MT User Manual

Version:1.2   Software Version: 4.2.2.2

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Revision Record

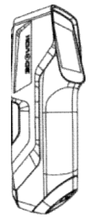
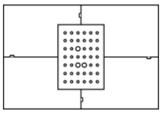
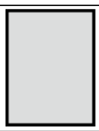
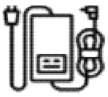
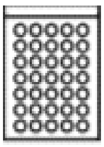
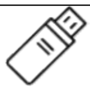
Revision Date	Revision Content	Reviser
2025.4.3	3DeVOK MT User Manual V1.2	Astrid

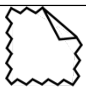
Contents

1 Product List and Description

The 3DeVOK product list of 3DeVOK MT is shown in Table 1-1:

Table 1-1 Product List and Description

Picture	Name	Description
	3DeVOK MT	The main working device, do not drop it.
	Master Plate (with 4 Expansion Accessories)	Used before scanning
	Grey Card	Calibrate the white balance
	Power Data Cable	For data transfer
	Power Cable (with plug)	DC: 12 V, 5.0 A
	Power Adapter	
	6 mm Reflective Markers	When the scanned object lacks rich and non-repeating geometric/textural features, reflective markers can be attached to the object surface or the surroundings to help positioning.
	3 mm Reflective Markers	
	Stickers for Hybrid Alignment	Act as texture features, assisting in the stitching process
	Carry Case	The outer packaging box for preservation and transportation of the device
	USB Stick (with Scanning Software)	With 3DeVOK Studio scanning software, MT Quick Guide and SET folder in it

	Scanning Sample (for Detail Verification)	Verify the capability of hybrid alignment
	Lanyard	Anti-slippery
	Dust-free Cloth	For Wiping the touch screen and the camera front cover panel

2 Introduction of 3D Scanner

2.1 Product Structure

The product structure of 3DeVOK MT is as shown in Figure 2-1.

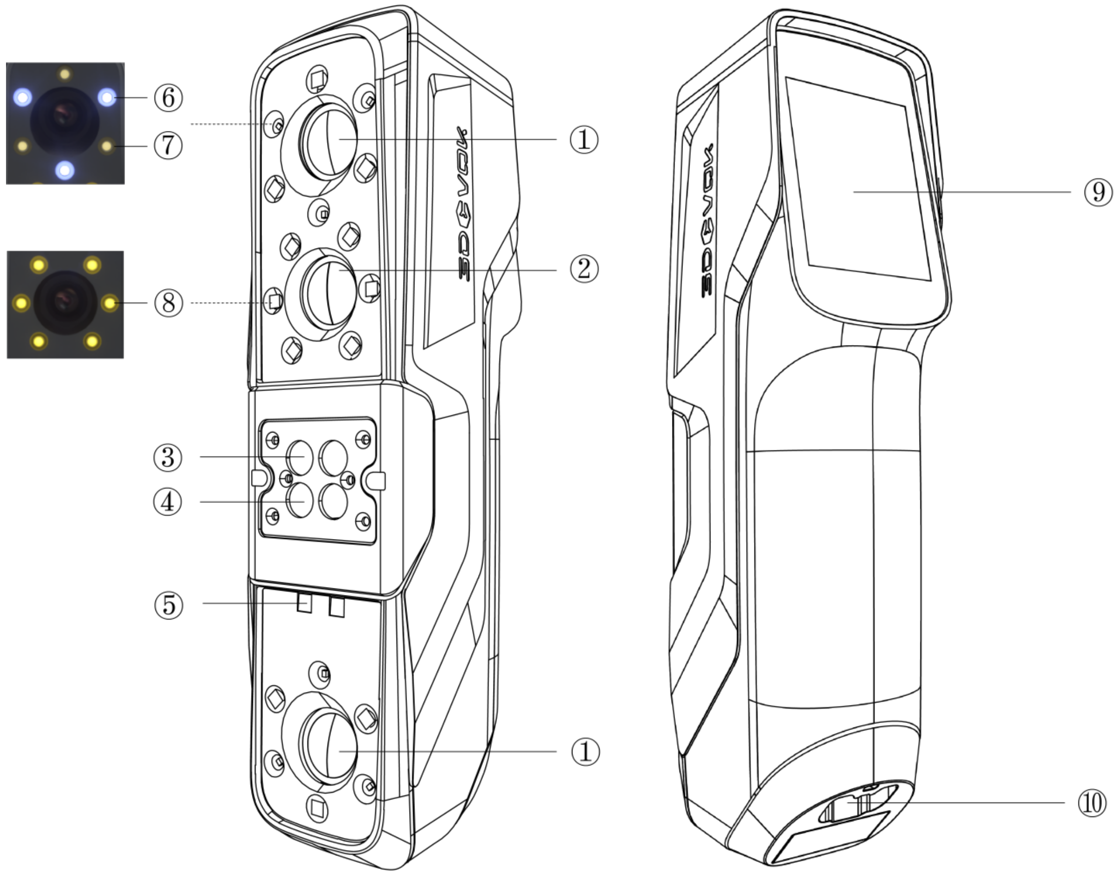


Figure 2-1 3DeVOK MT Product Structure

The components and functional descriptions of the product structure are shown in Table 2-1.

Table 2-1 Components and Functional Descriptions of the Product Structure

No.	Components	Functions
①	Black-and-white Camera	For data capture
②	Color Camera	For texture and color capture
③	Blue Laser Emitter	Source of blue laser

④	Infrared Laser Emitter	Source of infrared laser
⑤	Infrared VCSEL	Source of infrared structured light
⑥	Blue Laser Fill Light	Recognize markers when using blue laser
⑦	Infrared Laser Fill Light	Recognize markers when using infrared laser
⑧	Color Camera Fill Light	Recognize texture patterns
⑨	Touch Screen	Start/stop scanning and adjust parameters
⑩	Type-C Data Cable Interface	Connect the data transfer cable

2.2 Usage Precautions

- This product is a precision instrument; handle it gently and avoid any impact or dropping to ensure its proper functioning and longevity.
- When temporarily pausing the use of the scanner, disconnect all cables to avoid tripping hazards, which may lead to device falling and causing potential damage.
- The scanner automatically powers on upon cable connection and powers off when disconnected, as the product does not feature a dedicated power button.
- The PC used with this product must be equipped with two or more USB 3.0 ports. If the available ports are insufficient, utilize a USB hub to expand connectivity.
- When storing the cables, gently fold them following the existing fold lines to avoid sharp bends, as excessive stress may reduce device longevity.
- This product is not dust-proof or waterproof. Please ensure the operating environment is free from dust, moisture, and other contaminants that may affect the device's performance.

3 Configuration Requirements

3.1 PC Configuration

A laptop, desktop or workstation is required when using 3DeVOK MT scanner. The recommended PC configuration are listed in Table 3-1 below:

Table 3-1 Recommended PC Configuration of 3DeVOK

Recommended PC Configuration	
OS	Win10/Win11, 64-bit
CPU	i7-13650HX and above
RAM	32G and above
Graphic Card	NVIDIA discrete graphics card, NVIDIA RTX3060 and above
Port	USB 3.0

Note:

- **Power Supply:** During scanner operation, ensure the PC is connected to a stable power source and configured to operate in High-performance Mode. For detailed guidance on enabling High-performance Mode, refer to 4.4 Software Environment Configuration.
- **Environment:** Antivirus software or the enabling of Windows Defender may lead to unforeseen errors, potentially disrupting the normal functionality of the scanning software.

3.2 Solutions for Insufficient Memory

Insufficient system memory may result in common performance issues such as scanning latency and application crashes. When such issues occur during scanning, the following troubleshooting steps can be taken to identify potential causes. Additionally, configuring virtual memory can serve as a temporary resolution to mitigate immediate scanning-related problems.

3.2.1 Memory Usage Checking

If there are software crashes or unexpected shutdowns during scanning, the system's memory utilization should be examined via the Task Manager, as shown in Figure 3-1. The steps are as follows:

1. Search Task Manager;
2. Click Performance at the left side, then select Memory for checking the memory usage.

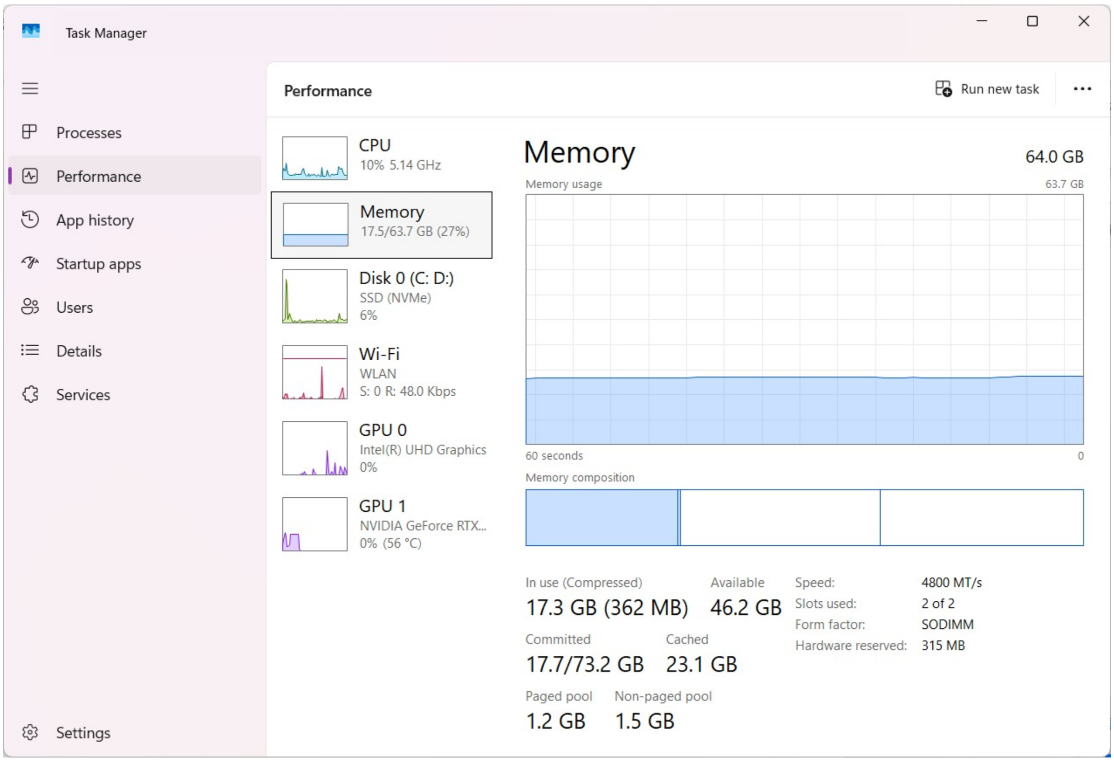


Figure 3-1 Memory Usage Checking

If system memory is fully utilized, verify whether multiple memory-intensive applications are active, such as 3D modeling software, rendering tools, or web browsers with numerous open tabs.

3.2.2 Virtual Memory Setting

If memory insufficiency persists after closing the aforementioned programs, it is recommended to either upgrade the physical memory through hardware acquisition or to expand the virtual memory. It should be noted that an increase in virtual memory may lead to a reduction in computational speed during software operations, as the efficiency of virtual memory is significantly lower compared to physical memory.

The allocation of virtual memory allows systems with constrained physical memory resources to meet transient data storage requirements.

The configuration process for virtual memory on PC is shown in Figure 3-2:

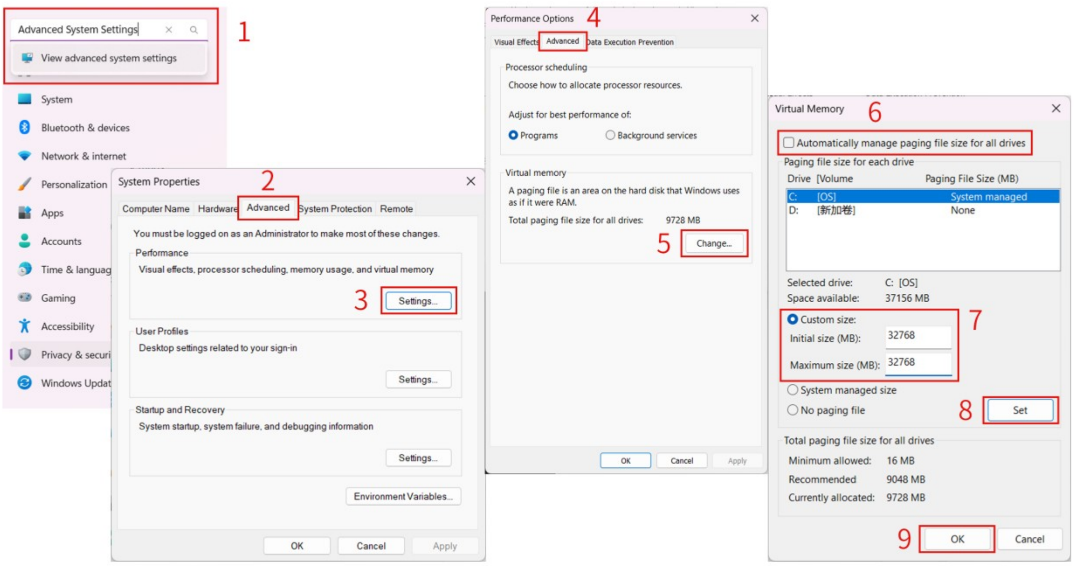


Figure 3-2 Virtual Memory Setting

4 Software Download And Installation

4.1 Software Download

The installation package for 3DeVOK Studio software can be obtained by visiting the official 3DeVOK website. Navigate to "Support" - "Download Center" (as shown in Figure 4-1), or directly access the download page by clicking the following link: https://www.3devok.cn/3devok-studio-scanning-software-download/

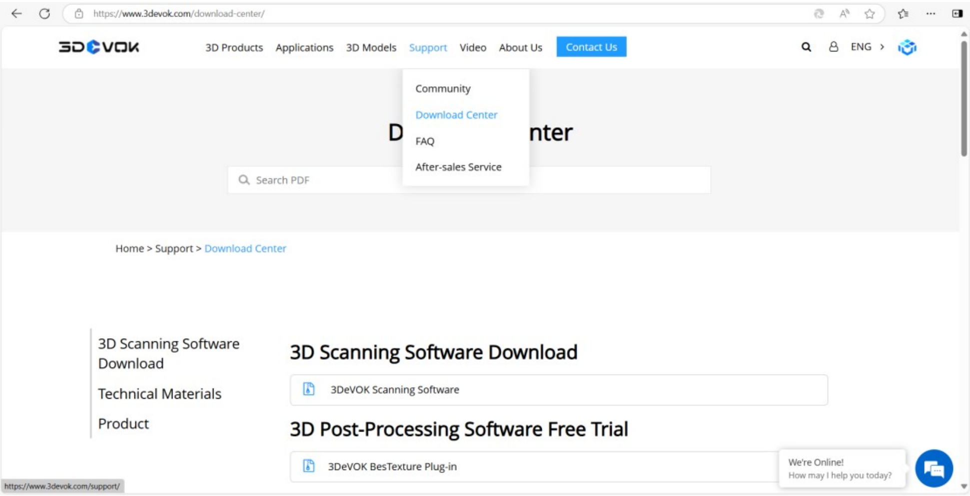


Figure 4-1 Software Download on the Official Website

Click "Request Download", enter the required information as prompted, and then click "Submit" to download the 3DeVOK software installation package (as shown in Figure 4-2).

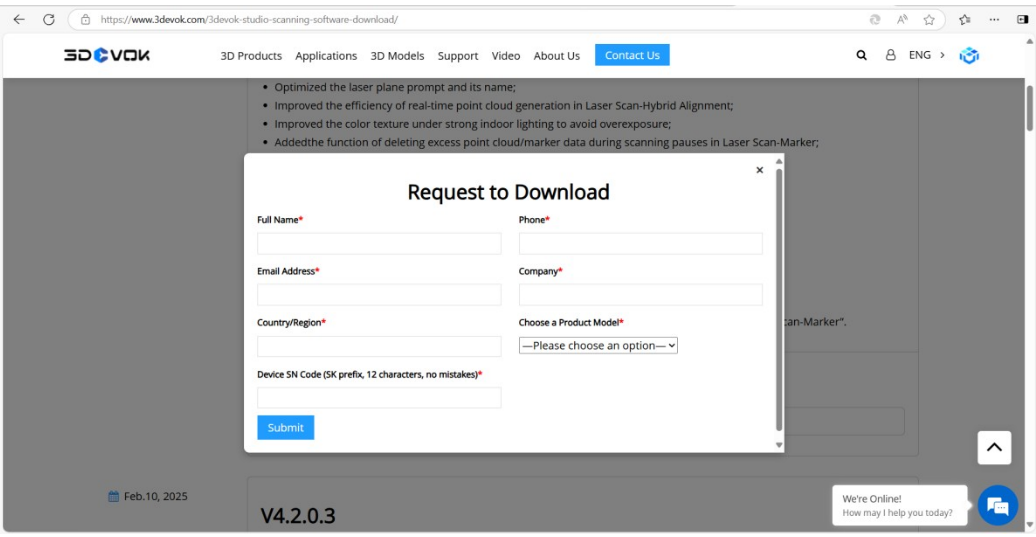


图 4-2 Download Information Interface

4.2 Software Installation

1. Double click the 3DeVOK Studio V4.2.2.2.exe, select the language and click OK, as shown in Figure 4-3.

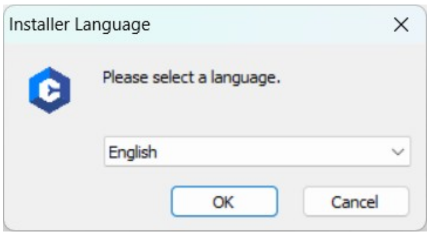


Figure 4-3 Select Language

2. Select the destination folder and click "Install", as shown in Figure 4-4.

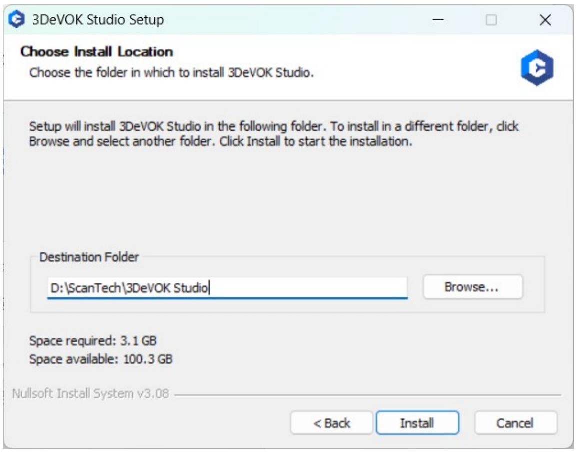


Figure 4-4 Select Destination Folder

3. The software will automatically begin installation. Wait for the installation to complete, then click "Close", as shown in Figure 4-5.

