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FEIMA ROBOTICS
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Pocket 3D

USER MANUAL

U.S. Edition – v2.0

Source and Editorial Note: This U.S. edition is based on technical documentation supplied by Shenzhen Feima Robotics Co., Ltd. SlamScanner.com has reorganized, edited, clarified, and supplemented the source material for U.S. users. Technical procedures and product requirements remain based on Feima source guidance unless otherwise noted.

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Important Safety and Product Notices

Read these notices before operating, charging, transporting, or storing Pocket 3D.

General operating safety

- Pay attention to the surrounding environment during data acquisition. Do not allow operation of the scanner to distract you from traffic, obstacles, drops, stairs, machinery, or other hazards.
- Pocket 3D is not explosion-proof. Do not use it where flammable or explosive gases may accumulate, including fuel-handling areas, mines, confined utility spaces, or similar hazardous locations.

Device protection

Pocket 3D is a precision measurement instrument. Dropping, impact, excessive dust or sand, liquid exposure, or unauthorized disassembly may damage the device.

Protect Pocket 3D from liquid exposure. Do not deliberately immerse the device or expose it to high-pressure or high-flow water. Splash-, water-, and dust-protection performance may decline with normal wear. Damage caused by liquid immersion is not covered by the product warranty.

- Protect the raised lenses of panoramic cameras from scratches and impact.
- Always shut down using the power button. Do not remove the battery handle or disconnect external power while the device is operating.

Battery and charging safety

- Use a compliant USB-C PD charger. Feima specifies 20 V PD charging, recommended current of at least 2 A, and recommended power greater than 30 W.
- Allow a hot battery to cool to room temperature before charging. Feima specifies an ambient charging range of 5°C to 40°C (41°F to 104°F).
- Store batteries in a cool, dry location away from children, pets, heat sources, direct sunlight, sharp objects, and conductive materials.
- Do not use a battery that is swollen, leaking, punctured, severely damaged, or otherwise abnormal. Follow applicable local requirements for lithium-battery recycling and disposal.

1 Product Introduction

1.1 Product Overview

Pocket 3D is a handheld SLAM LiDAR reality-capture system designed to collect spatial data for point-cloud, panoramic-image, and 3D Gaussian Splatting (3DGS) workflows. The system combines a 16-channel LiDAR scanner with an external supported panoramic camera, mobile control through SLAM GO iOS/Android app, and desktop processing in SLAM GO POST Pro Windows desktop software.

Pocket 3D supports rapid capture of indoor and outdoor environments and can be used for surveying and mapping, documentation, visualization, digital-twin and reality-capture applications, and other workflows that benefit from registered LiDAR and imagery. During data acquisition, the SLAM GO mobile app provides a real-time point-cloud display, allowing the operator to view the mapped environment as it is being captured.

1.2 Included System Components

- Pocket 3D scanner body
- SP20 intelligent battery handle/base
- TF (microSD) memory card (Installed)
- Camera mounting hardware (on board)
- USB SD/microSD card reader
- Wrench set & Extra Mag circle
- Charging cable
- Soft body carrying case
- Quick Start Guide
- Inspection certificate

The SLAM GO mobile app is auto licensed when it recognizes an available Pocket 3D device the and SLAM GO POST Windows desktop application recognizes project data from Pocket 3D and enables all required processing and visualization capabilities.

1.3 Key Technical Specifications

Specification	Value
Complete Machine	
Weight	700 g (1.54 lb), excluding camera
Dimensions	127 × 105 × 223 mm (5.0 × 4.1 × 8.8 in)
Power	7 W
Storage Capacity	64 GB TF (microSD) card
Battery Model	SP20
Battery Capacity	2450 mAh
Battery Runtime	Approx. 3 hours
Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Relative Humidity	<95%
Accuracy*	
Relative Accuracy	2 cm @ 60 m (0.8 in @ 197 ft)
Absolute Accuracy	5 cm (2 in)
LiDAR	
Measurement Range	0.15-100 m (0.5-328 ft)
Range at 10% Reflectivity**	30 m (98 ft)
Number of Channels	16
Horizontal Field of View	360°
Vertical Field of View	40°

Scan Frequency	10 Hz
Point Rate	48,000 points/second
Interfaces	
USB Type-C	Battery charging
Wi-Fi	Supported
Bluetooth	Supported
Bottom Mount	1/4-inch threaded hole

* Measurement accuracy under typical conditions.
** Test conditions: normal incidence, ambient illuminance 0-100 klux, detection probability 50%.

1.4 Controls and Status Indicators

The power/function button is used to power the device on and off and to start or stop acquisition. The system/status LED indicates startup, standby, initialization, acquisition, abnormal conditions, and firmware upgrade status.

Device state	Button action	Function
Power off	Press 1 second	Display battery level
Power off	Hold 3 seconds	Power on
Standby	Double-click	Start acquisition
Standby	Hold 3 seconds	Shut down
Scanning	Double-click	Stop acquisition

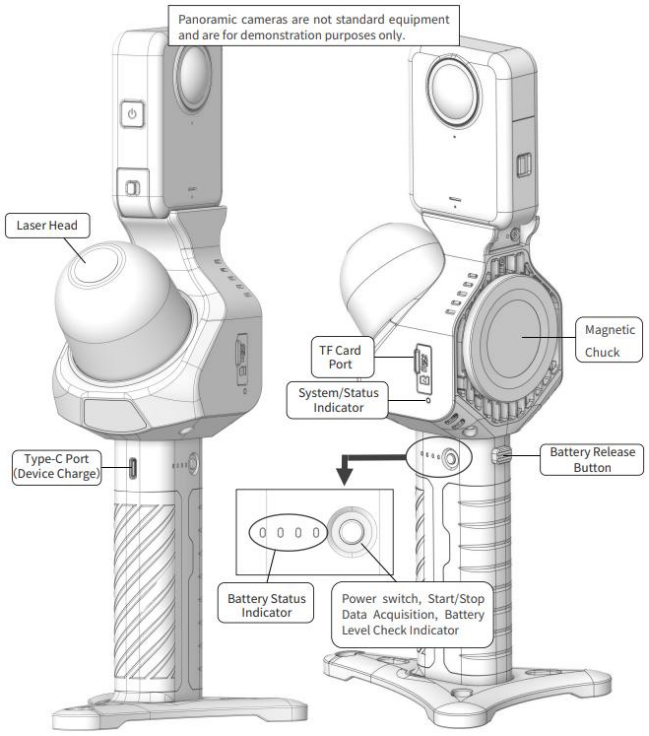
System/Status Indicator	Meaning
Steady green	Standby: scanner is on and ready to start acquisition
Fast-flashing green	Static initialization in progress: keep the scanner stationary
Slow-flashing green	Normal data acquisition in progress

1.5 Power / Charging

USB-C Charger: Pocket 3D does not currently include a charger in the standard package. Users must provide a compatible USB-C Power Delivery (USB-PD) charger that supports 20 V output. A 30 W or higher USB-C PD fast charger is recommended. Standard 5 V-only USB chargers are not suitable.

1.6 Hardware Layout

The diagram shows the layout of the various aspects and features of the hardware.



1.7 Included Software

SLAM GO is the companion mobile app for Pocket 3D, providing scanner setup, control, and monitoring from a compatible mobile device. SLAM GO POST Pro is the Windows desktop processing and visualization software for Pocket 3D, used to process collected data and generate, review, and manage scan results. Applications

SLAM GO Mobile App: To activate and start working with your Pocket 3D scanner in Section 3 you will need the SLAM GO mobile app. The SLAM GO app can be obtained through the iOS App Store or Google Play store for Android devices. You will also use this app to operate the scanner in the field and to connect and control a supported panoramic camera during data acquisition.

