



Color 3D Scanner

iReal 2S

User Manual

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Introduction

Please read user manual before start.

After reading, keep it safely for next time review.

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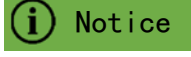
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Basic label

This manual will use the following labels to describe different significance, so please read carefully and make sure understand all of labels.

 Danger	Fail to obey the announcement will cause dangerous situation or injuries and deaths
 Warning	Fail to obey the announcement may cause dangerous situation or injuries and deaths
 Caution	Fail to obey the announcement may cause minor injury
 Attention	Fail to obey the announcement may damage product or surrounding



Safety Announcement

 Notice	During scanning process, must obey announcement and use product correctly
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Please use it correctly


To avoid malfunction of the KSCAN series and to ensure proper use, please observe the following precautions.


Normal Announcement

 Caution	<ul style="list-style-type: none"> ➤ Before starting work, please confirm the function and performance of this product, and the equipment can operate normally. ➤ If the product malfunction, please turn off the power immediately for preventing other damage. ➤ Please don't change temperature suddenly during product use, otherwise condensation will cause equipment failure.
 Attention	<ul style="list-style-type: none"> ➤ For out of the working range, and modified products, the company does not guarantee its function and performance. ➤ When this product is combined with other equipment, it may not be able to satisfy the function and performance depending on the


	conditions of use and the environment. Therefore, please pay attention to it before use.
--	--

Operation Announcement


 Warning	<ul style="list-style-type: none"> ➤ Please choose the correct power supply voltage. Otherwise malfunction will cause failure or fire. ➤ Please do not disassemble or modify the unit. Otherwise malfunction will cause failure or fire.
--	--

 Attention	<ul style="list-style-type: none"> ➤ In order to use this product properly and safely, please try to avoid the following places, otherwise it may cause malfunction. <ul style="list-style-type: none"> ● high humidity or dust; ● Corrosive or flammable gas; ● Splashes of water, oil, chemicals; ● static electricity. ➤ Dirty dirt, water or oil stains may affect the use of the product and cause measurement deviations; ● When it is attached to the surface of the product glass: blow off the dirt with clean air. When the soil is dirty, wipe it off with a soft cloth dampened with alcohol. ● When it is attached to the surface of the object: please blow off the dirt with clean air or wipe off the dirt with a clean soft cloth. ➤ If the measuring object vibrates, it may cause a deviation in the measured value. ➤ After turning on the power, wait about 5-10 minutes before use. Since the circuit will not stabilize immediately after the power is turned on, the measured value may be deviated.
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Accident Announcement

 Attention	<ul style="list-style-type: none"> ➤ Turn off the power immediately when the following phenomenon occurs. If you continue to use it, it may cause equipment failure. <ul style="list-style-type: none"> ● Water or foreign matter inside the device; ● The device is dropped, or the casing is damaged; ● The device emits smoke or an unusual smell.
--	--

Storage Announcement

 <p>i Attention</p>	<ul style="list-style-type: none">➤ Do not wipe the product with a damp cloth, volatile oil, thinner, etc. Otherwise, the product may be discolored or deformed. When the soil is dirty, use a cotton cloth to remove the diluted neutral detergent, wring it out, wipe it, and then wipe it off with a soft cloth.➤ Please try to avoid the following places for storage;<ul style="list-style-type: none">● high humidity or dust;● Corrosive or flammable gas.
---	---

1 Product description

Handheld 3D scanners usually include a light source (laser or white light, etc.), a structured light projector, two (or more) industrial cameras, a computing unit for 3D digital image processing, and a calibration board for calibrating the above equipment and Markers and other attachments. IReal 2S is a cost-effective handheld color 3D scanner carefully upgraded by Hangzhou Scantech. It can scan without sticking points, and can obtain high-definition delicate color textures, which fully meets the user's scanning needs for large and medium-sized objects and human body parts. Lightweight and portable design, easy-to-use software, ideal for handheld scanning users in non-industrial fields.

This manual mainly introduces the use of iReal 2S series handheld color 3D scanners (hereinafter referred to as iReal 2S scanner, iReal 2S or scanner).

2 Precautions before using

This chapter mainly introduces the product configuration, product structure, and device connection of the scanner.

2.1 Product Configuration

Please take out the security box with the scanner from the outer paper box, and check whether the box contains the following standard items.

Standard configuration:

(1) Main body of iReal 2S handheld color 3D scanner: its shape is shown in Figure 2-1.

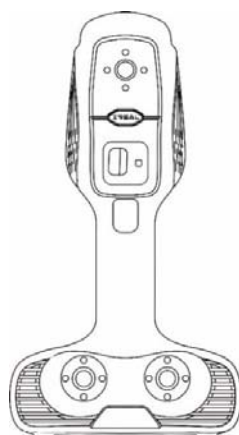



Figure2- 1 Handheld color 3D scanner

(2) Calibration plate: Referred to as the calibration plate, the shape of the calibration plate is shown in Figure 2-2.




Figure2- 2 Calibration plate

 Notice	It is mainly used to calibrate camera parameters. In order to ensure good data quality, the camera needs to be calibrated with a quick target plate before the scanner is started or when temperature changes or scan data quality is not good.
--	---

(3) Power data cable: Shape shown as Figure 2-3




Figure2- 3 Power data cable

 Notice	The DC interface is connected to the power adapter to power the scanner; the Type A interface is connected to the computer and the scan data is transmitted to the computer; the Type B interface is connected to the scanner.
--	--

(4) Power adapter: Figure 2-4 shows the shape of the power adapter.



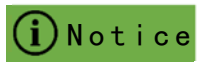
Figure2- 4 Power adapter

 Notice	Connect to the device through a power data cable to provide external power.
--	---

(5) Marking points: Figure 2-5 shows the shape.



Figure2- 5 Marking points



Several circular marker points. Marking points are used to attach to the scanned workpiece for scanner positioning.

(6) Dongle and USB disk: Figure 2-6.

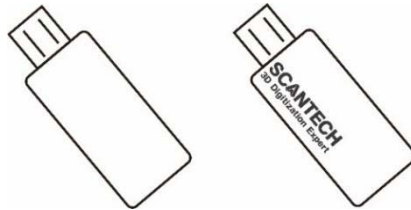
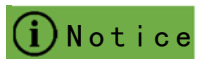


Figure2- 6 Dongle and USB disk

(7) Paper documents: including packing list and product warranty card. The paper file is shown in Figure 2-7.



Figure2- 7 Paper document



The specific model and quantity of optional accessories are subject to customer order.

2.2 Product structure

(1)The scanner product structure is shown in Figure 2-8.

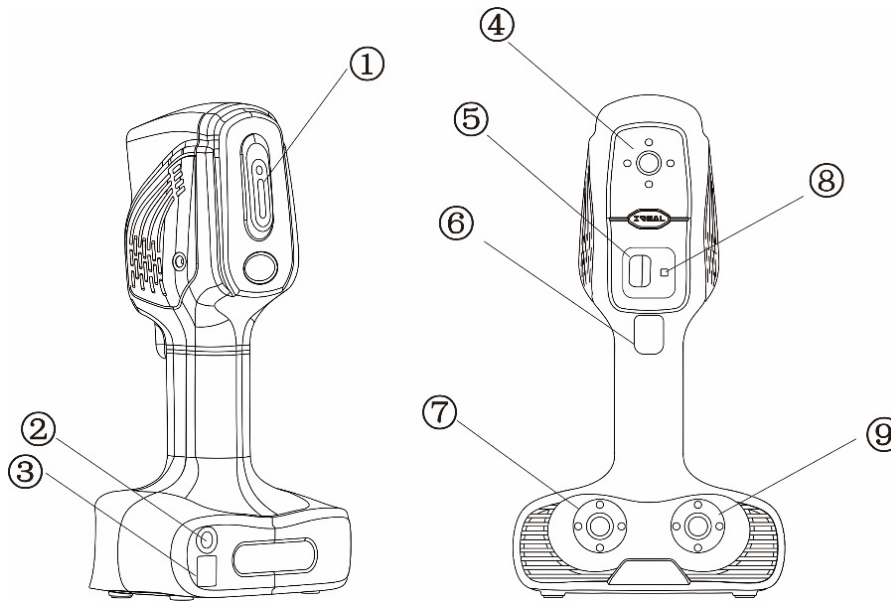


Figure2- 8 Product structure

- ①- Indicator light ②- Power cable port ③- Data cable port
- ④、⑦- Camera ⑤- Projector ⑥- Button ⑧- Infrared light source
- ⑨- Color camera

(2)The names and functions of some structural components are shown in Table 2-1.

Table 2- 1 Some component names and descriptions


Component name	Specific functions
①-Indicator light	Bright red: the scanner software is disconnected or the scanner is too far away Bright green: the scanner scans at a moderate distance Bright blue: the scanner is too close when scanning Bright yellow: The scanner failed to scan the stitching of objects.
②-Power cable port	Power interface for connecting power cables
③-Data cable port	Connect the USB interface of the data cable
⑥-Button	Start / pause scanner button

2.3 Before you using

- (1)The scanner is suitable for scanning objects over 30cm in size;
- (2)The calibration plate is made of glass and fragile;
- (3)Scan under the sun light source, you need a shade to scan;
- (4)In order to ensure the normal use of the scanning software, please turn off the computer protection / security anti-virus software;
- (5)The scanning software processes the scanned data transmitted in real-time during the scanning process in real time. The selection of appropriate hardware configuration can effectively improve the working efficiency of the entire scanning system. For the computer parameter configuration requirements of the scanning software, see Table 2-2.