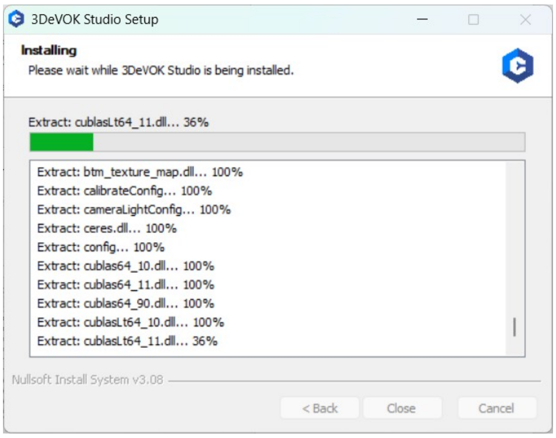


Figure 4-5 Software Installation

Note:

- Ensure that all the security applications are terminated prior to software installation and throughout the scanning procedure to prevent potential unforeseen errors.
- It is advisable to install the software on a drive with ample storage capacity, such as the D drive, to optimize performance and resource allocation.

4.3 Device Connection

The connection of the scanner involves two steps: powering the scanner and connecting it to the computer. The cables include the power adapter cable and the USB data cable, with the adapter powering the scanner. The power and data cable has four interfaces in total, connecting to the power source, computer, the power adapter, and the scanner, respectively. The detailed connection steps are as follows:

1. Connect one end of the USB cable to USB 3.0 port (the blue port) of PC (if it is a desktop, it should be plugged into the USB 3.0 port at the back of the chassis), then connect the other end to the bottom of the device (in the direction of the arrow), and tighten the screw, as shown in Figure 4-6.

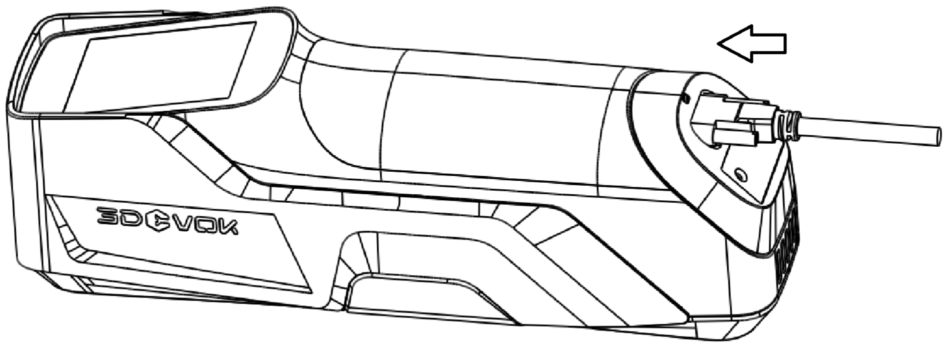


Figure 4-6 USB Cable Connection for Device

2. Connect the power cable and the power adapter to the power source, and connect the round plug at the end of the power adapter to the round connector of the USB cable, as shown in Figure 4-7.

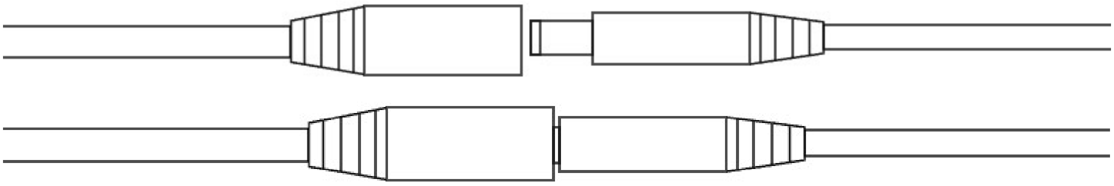


Figure 4-7 Round Plug Connection

3. The connection of device, data cable, power adapter, power cable, and PC is shown in Figure 4-8.

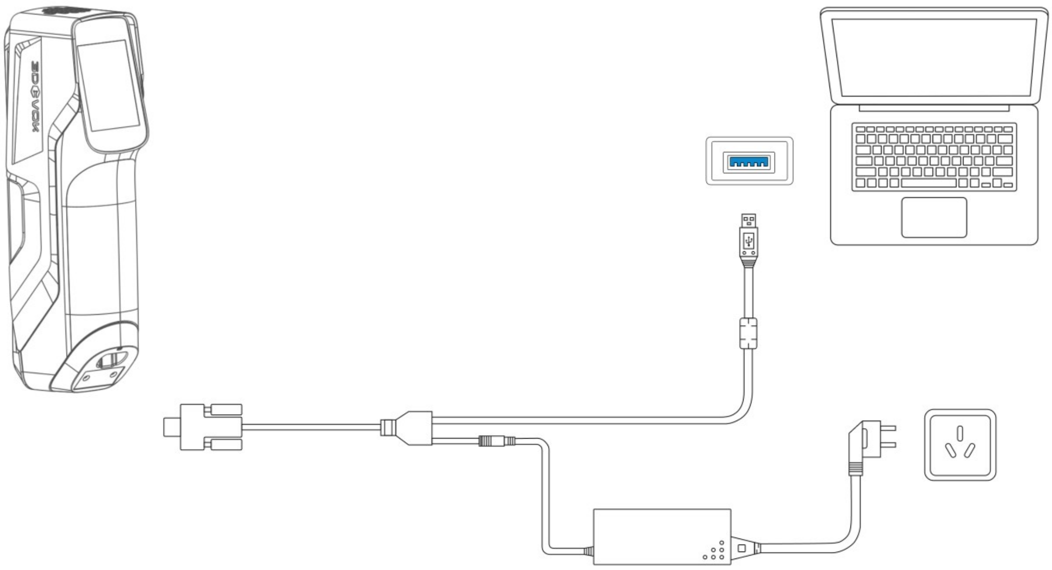
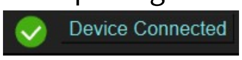


Figure 4-8 Device-to-PC and Power Supply Connection

Note: PC must be connected to a power source during operation to maintain optimal scanning performance.

4. After completing the connection, open the 3DeVOK Studio software. Once launched, 

will appear at the lower-left corner of the user interface, indicating that the device has been successfully connected to the PC.

Note: If the connection fails, reconnect the device or switch to a different USB 3.0 interface.

4.4 Software Environment Configuration

After successful software installation, set the GPU to High-performance mode and ensure the software runs on the discrete graphic card to optimize 3DeVOK Studio's performance. Detailed setup steps are as follows:

4.4.1 High-performance Mode Configuration

The steps of the configuration of High-performance mode are as follows:

1. Search for NVIDIA Control Panel and open it, as shown in Figure 4-9.

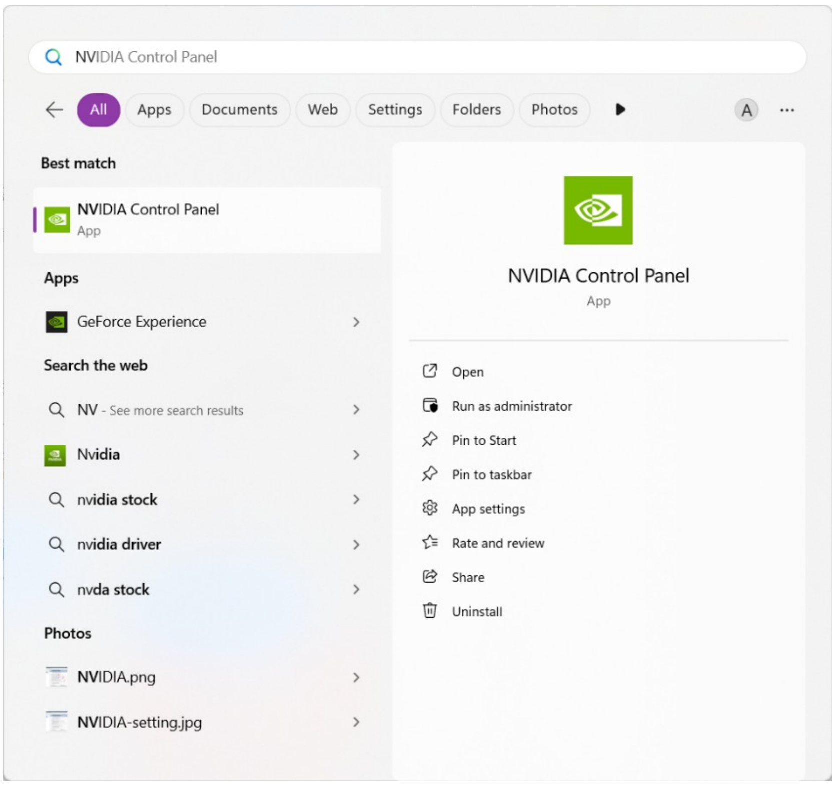


Figure 4-9 NVIDIA Control Panel

2. Click Manage 3D settings at the left panel, select High-performance NVIDIA processor from the "Preferred graphics processor" drop-down list, and Click "Apply", as shown in Figure 4-10.

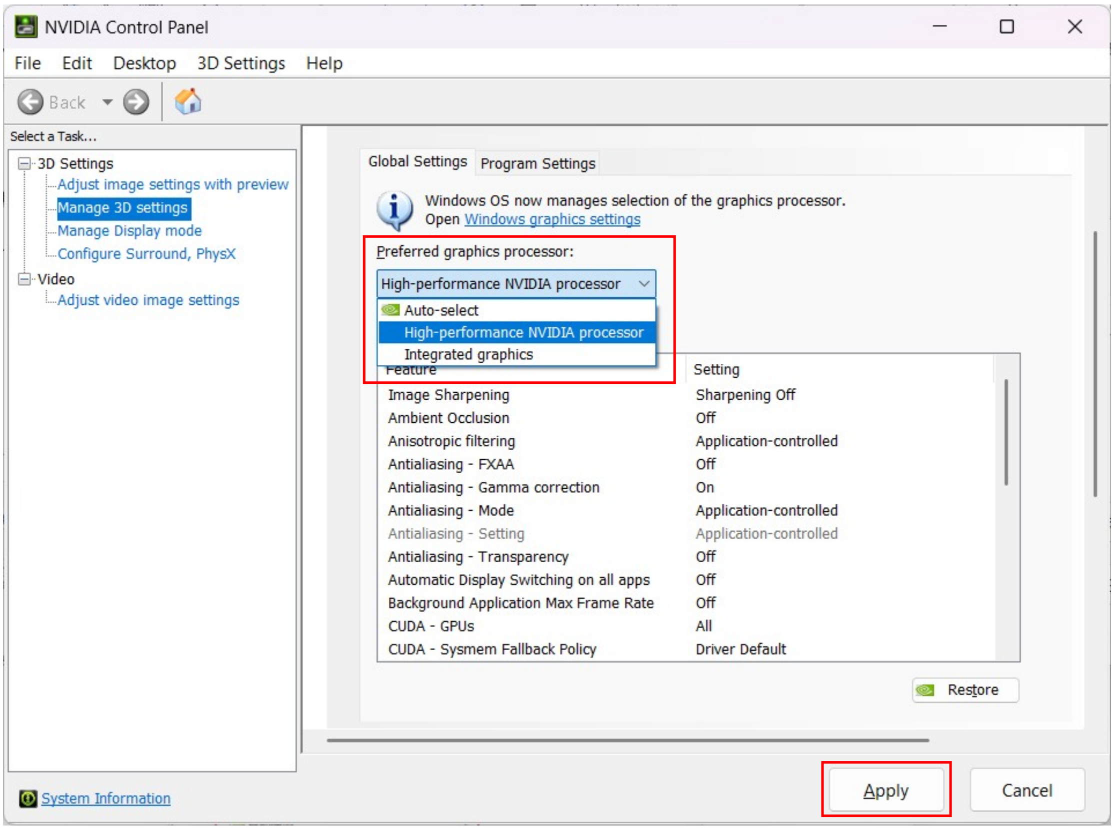


Figure 4-10 High-performance Mode Configuration

4.4.2 Discrete GPU Configuration

The detailed setup procedure for running 3DeVOK Studio on a discrete graphic card is as follows (shown in Figure 4-11):

1. Click Manage 3D settings at the left panel, and select Program Settings;
2. Click "Add" to select 3DeVOK STUDIO program for customization, and click "Apply".

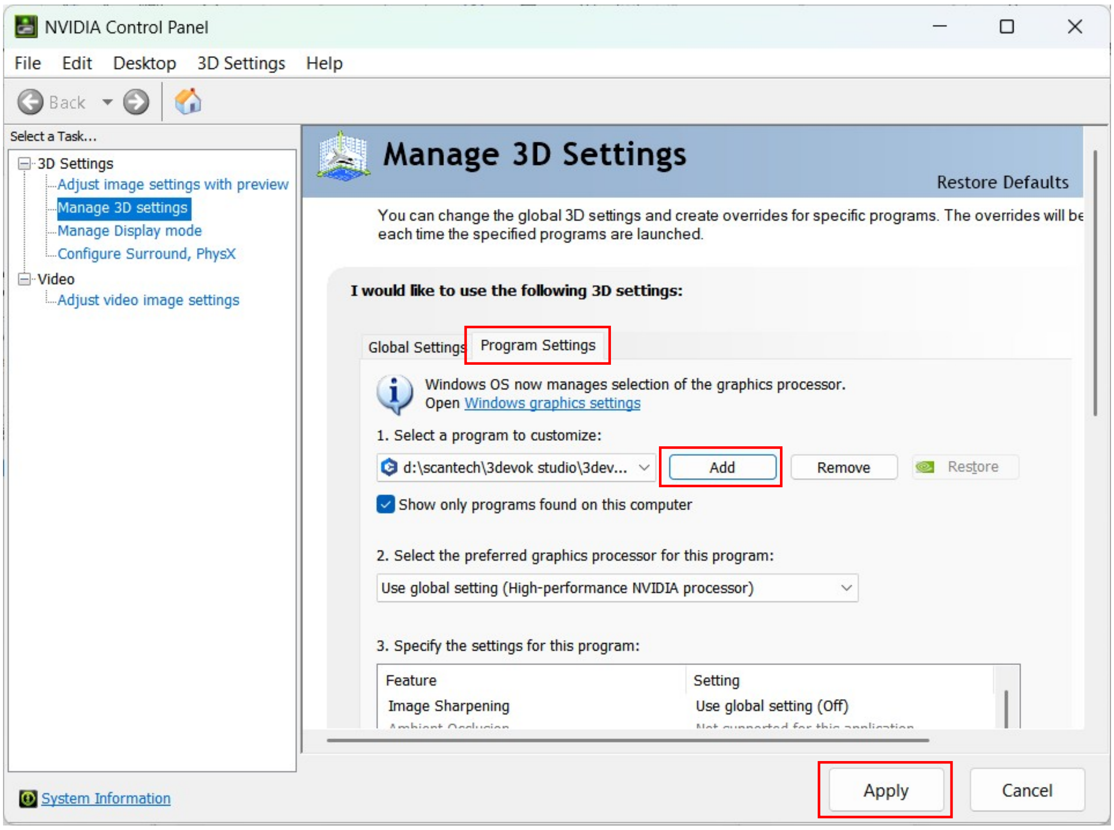


Figure 4-11 Discrete GPU Configuration

5 License Activation and Firmware and Screen Update

5.1 License File

The license file serves as an authentication document that validates the software authorization period. It is stored in the software root directory, alongside other scanner configuration files. Each scanner is assigned unique operational parameters and a corresponding license file. Prior to normal operation, license activation is mandatory upon device receipt. For 3DeVOK scanners, online license activation is required.

5.2 Online Activation

Import the activation file before first scan, and make sure the PC is properly connected to the internet during activation. The steps are as follows:

1. Click the Help button at menu bar, and Diagnosis from the drop-down list, as shown in Figure 5-1.

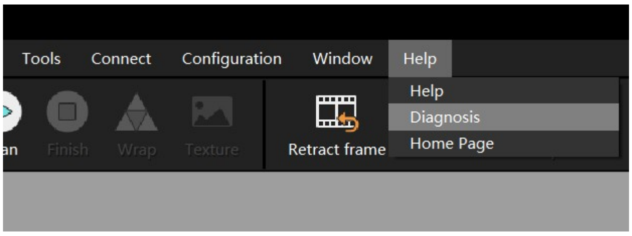


Figure 5-1 Diagnosis Button

2. Click the  button in the "License" section, as shown in Figure 5-2. Then, an online activation prompt will be displayed, as shown in Figure 5-3. Click "Start Online Activation", and the license file will be automatically downloaded.

Note: The initial activation time will be related to the warranty period. For details, please refer to the device purchase contract.