SLAM GO

SLAM GO Android

SLAM GO iOs

SLAM GO POST Pro Windows Desktop Application: To process the data collected with your Pocket 3D scanner, you will need the SLAM GO POST Pro Windows desktop software. The software is available for download from SlamScanner.com.

https://slamscanner.com/support/software/

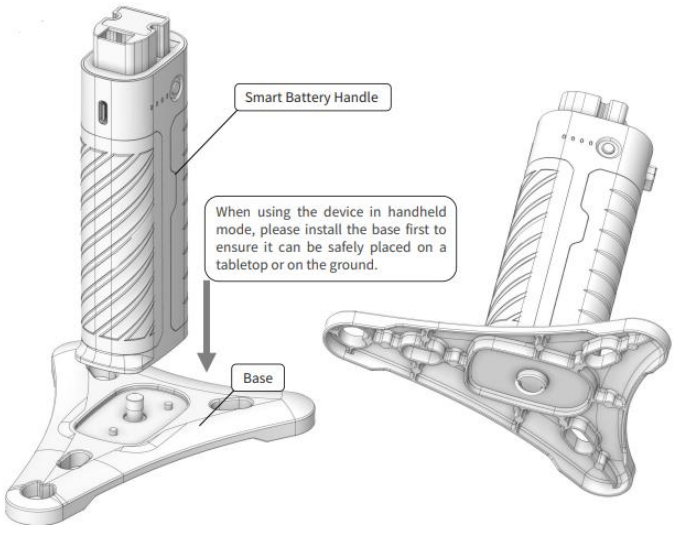
SLAM GO POST Pro

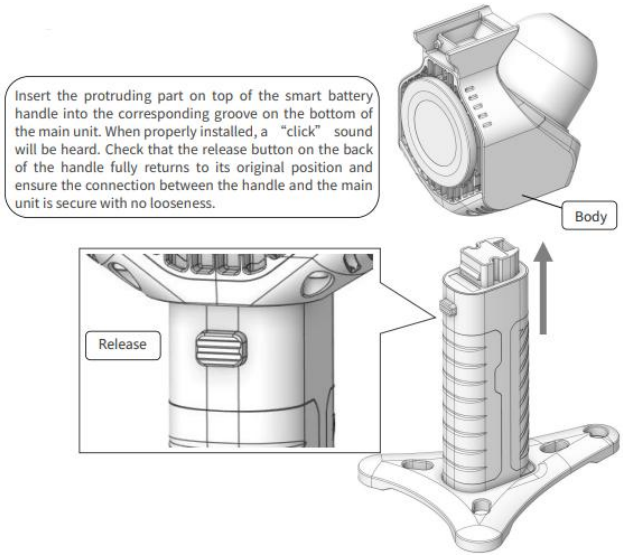
2 Hardware Setup and Assembly

2.1 Assemble the Scanner and Battery/Base

Install the scanner body securely on the intelligent battery handle/base as shown in the diagram. Confirm that the assembly is fully seated and rigid before use.

Note: It is best practice to attach the removable base to the battery first and then attach the scanner head to the batter and base assembly. This allows you to set the battery and base assembly on a stable surface while you attach the scanner head.





2.2 Install a Supported Panoramic Camera

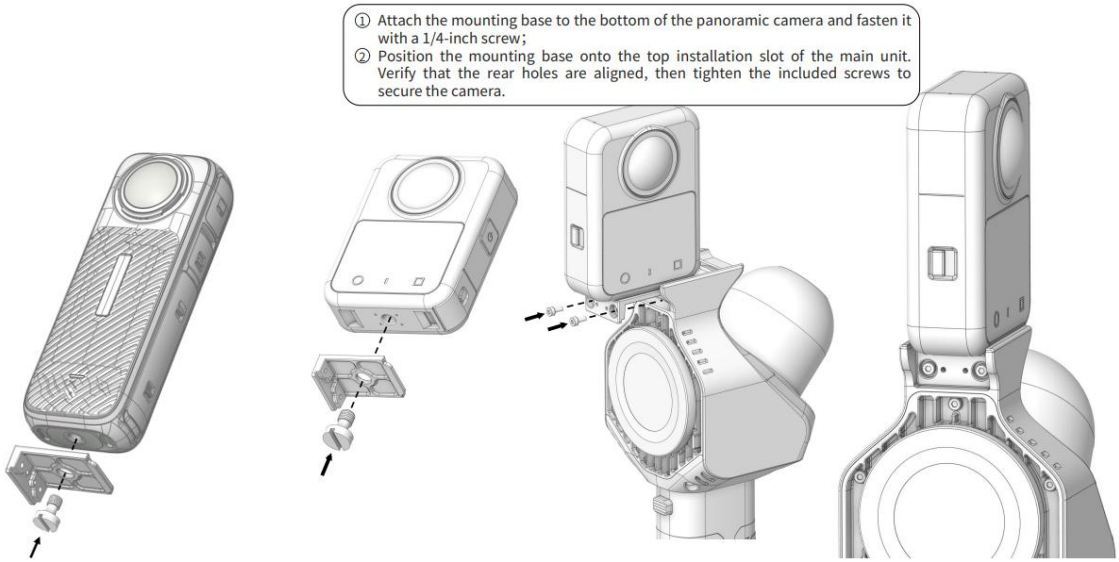
Pocket 3D supports third-party panoramic cameras.

- DJI Osmo 360
- Insta360 X4, X4 Air, and X5.

The panoramic camera attaches mechanically to Pocket 3D using the supplied mounting hardware. No wired connection between the camera and scanner is required. The panoramic camera is connected to the SLAM GO mobile app after the hardware has been assembled. Camera connection and control are covered in Section 3.

Install the panoramic camera using the provided universal mounting bracket. Secure the bracket to the camera with the 1/4-inch screw with anti-loosening washer. Secure the camera and bracket to the scanner body using the two provided M2x5 mounting screws. The camera should be secure and rigidly attached.

Camera Orientation The default installation has the panoramic camera screen facing left and the power button toward the rear of the Pocket 3D. The camera may alternatively be rotated 180°. During calibration, select the orientation matching the actual installation. Once calibrated, the camera and its mounting orientation must remain unchanged. If the same camera is removed and reinstalled in exactly the same position and orientation, recalibration is not required.



IMPORTANT - Camera calibration is required before image-based acquisition, pano generation and point-cloud colorization using 360 imagery, or 3DGS processing. Once calibrated, keep the camera mounted in the same position. Removing, loosening, repositioning, or reinstalling the camera requires recalibration.

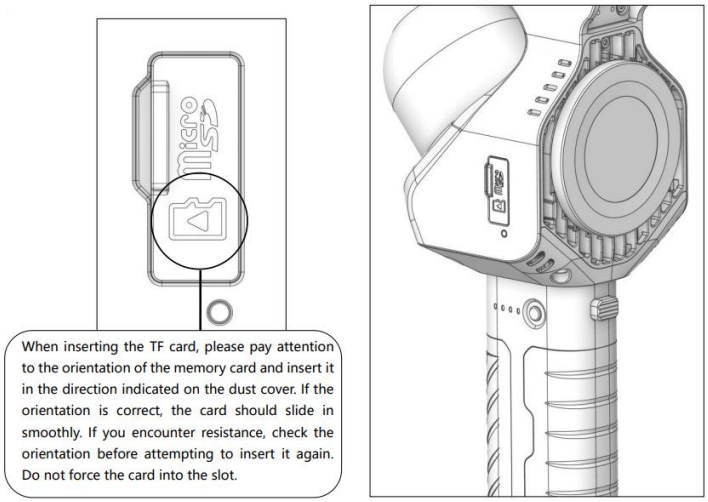
2.3 Install the TF (microSD) Card

Pocket 3D supports TF/microSD storage capacities up to 256 GB. The supplied TF memory card has an operating temperature range of 0°C to 50°C (32°F to 122°F) and is suitable for data storage under normal operating conditions.

Keep at least 10% of the card capacity free to ensure sufficient space for data acquisition.

For operation in more extreme temperatures, Feima recommends a U3-speed-class memory card with an operating temperature range covering −25°C to +85°C (−13°F to 185°F).

Power the scanner off before inserting or removing the card.