Table 2- 2 Computer parameter configuration requirements

Item	Recommended configuration
CPU	i7-8750H and above
RAM	16G and above
Video memory	NVIDIA GTX1050Ti and above,independent memory 4G and above
Interface	USB3.0
System	Windows10 64bit


 Notice	<p>When the scanner is operating, plug the computer into a power source and set the power source to high-performance mode.</p>
---	--

3 Software and hardware installation

This chapter mainly describes the software and hardware installation of this product.

3.1 Software Installation

This section describes the steps for installing the scanning software RealViewerVX.XX.exe installation package to a computer. Here, the installation is mainly performed on a Windows 10 system as an example.

 Notice	VX.XX in RealViewerX.XX.exe is the version number of the software installation package. The version number may be changed due to software upgrade in the future. It is subject to change without notice.
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(1)Right-click the RealViewerVX.XX.exe installation package, select the desired language,select Run as administrator, check "I agree to the License terms and conditions.", And click "INSTALL" (Figure 3-1)

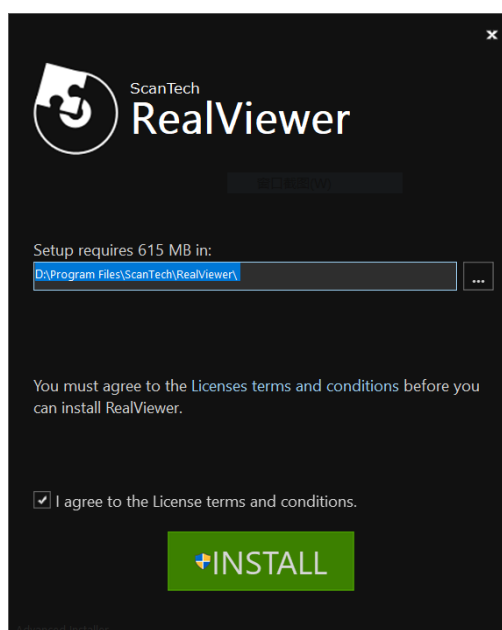


Figure3- 1 RealViewer software installation

(2) Wait for the installation process, press the keyboard "ENTER" (Figure 3-3), and wait for the installation to complete.

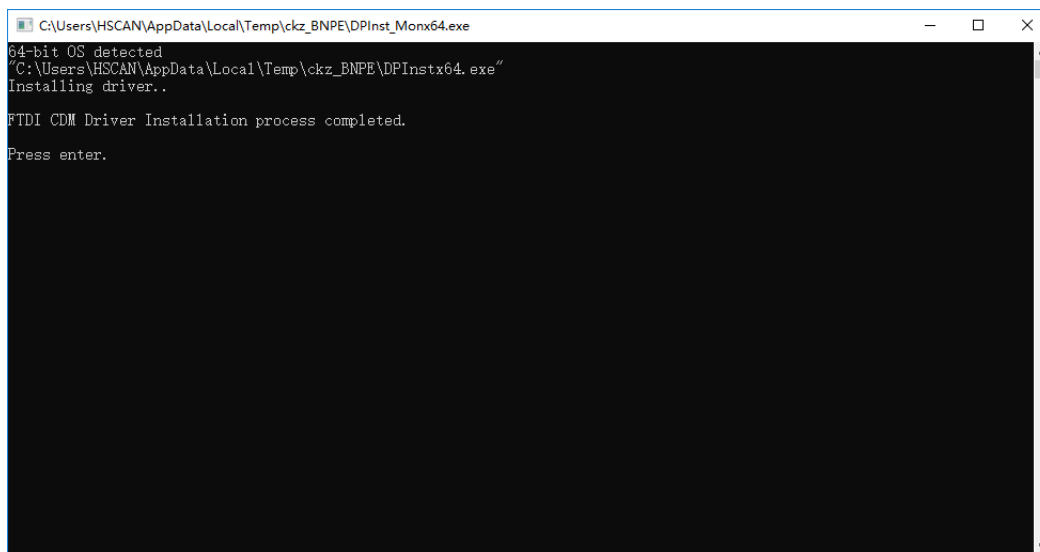


Figure3- 2 RealViewer software installation

(3) Click "Finish" to complete the software installation (Figure 3-3).

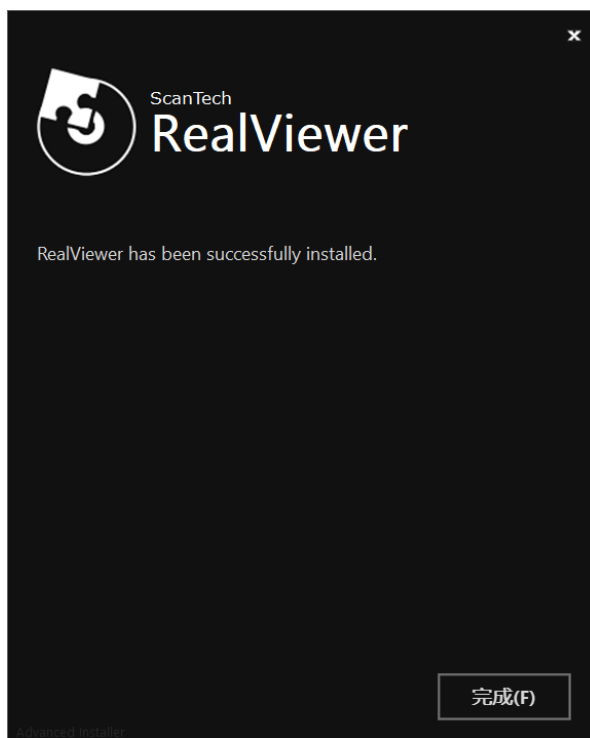


Figure3- 3 Installation complete

3.2 Hardware connection

The device connection includes two steps: connecting the power to the scanner and connecting the scanner to the computer. The connection line includes a power adapter connection line and a power data cable. The power adapter provides power to the scanner. The power data cable has a total of four interfaces, which are respectively connected to the computer, power adapter and scanner. The specific connection methods are as follows (refer to Figure 3-4):

Step 1: Connect the USB interface of the data cable to the USB 3.0 port on the computer;

Step 2: Connect the power interface and the USB interface of the power data cable to the corresponding interfaces of the device respectively (when connecting, pay attention to the direction of the arrow on the cable interface to be consistent, otherwise the interface may be damaged);

Step 3: Connect the power adapter port to the DC interface of the power data cable;

Step 4: After checking that the above steps are connected correctly, finally connect the power adapter plug to the power interface.

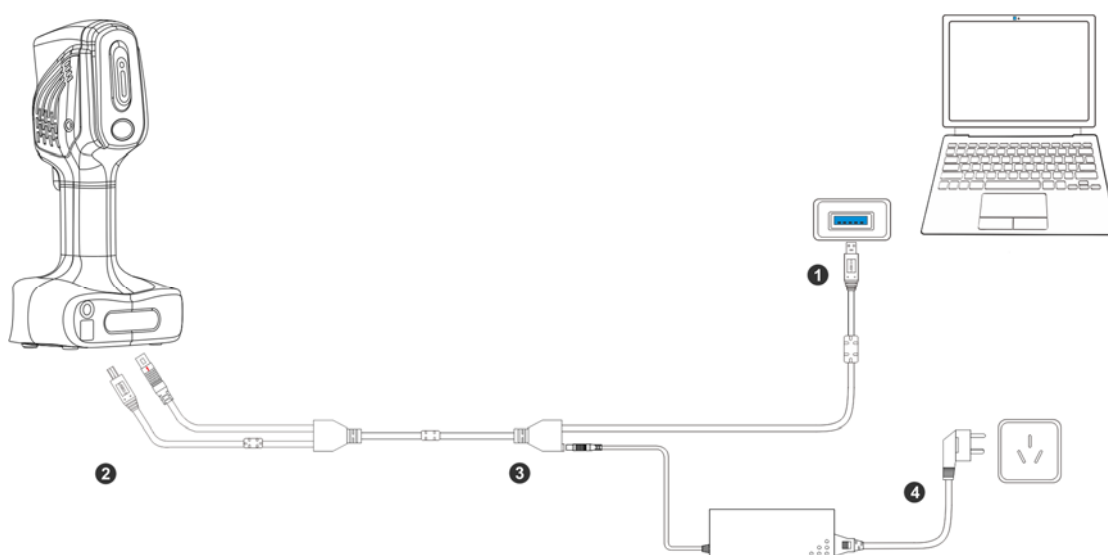


Figure3- 4 Hardware connection

3.3 Software operating environment settings

After the installation of the scanning software is completed, in order to ensure the smooth use of the software, it is necessary to set the running permissions of the software: give the scanning software administrator permission to run.

Give administrator permission to run: Right-click the scanning software shortcut icon, click "Properties", select the "Compatibility" tab in the pop-up properties window, check the "Run this program as an administrator" option, and click "Change All user settings" button, check "Run this program as administrator" again in the pop-up dialog box, and click the "OK" button (Figure 3-5).