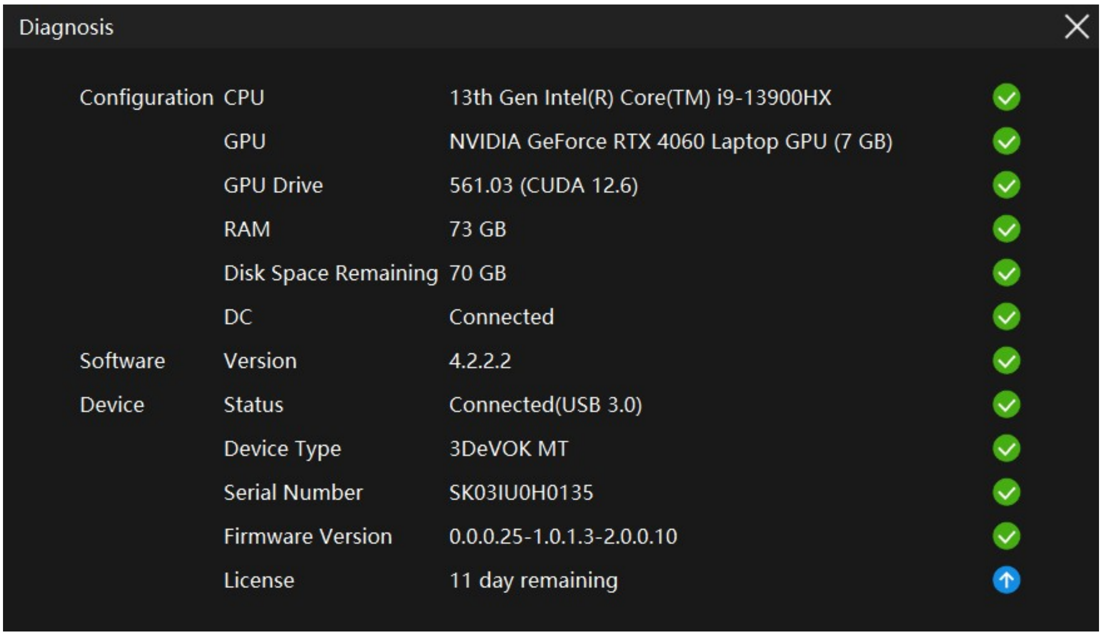


Figure 5-2 Online Activation Button

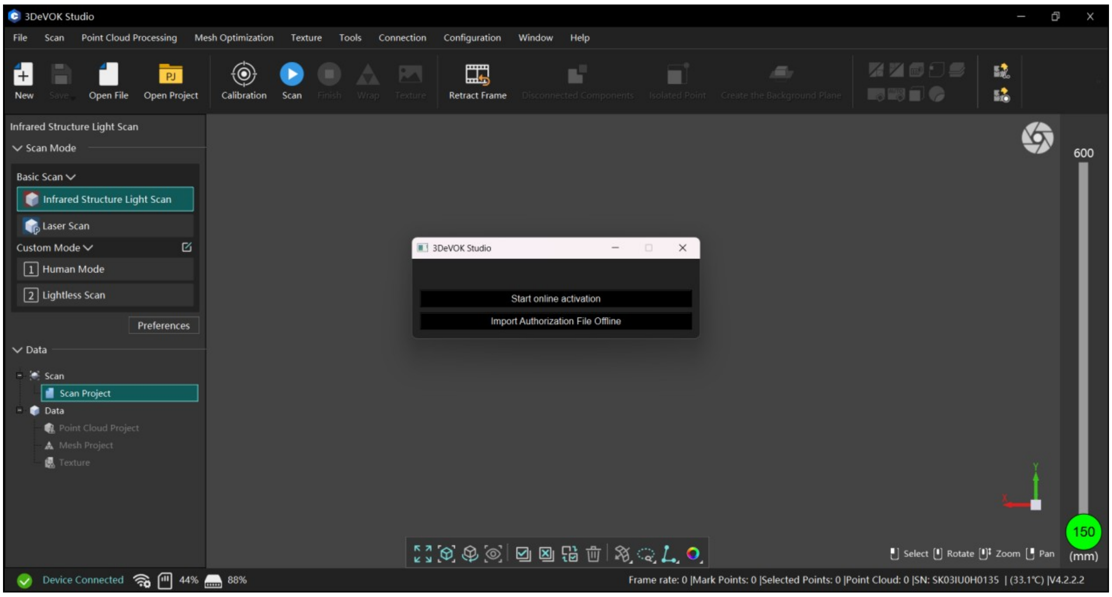


Figure 5-3 Start Online Activation

Note: Online activation is a one-time process upon first use. No further activation is needed for subsequent operation.

3. Upon successful activation, the device and software can be used normally.

5.3 Firmware and Screen Update

For 3DeVOK Studio V4.2.2.2, it is of necessity to update the firmware and screen. Check the firmware version of the device at the Help button at menu bar, and Diagnosis from the drop-down list.The update steps are as follows:

1. Check the "Firmware Version" section. **For V4.2.2.2,** ensure the parameters are configured as **0.0.0.25-1.0.1.3-2.0.0.10. Otherwise, click the**  **button to import the update files**, which is shown in Figure 5-4.

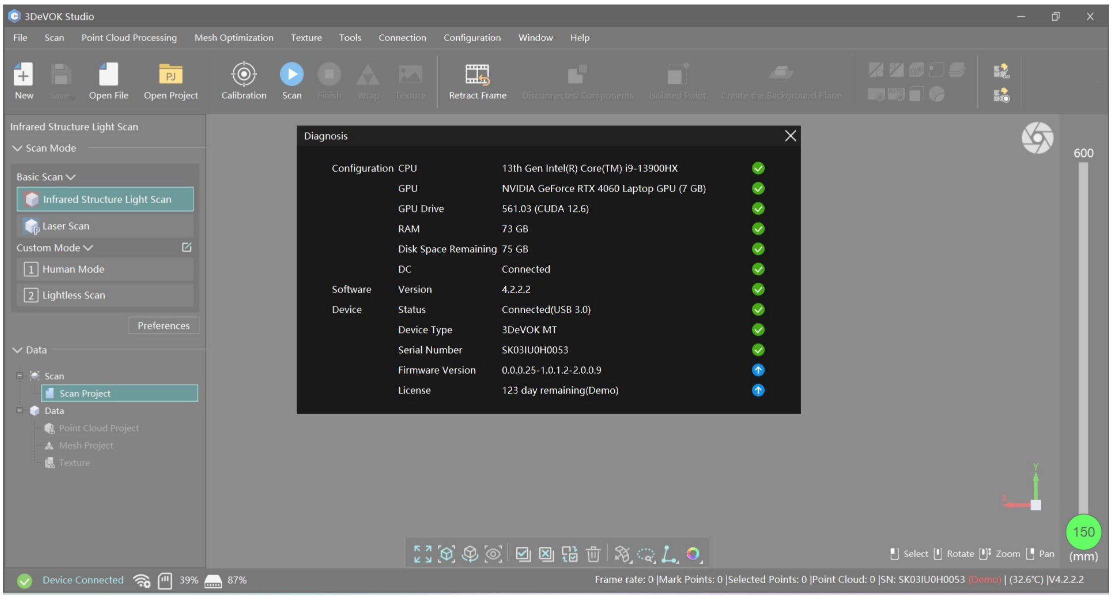


Figure 5-4 Check the Firmware Version

2. Click  for device update, and select Browse to import the zip file of Firmware and Screen Update (which can be downloaded via the Wetransfer link). Click Start Upgrade to initiate the process, which is shown in Figure 5-5.

Note:

- The update process requires about 7- 8 minutes. During upgrade, do not power off the device.
- Wait for the successful instructions, then the device can be used normally.

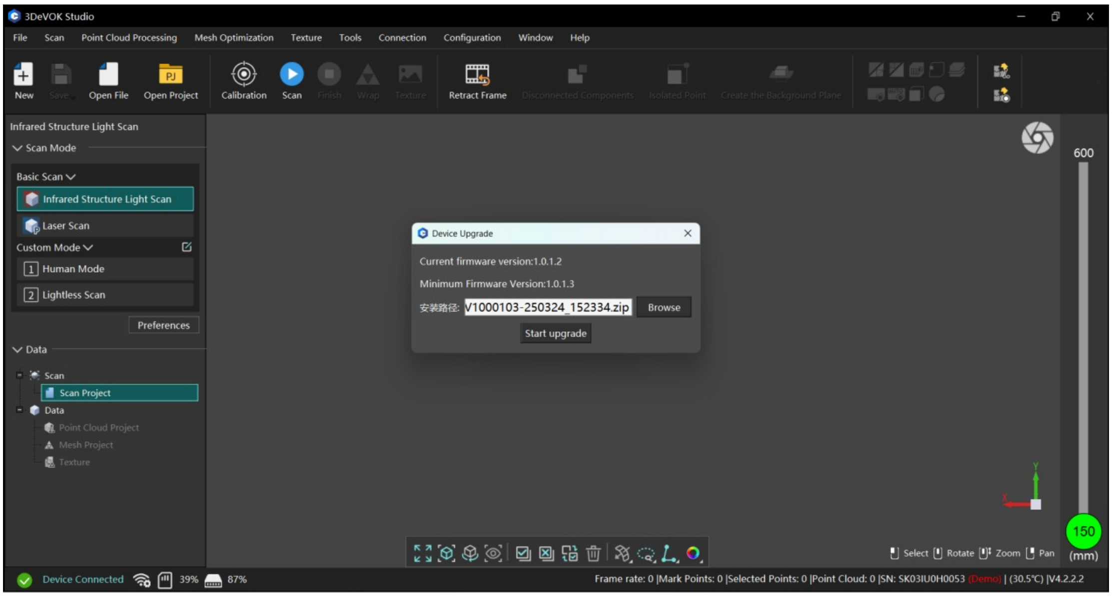


Figure 5-5 Import the Update Zip File

3. After the upgrade process, check the Diagnosis. The icon  will turn  indicating that the firmware and the screen are the latest one (**0.0.0.25-1.0.1.3-2.0.0.10, compatible with V4.2.2.2**), which is shown in Figure 5-6.

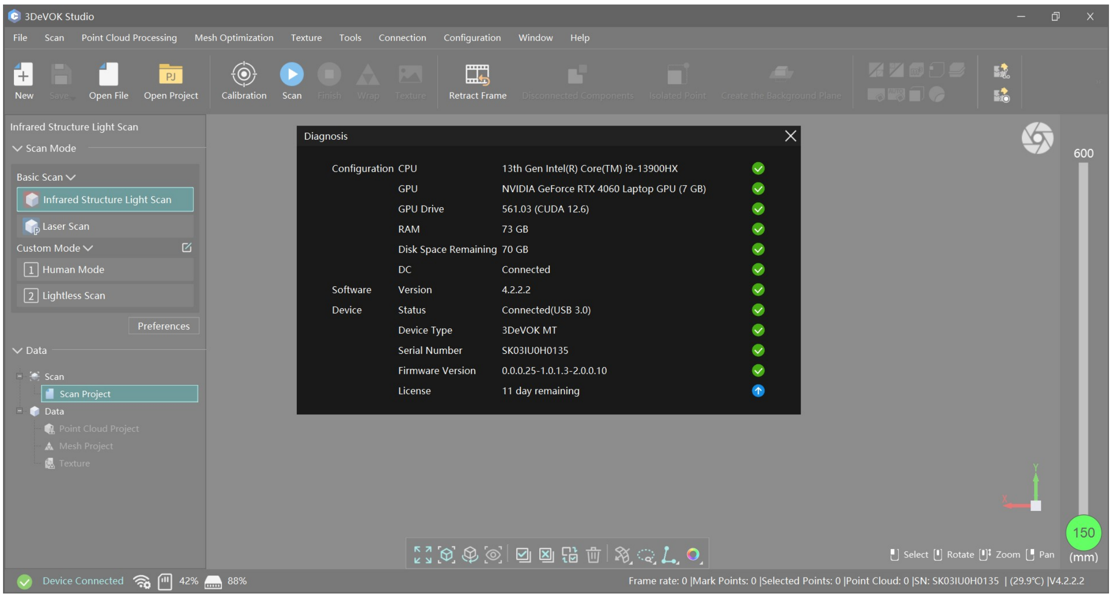


Figure 5-6 The Latest Firmware Version for V4.2.2.2

6 Calibration

6.1 Calibration Purpose

The device must be calibrated before scanning to adjust the camera parameters when using the scanner for the first time.

Note: After connecting the device, wait until the computer successfully recognizes the camera driver (approximately 5-10 seconds). Only proceed with calibration/scanning or other basic operations when the device is connected.

6.2 Situations Requiring Calibration

Calibration is required under the following circumstances:

- Initial use of the device;
- Prolonged inactivity of the device;
- After mechanical shaking or transportation;
- Insufficient single-frame scan data;
- Failed data stitching or unrecognized markers.

6.3 Calibration Operation

The 3DeVOK Studio software provides four distinct calibration modes:

- **Standard Calibration:** Calibrates device accuracy parameters
- ***Fast Calibration**: Calibrates device accuracy parameters (for 3DeVOK MQ use)
- **White Balance Calibration**: Calibrates color reproduction parameters
- **Laser Plane Calibration:** Resolves laser line discontinuity issues

Each calibration type generates corresponding parameter files in the software root directory. The specific calibration procedures are as follows.

6.3.1 Standard Calibration

The Standard Calibration is an essential procedure for 3DeVOK MT devices, offering more comprehensive calibration steps and higher precision than the Quick Calibration option. The standard calibration procedure is as follows:

1. Take out the Expansion accessories from the case, assemble it, and place it around the master plate, as shown in Figure 6-1.

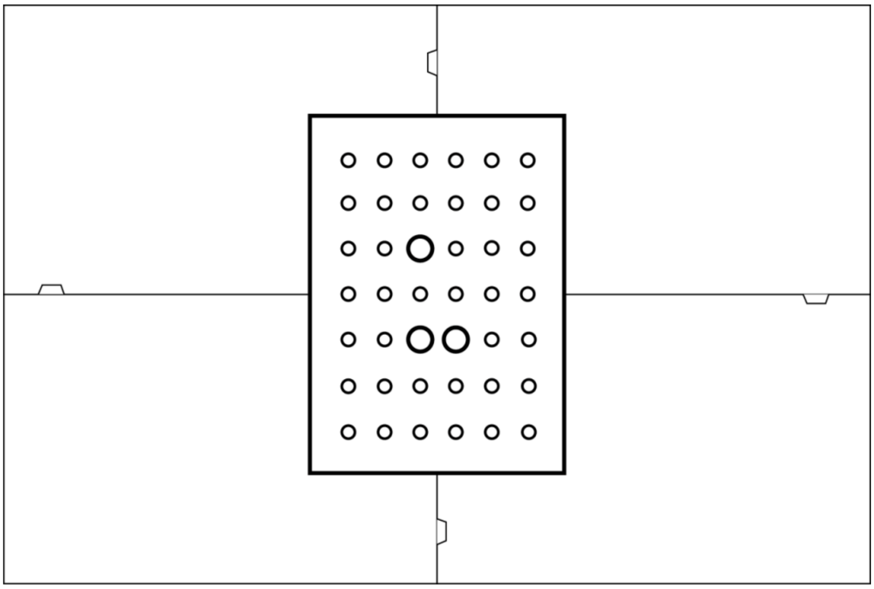


Figure 6-1 Master Plate and Accessories Placement of 3DeVOK MT

2. Click 

for device calibration, and follow the steps shown in Figure 6-2.

- For Steps 1-6: Gradually elevate the scanner to increase its distance from the calibration board, ensuring the position indicator moves through all designated frames on the right-side distance bar until all six scanning intervals turn green.
- For Steps 7-16: Move the scanner to track the blue reference at the interface, and align the gray projection with the red target box.

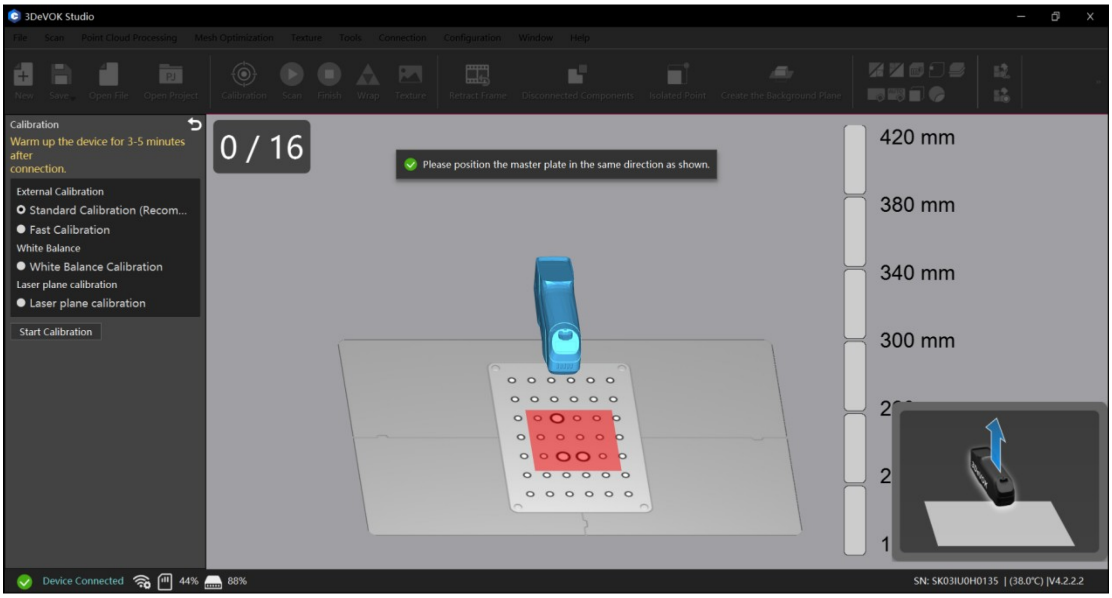


Figure 6-2 Standard Calibration

6.3.2* Fast Calibration【For 3DeVOK MQ Use】

The Quick Calibration routine serves as the mandatory calibration procedure for all 3DeVOK MQ devices. All MQ units connected to PC shall undergo Quick Calibration. Proceed with the following steps:

1. Take out the master plate from the bag, place it on a flat and light-color table, as shown in Figure 6-3.

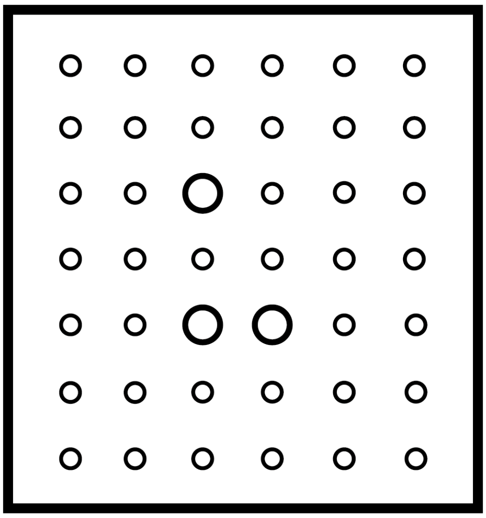


Figure 6-3 Master Plate of 3DeVOK MQ

2. Click 

for device calibration, and follow the steps shown in Figure 6-4.