3 SLAM GO Mobile App Setup and Device Connections

After assembling Pocket 3D and installing the panoramic camera, install and configure the SLAM GO mobile app. SLAM GO is required for initial scanner activation and is recommended for normal operation with a supported panoramic camera.

3.1 SLAM GO Account and Operation Insights

Before first use, create a Feima account. SLAM GO supports registration using either a mobile phone number or an email address.

IMPORTANT: North American Users: Although the SLAM GO registration screen defaults to the phone number registration method, **email registration is required** for users in the United States and Canada. Select the email-registration option rather than proceeding with the default phone number method. A verification code will be sent automatically to the email address entered and normally arrives within one or two minutes.

After SLAM GO registration, you will connect Pocket 3D to the SLAM GO mobile app to make it available for use. Pocket 3D uses Bluetooth during the initial connection process to establish its connection to the phone's Wi-Fi hotspot, which is then used for normal communication. After initial setup and connection, Pocket 3D will normally reconnect to SLAM GO automatically when the phone's Wi-Fi hotspot is enabled.

Notes:

1. Android devices shut off the Hotspot by default whenever the mobile device is shut down and needs to be enabled to allow the Pocket 3D to connect to SLAM GO.
2. Android mobile devices often have a default power setting that disables the hotspot after 5 minutes and this can be frustrating and it is recommended this be changed.
3. If you are experiencing any difficulty in the mobile device recognizing the presence of Pocket 3D, you may need to switch the hotspot frequency from 2.4 ghz, to 5 ghz.

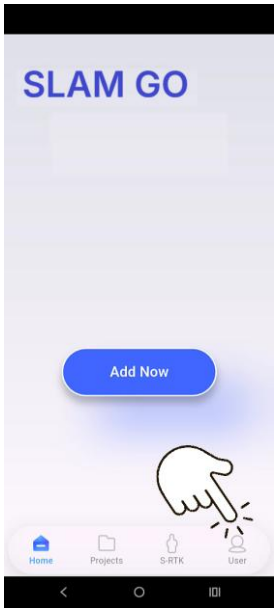
3.2 Create an Account

Before you start using SLAM GO, you should set up an account. The screens can be a little unclear as to the steps required.

- By default, the system wants to use a phone number for activation, but users should select the email method
- The “Sign In” screen has a large “Sign In” button, but for the initial set up you need to select the small “Sign Up” link

- The info input page has a few challenges but if you follow the sequence outline below it is very simple. WE suggest entering your email and password (twice) before you request a code. Do not hit this “Sign Up” until you get the code in place. Once you ask to send a code the app starts a count down. It can be challenging to retrieve the code, enter the code and then still need to enter your password (twice) before the count expires.

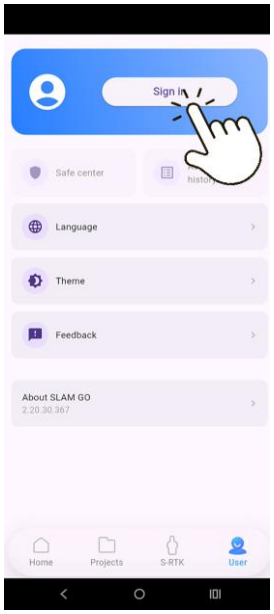
After Starting the app:



After Launching SLAM GO

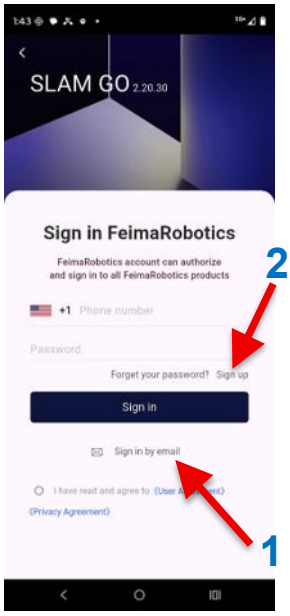
- Select User

After Selecting User:



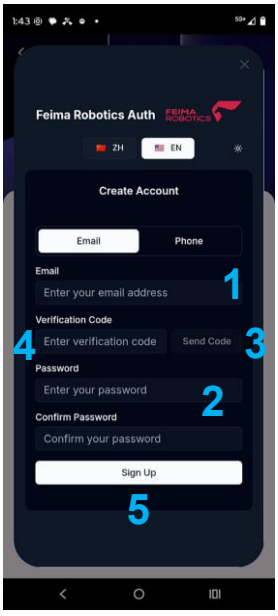
- Select Sign In

Sign In Screen:



1. Configure to Use Email
2. Select Sign In

Info Input Page



1. Enter an email address
2. Enter a new password twice
3. Request a code
4. Retrieve the code from your email and enter it
5. Sign up

3.3 Connect Pocket 3D and Activate It

This connection sequence shows how to connect to any scanner and also shows the steps required if the scanner has not yet been activated. The scanner must be running in standby mode. In addition, **you must have the mobile device’s hotspot on and know the password.** Note that android devices ALWAYS turn off the hotspot when the device is turned off, so you always need to turn it on when first turning on the device.

When a scanner is fresh from the factory, it requires activation before first use. This is a one-time occurrence. It will happen automatically. The activation requests a user and company name. Steps 1-3 will always occur when connecting an unknown scanner to the app. Step 4 will only happen when the scanner has never been activated.

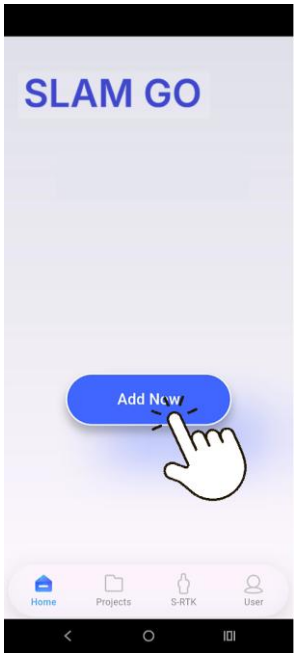
Step 2, connecting to the hotpot can often take a few minutes for the scanner to recognize the hotspot and may need some manipulation. You need to start by selecting the Bluetooth icon at the top of the screen. In busy network environments hotspots seem to have less seniority. When a hotspot is recognized, it will show in the list of “Available” and is some cases it will auto connect and show in the “Connected” field.

If you don’t see your device’s hotspot, you can try toggling the mobile device hotspot on/off. You can also change between 2.4 GHz, 5 GHz (on android) or Max Compatibility (on iOs). Both are supported and, in some cases, one works better than the other.

The Pocket 3D name (serial number) will show. Select it and then select the hotspot.

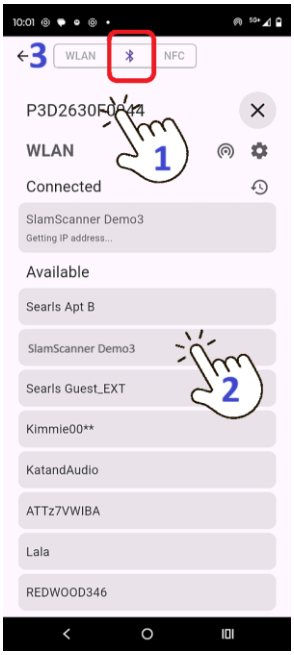
Once you are connected to a new device, it will ask for the activation info. Activation is instant.

1. Add a New Device:



Select “Add Now”.