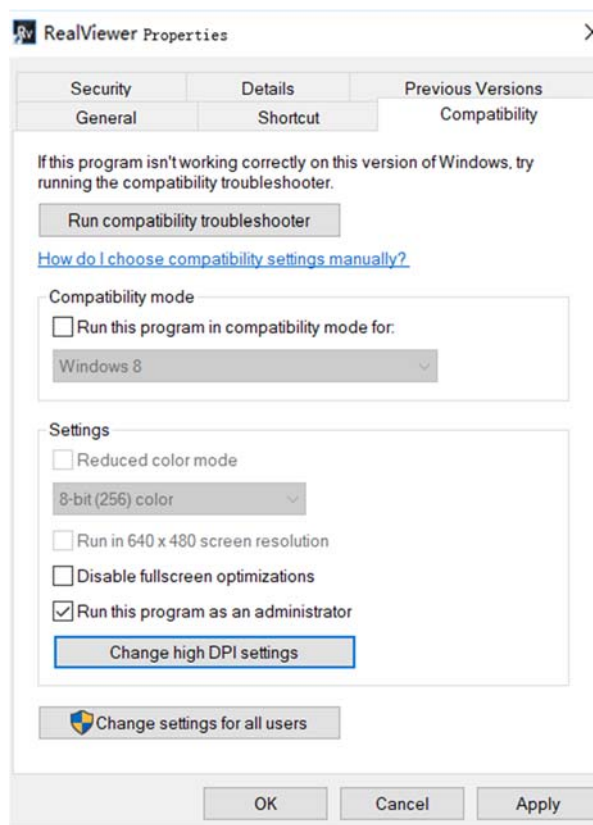



Figure3- 5 Give administrator permission

3.4 Device file configuration

After starting RealViewer scanning software, you need to manage file configuration. There are two main ways to manage file configuration:

(1) Right-click the "RealViewer" software icon, select "Open file location", open the "iRealSET" folder in the file location, and replace the folder with the iRealSET backup in the U disk provided with the iReal 2S scanner folder.

(2) Click the “” Import Configuration File icon on the software scanning interface to import the iRealSET backup folder in the USB flash drive provided with the iReal 2S scanner, and the interface will be displayed after the import is successful (Figure 3-6).

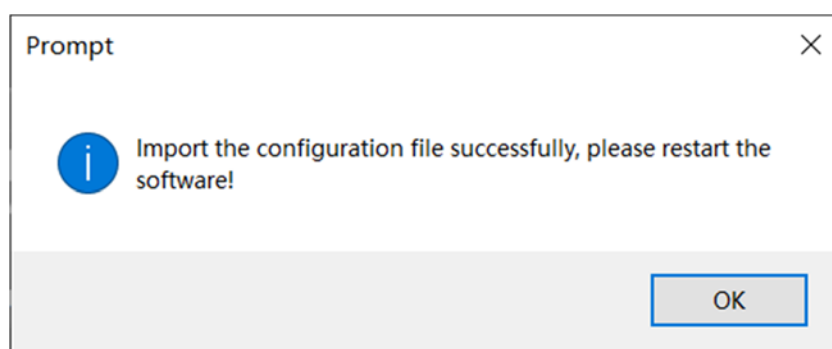



Figure3- 6 Set file imported successfully

At this point, the software and hardware installation of the device is all completed. Restart the computer and plug in the dongle to start the scanning software for scanning.

4 Quick start process

This chapter mainly describes the calibration and basic scanning operation process of the iReal 2S series.

 Notice	The device is successfully connected, you need to wait for the computer to successfully recognize the camera driver (3-5 seconds), and then open the software for calibration / basic scanning operations.
---	--

4.1 Calibration

For the first use of the scanner, you need to calibrate the device before scanning, the purpose is to calibrate the camera parameters. The following situations require calibration of the equipment:

- ① Use the equipment for the first time;
- ② The equipment has not been used for a long time;
- ③ The equipment is shaken / transported;
- ④ The amount of scanning data in a single frame is small;
- ⑤ The data cannot be spliced.

(1)Click “Calibration” on the main page to start the calibration operation demonstration video. After learning, click “Calibration” to control the angle of the scanner, adjust the distance between the scanner and the calibration board, and ensure the gray shaded part and red shade on the calibration board. Partially overlap; move the scanner according to the calibration interface prompts, so that the gray and blue model scanners basically overlap, and complete the calibration steps (Figure 4-1).

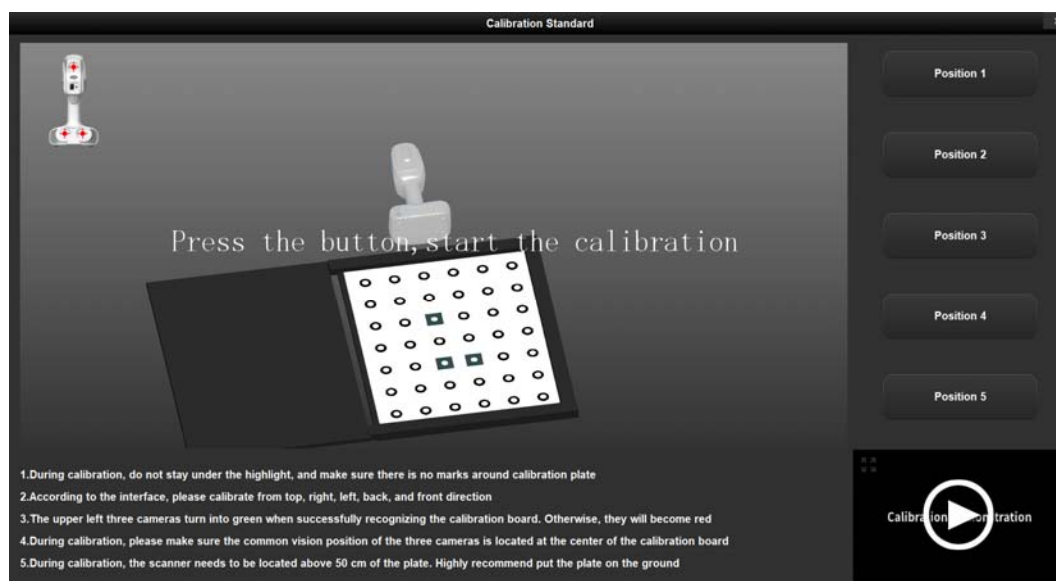


Figure4- 1 Calibration step

(2)Follow the calibration software prompts to complete the five calibration steps from position one to position five step by step. Final calibration results (Figure 4- 2).

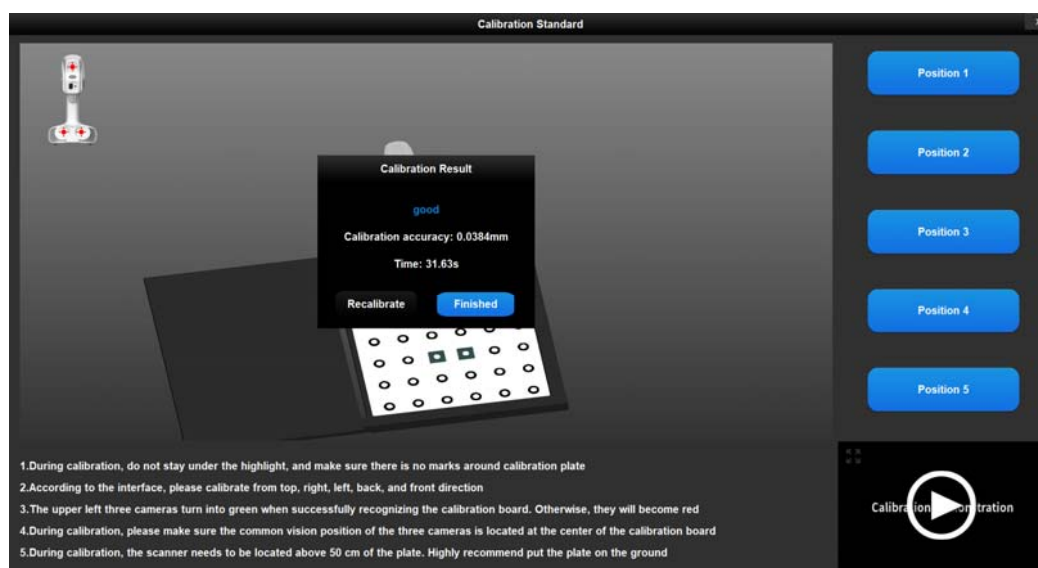






Figure4- 2 Calibration Results

 Notice	<p>Before Calibration: Red indicator light on the simulation device which is on the top left corner of the software interface;</p> <p>During Calibration: Green indicator light on the simulation device on the top left corner of the software interface.</p>
---	--

4.2 Basic scan process

Start the scan after the first calibration, the following are the basic process of the color object scan.

(1)Click home page“colorful item”-“next step”, enter color object scan interface, single click“” to pre-scan, switch“”choose black and white camera or color camera, slide the progress bar to adjust the camera brightness (Figure 4-3), click“”to stop pre-scan.