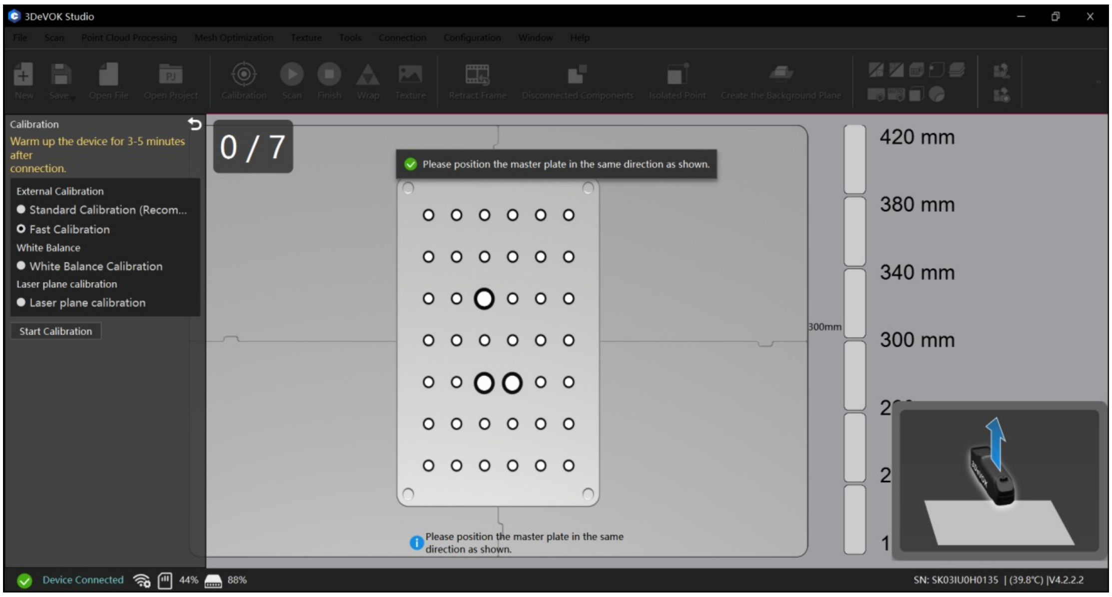


Figure 6-4 Fast Calibration

6.3.3 White Balance Calibration

When enhanced color fidelity is required for texture mapping, perform white balance calibration. The steps are as follows:

1. Take out the gray card from the case and position it face-up on a light-color surface;
2. Select the "White Balance Calibration " function on the left, and process the calibration following the on-screen instructions, as shown in Figure 6-3.
3. Align the scanner perpendicularly to the gray card surface, adjust the distance until the position indicator enters the yellow target frame on the user interface. Maintain a vertical standoff distance of 300 mm between the scanner and the gray card.

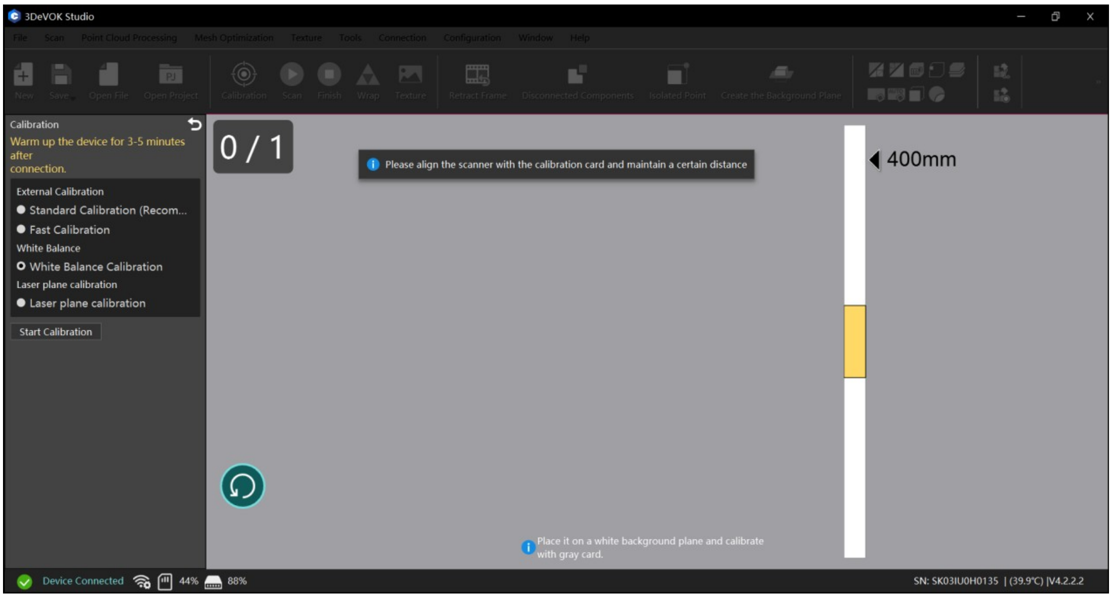


Figure 6-3 White Balance Calibration

Note: In which situations is white balance calibration required?

- Environmental Change Between Scans (e.g., outdoor-to-indoor transition).
- Color Deviations (e.g., significant hue/saturation deviation during real-time preview)
- Complex Ambient Lighting (e.g., Mixed artificial light sources (e.g., red/green dominant illumination)

6.3.4 Laser Plane Calibration

After standard calibration, if there is laser line discontinuity or excessive noise data during scanning, perform laser plane calibration. The steps are as follows:

1. Use a white wall (at least 45 cm × 45 cm) or arrange four clean A4 white papers in a 2×2 grid pattern on a flat table surface to serve as the laser plane.

2. Select the "Laser Plane Calibration" function on the left, and process the calibration following the on-screen instructions, as shown in Figure 6-4.

3. Gradually elevate the scanner to increase its distance from the white surface, ensuring the position indicator moves through all designated frames on the right-side distance bar until all six scanning intervals turn green.

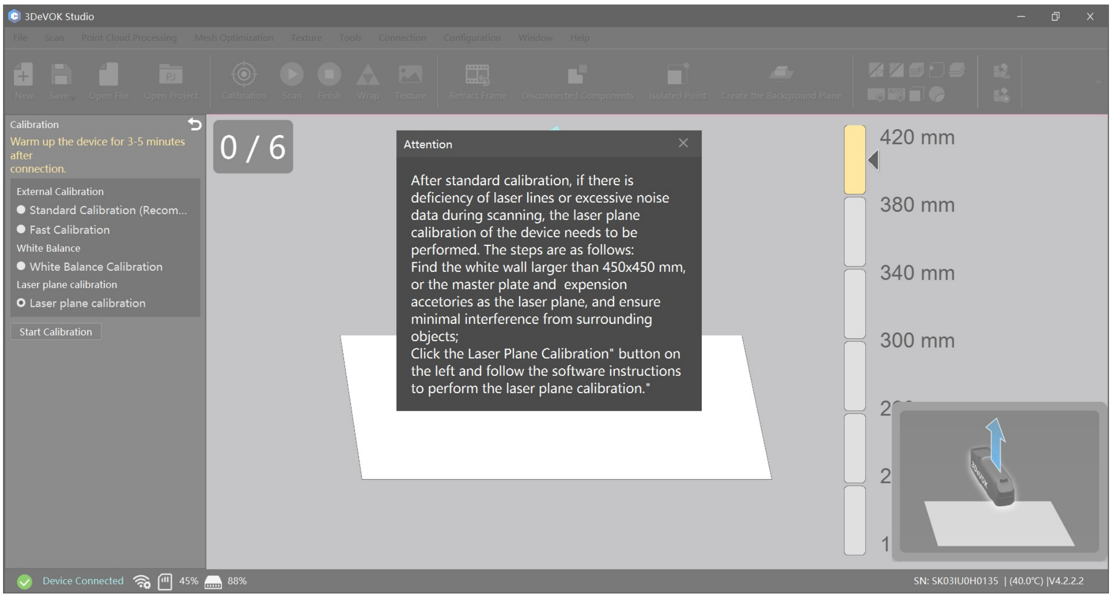


Figure 6-4 Laser Calibration

7 Scanning

7.1 Scan Mode

In the software interface, the left sidebar displays two basic scan modes: Infrared Structured Light Scan and Laser Scan, as shown in Figure 7-1.

For Laser Scanning, the following configurable options are available:

- Laser Source: Toggle between Blue Laser and Infrared Laser
- Alignment Method: Choose either Marker Alignment or Hybrid Alignment

These options combine to provide four distinct scanning configurations under the Laser Scan mode.

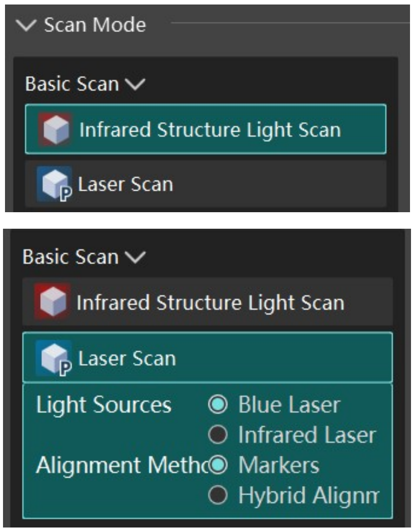


Figure 7-1 Two Basic Scan Modes of 3DeVOK MT

7.1.1 Infrared Structured Light Scan

Infrared scan refers to a 3D scanning method that utilizes speckle patterns projected by VESEL (Vertical Cavity Surface Emitting Laser) devices. The VESEL emitter projects rectangular speckle patterns onto the target object, enabling smoother scanning operations and efficient data acquisition for medium-to-large sized objects.

This technology employs hybrid alignment (combining geometric features, texture features, and markers). With these three characteristics and a larger scanning area compared to laser scan, it significantly enhances stitching capability and enables rapid acquisition of color 3D model data.

7.1.2 Laser Scan

The 3DeVOK MT product employs a blue light source consisting of 34 beams (17 pairs) of cross-line blue lasers, complemented by an infrared one with 22 beams (11 pairs) of cross-line infrared lasers. The increased laser line enables a significant improvement in scanning frame rate, achieving up to 70 FPS, which substantially enhances overall scanning efficiency.

Differences Between Blue Laser and Infrared (Key Four Aspects):

- Visibility & User Experience:
  Infrared lasers operate in the non-visible spectrum, while blue light is visible. This makes infrared scanning more user-friendly (e.g., no glare or visual disturbance).
- Material Adaptability:
  Blue light is prone to absorption by red/yellow objects, rendering it unsuitable for scanning such surfaces. Infrared exhibits superior penetration and reflection consistency across colors.
- Detail Resolution:
  Blue light achieves marginally higher detail accuracy, making it ideal for high-precision applications.
- Scanning Speed:
  With a higher laser line density (34 beams vs. 22 beams), blue light enables faster scanning compared to infrared.

7.1.3 Custom Mode

In addition to infrared structured light and laser scan modes, the software also features exclusive custom modes, including Human Mode, Lightless Scan, and support for adding user-defined custom modes.

7.1.3.1 Human Mode

Human Mode is designed for human body scanning, utilizing infrared as the light source and geometric features for alignment, ultimately outputting a colored 3D model, which is shown in Figure 7-2. For detailed parameter settings, refer to 7.3.1: Infrared Structured Light Parameter Configuration.

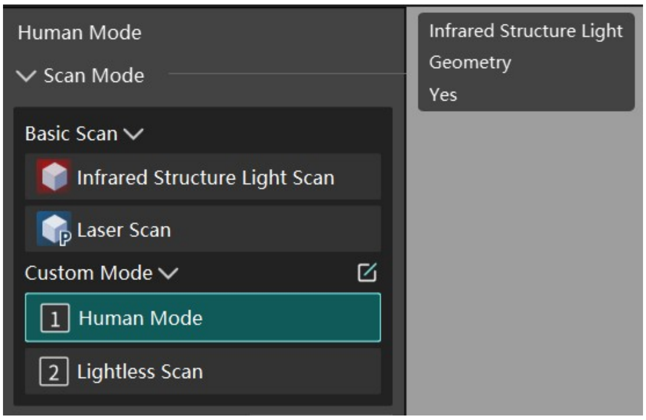


Figure 7-2 Human Mode

7.1.3.2 Lightless Scan

Lightless Mode is optimized for infant scanning and light-sensitive individuals, with all LED fill lights disabled for enhanced safety (resulting in no color data output). This mode employs infrared as the light source and utilizes geometric features for alignment, ultimately generating a white 3D model, which is shown in Figure 7-3. For detailed parameter settings, refer to 7.3.1: Infrared Structured Light Parameter Configuration.

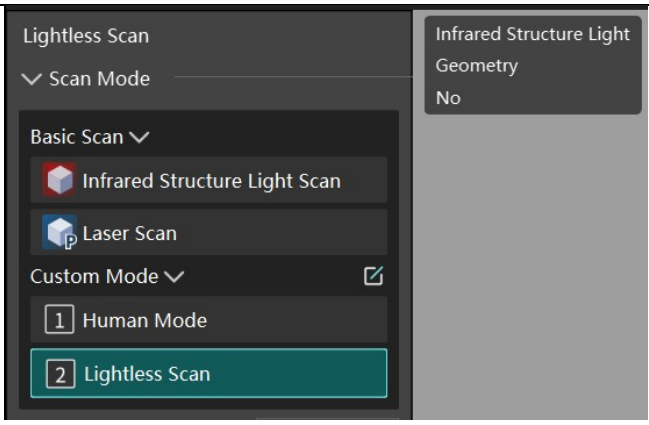


Figure 7-3 Lightless Scan

7.1.3.3 Adding Custom Mode

The software supports adding custom modes. Click the  button to the right of Custom Mode, then select "Add" in the top-left corner of the pop-up window to create a new custom mode.

- **Light source**: Select either option.
- **Alignment Method**: The first three options (Texture, Geometry, Markers) can be freely combined, while the fourth, **Auxiliary Fiducial Markers**, requires separate selection, which is shown in Figure 7-4.
- **Texture**: Select either option.

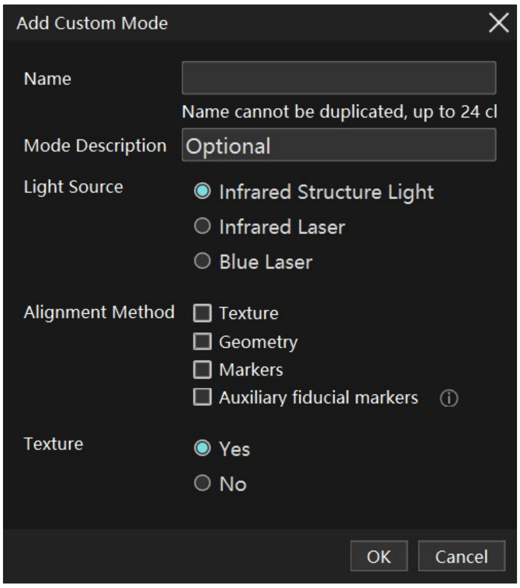


Figure 7-4 Add Custom Mode

Custom Mode: Auxiliary Fiducial Markers

Alignment: Combines markers with geometric features for stitching data.

Alignment Mechanism:

1. The device must detect at least one marker per frame to begin scanning and alignment.
2. If alignment is lost, at least two markers must be detected in a single frame to recover tracking.

Applicable Scenarios:

- Objects with partial geometric features (insufficient for full feature-based alignment), e.g.:

  Infant heads (low geometric distinctiveness)

  Structured workpieces (repetitive geometry)
- When moderate alignment accuracy is acceptable, avoiding marker mode (which requires ⩾4 markers/frame).
- Not suitable for flat objects—these require pure marker-based alignment.

Auxiliary Fiducial Markers VS Markers (Hybrid Alignment)

- Auxiliary Fiducial Markers requires at least one marker at every FOV, while hybrid alignment only necessitates markers in areas with insufficient geometric features. Theoretically, the former requires more markers than the latter.
- **Auxiliary Fiducial Markers** prioritizes marker detection first in order to prevent geometric feature misalignment. While Hybrid Alignment recognizes texture first, then geometry, markers the last.

7.2 Alignment Mode

The alignment modes include Hybrid Alignment and Marker Alignment.

- Hybrid Alignment:

  This mode serves as the alignment method in both Infrared Structured Light Scan and Laser Scan (no markers). Compared to geometric-only or texture-only stitching, it significantly enhances alignment capability while simultaneously providing colored 3D model data.

- Marker Alignment:

  This mode is exclusive to laser scanning, which delivers higher-detail and higher-precision models.

7.2.1 Hybrid Alignment

This advanced mode enables simultaneous recognition of:

- **Geometric features** (surface contours/edges)
- **Texture features** (natural patterns)
- **Markers** (when applied)

The hybrid alignment mode improves scanning performance through:

- Enhanced alignment accuracy
- Reduced marker dependency (enabling scans with:
  1. Zero markers for textured objects
  2. 3-5 markers for low-feature surfaces)

Note:

- For objects with limited geometric features and uniform coloration (e.g., car doors), markers must be applied to featureless areas (e.g., flat surfaces) to facilitate scanning and alignment.