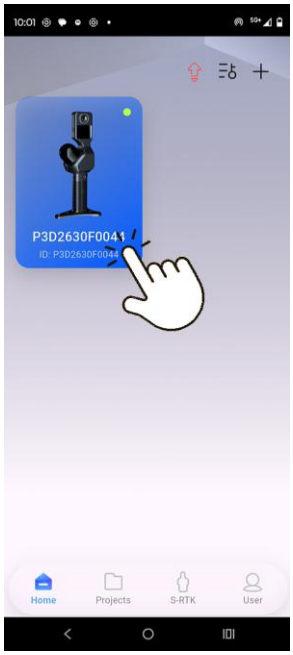
2. Connect the Hotspot:



Select the Bluetooth icon at the top of the page

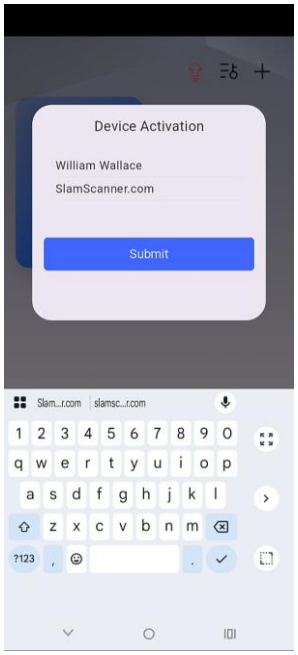
1. Select the Pocket 3D
2. Select the device’s hotspot and provide the password
3. Return to the start screen

3. Open a Scan Session:



Select the Pocket 3D

4. New Device Activation:



Enter the activation info as requested

3.4 Camera Parameter Presets

When using the DJI Osmo 360 camera, please configure it as follows for Data Acquisition:

- Hyperlapse mode, 8K, 30 fps, ×10, Standard (Distortion Correction) mode.

When using an Insta 360 camera, please configure it as follows for Data Acquisition:

- TimeShift mode, resolution of 5.7K/6K/8K, frame rate of 30, and speed multiplier of ×10.

Refer to the Panoramic Camera Setup Guide, provided as a companion document to this Product Manual, for recommended camera settings. Consult the camera manufacturer's documentation for detailed configuration instructions. Once configured, the camera will retain these settings for subsequent use, just as the scanner retains its calibration.

With the panoramic camera securely installed, configure it using the settings specified above.

Note that these calibration process camera settings are the same setting to use during normal data acquisition. The calibration project needs to use the same parameters as normal data acquisition.

3.5 Camera and SLAM GO App Connection

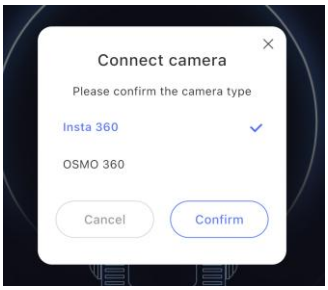
SLAM GO can establish a wireless control connection with a supported panoramic camera. Once connected, SLAM GO automatically starts the camera recording when a Pocket 3D scan is started and stops the camera

recording when the scan is ended. The camera can be connected in the SLAM GO mobile app before it is mechanically installed or calibrated.

With Pocket 3D connected to SLAM GO, open the Start Work screen. A camera icon in the upper-left corner displays the current camera connection status. Before a camera is connected, the status displays Not Connected in red.

1. Power on the supported panoramic camera and keep it near the Pocket 3D and mobile device.
2. On the SLAM GO Start Work screen, tap the camera icon.
3. In the Connect Camera dialog, select Insta360 or Osmo 360, as appropriate, and select Confirm.
4. SLAM GO searches for available cameras. Select/approve the camera that appears.
5. SLAM GO sends a confirmation code to the camera. Accept the connection request/code on the camera.
6. Camera status changes to **"Connected"** in blue when camera is connected.





The camera connection information is retained by SLAM GO. After disconnecting from Pocket 3D and reconnecting during a later session, the camera status will again initially display Not Connected. With the previously configured camera powered on and nearby, tap the camera icon and approve the reconnection in SLAM GO. The confirmation-code step on the camera is not required again.

During normal operation, verify that the camera shows Connected before starting an image-based scan. When connected, SLAM GO automatically starts and stops camera recording with the Pocket 3D acquisition sequencing.

Camera File Timestamps: Connecting the panoramic camera through SLAM GO provides camera recording control but does not set or synchronize the camera's internal clock. Verify the camera time as described above before collecting calibration or project data. This is not a processing requirement, but having accurate timestamps is a good way to identify/associate camera files with the proper scanner project files.

3.6 Operating With or Without the SLAM GO App

The SLAM GO mobile app is required for initial account setup, device connection, and activation of Pocket 3D. After the scanner has been activated, Pocket 3D can be operated independently using its onboard function/power button to power the scanner on, initiate static initialization and data acquisition, stop acquisition, and power the scanner off.

However, when a supported panoramic camera is used, operation through SLAM GO is recommended because the app can connect to and automatically control the panoramic camera. With the camera connected to SLAM GO, starting and stopping Pocket 3D acquisition also starts and stops the camera recording.

The SLAM GO app also provides additional field functionality, including remote scanner control, a real-time point-cloud display that allows the operator to monitor the mapped environment as it is being captured, and direct control-point acquisition.

Control points can also be recorded without the app. During acquisition, position the center of the Pocket 3D base over the control point and allow the scanner to remain stationary for approximately 10 seconds. The system will automatically detect the stationary condition and record a control point.

See Section 1.4, Controls and Status Indicators, for a quick reference to button functions and Section 5, Basic Operation, for scanner operation during a normal scanning session.

4 External Panoramic Camera Calibration — Pocket 3D

Before using an external panoramic camera with Pocket 3D, the camera must be calibrated to establish its precise spatial relationship with the scanner. This calibration enables panoramic imagery to be correctly aligned with LiDAR data during processing, supporting colorized point clouds and 3D Gaussian Splatting (3DGS) models.

Calibration is generally a one-time procedure for each camera installation, provided the same camera and mounting configuration are maintained.

The procedure involves collecting a short, specialized scanning project using one of two prescribed methods, then processing the data in SLAM GO POST Pro to generate a calibration file (pano_cam_calib.yaml). This file defines the camera-to-scanner alignment and is installed on Pocket 3D for automatic inclusion in subsequent scanning projects.

This section describes the complete calibration workflow, including camera configuration, calibration data collection, processing, verification, and installation of the calibration file.

4.1 Camera Calibration Considerations

The following guidelines and requirements should be considered when preparing for camera calibration. Detailed instructions for each step are provided in the sections that follow.

- **Camera configuration:** Each supported panoramic camera requires specific recording settings for use with Feima scanners. Refer to the separate *Camera Setup Guide* for camera-specific configuration instructions. The same camera settings must be used for calibration and subsequent project data collection.
- **Calibration environment:** Select an area with suitable visual features and minimal activity. Avoid moving people, vehicles, or other objects during calibration data collection.
- **Camera operation:** Avoid touching or disturbing the camera during recording. Use voice commands to start and stop recording when supported or follow the applicable camera control procedures.
- Initial calibration: Calibrate each newly attached external camera to establish its alignment with the Pocket 3D scanner.
- **Recalibration requirements:** Recalibration is required when the camera is replaced with a different camera or its mounting orientation changes. If the same camera is removed and reinstalled in exactly the same manner and orientation, the existing calibration may be reused, provided the mounting relationship remains unchanged.

4.2 Panoramic Camera Settings

Pocket 3D supports compatible external panoramic cameras, including models from Insta360 and DJI. Each camera offers different recording modes and resolution options, so it is important to configure the camera correctly before beginning calibration.

For use with Pocket 3D, panoramic cameras must record video using the specified time-lapse capture mode, frame rate, and speed multiplier. These settings allow imagery to be processed and aligned with the scanner's LiDAR data.

The following recording settings are required:

- **Insta360 X4, X4 Air, X5, and X6:** Moving Time-lapse (TimeShift) mode, 30 fps, 10× speed multiplier. Select 5.7K, 6K, or 8K resolution as supported by the camera.
- **DJI Osmo 360 and Osmo 360 II:** Hyperlapse / Time-shift mode, 8K resolution, 30 fps, 10× speed multiplier, with Standard (distortion correction) mode enabled.

Video Resolution: Where multiple resolutions are supported, higher resolutions provide greater image detail and can improve the quality of colorized point clouds and 3D Gaussian Splatting (3DGS) models. For cameras

supporting 8K recording, this will generally be the preferred choice for maximum image quality. Lower resolutions, such as 5.7K or 6K, remain valid options and may reduce storage and processing requirements.