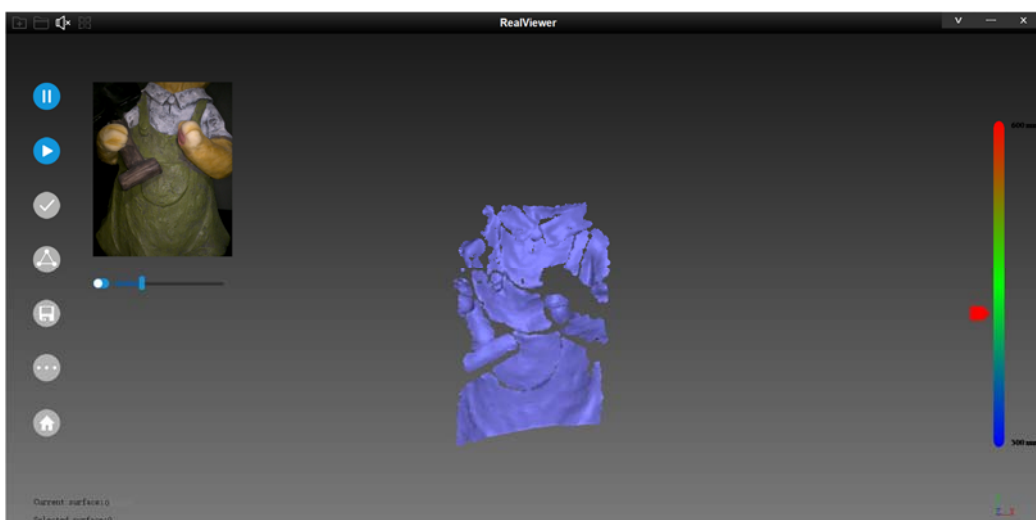







Figure4- 3 Pre-scan

(2)To check the scan result during the scan, click“”to stop scan“” to process point cloud, check the scan data, if not good, click “” to continue the scan.

 Notice	<p>Scanning may be suspended in the following three situations: a) the user needs to withdraw the wrong scan data during the scanning process; b) the point cloud needs processing operation; c) the scanning process needs to switch the blue / infrared scanning mode.</p>
---	--

(3)After the scan, click“”to finish the can, scan result (Figure4- 4) .

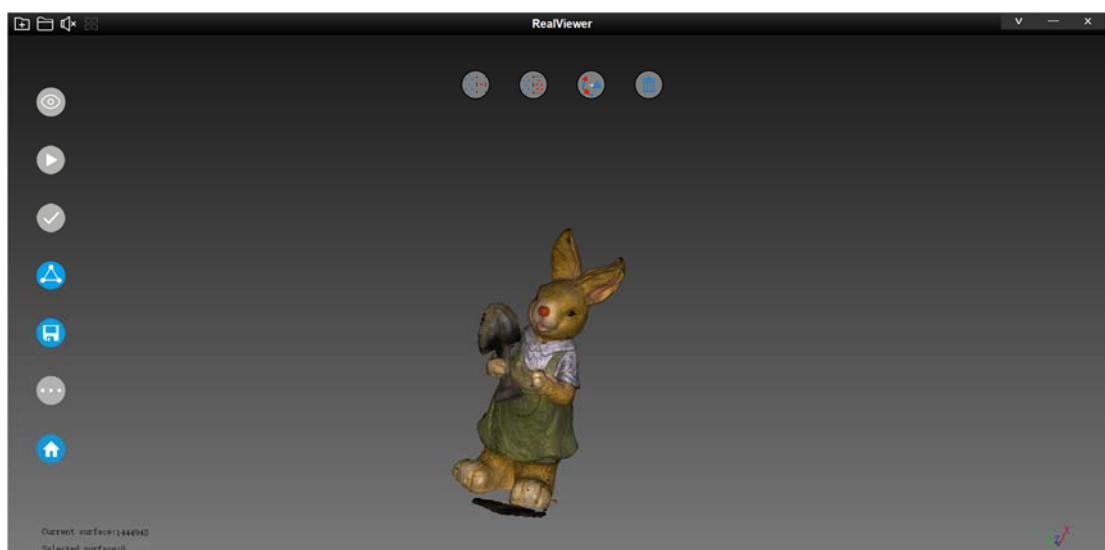


Figure4- 4 Finish scan




(4)Finish scan, click“”isolated point to remove the extra points (错误!未找到引用源。) .



Figure4- 5 Delete isolated points

(5)Click “Disconnected item” to find and delete the point cloud far away from the point group. If the data stitching error is caused by too little single frame data, you can click the Delete overlay “”button to delete it.

(6) Click “” to wrap point cloud to triangular mesh surface, edit triangular mesh surface, delete and adjust the brightness and contrast. In general, choose “closed mode” to fill the holes, and then click “apply” (Figure4- 6) .

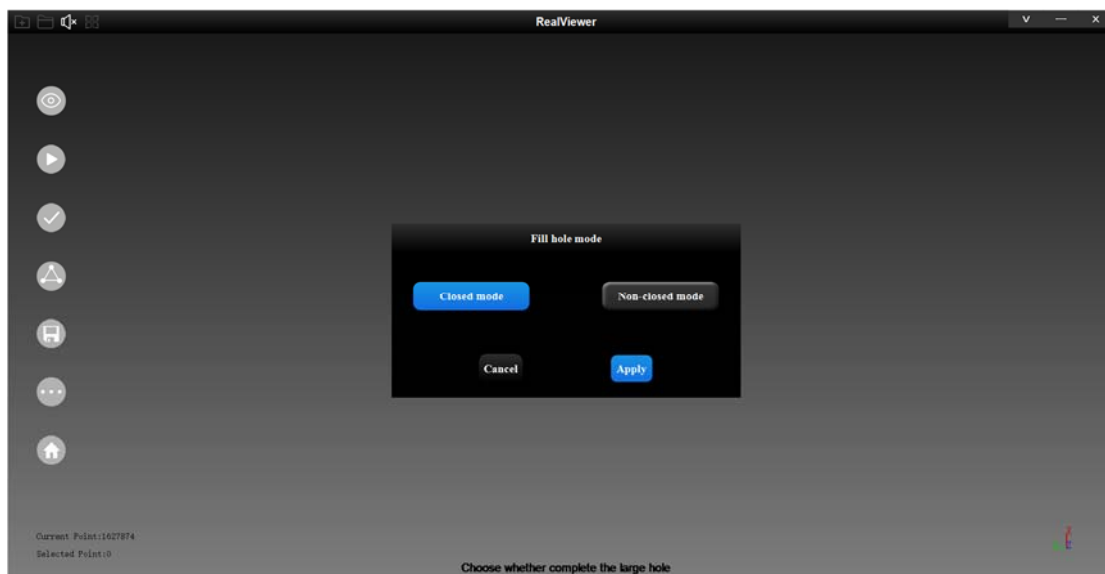


Figure4- 6 Fill hole mode

(7) After “Fill hole mode”, pops up “mesh optimization” window, can choose the level of smoothing (generally choose "High Detail") according to the requirements for the effect of the scanned object, and click "Apply" (Figure4- 7).

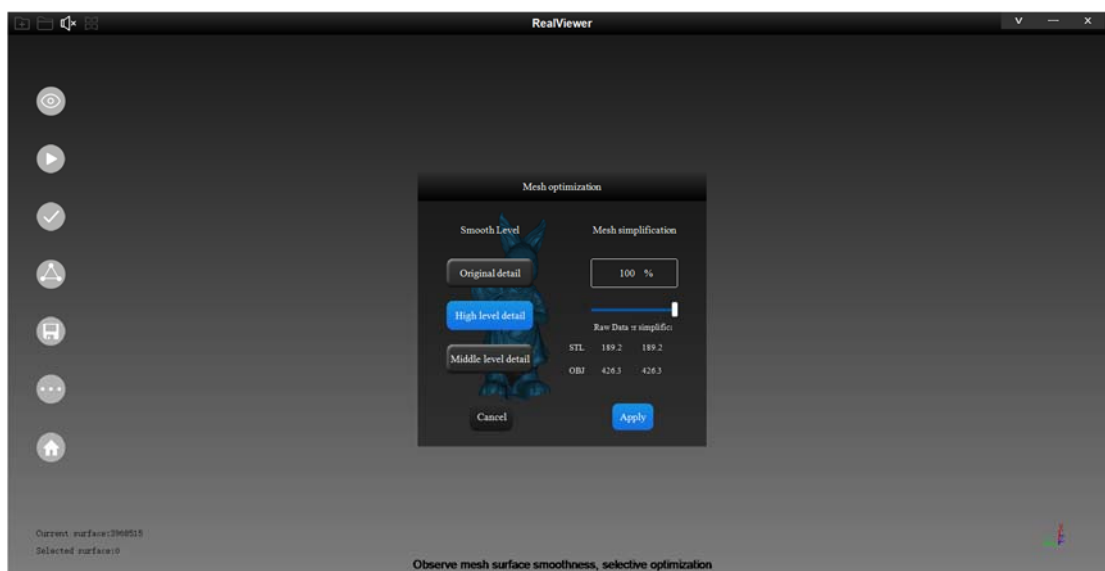



Figure4- 7 Mesh optimization

(8)After the data processing, the user can adjust the parameters such as the color difference, saturation, and brightness of the scanned object according to the actual use situation (Figure4- 8).



Figure4- 8 Adjust color difference

(9)After adjusting the required color difference, click "" to save the data. The color model file is saved in .obj format first, and the point cloud data is saved in .asc and .ply format.