Hybrid alignment is suitable for objects with abundant geometric/texture features that do not require strict precision or high scanning demands, such as artworks, ornaments, sculptures, and medical uses.

7.2.2 Marker Alignment

Marker alignment refers to an alignment method that utilizes specially designed black-and-white circular reflective markers as the reference. This approach demonstrates notable advantages including feature-independent performance, high precision, low misalignment rate and exceptional stability. However, limitations exist including time-consuming marker application/removal, residue risk and consumable cost.

Note:

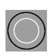
- For scenarios requiring exceptional model accuracy (e.g., automotive floor mats, industrial components, or flat/low-feature surfaces), select Marker Alignment.
- Do not reuse markers.
- 3DeVOK MT achieves its highest scanning precision in Marker Mode, with accuracy of up to 0.04mm + 0.06mm/m.

7.2.2.1 Reflective Markers

Reflective markers typically feature a circular, reflective design, with standard specifications of 6mm inner diameter and 10mm outer diameter, which is shown in Figure 7-5. A minimum of four markers is required to establish proper orientation.

Figure 7-5 Markers With 6mm Inner Diameter And 10mm Outer Diameter (Unit: mm)

Note:

- The scanner requires ≥**4 markers** to be simultaneously recognized for successful alignment in Marker Alignment.
- For accurate detection, scan markers from multiple angles (top/ front/ back/ left/ right/45° tilt).
- Marker Status During Real-Time Scanning:  /  /  respectively means Processed / Tracking / Not Visible.

7.2.2.2 Marker Sticking

The distance between two markers should be 3 cm to 12 cm, and the specific spacing should be determined according to the actual condition of the work piece.

If the surface curvature changes are small, the distance can be appropriately increased up to a maximum of 12 cm. If the work piece has many features or significant curvature changes, the distance should be appropriately reduced to a minimum of 3 cm.

Note that the markers should be randomly distributed to avoid regular patterns.

Marker Sticking Precautions:

- The distance between two markers should be about 6-8cm, with a maximum distance of 10-12 cm.
- When placing markers, keep each marker at least 3 mm away from holes or folded edges of the object to ensure proper operation of the marker hole-filling algorithm. Otherwise, it may affects edge data quality.
- The more irregularly the markers are placed, the less likely misalignment will occur.
- For non-flat objects, place markers on all dimensions of the object to achieve higher accuracy in marker recognition and alignment.
- Do not place markers on edges, as it may cause missing edge data during point cloud generation.
- Two marker sizes are available: standard (6mm inner/10mm outer diameter) and small (3mm/6mm). Use small markers for small or complex objects, and standard markers for larger objects to ensure better recognition.
- When attaching markers to curved surfaces, do not bend them to avoid affecting marker recognition accuracy.

7.3 Scan Parameters

7.3.1 Infrared Structured Light Parameter Configuration

Before selecting Infrared Structured Light Mode, click the "Preferences" button at the bottom right to access parameter configuration. The parameter settings is shown in Figure 7-6.

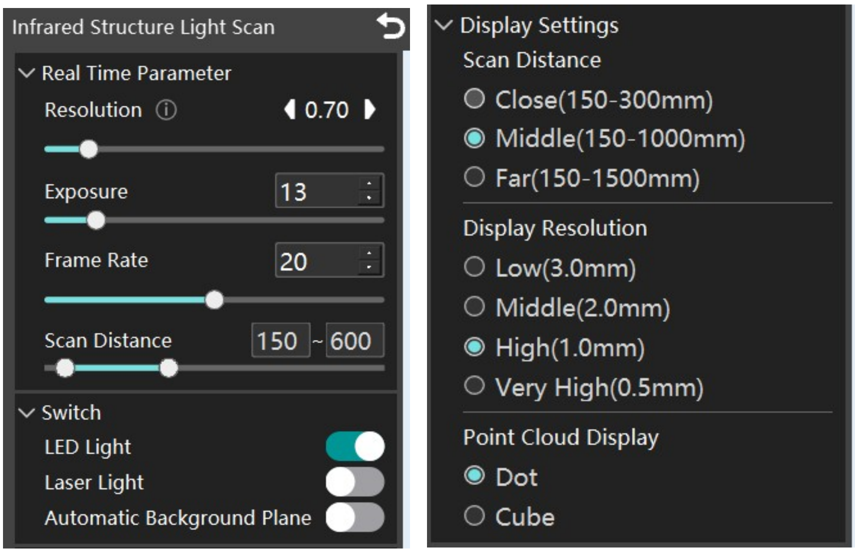


Figure 7-6 Infrared Structured Light Parameter Configuration

Real Time Parameter:

- **Resolution:** The distance between adjacent point clouds in a scanned object. A higher resolution yields greater detail and finer features in the model, though it also increases point cloud processing time. Processing speed is dependent on the computer's hardware capabilities. For most applications, a resolution setting between 0.2 and 0.3 provides an optimal balance of detail and efficiency.
- **Exposure:** Adjusts the intensity of the laser line during scanning. Optimal brightness depends on the surface properties of the scanned object—darker or reflective surfaces (e.g., black or glossy materials) typically require higher settings. For such materials, a brightness level above 50 is recommended. For detailed instructions on verifying laser line brightness,refer to 7.5.2: Camera Field of View.
- **Frame Rate:** Refers to the scanning frame rate. For example, 20 FPS means the scanner can recognize 20 real-time images per second during scanning.
- **Scan Distance:** Maintaining proper depth of field control during scanning is critical for achieving optimal results. By keeping the scanning distance within the

recommended range, operators can ensure smooth data acquisition, maximize detail capture, and effectively filter environmental interference through adjustable near/far distance limits. For best results, maintain the scanning distance as close as possible to the ideal working range:

- 300 mm for infrared laser/infrared structured light
- 210 mm for blue laser

Optimal distances directly correlates with scan quality and detail resolution.

Switch:

- **LED Light:** Enhances surface texture recognition and provides color mapping. If it is disabled, it degrades texture stitching and color data quality. Keep enabled when using hybrid alignment or requiring color data.
- **Laser Light:** Help recognizing markers. Manually enable it when using structured light or laser with hybrid alignment (requires markers).
- **Automatic Background Plane:** Creates a virtual plane to filter out background noise. Align the first frame to the plane when start scanning, and the scanner automatically masks the plane, focusing only on the subject.

Display Settings:

- **Close：** Optimized for small/medium objects (10 cm-20 cm).
- **Middle：** Best for moderate-sized objects (>30 cm) with rich features.
- **Far：** Exclusive to infrared Structured Light mode, suitable for large-sized objects with fewer details, such as leather sofas, carpets, etc.

Display Resolution:

- **Low/Middle/High/Very high:** Refers to the on-screen point cloud resolution shown during real-time scanning, which differs from the actual scan resolution:
  - When scanning at 0.3 mm resolution with high display resolution selected
  - The live preview may render at 1 mm resolution
  - While the captured data retains the true 0.3 mm resolution

  Note that display resolution is dependent on PC specifications - higher display resolutions require more powerful hardware.

Point Cloud Display:

- **Dot/Cube:** Purely affects the visual representation of point clouds during scanning, with no impact on actual scan data quality or accuracy.

7.3.2 Laser (Hybrid Alignment) Parameter Configuration

Before selecting Laser Scan(Blue/Infrared Laser)-Hybrid Alignment, click the "Preferences" button at the bottom right to access parameter configuration. The parameter settings is shown in Figure 7-7.

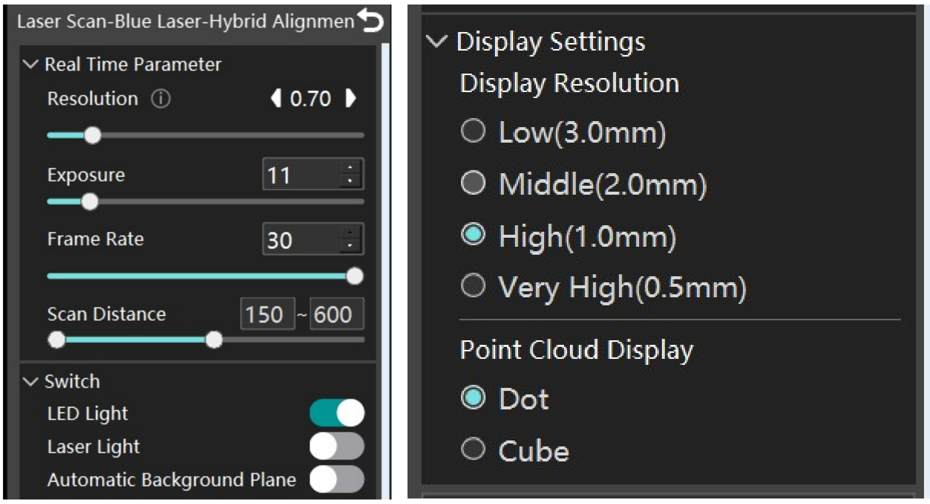


Figure 7-7 Laser (Hybrid Alignment) Parameter Configuration

Since both laser and infrared structured light scan utilize hybrid alignment for scanning and point cloud generation, their parameter configurations share identical meanings. For detailed parameter explanations, refer to 7.3.1 Infrared Structured Light Parameter Configuration.

7.3.3 Laser (Marker) Parameter Configuration

Before selecting Laser Scan(Blue/Infrared Laser)-Marker Alignment, click the "Preferences" button at the bottom right to access parameter configuration. The parameter settings is shown in Figure 7-8.

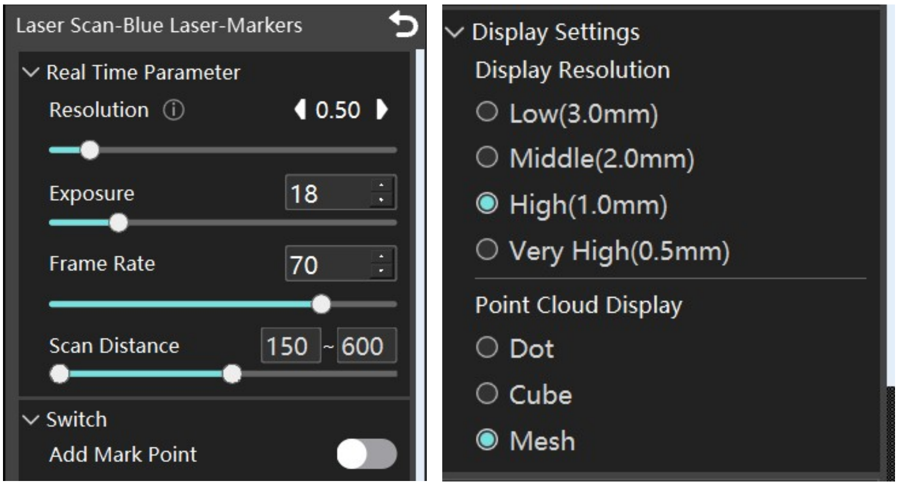


Figure 7-8 Laser (Marker) Parameter Configuration

Several parameters for marker alignment requires distinct settings compared to hybrid alignment:

- **Frame Rate:** Marker alignment achieves a significantly higher frame rate than hybrid alignment, reaching up to 70 FPS. While the settings allow increasing this to 80 FPS, this option demands higher computer performance and is generally not recommended.
- **Add Mark Point:** If the stitching process becomes unstable during scanning, operators may supplement additional markers in areas with insufficient marker coverage. Noted that this option remains accessible throughout the scanning workflow - either during pre-scan configuration or mid-scan adjustment.

Note:

- Avoid extensive reliance on newly added markers during scanning. These supplemental markers may exhibit lower positional accuracy, and prolonged scanning process could potentially generate outlier points.

- **Point Cloud Display-Mesh：** During real-time scanning in marker mode, the model visualization on the scanning interface is displayed as a dynamic mesh representation. This rendering provides a real-time simulation of the final mesh outcome.

Note:

For normal performance when using real-time mesh functionality in marker mode, Dedicated GPU Memory of PC should meet or exceed 6GB.

7.4 Touch Screen

The touchscreen interface features scanning control buttons that can be activated during operation. The specific functions are illustrated in Figure 7-9:

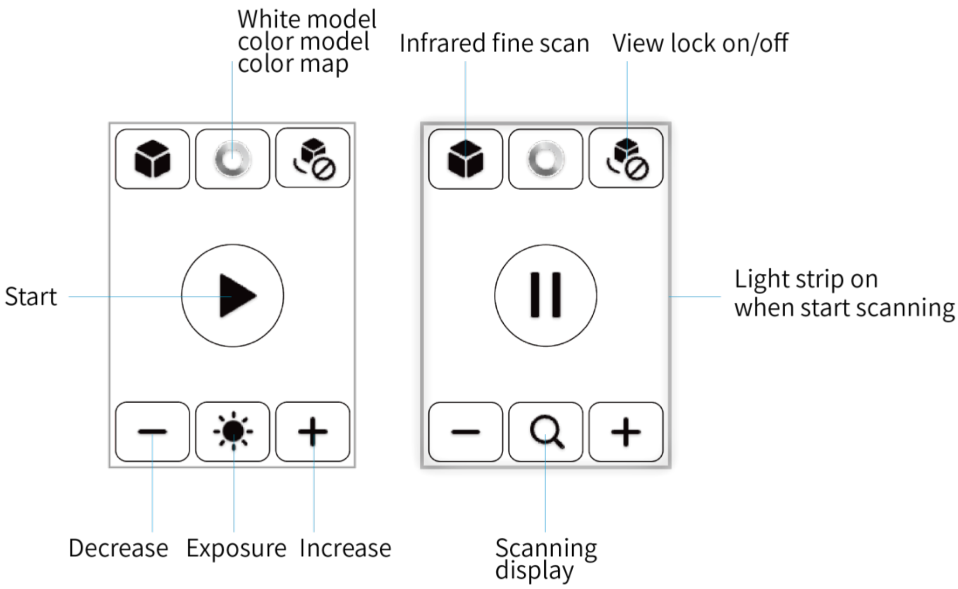


Figure 7-9 Button And Corresponding Function of Touch Screen

7.5 Scanning Interface

The scanning interface features functional buttons distributed across all four edges of the screen - top, left, right, and bottom. Refer to Table 7-1 below for detailed information:

7.5.1 Top Toolbar

Table 7-1 Top Toolbar Icons and Functions

Interface	Name	Icon	Description
Default	New Save Open File Open Project		Create a new scan Save the file/project Open the local file Open the local project
Calibration	Calibration		Calibrate device, white balance and laser plane
Scan	Start		Start scanning
	Finish		Finish scanning process/marker scanning(in marker mode)
	Retract Frame		Retract the wrong data
	Create Background Plane		Select markers to create background plane, blocking plane data
Point Cloud	Disconnected Components		Select data that is separated from main body
	Isolated Point		Select points that are floated around the model
	Wrap		Wrap the point cloud

Mesh	Manual Hole Filling		Fill the holes manually based on the curvature or with a plane
	Auto Hole Filling		Automatically fill holes based on defined parameters
	Mesh Refinement		Reduce mesh density to 60%
	Mesh Simplification		Increase mesh density by 3 times
Texture	Texture		Map the texture captured by color camera
	Simulation Preview		Preview the model after texture mapping
Tool	Model Stitching (Feature)		Alignment of Complementary Models Based on Shared Geometric Features
	Model Stitching (Markers)		Alignment of Complementary Models Based on Shared Markers

7.5.2 Camera Field of View

The camera field of view provides real-time visualization of the scanner's observable area, enabling operators to: (1) verify object position relative to the optimal scanning zone, while simultaneously monitoring (2) laser line intensity, (3) color camera fill light levels, and (4) color camera exposure values for comprehensive process control, which is shown in Figure 7-10.

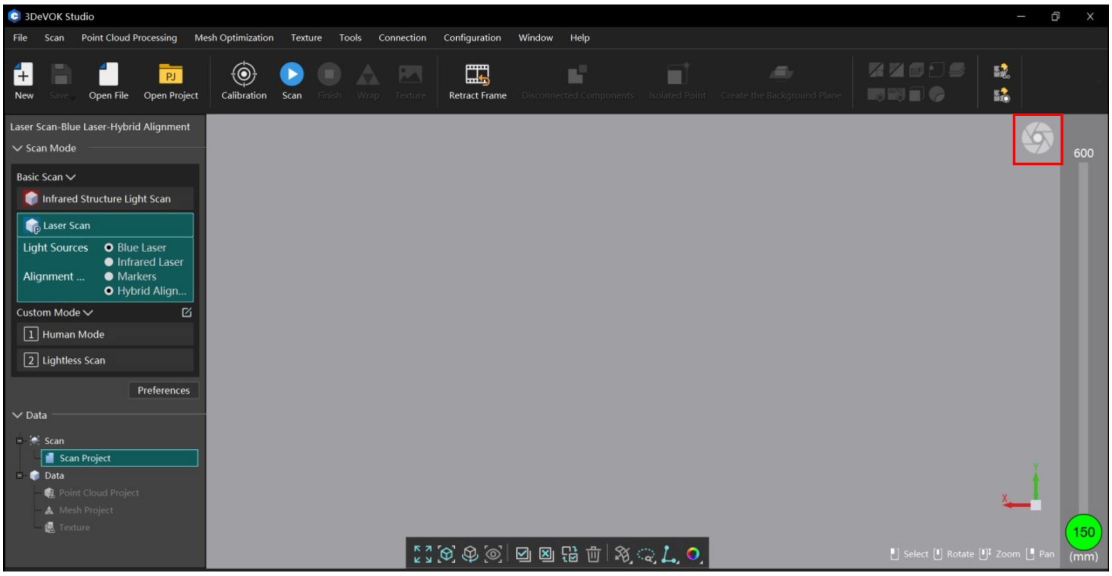


Figure 7-10 Camera Field of View

With the Camera **field of view** enabled, monitor real-time laser line intensity and adjust Exposure via the Real Time Parameter panel in the left sidebar. For the laser line brightness, refer to Figure 7-11 for optimal exposure.