Important: The camera recording settings used during calibration must also be used during subsequent project data collection. Changing these settings may affect the validity of the calibration.

For detailed instructions on configuring each supported camera, including explanations of recording modes, resolution options, and camera menu settings, refer to the separate **Panoramic Camera Setup Guide**.

4.3 Camera Calibration Workflow

Begin with the panoramic camera properly installed on Pocket 3D, following the camera mounting instructions elsewhere in this manual.

The calibration process requires collecting a short scanning project using a prescribed scanning procedure. This project captures the LiDAR and panoramic camera data needed to determine the camera's position and orientation relative to the scanner. Unlike a normal scanning project, the objective is not to capture a complete environment but to collect the specific data required for accurate camera calibration.

Once the calibration scan has been completed, the project data is transferred to the computer and processed in **SLAM GO POST Pro** using its dedicated camera calibration project feature. The software analyzes the collected data and generates the calibration parameters needed to align the panoramic imagery with the LiDAR point cloud during subsequent scanning projects.

There are **two methods for collecting calibration data**, described in the following sections. Both accomplish the same objective but use different scanning procedures. Select the method best suited to your equipment and available calibration environment, then follow its instructions to complete the calibration scan.

4.3.1 Calibration Data Collection — Best Practices

Before beginning either calibration method, review the following recommendations to ensure consistent data collection and improve the likelihood of successful calibration processing.

- **Use the SLAM GO mobile app to control scanner acquisition.** Start and stop the scanning project using the **Start Work** and **Stop Work** functions in the SLAM GO mobile app. When starting work, allow the scanner to complete its automatic initialization sequence before beginning the prescribed calibration movements.
- **Manage panoramic camera recording separately.** The panoramic camera may be started automatically by SLAM GO when the scanning project begins, as it would during normal data collection. However, calibration requires the camera recording to end before the LiDAR scanning project is completed. Stop the camera manually at the point specified in the selected calibration procedure, then continue collecting LiDAR data until the procedure is complete. Use the camera's voice commands to stop recording when supported, avoiding unnecessary movement of the scanner.
- **Allow sufficient time for calibration data collection.** Plan for approximately two minutes of total LiDAR data collection, including the prescribed calibration movements and the additional scanning performed after panoramic camera recording has stopped. The duration of panoramic camera recording is determined by the time needed to complete the prescribed movement pattern. Move slowly and steadily throughout the procedure without rushing.
- **Collect backup calibration datasets.** Whenever possible, collect more than one complete calibration dataset during the same session. Having an alternate dataset available can save time if the initial dataset does not produce a successful calibration.
- **Maintain consistent camera settings.** Use the same panoramic camera recording settings for calibration that will be used during normal scanning projects. Changes to recording configuration may affect the applicability of the resulting calibration.

4.3.2 Method 1 — Indoor Calibration

This method uses a small indoor scanning project to collect the LiDAR and panoramic imagery needed for camera calibration. The procedure involves a short, controlled movement through the room while maintaining a consistent scanner orientation.

Select an indoor space larger than 5 × 5 meters (approximately 16 × 16 feet) with recognizable visual features on the walls and surrounding surfaces. These features are important because the calibration software uses them to establish the relationship between the panoramic imagery and the LiDAR data. Avoid featureless rooms, confined spaces, and areas where people or objects may move during collection.

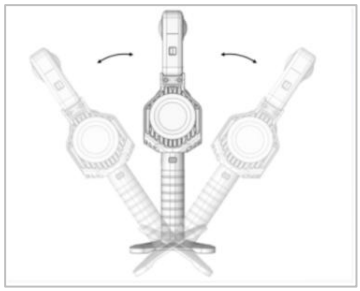


Example of a suitable indoor calibration environment

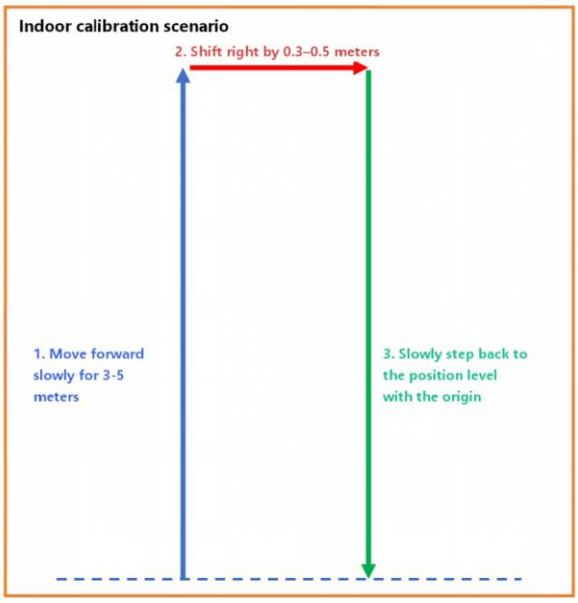
During the calibration scan, move slowly and steadily, keeping the scanner approximately level and facing the same direction. Position the panoramic camera above your head whenever possible to minimize the operator's appearance in the imagery, and avoid blocking the wall features needed for calibration.

Follow these steps to collect the calibration data:

1. **Initialize the scanner.** Position the scanner near the centerline of the room. Use **Start Work** in the SLAM GO mobile app to begin scanner data collection. The panoramic camera may be started using the mobile app or started otherwise just before Start Work. The scanner will automatically perform its initialization sequence, with a 20-second countdown displayed in the app. Keep the scanner stationary until initialization is complete before beginning the calibration movements.
2. **Begin the calibration movement.** After the stationary period, carefully lift the scanner and gently tilt it a small amount to the left and right several times. This controlled tilting motion helps initialize the scanner's inertial measurement unit (IMU). The movement should be smooth and deliberate, not a rapid or forceful shaking action. Once completed, raise the camera above head level in preparation for the scanning path.
3. **Move forward.** Walk slowly forward approximately 3–5 meters (10–16 feet), keeping the scanner steady, approximately level, and facing the same direction throughout the movement.



Important: Sideways movement is a translation, not a turn. During the return pass, walk backward rather than turning the scanner around.



4. **Shift sideways and return.** At the end of the forward movement, take a lateral step approximately 0.3–0.5 meters (1–1.5 feet) to either the left or right. Without turning the scanner, slowly walk backward toward the original starting position, maintaining the same scanner orientation.
5. **Complete the collection.** Upon returning to the starting position, stop the panoramic camera recording using a voice command. Continue collecting LiDAR data of the surrounding environment to complete the scanning project. Allow at least two minutes for the complete data collection.

Once the scanning project is complete, the collected data is ready for processing using the camera calibration feature in SLAM GO POST Pro, as described later in this guide.

4.3.3 Method 2 — Wall Calibration

This method uses a flat wall with recognizable visual features to collect the data needed for panoramic camera calibration. Rather than moving through a room, the operator follows a prescribed scanning path in front of the wall, capturing the same features from several positions. This provides the calibration software with the imagery and LiDAR measurements needed to determine the camera's alignment with the scanner.

Select a flat, unobstructed, nonreflective wall at least 3 meters (10 feet) wide and 1.5 meters (5 feet) high. The wall should have distinctive visual features, such as patterns, graphics, or architectural details, that can be recognized throughout the scanning sequence. Avoid blank or uniformly colored walls, reflective surfaces, and areas where people or moving objects may interfere with data collection.