5 Software function

This chapter mainly introduces the main interface, professional mode, and scanning interface functions. The main interface includes 4 scanning modes: portrait (hair), human body parts, colored items, and exclusive mode. The professional mode interface is mainly composed of 4 parts of parameters, such as light source mode, model color, stitching mode, and dot pitch setting. The scanning interface includes the functions of the scanning and post-processing modules.

5.1 Main Interface function

On the main interface of the software, you can select the corresponding scanning mode according to different scanned objects, as shown in Figure5- 1. The specific functions of the scanning mode are shown in Table 5-1. After determining the scanning mode, click "Next" To enter the scan interface.

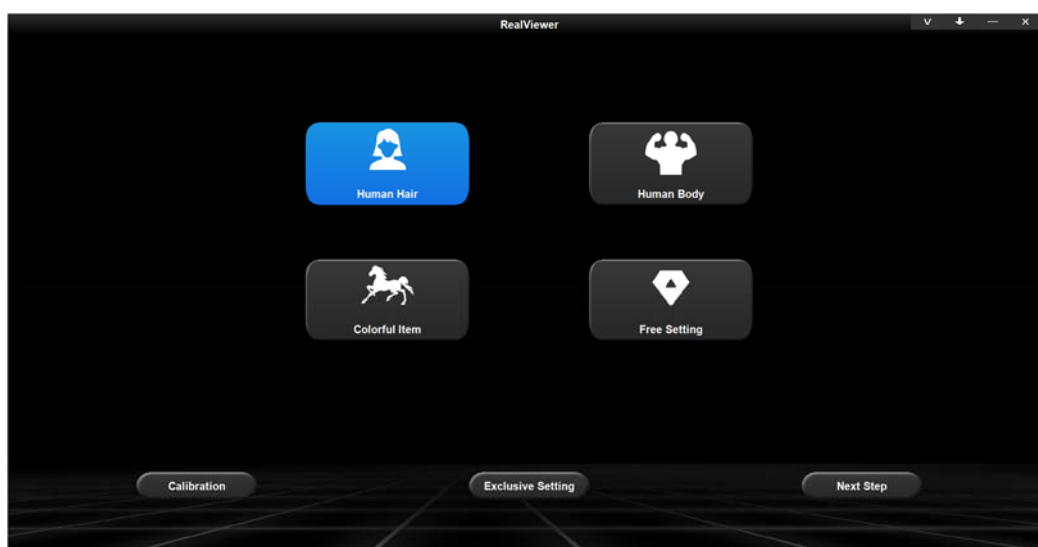


Figure5- 1 Main interface

Table 5- 1 Scan mode introduction

Scan mode	Specific function	Parameter settings
Human Hair	Scan optimization mode (infrared invisible light scanning) to obtain hair bust / full body image data.	Light source: fast scanning of infrared light; Model color: color texture; Stitching: features; Resolution: Medium detail.
Human Body	Exclusive scanning optimization mode (blue light scanning), to obtain high-precision human body data.	Light source: blue light fine scan; Model color: color texture; Stitching: features; Resolution: Medium detail.
Colorful Item	It is suitable for scanning colored items with continuous irregular features, and the size of the item is better to be more than 50cm.	Light source: blue light fine scan; Model color: color texture; Stitching: features; Resolution: Medium detail.
Free Setting	Select the corresponding professional mode for scanning according to the size, material, texture requirements, model fineness requirements, etc. of the tested item.	default setting Light source: blue light fine scan; Model color: color texture; Stitching: features; Resolution: Medium detail.
Exclusive Setting	Users can set scanning parameters in "Free Settings", click "Save Settings" and open "Exclusive Setting" to enter the selected parameters for scanning. Software default "exclusive settings" parameters: Blue-ray fine scan, monochrome without texture, feature stitching and high detail.	Users can select the parameters in "Free Setting" and click "Save Settings" to save the parameters.

5.2 Free Settings Function

The free setting interface mainly includes 4 parameters, such as light source, model color, stitching, and point spacing, as shown in Figure5- 2. Refer to Table 5-2 for detailed parameter selection function during specific equipment scanning operation.

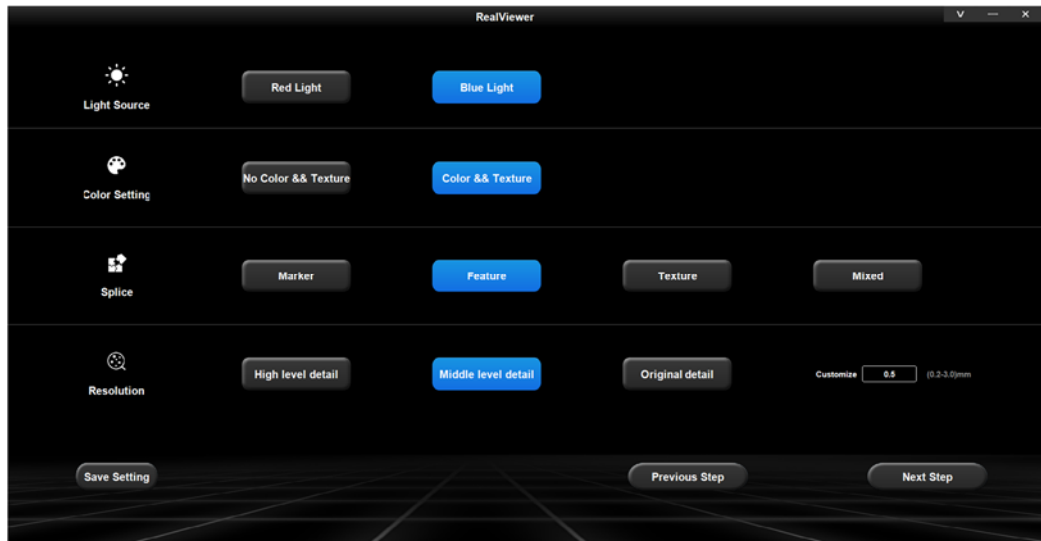


Figure5- 2 Free Settings Interface

Table 5- 2 Free setting interface button function

Parameter Type	Button	Function
Light Source	Red Light	Human eye safety mode, fast scanning speed, strong material adaptability, can scan 3D data of human hair.
	Blue Light	It has strong anti-interference to the outside world, high quality point cloud, and can obtain models with higher details.
Color Setting	No Color && Texture	Obtain single color stl data, and cannot restore the surface color of the item.
	Color && Texture	Scan the surface color of the object to obtain the color model and obj model file.
Splice	Marker	When the scanned object has no features, has repetitive features, or is symmetrical, it is necessary to attach marked points on the measured object before scanning, and 4 or more identified marked points must match the existing marked points.
	Feature	When the article has continuous irregular geometric feature changes, the feature stitching scan can be performed according to the common geometric features identified by the two frames.
	Texture	When the article has continuous irregular color pattern changes, the texture stitching scan is performed according to the common pattern features identified by the two formats.
	Mixed	Integrating three modes of marked points, features, and texture stitching, according to the

		characteristics of the item, the marked points, texture, and geometric features are successively identified, and stitching is performed according to the first recognized feature.
Resolution	High level detail	Point distance is up to 0.5mm / 0.2mm, suitable for scanning items within 30-80cm.
	Middle level detail	Point distance is up to 1.0mm / 0.5mm, suitable for scanning items within 80-150cm.
	Original detail	Point distance is up to 1.5mm / 0.9mm, suitable for scanning objects within 150-300cm.

5.3 Scan interface function

The scanning interface mainly includes a menu bar, a toolbar, and a status bar (Figure5- 3). For details about the functions of the software buttons during the scan operation of a specific device, see Table 5-3.

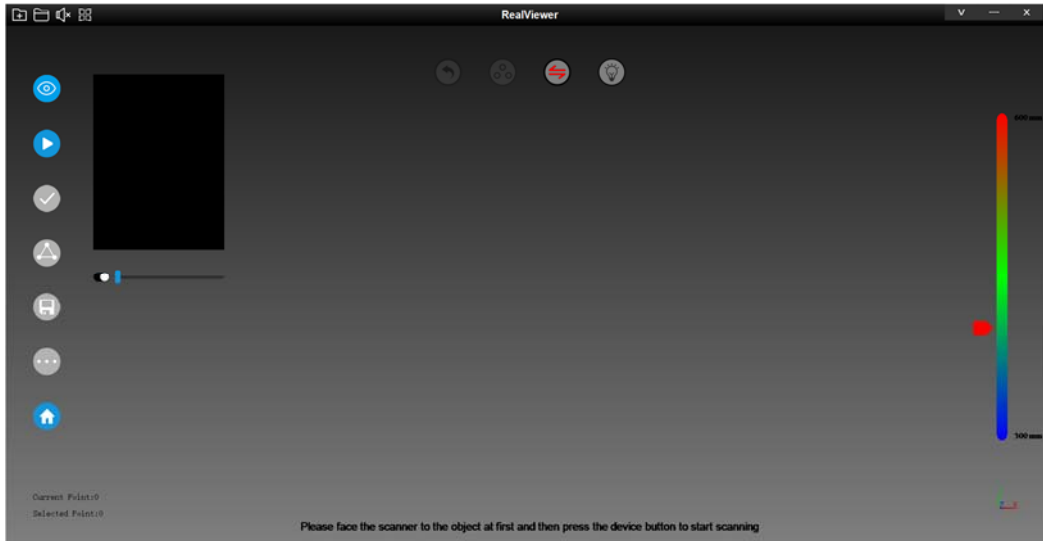






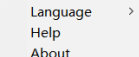




Figure5- 3 Scan Interface

Table 5- 3 Scan interface button function

Window	Button	Function
Menu		Clear the data and select rescan according to the current mode.
		Open the scan data and enter the browse mode.
		Turn on the device beep, and the buzzer will emit a beep when the device scans beyond the scan specific or cannot be spliced.
		Turn off the device beep sound. When the device scans beyond the scan specific or cannot be spliced, the buzzer will not make sound.
		Import a valid management profile
		Splice two different project files together through common features.
		Language: software interface language can be switched, help: provide help information; about: display software, hardware version, authorization information, copyright information, etc.
Left tool bar		Pre - scan button. Familiarize yourself with the best scanning distance of the device. Adjust the camera brightness to ensure the maximum point cloud out. Click again to stop pre - scan and start the first frame scan.
		Point the scanner at enough geometric features / patterns / marking points of the scanned object, and click the button to start the first frame scan. Note: If there is less scan data in the first frame or the scanner is not aligned with the object under test, splicing failure may result.



