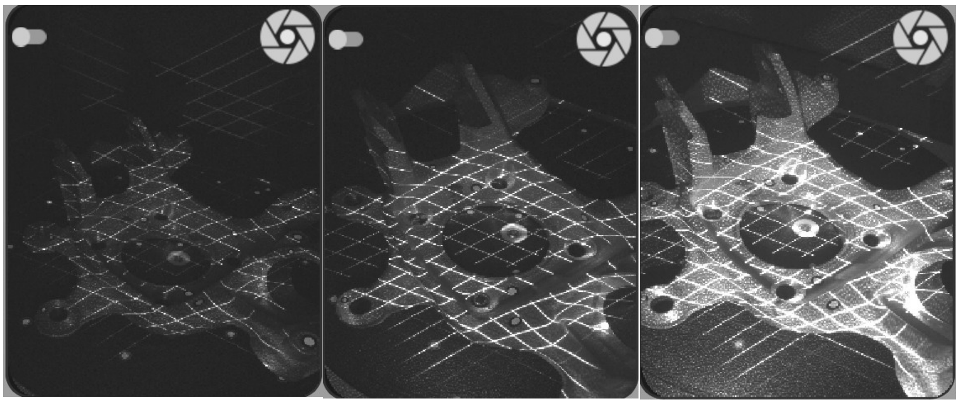


Figure 7-11 Brightness of Laser Line-Underexposed/Moderate/Overexposed

Note:

- **Left:** Underexposed, which results in failed point cloud generation
- **Middle:** Optimal laser brightness for scanning
- **Right:** Overexposed, which leads to poor point cloud generation, rough data surface and excessive noise

After the top-left toggle is enabled, adjust the color camera fill light brightness and color camera exposure with the bottom control panel based on real-time camera, which is shown in Figure 7-12.

Figure 7-12 Real-time Camera, Color Camera Fill Light and Color Camera Exposure

Note:

- Improper lighting/exposure settings critically impact texture quality: excessive fill light brightness causes localized overexposure while insufficient fill light leads to color desaturation, similarly, camera overexposure washes out details whereas underexposure produces dark textures.

7.5.3 Bottom Toolbar & Right-Click Context Menu

Table 7-2 Bottom Toolbar Icons and Functions

Name	Icon	Description
Zoom In		Full screen display
Best View		Reposition the model to the center of the scan viewport
Browse Mode		Enables continuous model rotation
View Lock		Lock the camera view
Select All		Select all data
Clear All		Clear all selected data
Reverse Selection		Reverse the selected area
Delete		Delete data
Select Through Mesh		No: Select only the triangular data that is clearly visible on the front side of the scanning interface. Yes: Select all triangular data, whether on the front, back, or hidden.
Lasso		Select data with lasso
Rectangle		Select data with rectangle
Polyline		Define an irregular polygonal region by selecting a limited number of points
Select Point		Select/Delete point cloud
Select Mark Point		Select/Delete markers

Select Mesh		Select mesh (fill holes, etc.)
White Model		White model display
Color Model		Color model display
Color Map		Data quality display

The right-click context menu provides identical functionality to the bottom toolbar, but arranged differently, which is shown in Figure 7-13.

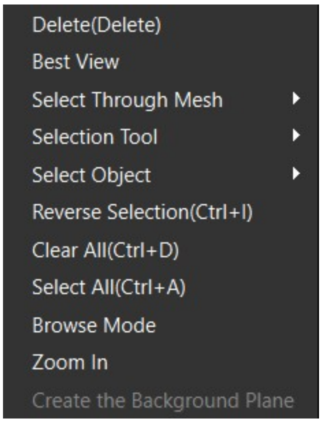


Figure 7-13 Right-Click Context Menu

7.6 Scanning Skills

7.6.1 Scanned Object And Size

For objects scanned with 3DeVOK MT, the primary classifications and suggested scanning modes are listed below:

- **Matte/textured/multi-colored objects:** Laser Scan - Hybrid Alignment / Infrared Structured Light Scan
- **Large-scale objects:** Infrared Structured Light Scan / Marker Alignment
- **Human:** Human Mode / Lightless Scan
- **Glossy black/reflective/detailed components:** Laser Scan - Marker Alignment

Object size range: 5 cm to 5 m

Note:

- For small objects (5-10 cm), use marker-based mode for better details;
- For large objects (multi-meter), prioritize marker-based mode for precision or infrared structured light scan for faster scanning when absolute accuracy isn't required.

7.6.2 Scanning Angle And Distance

The dual black-and-white cameras are mounted at a specific angle to each other, and the optimal scanning angle occurs when both cameras can detect the target object at near-vertical incidence angles, which is shown in Figure 7-14. Point B yields the highest point cloud density, while points A and C produce the sparsest data. For challenging areas or dead zones, the scanner can be re-positioned to ensure simultaneous object visibility by both cameras.

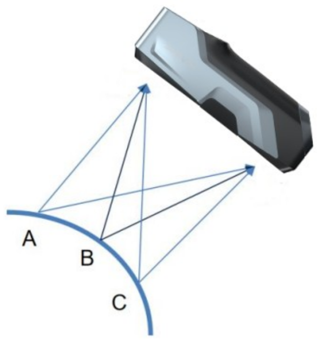


Figure 7-14 Optimal Imaging Points for Black-and-white Cameras

For optimal scanning results, maintain a working distance between 200mm and 400mm to achieve the highest point cloud quality and finest detail resolution.

Optimal scanning distance of Infrared Structured Light Scan: 300 mm

Optimal scanning distance of Infrared Laser: 300 mm

Optimal scanning distance of Blue Laser: 210 mm

7.6.3 Alignment Skills

7.6.3.1 Scanning Technique

To avoid frequent problems like missing data, misaligned layers, or failed stitching, apply these proven techniques:

1. **Address wrong layers:** When scanning, it is necessary to first plan the shortest scanning path. Scan the large contours of the object first, and then perform a detailed scan of every part. This can help avoid layer misalignment caused by accumulated errors. If local scanning is done first and then followed by a surrounding scan, layer misalignment may occur.

2. **Address misalignment and wrong registration:** The reason for misalignment and wrong registration is that the scanner recognizes too few features in a single frame, making it impossible to stitch the data together. The possible causes include:

- Scanning distance being too close with too few features;
- Scanning distance being too far, resulting in no recognition;
- Scanning areas with no distinguishable features.

Strategies to minimize alignment errors/misalignment and critical scanning techniques are as follows:

1. The top of an object is usually prone to misalignment. When scanning the top of an object, the scanner should not be positioned vertically to scan directly onto the top. Instead, features from other areas (such as the middle section) should be used for stitching to the top. It is advisable to slightly increase the scanning distance, allowing the single frame to cover both the transition area and the top. Once the top features are being scanned, slowly return to the optimal distance to capture the details of the top (note: avoid scanning vertically).

2. When scanning details, direct scanning in a very short distance is not recommended. The principle is the same as the previous one: a transition area should be scanned to capture features, then scan the details locally.

3. When scanning solid-colored objects, stitching loss may occur sometimes, and appropriately placing a few points and use texture stickers is recommended in

this case. For the usage of stickers, refer to 7.6.3.3 Usage of Stickers for Hybrid Alignment.

7.6.3.2 Techniques for Lost Alignment Recovery

For hybrid alignment:

Causes:

- **Scanner moved too quickly**, resulting in insufficient feature overlap between frames
- **Improper scanning distance** (too close/far), causing feature recognition failure by the cameras

Solutions:

- Return to a previously scanned area while maintaining the optimal scanning distance
- Pause for 2 seconds to allow the scanner to recognize features and re-establish alignment

Note:
● Begin with feature-rich areas for the first frame to establish a strong reference.
● Pause scanning if alignment fails for >5 seconds, reposition the scanner to previously captured areas with clear features and resume scanning.

For marker mode:

Causes:

Insufficient markers / Marker degradation / Overly regular marker arrangement

Solutions:

- Add several markers in sparse areas and continue scanning, though with reduced positional accuracy. For better results, initiate a new scan with properly distributed markers.
- Remove worn-out markers with alcohol swabs, and replace with new ones.
- Rearrange the existing markers to avoid overly regular placement.

7.6.3.3 Usage of Stickers for Hybrid Alignment

Texture-assisted stickers are designed to augment surface features, particularly when using hybrid alignment mode. They improve stitching capability by adding artificial texture to low-feature surfaces. The usage of stickers is as follows:

Step 1:

Evaluate the object' s geometric and textural characteristics. If insufficient for hybrid alignment, apply stickers to either:

- The object' s surface (avoid obscuring key geometry)
- Surrounding areas (e.g., turntable/workspace)

Step 2:

Place stickers 12-15 cm apart.

- Small objects: Attach to adjacent surfaces (e.g., scanning table)
- Large objects: Apply directly to the object without covering critical features, which is shown in Figure 7-15.

Figure 7-15 Placement of Hybrid Alignment Stickers

1. Color camera fill light must be enabled to ensure proper recognition of both the object and texture stickers. Verify that the scanner' s cameras can simultaneously detect the target object' s surface and the applied texture stickers at the same frame (critical for hybrid stitching enhancement)

2. If stickers were placed directly on the object, their scan data may appear as protrusions. Select and Delete the affected regions, fill the holes of the mesh data, then a texture-free white model can be produced.

Note:

- Both markers and texture-assisted stickers serve as artificial features to enhance stitching capability in hybrid alignment mode, with markers (placed 6-8 cm) being ideal for small/medium objects' surfaces while texture stickers (spaced 12-15 cm) better suit large objects like doors or floors. If stickers are required for scanning small-size objects, apply stickers to surrounding surfaces instead.
- When texture stickers or markers are applied directly to the object's surface, they become permanently embedded in both the 3D geometry and texture maps, with no automated removal capability in standard scanning software.

7.7 Far Distance Scanning and Partial Fine Scanning

The Far Distance Scanning and Partial Fine Scanning are performed as follows:

1. Before scanning, click Settings and select "Far (150mm-1500mm)" in Scan Distance. The default resolution for far distance scanning is set to 3.0, which is shown in Figure 7-16. This value can be modified as needed based on specific application requirements.

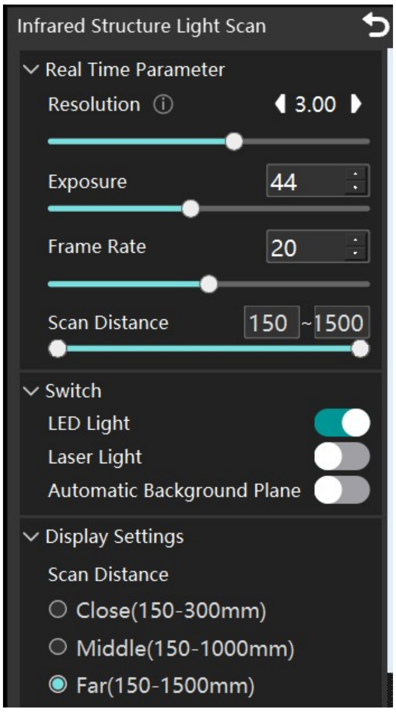


Figure 7-16 Parameters of Far Distance Scanning

2. In far-distance scanning, the left control panel provides two scan mode options in the "Scan Mode" column, which is shown in Figure 7-17:

- Speckle Scan: Default mode for standard far-distance scanning using structured light
- Partial Fine Scanning: High-precision scanning mode with selectable light sources (structured light/infrared laser/blue laser)

The default resolution for partial fine scanning is set to 0.2.

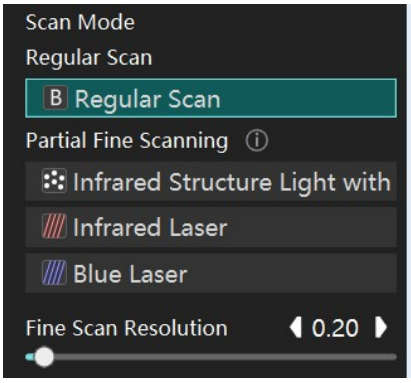


Figure 7-17 Parameters of Partial Fine Scanning

3. Upon completion of regular structured-light scanning, click the Structured Light/Infrared Laser/Blue Laser button (either option) to start partial fine scanning:

- Identify and track the data with feature-dense regions.
- Perform fine scanning of the target region at the optimal scanning distance.

4. Upon completion of the fine scanning process, use the lasso selection tool (left mouse button) to designate the high-resolution scan regions for retention. Due to the significant resolution difference between the basic scan (3.0 mm) and the fine scan (0.2 mm), visible discontinuities may occur at their boundaries. To avoid edge artifacts, select the areas that need fine scanning, ensuring that the fine scan boundary overlaps with object’ s natural edges (e.g., sharp corners or surface ridges) to facilitate seamless data fusion.

8 Post Processing

8.1 Point Cloud Processing

It is necessary to finish the scanning process before point cloud processing. For ending the scanning, refer to 8.1.1 Point Cloud Processing Steps.

8.1.1 Point Cloud Processing Steps

1. Select the unwanted noise data with lasso tool by left-clicking the mouse. Delete the selected data by either right-clicking and choosing "Delete" from the context menu, or pressing the Delete key on your keyboard, which is shown in Figure 8-1.

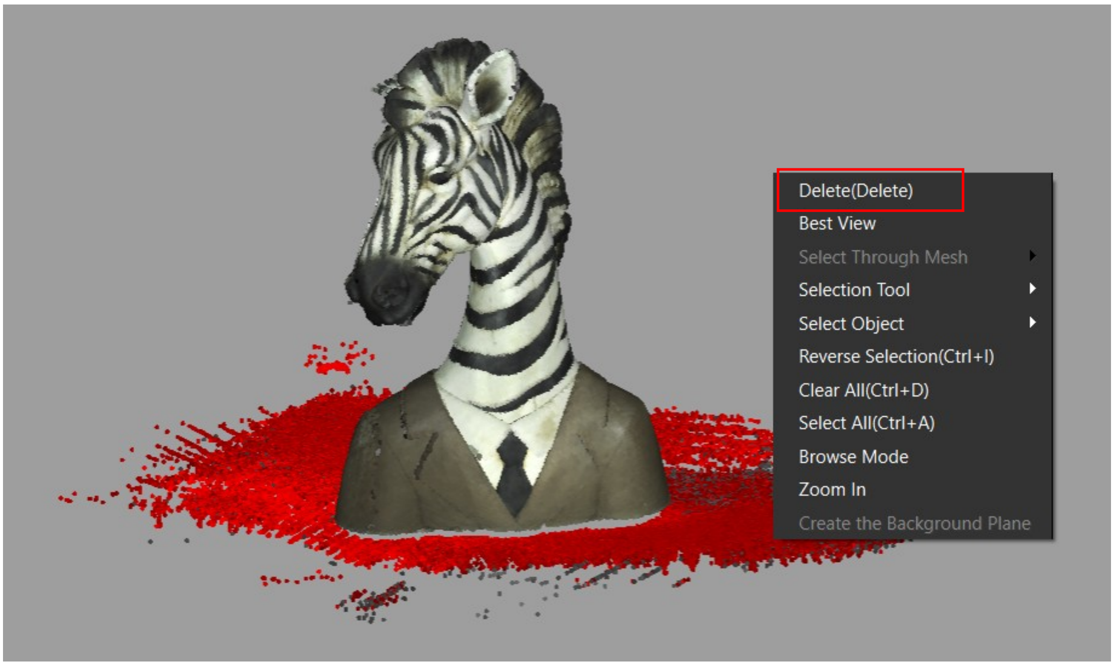
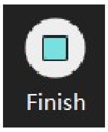


Figure 8-1 Delete Noise Data

2. Click the 

button to start processing. Alternatively, on touchscreen devices press and hold the ▷ button until the green circular progress bar completes a full cycle. Release the button when it turns into a green ✓ to finalize the scan and begin processing.

Figure 8-2 Long Press for Finishing Scanning Process

3. The interface will automatically switch to the Point Cloud interface, and the generated point cloud model will be displayed, which is shown in Figure 8-3.

Click the "Disconnected Components" button, and the software will automatically identify and highlight (in red) all data points disconnected from the main body Right-click and select "Delete" to remove the selected data.

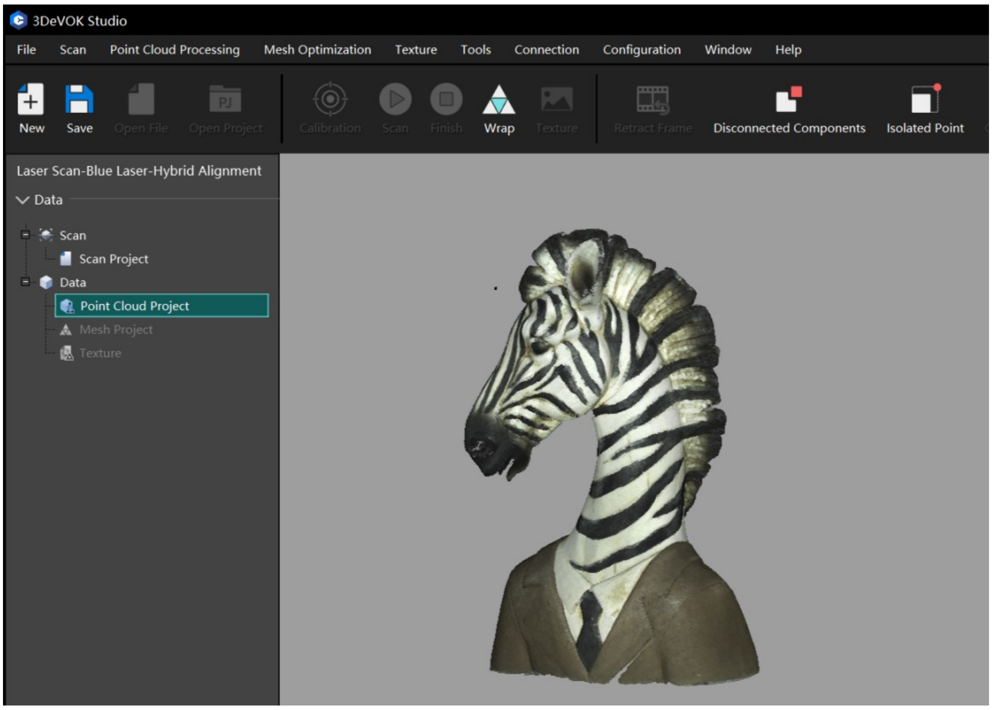


Figure 8-3 Point Cloud Interface of 3DeVOK Studio

8.1.2 Factors Impacting Point Cloud Processing Time

Two primary factors significantly impact point cloud processing duration:

- **Resolution**: Higher resolutions (smaller values) increase processing time.
- **Scanning Duration**: Longer scans directly result in longer computation times, for every frame captured is being processed after finishing scanning.