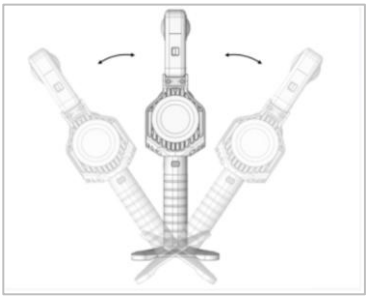


Example of a suitable textured wall for calibration

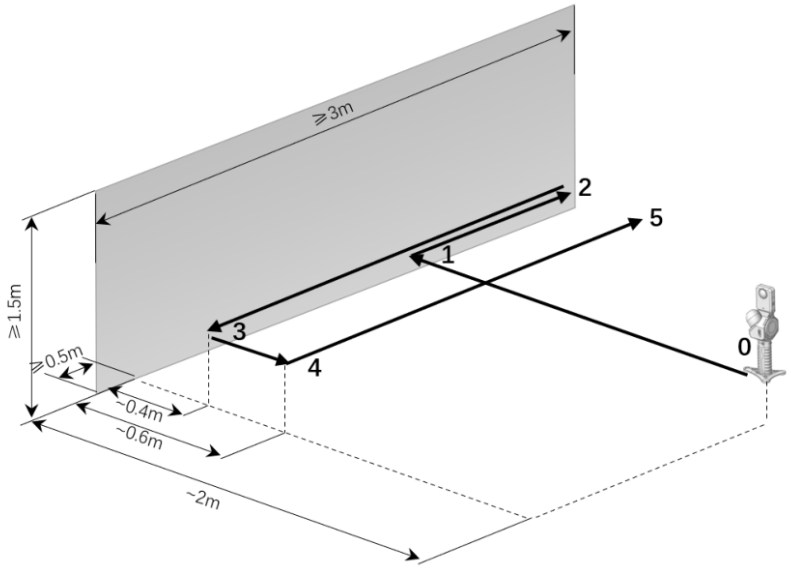
During the calibration scan, move slowly and steadily, keeping the scanner facing directly toward the wall. Except for the initial gentle tilting motion, maintain a level scanner orientation throughout the collection. Avoid standing between the camera and the wall or blocking the visual features needed for calibration.

Follow these steps to collect the calibration data:

1. **Initialize the scanner (Position 0).** Place the scanner on a stable surface approximately 2 meters (6.5 feet) from the center of the wall, facing it directly. Use **Start Work** in the SLAM GO mobile app to begin scanner data collection. The panoramic camera may be started using the mobile app or started otherwise just before Start Work. The scanner will automatically perform its initialization sequence, with a 20-second countdown displayed in the app. Keep the scanner stationary until initialization is complete before beginning the calibration movements.
2. **Begin the calibration movement (Position 0 to 1).** After the stationary period, carefully lift the scanner and gently tilt it a small amount to the left and right several times. This controlled movement helps initialize the scanner's inertial measurement unit (IMU). The motion should be smooth and deliberate, not a rapid or forceful shaking action. Return the scanner to a level orientation, then move slowly toward the wall until the scanner is approximately 0.4 meters (16 inches) away.



The remaining movements follow a specific path across the wall, illustrated below. Throughout this sequence, keep the scanner facing the wall without rotating it as you move sideways.



3. **Move toward the right side (Position 1 to 2).** Maintaining a distance of approximately 0.4 meters (16 inches) from the wall, move slowly sideways from the center toward the right. Stop approximately 0.5 meters (1.5 feet) before reaching the right edge of the wall, ensuring that recognizable wall features remain visible to the camera.
4. **Traverse to the left side (Position 2 to 3).** Without turning the scanner, move steadily sideways toward the left side of the wall. Maintain the same 0.4-meter distance and stop approximately 0.5 meters before reaching the left edge. Keep the scanner level and facing directly toward the wall throughout the movement.
5. **Move slightly away from the wall (Position 3 to 4).** Take a small step backward, increasing the distance between the scanner and the wall to approximately 0.6 meters (2 feet). Maintain the scanner's orientation.

6. **Return toward the right side (Position 4 to 5).** Move slowly sideways toward the right side of the wall again, maintaining the approximately 0.6-meter distance. Continue until you reach the right-side sampling position, completing the prescribed calibration path.
7. **Complete the collection.** Once the wall scanning sequence is finished, hold the scanner steady and stop panoramic camera recording using a voice command. Continue collecting LiDAR data while scanning the ceiling, floor, and surrounding environment near the wall. When finished, place the scanner on a stable surface and stop LiDAR data collection to complete the calibration project.

The complete LiDAR scanning project should take approximately two minutes, including the additional scanning performed after panoramic camera recording has stopped. Do not rush the calibration movements, as smooth and consistent data collection is important for successful calibration.

Once the scanning project is complete, the collected data is ready for processing using the camera calibration feature in SLAM GO POST Pro, as described later in this guide.

4.4 Process a Calibration Project in SLAM GO POST

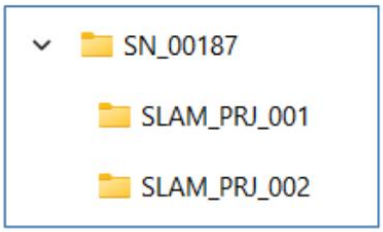
The field calibration scan produces two separate sets of source data: LiDAR/SLAM measurements recorded by the scanner and panoramic imagery recorded by the camera. Before calibration can be computed, the scan project files must be transferred to the processing computer and the 360 video file must also be copied and added to the same scan project. SLAM GO POST Pro then uses the synchronized data to estimate the camera's mounting relationship to the scanner and generates a calibration file for later use.

4.4.1 Transfer the Scanner Calibration Dataset

For Pocket 3D, raw scanner data is stored on its TF (microSD) card. A scanner power-on session creates a folder named SN_nnnnnn; individual scans recorded during that session are stored in numbered SLAM_PRJ_nnn folders. A calibration scan is one of these scan projects.

1. Shut down the scanner. Power off Pocket 3D completely before removing its TF/microSD card.

2. Connect the card to the computer. Remove the card and insert it into a compatible card reader connected to the Windows processing computer.



3. Find the calibration scan. Locate the applicable SN_nnnnnn session folder and, inside it, the SLAM_PRJ_nnn folder corresponding to the calibration capture. The most recent folder may be the correct one, but confirm the acquisition session and scan before proceeding.

4. Copy the data to a local working folder. Copy the entire relevant scanner session folder, including the complete calibration SLAM_PRJ folder and its contents, to a suitable location on the processing computer. Do not run calibration directly from the scanner memory card.

Note: It is a best practice to keep an untouched backup of the original field data. Preserve the internal files and subfolders of each SLAM_PRJ project; do not rename or remove individual raw-data files.

4.4.2 Transfer and Match the Panoramic Camera Recording

The panoramic camera records its imagery separately from the scanner. Each calibration scan must be paired with the camera recording captured during that same acquisition. Pairing the wrong recording with a scan can prevent successful calibration or produce an incorrect result.

1. Copy the camera files. Transfer the original video files from the panoramic camera to the computer using its memory card and a reader or a supported USB cable connection. Retain the original filenames.

2. Identify the matching recording. Use the calibration scan's acquisition time and the camera recording time to identify the correct pair. If multiple calibration scans were captured, match each camera recording to its own SLAM_PRJ folder.

3. Populate PANO_CAM. Open the corresponding calibration SLAM_PRJ_nnn folder on the computer and locate its PANO_CAM subfolder. Copy the associated original camera recording into PANO_CAM without renaming the camera files.

4. Verify the assembled project. Confirm that the scanner's raw files remain in their original locations and that PANO_CAM contains the camera recording for this particular calibration scan.

Note: Camera file extensions depend on camera model and recording mode. Insta 360 video files use a .INSV extension and DJI Osmo cameras use .OSV.