	<p>Click to stop scan.</p>
	<p>All point cloud data are processed by filtering, encapsulation, and deletion stacking. After the processing is completed, data can be deleted, encapsulated, and other operations.</p> <p>Note: You cannot continue scanning after clicking</p>
	<p>Encapsulate all the acquired point cloud data, generate triangular mesh faces, and automatically perform mesh optimization.</p>
	<p>To save data, single color models generally choose to save .stl / .obj mesh files; color models require texture display, and the .obj mesh format is exported by default; point cloud data is saved in .asc / .ply format.</p>
	<p>Return to the mode selection interface.</p>

Table 5- 3 Scan interface button function

Window	Button	Function
Left toolbar (extensions)		Select the point calculation button, select two or more points, and press the distance between the points and the angle formed by the line segments connected between the points. Click the button again to exit the point selection calculation mode.
		Select surface calculation button, select a part of the triangle surface to calculate the corresponding three-dimensional surface area, and click the button again to exit the surface selection calculation mode.
		Under the color model, click the color magic wand, set the tolerance value in the dialog box, and intelligently distinguish the colors on the model to achieve the intelligent selection of the triangular surface for calculating the three-dimensional surface area. Note: The selected area and the area outside need to have obvious pixel differences and sharp edges.
		Subdivide each triangle to increase the number of triangles in the mesh data.
Left tool bar		Withdraw the current frame scan data. If it is selected by mistake, left-click to cancel the selection.
		When the scan is paused, the data can be processed by point cloud filtering, global accurate stitching, etc., and the scanned data can be observed more clearly. Note: The editing and deletion of point cloud data can only be performed after the scan is finished.

		When scanning is paused, click to switch between red and blue light scanning modes.
		Turn on the fill light system to obtain more realistic texture color and more stable point / texture stitching; turn off the fill light system to scan the human eye more safely.
Point cloud process toolbar		Pick points that are at a distance from most other points
		Evaluate the proximity of points and select a group of points that are far away from each other.
		Choose a group of feature points that are similar to the subject but have repeated feature points (deformation due to human shaking / too few single-frame data leads to data stitching errors).
		Delete the selected data. If you select data by mistake, you can click ctrl + z to recover the data.
Display interface		Switch the field of view of the black and white camera or color camera directly, and adjust the brightness of the camera.

6 Scan Example

This chapter mainly introduces different splice methods (marker splicing, texture splicing, feature splicing) as examples.

6.1 Marker splicing

When the surface of the object is smooth and non-feature, with repeated features or symmetry, it is necessary to paste markers on the object before scanning. The following is an example of scanning the sofa.

6.1.1 Paste markers before scanning

info:

The distance between each two markers is 30mm to 250mm, and it should be determined according to the actual situation. If the curvature of the surface is small, the distance between the markers can be farther, the maximum distance is 250mm. If the curvature of the surface changes greatly, the distance between the markers can be smaller, the minimum distance is 30mm (Figure6- 1).

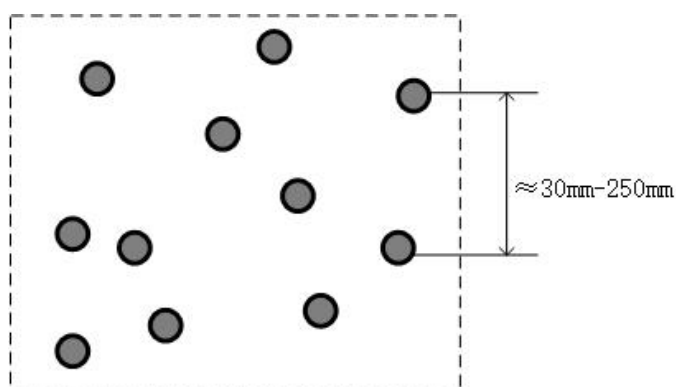


Figure6- 1 Paste markers

Note that the markers should be randomly distributed to avoid regular arrangement (Figure6- 2).

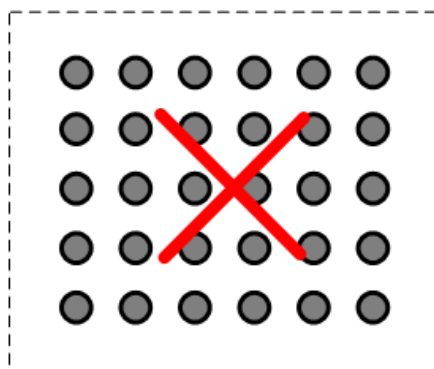


Figure6- 2 The wrong way of pasting

In addition, you should pay attention to avoid overlapping, hidden or damaged markers when pasting points. If the object needs to be sprayed powder (for example, scanning black, transparent or shining objects), first spray the powder and then paste the points.

6.1.2 Scan parameter settings

Click “Free Setting” to select the scanning parameters. The scanning parameters are as follows:

- ① Light source: blue light fine scanning (selected according to the required scanning detail level);
- ② Color Setting: No color&Texture (get stl data);
- ③ Splice: markers;
- ④ Resolution: Middle level detail (selected according to the required resolution).

6.1.3 Marker splicing process

(1) Click pre-scan, we can grasp the optimal distance for scanning and the brightness of the camera. Click the button on the scanner to pause the pre-scan.

(2) When scanning is started, the software scans the markers by default. After the scanning is completed, click "End Scan" to complete the scanning of the markers (Figure6- 3).

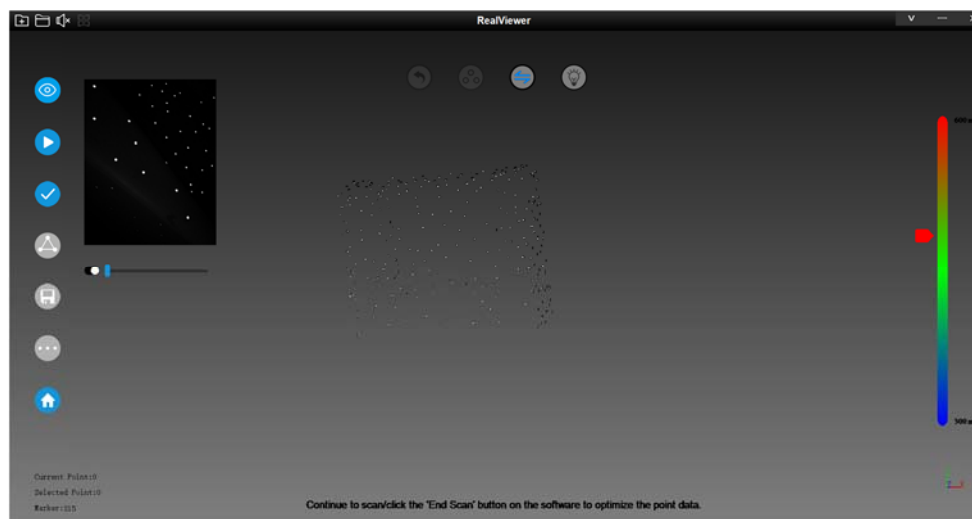


Figure6- 3 Marker scanning completed

(3) Click "▶" again or press the scanner start button to start object scanning.

After scanning is complete, click "✓" to finish scanning (Figure6- 4).

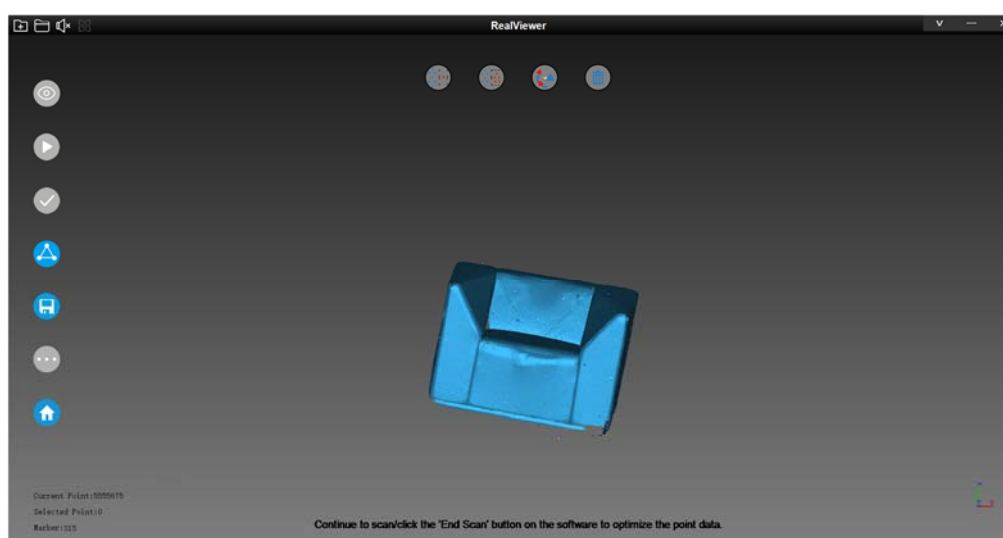


Figure6- 4 Scan completed

6.2 Texture splicing

When the object has continuous irregular color pattern changes, texture splicing can be performed according to the common pattern features identified by the two formats. The following takes scanning "painting" as an example.

