY/STL/OBJ format.

④ File formats: ply/obj/stl/zx3d

At the bottom of the software interface, you can see specific operation instructions.

## 7. FAQ

**Q The preview image is stuck.**

**A** ① if the scanner is powered off - reconnect the power cable, and then connect the USB data cable; ② if the software does not respond - restart the software.

**Q The size of the object is too small, and the scan usually fails.**

**A** The minimum scannable size is: 100x100x100 (mm). To scan objects smaller than this size, auxiliary object is required to help the scanning.

## Appendix

### 8. Precautions

1. Please use the device indoors at the temperature of -10°~35°. The scanning effect would be better under dark light. If you need to use it outdoors, please block the sunlight and ambient light properly.
2. Do not dismantle or modify the device.
3. Please do not use the device in where there is dust or cigarette smoke.
4. Do not wet it by exposure to liquid such as fresh water, sea water, milk, soda or soap water.
5. Do not use or store the device in extremely high temperature environment, such as putting it near fire or heater.
6. Do not hit the device fiercely. Do not hammer it, pile up heavy objects on it, step on it or drop it down.
7. In case of any device failure, please stop using the device and contact your local distributor or authorized maintenance agent.

# WARNING

**The product cannot be returned if the “Warranty Void If Removed” label is damaged or removed.**

**Do not look directly at the projected light, or project the light directly at eyes.**