Example of the relevant project structure (illustrative names):

Calibration_Working_Folder/

SN_00187/

SLAM_PRJ_001/

[original scanner data and subfolders]

PANO_CAM/

[matching panoramic-camera recording]

4.4.3 Create the Calibration Project in SLAM GO POST Pro

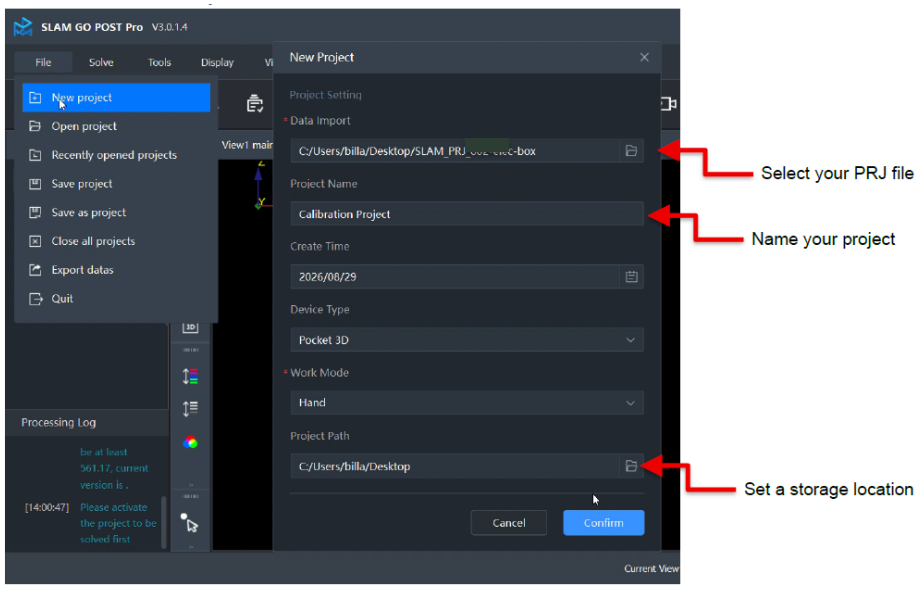
Once the scanner data and camera recording have been assembled, the calibration dataset is ready to open in SLAM GO POST Pro. This is a dedicated camera-calibration operation, rather than the normal point-cloud or 3DGS production workflow.

1. Start a new project. Launch SLAM GO POST Pro and choose File > New Project.

2. Select the prepared raw dataset. Browse to the copied calibration scan project on the processing computer and select the raw project folder or data entry requested by the software.

3. Confirm project settings. The software identifies the scanner model and proposes a project name and output location. Review these values, adjust them as needed, and create the project.

4.4.4 New Project Dialog Box

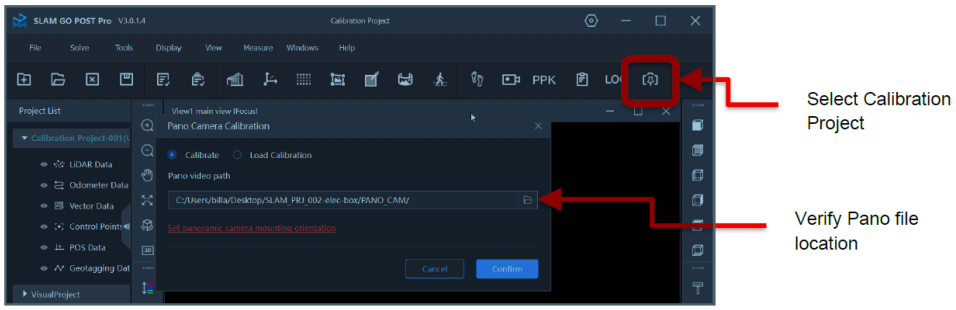


4.5 Run Panoramic Camera Calibration

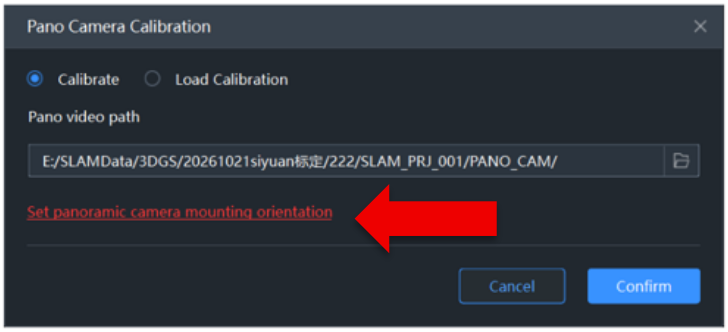
The calibration tool uses the LiDAR geometry and panoramic imagery to determine the relative installation parameters of the camera. The mounting direction must match the camera's actual physical orientation on the scanner.

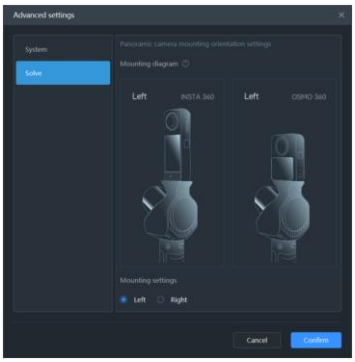
1. Open the calibration command. Select Pano Camera Calib (Panoramic Camera Calibration) from the toolbar.

2. Check the camera data location. Confirm that the calibration dialog points to the correct PANO_CAM folder and that the expected panoramic-camera data is present. Correct the path if necessary.



3. Set the mounting direction. Select Set Panoramic Camera Installation Direction and specify the camera's actual installation orientation, following the on-screen choices. If the "Set Pano…" is Red, you must click it to set the direction before you can proceed.



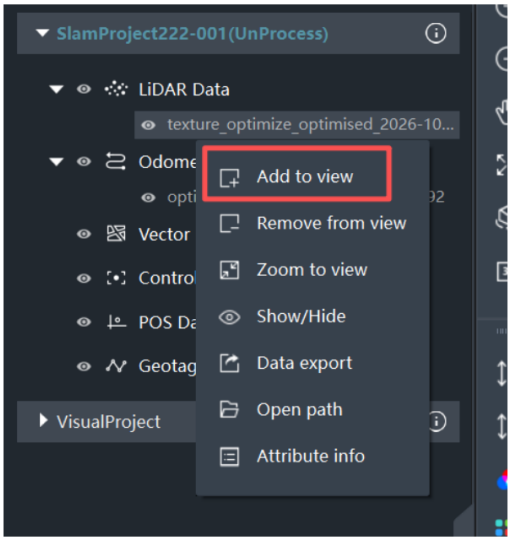


4. Start processing. Select Confirm to begin the calibration operation and allow processing to finish.

4.5.1 Inspect and Validate the Calibration Result

Do not treat completion of the processing operation alone as proof of a valid calibration. The resulting imagery must align visibly with the point-cloud geometry.

1. Display the result. After processing finishes, right-click the resulting point-cloud data in the project tree and select Add to view.



2. Examine color alignment. Inspect recognizable wall features, corners, edges, and other scene details. A successful calibration should produce color mapping that follows the underlying LiDAR geometry consistently.

[Hint: You can use a clip box to remove parts of the point cloud to see the calibration wall more easily.]

3. Identify failures. Ghosting, doubled edges, disordered colors, or obviously shifted imagery indicate that calibration quality is unacceptable. Recheck that the correct camera recording was paired with the scan and that the mounting direction and camera settings were correct. If the result remains poor, use another complete calibration dataset or recollect the data and repeat the procedure.

4.5.2 Failed Calibration



Ghosted and cloudy areas show bad calibration.

4.5.3 Successful Calibration



Clear application of color and no visual echoes or ghosting.

4.6 Locate and Apply the Calibration File — Pocket 3D

Upon completion, regardless of the quality of the outcome, the calibration process generates a file named pano_cam_calib.yaml in the calibration project directory on the processing computer. This file contains the calibration parameters that define the alignment between the panoramic camera and the Pocket 3D scanner.

Once you have an acceptable calibration, copy the file to Pocket 3D using the following procedure. Storing this calibration file on the scanner causes it to be included automatically in future scanning projects.

1. Locate the calibration file. Open the completed calibration project directory on the processing computer and locate pano_cam_calib.yaml. Verify that the file was successfully generated. Retain a backup copy for future reference.

2. Copy the file to the Pocket 3D memory card. With Pocket 3D powered off, remove its TF/microSD card and connect it to the processing computer using a card reader. Copy pano_cam_calib.yaml into the DATA folder at the root of the memory card. Preserve the exact filename.