6.2.1 Scan parameter settings

As "painting" has no obvious features but has obvious patterns, select the splicing method as "texture" and click "Free setting" to select the parameters. The scanning parameters are as follows:

- ① Light source: blue light fine scanning (selected according to the required scanning detail level);
- ② Color Setting: color& texture (get the surface color of the object, get the color .obj model file);
- ③ Splicing: texture;
- ④ Resolution: Middle level detail (selected according to the required resolution).

6.2.2 Texture splicing process

(1) Click "👁️" for pre-scan, we can grasp the optimal distance for scanning and the brightness of the camera. Click the button on the scanner to pause the pre-scan(Figure6- 5).



Figure6- 5 Preview scan

(2)Click "▶️" or press the scanner button to start scanning. After scanning is complete, click "✅" to finish the scan or press the scanner button to complete the object scanning (Figure6- 6).

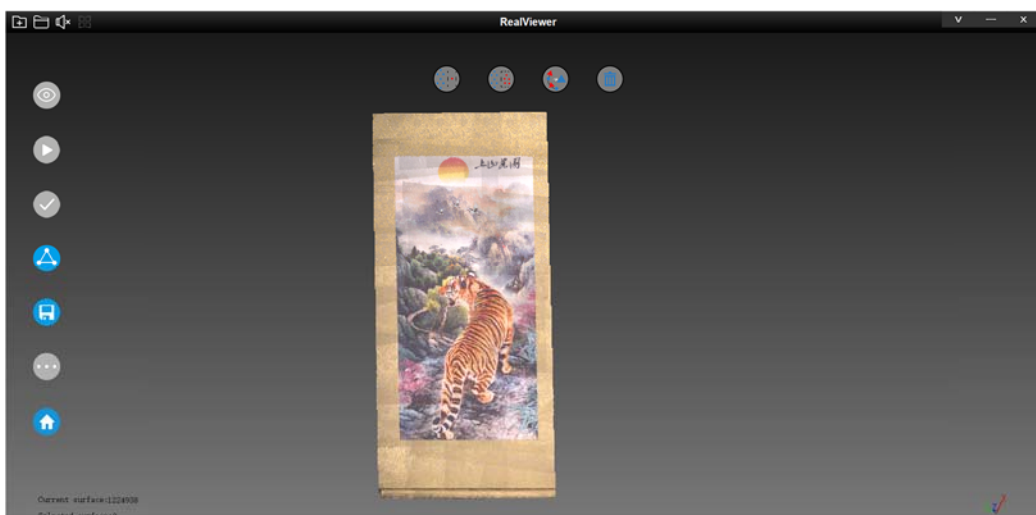


Figure6- 6 End Scan

7 Software function introduction

This chapter mainly introduces three application functions such as point cloud processing, extended functions, and model splicing for the scanned data.

7.1 Point cloud process

Point cloud process mainly includes three processing methods: outliers, disconnected components, and delete overlapping data.

7.1.1 Outliers


For the scanned data, click "" to select points with a certain distance from most other points (Figure7- 1)



Figure7- 1 Outliers

7.1.2 Disconnected components



For the scanned data, click the “” to select a group of points far away from other groups (Figure7- 2).



Figure7- 2 Disconnected components


7.1.3 Delete overlapping

For the scanned data, click “” to delete the overlapping, and select a point group that is similar to the main point group but has repeated features.

7.2 Extended functions

The data expansion function mainly includes 4 functions such as point selection calculation, surface selection calculation, color magic wand, and refine.

7.2.1 Point calculation

For the scanned data, click "" to select point calculation, select the point to be calculated, and click "Calculate" to get the point cloud numerical information (Figure7-3).

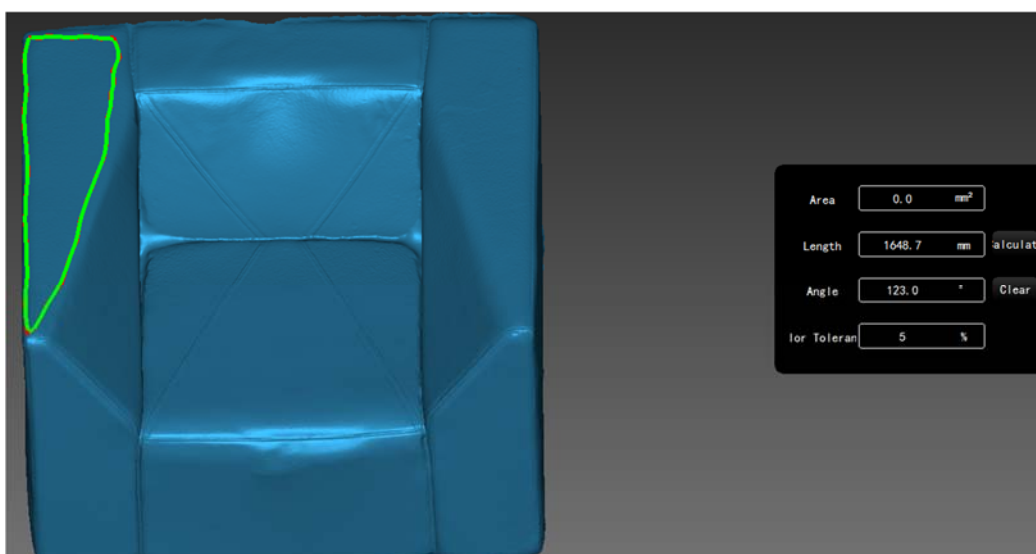



Figure7- 3 Calculation of point calculation

7.2.2 Surface selection calculation

For the scanned data, click "" to select the surface calculation, select the required calculation surface, and click "calculate" to get the 3D surface area value of the selected part (Figure7- 4).

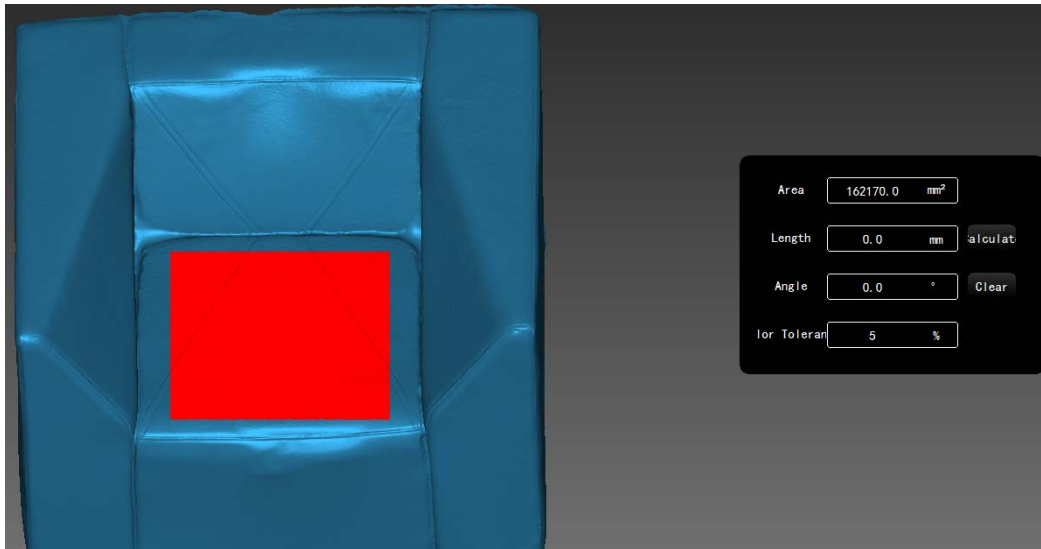



Figure7- 4 Calculation of surface selection

7.2.3 Color Magic Wand

Under the color model, click "" Color Magic Wand, and set the color tolerance percentage in the dialog box. By intelligently distinguishing the colors on the model, you can achieve the intelligent selection of the mesh data. Click "Calculate" to get the area(Figure7- 5).