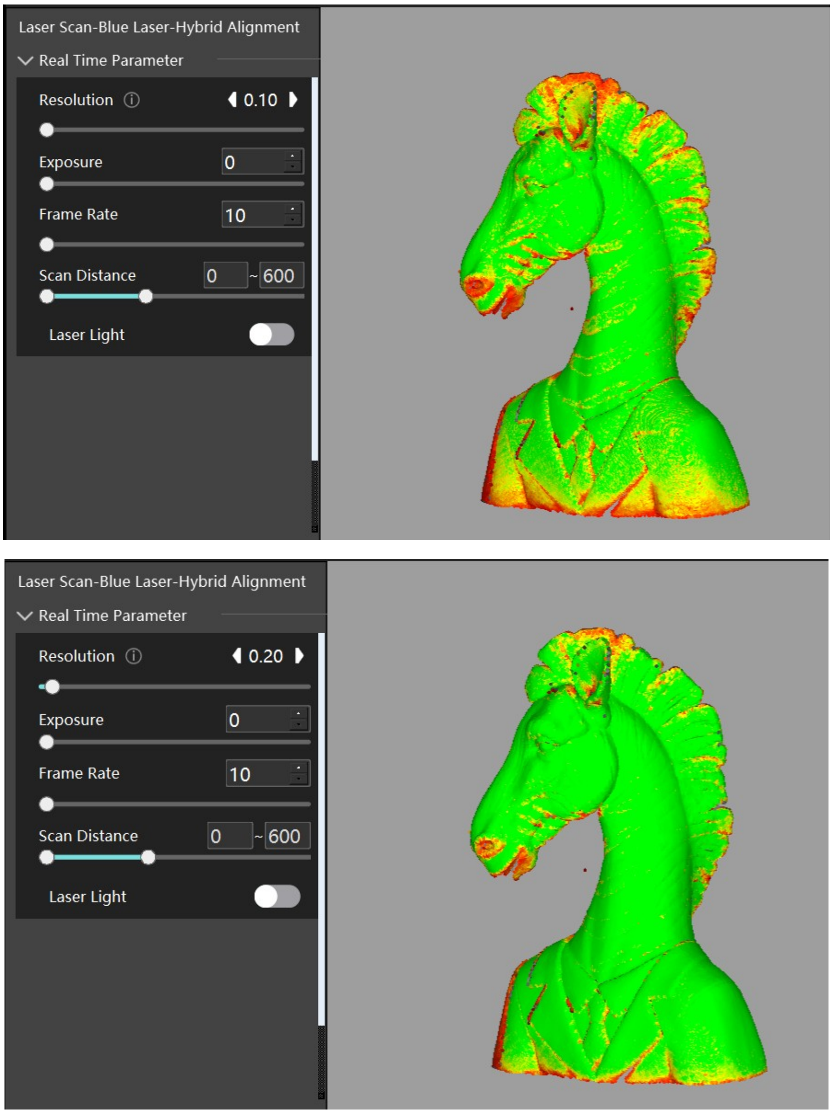
Important Notes:

1. Resolution can be adjusted dynamically during scanning.
2. The final output resolution is determined by the parameter selected **before** processing.
3. Data quality varies with resolution settings:

Green in the display indicates sufficient data for detailed reconstruction at current resolution

Yellow / **Red** signals inadequate data capture for optimal results

The color map quality comparison of the same object at different resolutions is shown in Figure 8-3.



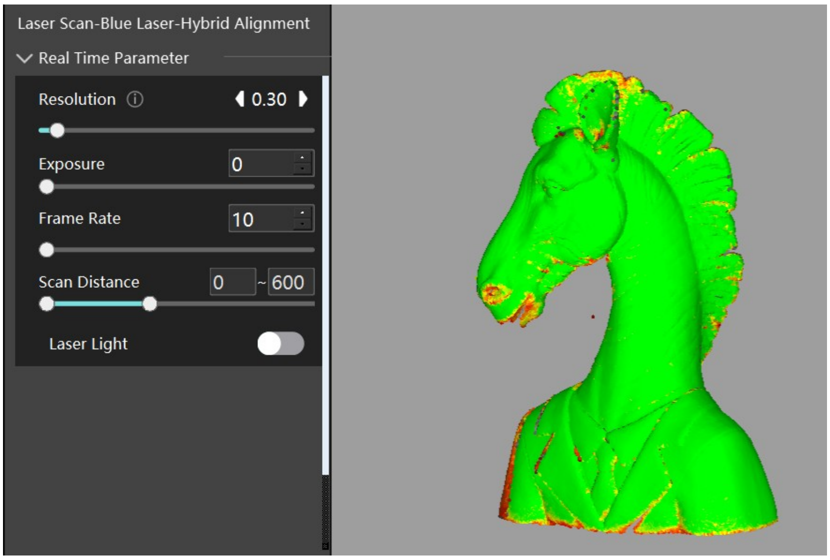


Figure 8-4 Color Map of the Same Object under Different Resolution

8.2 Mesh Processing

Click the 

button to initiate mesh generation. The Wrap Settings (left sidebar) displays two key parameters including Wrap Type and Wrap Mode, which is shown in Figure 8-5:

After configuring parameters, click "Apply" to start wrapping.

Wrap Type:

- Not Close Holes (Default): The generated mesh will preserve all original geometric features without hole filling. This mode is recommended for maintaining raw scan accuracy, and perform manual hole filling either via the software's built-in tools or by exporting to third-party software.
- Close Small Holes: It will automatically fill minor holes in the mesh during generation, which requires longer repair time compared to Not Close Holes.
- Fully Close Holes: Automatically fill all detected holes in the mesh during generation. It may incorrectly fill intentional holes that are part of the original

design, which is not recommended for precision engineering workflows.

Wrap Mode:

- **Curvature Optimization (Default):** Automatically adjusts mesh density based on local curvature during wrapping, with curvature-adaptive smoothing for superior surface quality compared to Standard Effect.
- **Standard Effect:** Perform raw-data wrapping of the work piece without smoothing to preserve the original model geometry.
- **Smaller Files:** Acquire minimal-volume mesh files.

- **Mesh Optimization:** Perform model optimization through smoothing, edge flow alignment, and basic sharpening.
- **Fill Holes of Markers:** During wrapping, automatically fills marker-covered areas based on curvature analysis of adjacent scan data.
- **Mesh Simplification:** Simplifies generated mesh during wrapping with real-time adjustable reduction ratio.

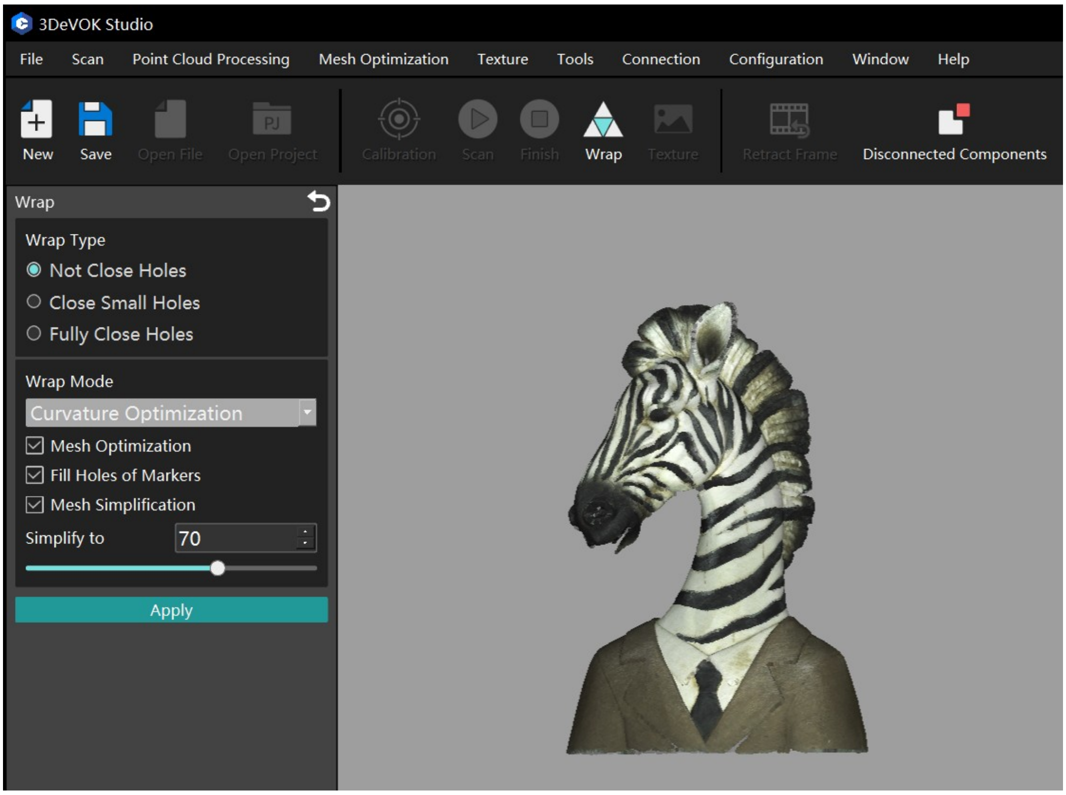
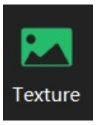


Figure 8-5 Wrapping Interface and Settings of 3DeVOK Studio

8.3 Texture Processing

Apply texture mapping by clicking the 

button, then click the "Apply" function for mapping. Enable "Beautify and Smooth" and "Highlight Suppression" and adjust parameters if necessary in human mode in the left panel settings for automatic skin refinement and whitening effects, which is shown in Figure 8-6.

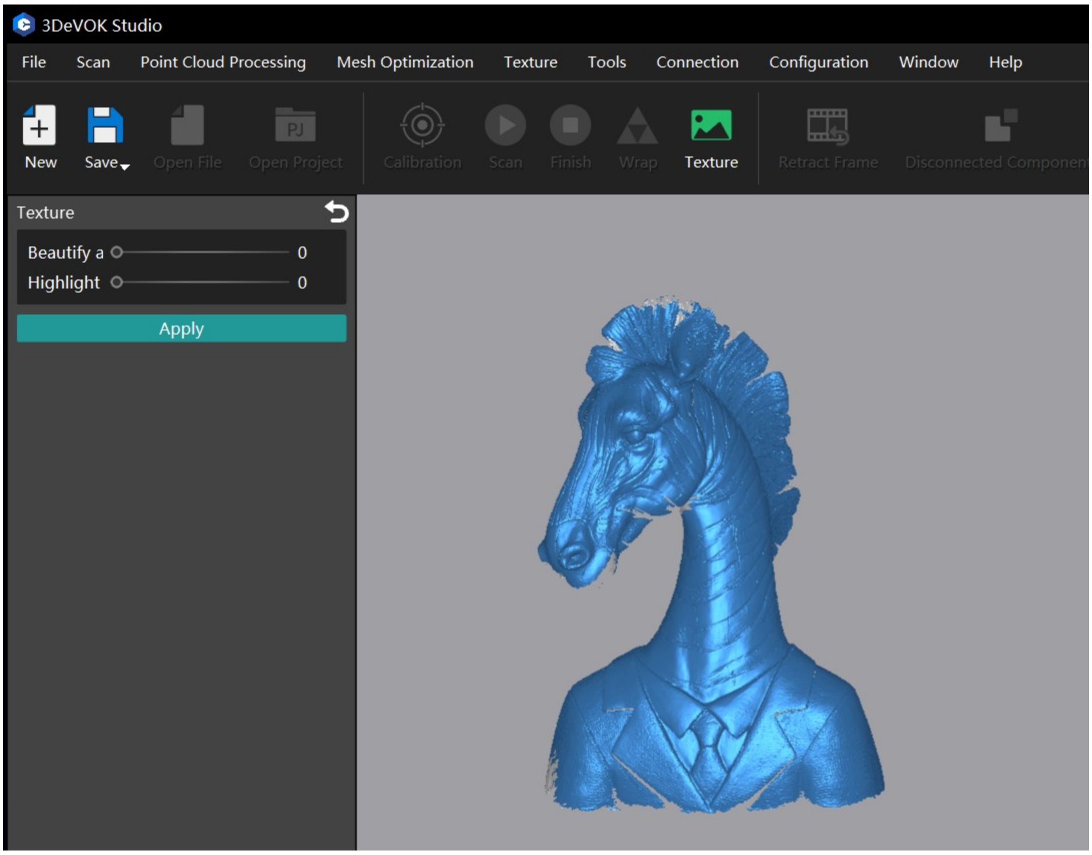


Figure 8-6 Texture Interface of 3DeVOK Studio

8.4 File Saving

The scanning workflow can be divided into four modules: Scanning, Point Cloud, Mesh, and Texture Mapping. Each module outputs distinct data types and corresponds to separate interfaces within the software, as detailed in Table 8-1.

Table 8-1 Scanning Process and Data Types Saved at Each Interface

Data Type	Interface	Data Type To Be Saved
Original Data	Scan	Scan Project (.epj)
Point Cloud Data	Point Cloud	Point Cloud Project (.apj), Point Cloud file (.asc)
Mesh Data	Mesh	Mesh Project (.spj), Mesh File (.stl/.sk/.obj (white model) /.ply)
Mesh Data with Mappings	Texture	Mesh File (.stl/.sk/.obj (colorful model)/.ply)

8.4.1 File Formats and Usage

Table 8-2 File Formats and Usage

File Type	Format	Data Type	Step	Description
File	.asc	Point Cloud File	After processing point cloud	Can be wrapped in other software
	.stl	Mesh File	After wrapping	Commonly used for 3D printing
	.obj	Mesh File	After wrapping/mapping	3D data format with texture (still white mold after wrapping)

	.ply	Mesh File	After wrapping	Mesh data with colors
	.mk2	Marker File	When scanning markers	Save marker data
	.sk	Mesh File	After wrapping	Data format unique to Scantech
Project	.map	Mapping Project	After wrapping	It can be imported to iReal 3D Mapping software to optimize the textures
	.epj	Scanning Project	During scanning	Original scanning data
	.apj	Point Cloud Project	After processing point cloud	Point cloud files or projects can be aligned with Model Stitching function (White model can also be saved as point cloud project)
	.spj	Mesh Project	After wrapping	Mesh project can be used for mapping in Bestexture

8.4.2 Project File

Three types of project files can be saved in 3DeVOK Studio software: Scan Project, Point Cloud Project, and Mesh Project. These project types share the following common features:

- It creates a designated folder with user-specified name at the target location upon saving
- Each folder contains a complete set of interdependent files
- Only the index file (.epj/.apj/.spj) needs to be selected when reopening projects.

8.4.2.1 Scan Project

The scan project directory contains the following files and folders: .epj file (Index file), DataImage folder, iRealSET folder, TextureImage folder (Color texture files), g.lp file, mark.show file, p.tsdf file, pro.smf file and s.show file, which is shown in Figure 8-7.

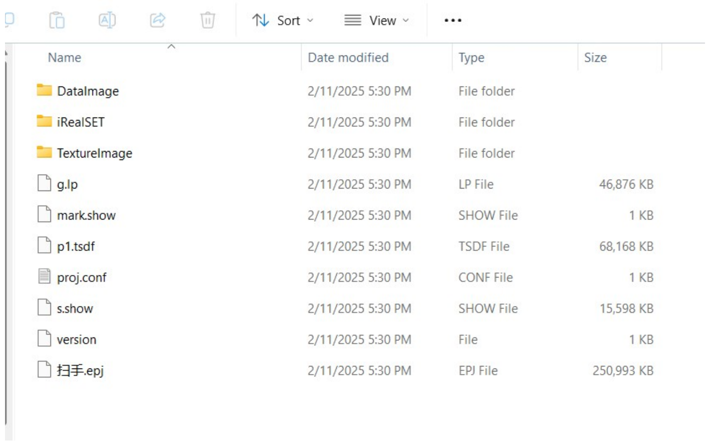


Figure 8-7 Structure of Scan Project

Due to the large file size, scan projects are not recommended for routine saving or sharing; to verify data integrity when opening fails, check the DataImage folder for sequentially numbered, non-zero KB files as validation.

Note:
● Scan projects can be saved anytime during scanning and resumed later if the object maintains geometric stability. ● It is advisable to save scan project during on-site scanning and perform offsite post-processing.

8.4.2.2 Point Cloud Project

The point cloud project directory contains the following files and folders: .apj file, .asc file, TextureImage, or .mk2 file, as shown in Figure 8-8.

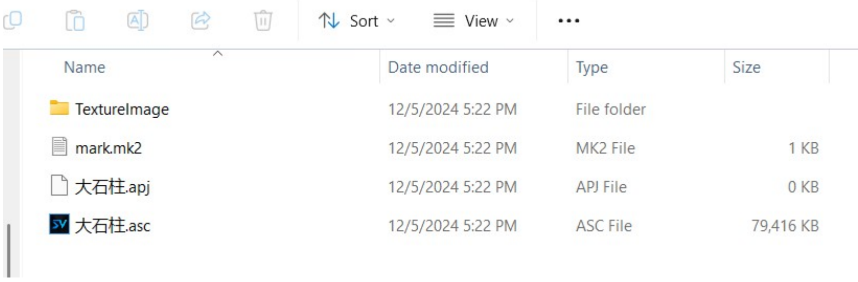


Figure 8-8 Structure of Point Cloud Project

- .apj file: Index file.
- .asc file: Standard .asc files can be independently copied or processed in third-party software for wrapping to generate .stl formats.
- TextureImage folder: This folder stores exclusive texture mapping data readable only by 3DeVOK Studio. The software automatically attempts to apply these textures when opening .asc point clouds or .stl mesh files, regardless of whether the 3D files are original or externally sourced.

Two Point cloud project files can be combined into a single model using the Model Stitching Tool in 3DeVOK Studio, with texture data after combination.

8.4.2.3 Mesh Project

The mesh project directory contains the following files and folders: .spj file, .stl file, TextureImage folder, which is shown in Figure 8-9.

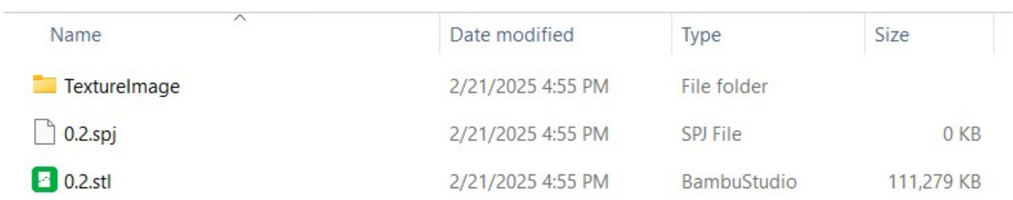


Figure 8-9 Structure of Mesh Project

- .spj file: Index file.
- .stl file: Standard .stl 3D file can be directly used as a white model, suitable for 3D printing and archiving. It also supports third-party software for reading and processing—for example, importing the .stl file into repair or sculpting software for fixes, saving it under the original filename in the same folder, then reopening the mesh project in 3DeVOK Studio to reprocess the textures for a more refined result.
- TextureImage folder: The same as Point Cloud Project.

Note:

- The primary function of a point cloud project is to perform data alignment between two point cloud datasets.
- When the .asc file in the folder is converted to .stl, the point cloud project has been transformed into a mesh project. This allows for texture mapping in 3DeVOK Studio, provided that the coordinates in the .asc-to-.stl conversion process remain unchanged.

8.5 Jump Methods of Third-Party Software

Click the Connection button in the menu bar to view third-party software options. Then, select a software entry to launch the corresponding program, facilitating further operations, which is shown in Figure 8-10.

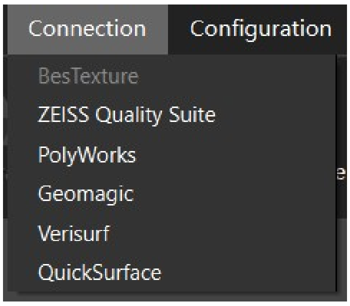


Figure 8-10 Jump Links and Software Supported

Noted: The BesTexture (Texture Replacement) plugin will only activate its corresponding link after the texture mapping process is completed within the software.

9 Model Stitching

9.1 Model Stitching (Features)

Feature-Based Stitching refers to the process of aligning and merging two point cloud projects by identifying and matching corresponding geometric features on the object’ s surface. The specific operational steps are as follows:

1. Perform two separate scans of the work piece’ s front and back parts, generating independent point cloud datasets. Save these as distinct point cloud projects (Designated as Project A and Project B) to the local PC storage directory.

Note:

- Texture can only be applied after saving point cloud projects. Point cloud files retain only geometric data, thus outputting only white models.
- To enable feature-based stitching, certain overlap areas must be maintained between Scan A and Scan B within the shared space.

2. Click the Model Stitching (Features) Button, which is shown in Figure 9-1.

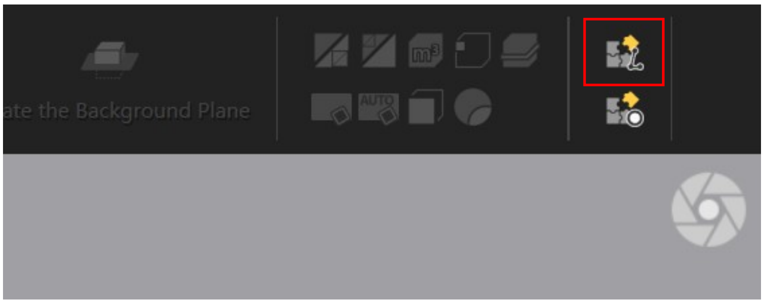


Figure 9-1 Model Stitching (Features) Button

3. Import the target point cloud projects (Project A and Project B) into the dual-view workspace by clicking the import button (highlighted in red frame), which is shown in Figure 9-2.

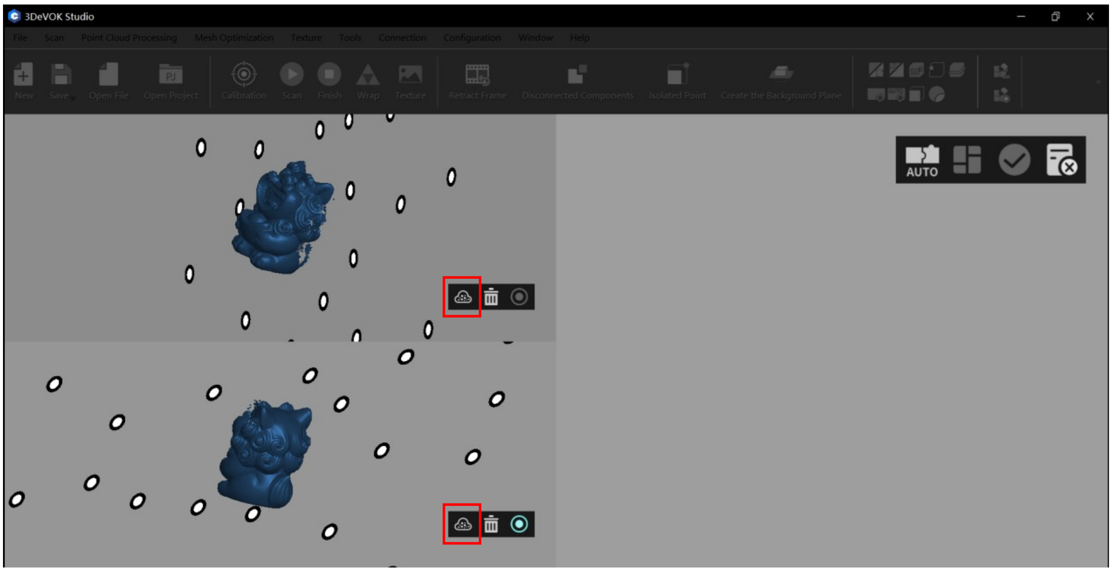


Figure 9-2 Import Point Cloud Projects in Model Stitching (Features)

4. Manually select more than three corresponding points with identical geometric features between Project A and Project B, which is shown in Figure 9-3. If incorrect features are selected during alignment, delete erroneous points with the  button, and select new corresponding points.

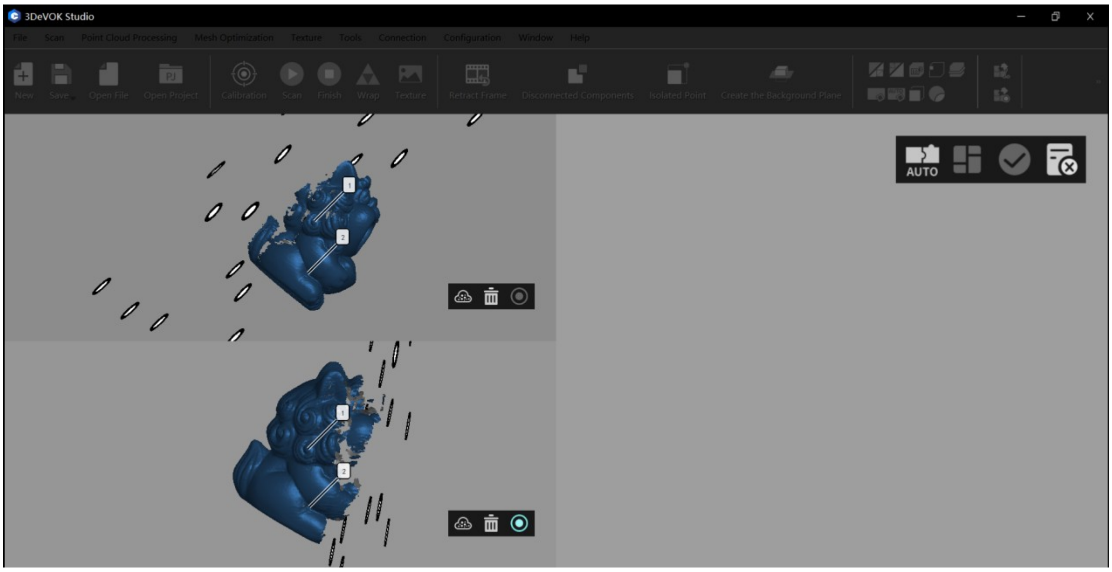


Figure 9-3 Select Common Features

5. After initial model stitching, perform fine registration by clicking the  button to correct minor misalignment, then click  to apply, which is shown

in Figure 9-4.

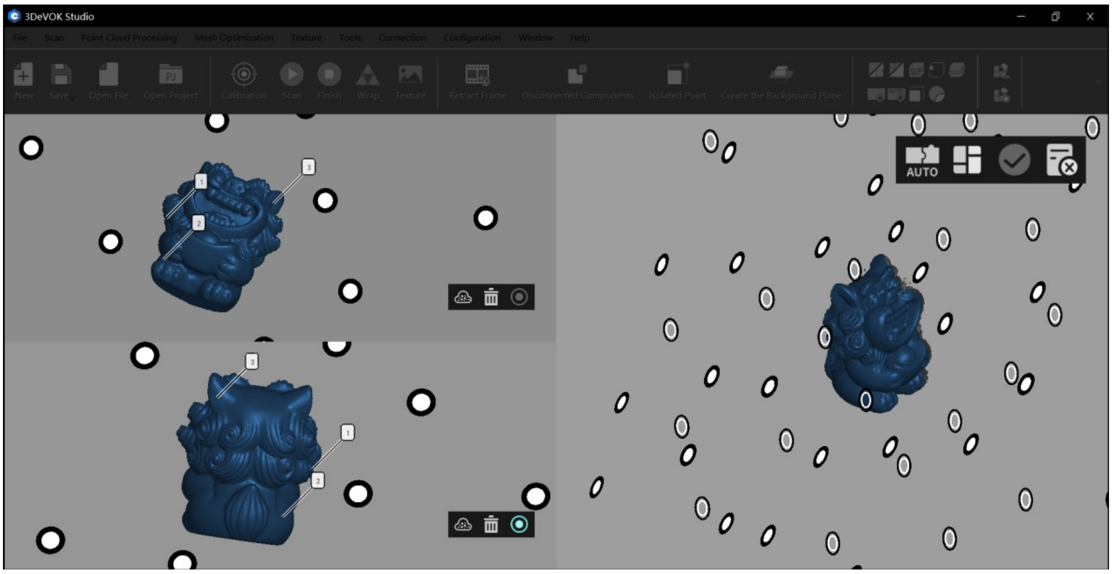


Figure 9-4 Fine Registration

6. Upon successful stitching, access the point cloud interface for further processing, including wrapping and surface reconstruction.

9.2 Model Stitching (Markers)

Marker-based stitching refers to the process of aligning and merging two point cloud projects by matching common markers on the object’ s surface. The specific operational steps are as follows:

1. Perform two separate scans of the work piece’ s front and back parts, generating independent point cloud datasets. Save these as distinct point cloud projects (Designated as Project A and Project B) to the local PC storage directory.

Note:

- Texture can only be applied after saving point cloud projects. Point cloud files retain only geometric data, thus outputting only white models.
- When placing markers, ensure that the common areas of the work pieces have a sufficient number of markers (at least 4) for data stitching. For marker placement guidelines, refer to 7.2.2.2 Marker Sticking.

2. Click the Model Stitching (Markers) Button, which is shown in Figure 9-5;

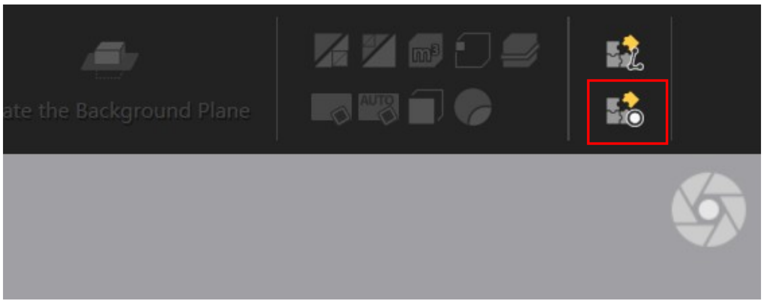


Figure 9-5 Import Point Cloud Projects in Model Stitching (Markers)

3. Import the target point cloud projects (Project A and Project B) into the dual-view workspace by clicking the import button (highlighted in red frame), which is shown in Figure 9-6.

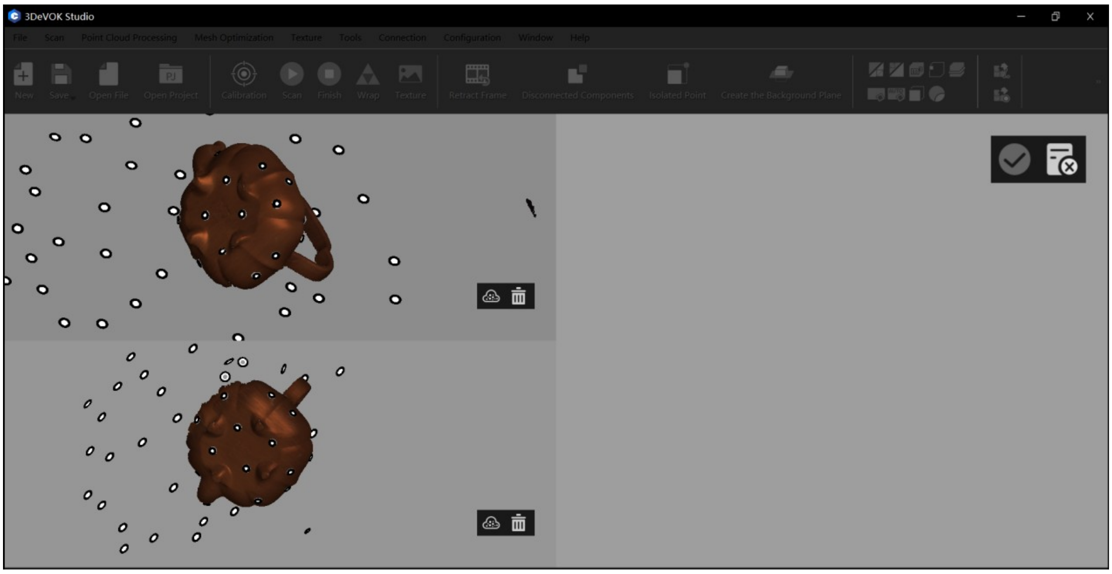


Figure 9-6 Import Point Cloud Projects in Model Stitching (Markers)

4. Left click to select at least four pairs of common markers with lasso, which is shown in Figure 9-7;

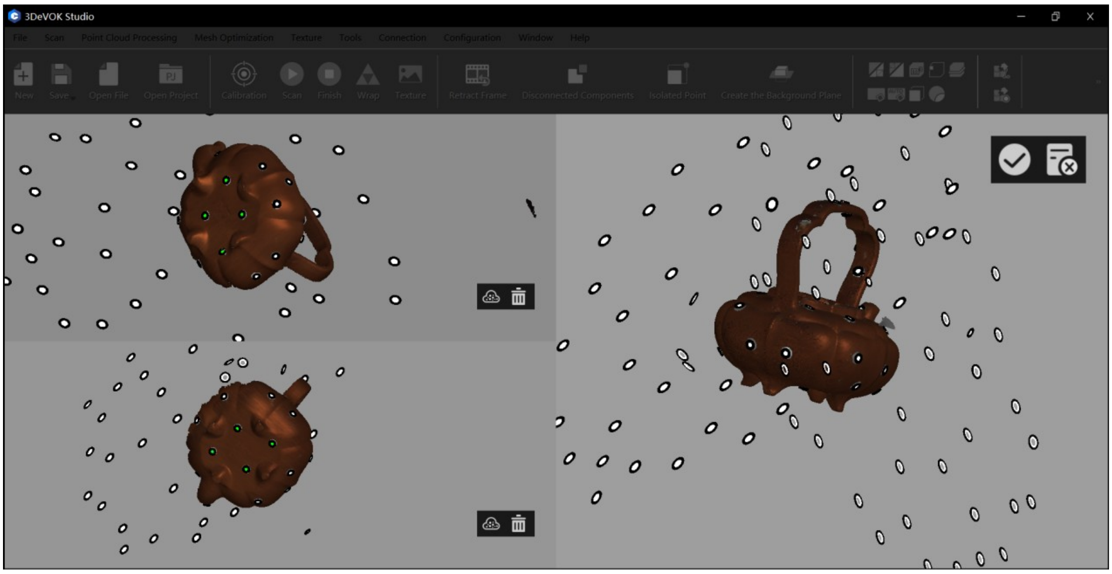


Figure 9-7 Select Common Markers

5. Click the  button to apply.

6. Upon successful stitching, access the point cloud interface for further processing, including wrapping and surface reconstruction.

For more video tutorials and software updates on 3DeVOK products, please visit the official website: https://www.3devok.com/.

Or scan the QR code below to access the latest videos on major platforms.

LinkedIn: 3DeVOK Studio

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YouTube: 3DeVOK Studio

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