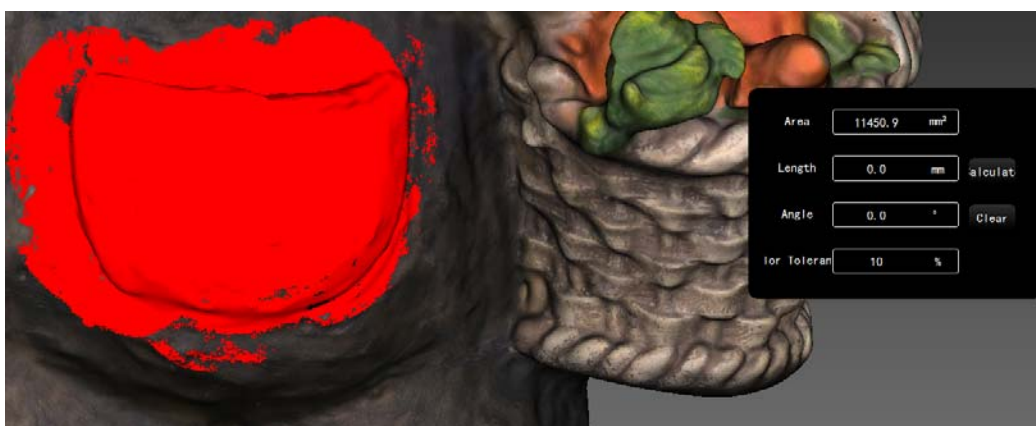




Figure7- 5 Color Magic Wand

7.3 Model splicing

(1) Click the model splicing button "" in the scanning interface, and click "" on the upper and lower interfaces,import the two data to be stitched (Figure7- 6).

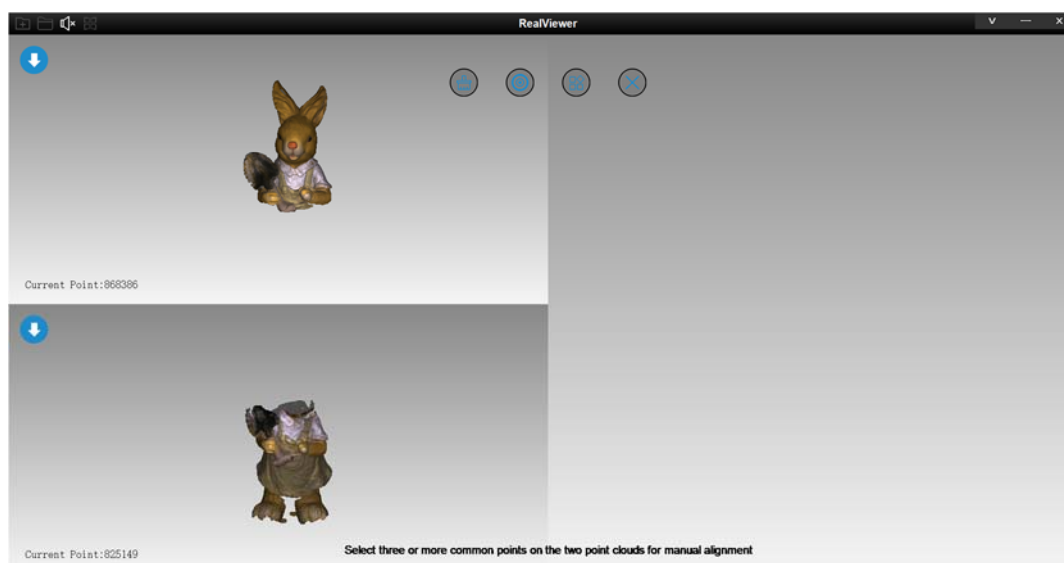



Figure7- 6 Import splicing data

(2) Select N points ($3 \leq N \leq 9$) in the common part between the two sets of data, and the two sets of data can be spliced automatically. If you click the “” button, the two sets of data can be spliced more accurately (Figure7- 7).

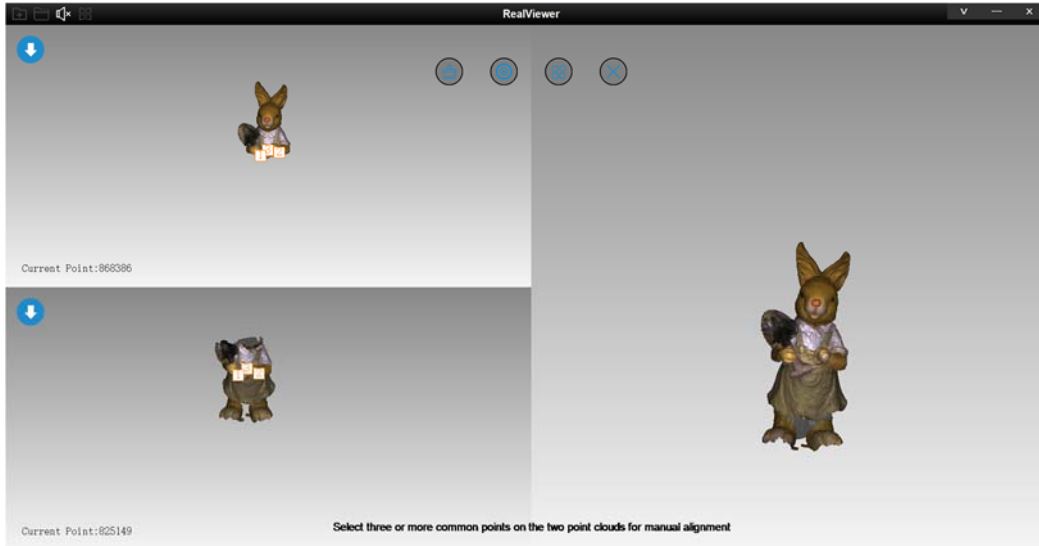



Figure7- 7 Splicing results

(3) Click the “” button to generate the final splicing data and view the overall error of the data stitching (Figure7- 8).

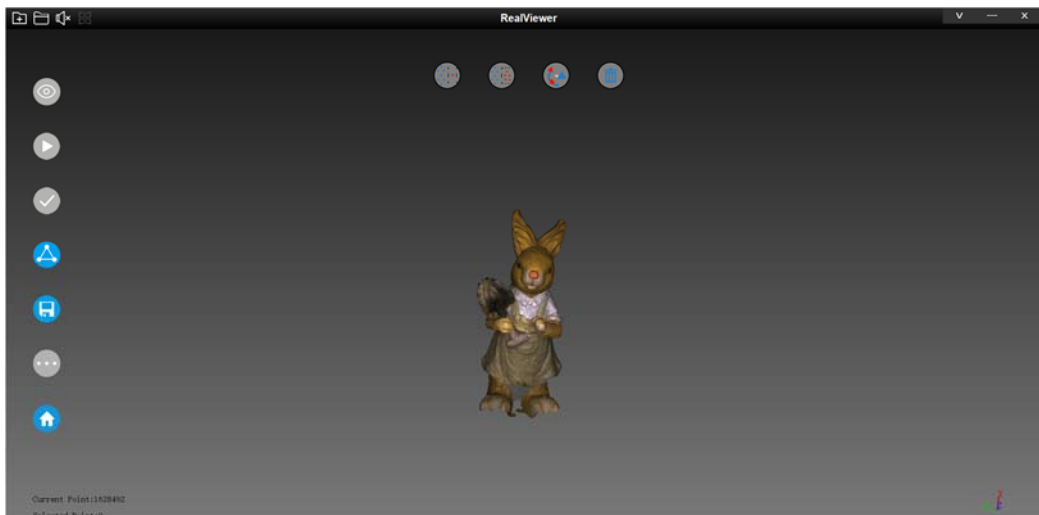


Figure7- 8 Splicing completed

8 Skills

This chapter mainly introduces some techniques during the use of the scanner, including basic scanning techniques and human (hair) scanning techniques.

8.1 Basic Scanning Techniques

(1) The projection direction of the scanner is parallel to the surface of the scanned object in order to obtain the maximum out-point amount on the surface of the scanned object (Figure8- 1).



Figure8- 1 Scanning direction

(2) When the distance between the scanner and the object is between 400 to 500mm, the output of the scanner is the best. When higher details are needed, the scanner can be adjusted to 350 to 400mm. Good surface details are obtained, but the number of output points is small. After the distance between the scanner and the object is 500 mm, the output point becomes larger, and the quality of the point cloud decreases.

(3) Please move the scanner uniformly during use.

8.2 Human Body (hair) scanning techniques

When scanning the human body, keep the human body as still as possible, for example: try not to blink when scanning the eyes; try to reduce the breathing range when scanning the abdomen, otherwise the obtained model is prone to overlap. When scanning the whole body, you can scan the volatile parts at one time, and try to avoid rescanning. For example, you can scan the face (including ears) and neck first, and then scan other parts. Wrap back to the face (reduces the possibility of face overlapping).

When scanning hair with infrared mode. Because there are fewer points, it is easy to splice errors when scanning the hair directly. Try to scan the hair together when scanning the forehead, shoulders, and back. The infrared mode is suitable for scanning thick hair, and the blue light mode is for short and thin straight hair.

Method for scanning the entire human body: chest and abdomen-side face (including ears)-front face-chin-chest and abdomen-left / right front leg-abdomen-the other leg-abdomen-waist-abdomen-waist (closed loop)-back -Abdomen-left / right hind legs-waist-the other foot-back-neck-head (scan the hair as much as possible)-chest and abdomen (end).

9 Info

- (1) The device must be connected with USB 3.0;
- (2) After a long time use, there is a slight heating phenomenon on the bottom of the device, which does not affect the use of the device;
- (3) If the computer is equipped with protection software, the operation may not be smooth;
- (4) In order not to affect the scanned data, the computer needs to be connected to the power during the scanning process.
- (5) Do not unplug the dongle during software use.