3. Reinstall the memory card. Safely eject the memory card from the computer and reinsert it into Pocket 3D.

4. Import the calibration file. Power on Pocket 3D. During startup, the scanner automatically imports pano_cam_calib.yaml into its internal storage. After a successful import, the scanner removes the temporary copy from the memory card's DATA folder. Therefore, you can validate that the calibration file was stored on the Pocket 3D device by validating that is has been deleted from the DATA folder.

5. Automatic application to future projects. Once installed, Pocket 3D automatically includes the stored calibration file in the raw-data directory of each newly collected scanning project. SLAM GO POST Pro can then use the calibration parameters when processing the project's panoramic imagery, without requiring the operator to manually copy the calibration file into each project.

Important: The stored calibration remains valid only for this exact camera and mounting configuration used during calibration. If the camera is replaced (with a different camera, even if it is the same model) or its mounting orientation changes dramatically, you must perform a new calibration and install the updated pano_cam_calib.yaml file using the same procedure.

4.7 Preserve Calibration Validity

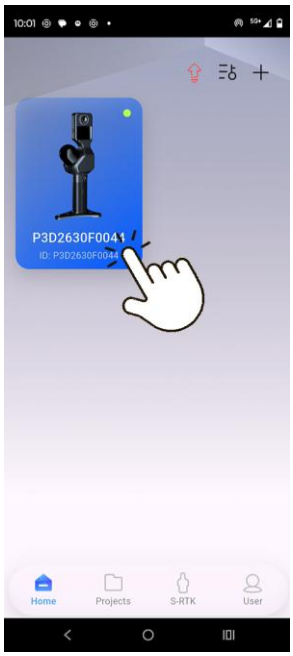
A calibration is specific to the camera, its mounting position and orientation, and the recording configuration used. Continue using the same camera recording settings for subsequent scans. Recalibrate when the camera is replaced (with a different camera) or its mount or orientation changes. If the same camera is removed and reinstalled in exactly the same orientation, the calibration remains valid; nevertheless, verify that the mount has not shifted and that subsequent color mapping remains accurate. When in doubt, recalibrate.

5 Basic Operation

5.1 Typical Scanning Workflow

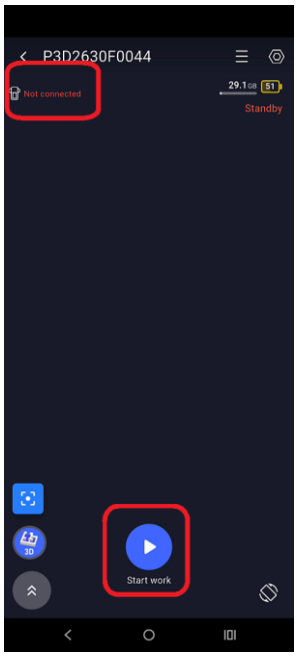
After the scanner and panoramic camera have been set up and the camera has been calibrated, normal scanning operation is straightforward. Open that app and a running scanner will show up on the home screen. The green dot indicates it is connected. If the camera is not connected, select the Not Connected link at the top left to connect it. Then hit Start Work. The app will start up the camera and Pocket 3D enters a 20 second initialization phase as the app provides a countdown. When it starts, you will see collected data start to show on the screen. Pick up the device, do the left right synch motion and get scanning. The mobile app shows your progress as you work, and you will see point clouds and your walking path.

1. Home Screen:



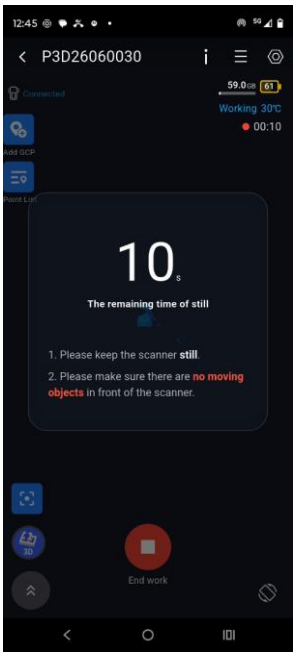
Select the Pocket 3D to get started

2. Start Work Screen:



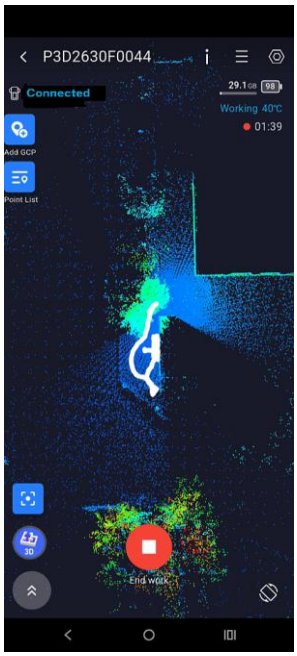
1. Connect the camera
2. Hit Start Work

3. Initialize Count Down:



Leave the scanner alone while it initializes

4. Working:



1. Watch your work
2. Hit End Work when you are done.

5.2 Power On for Standby Mode

Place the Pocket 3D device on a fixed, stable surface such as the ground, floor, or a sturdy tabletop. Do not hold the scanner in your hand.

- Ensure that the area in front of the scanner contains observable surfaces or objects within the scanner's measurement range. Feima specifies that the nearest measured object in front of the scanner should be more than 0.4 m (16 in) away.

Press and hold the Pocket 3D function/power button for approximately 3 seconds. After power-on, the scanner performs its startup and self-check sequence. Wait until the system/status indicator is steady green, indicating that the device is in standby mode and ready to begin acquisition.

5.3 Prepare the Panoramic Camera

When panoramic imagery will be collected for point-cloud colorization, panoramic-image generation, or 3DGS processing, power on the panoramic camera before beginning the scanning session.

Confirm that the camera lenses are clean and that the camera is using the same recording settings used during panoramic-camera calibration.

On the SLAM GO Start Work screen, verify that the panoramic camera status displays Connected. If the camera is not connected, select the camera icon and establish the connection as described in Section 3.5.

When the camera displays Connected, SLAM GO will automatically start and stop panoramic-camera recording when you Start Work for Pocket 3D acquisition. There is no need to separately start the camera before beginning a normal scanning session.

5.4 Start the Scanning Session

Place Pocket 3D on a fixed, stable surface and confirm that the scanner is in standby mode with a steady green status indicator.

Select Start Work in the SLAM GO app. The connected panoramic camera will begin recording immediately, and Pocket 3D will enter static initialization. The system/status indicator will fast-flash green during initialization, and SLAM GO will display the initialization countdown. Initialization takes approximately 20 seconds.

During static initialization:

- Leave Pocket 3D on a fixed, stable surface such as the ground, floor, or a sturdy tabletop. Do not hold the scanner in your hand.
- Keep the scanner completely still throughout the initialization period. The scanner may be placed at an incline, if necessary, but it must not move.
- Do not point the scanner into open space. Position it so that clearly defined, stationary surfaces or objects are visible within its field of view.
- Keep objects immediately in front of the scanner more than 0.4 m (16 in) away. Nearby walls, furniture, structural features, or other stationary surfaces within approximately 10 to 50 ft generally provide useful geometry for initialization.
- Keep the scanner's field of view free of moving objects. During initialization, avoid people or other moving objects passing in front of or immediately around the scanner.

When initialization is complete, the system/status indicator changes to the normal acquisition slow-flashing green state. You may then pick up the scanner and proceed with the starting alignment motion and data capture as described in Section 6.

5.5 End the Scanning Session

When data collection is complete, it is best to return the scanner to the starting location when practical. Returning to the starting area provides loop closure and is a best practice for SLAM data collection, but it is not a hard requirement.

Select End Work in the SLAM GO app. Pocket 3D acquisition will end, the system/status indicator will return to steady green, and the connected panoramic camera will stop recording automatically.

Before beginning another scan, verify that the scanner has returned to standby and that the panoramic camera continues to display Connected in SLAM GO.

5.5.1 Manual Start and Stop Operation

Pocket 3D and the panoramic camera can also be operated manually when automatic camera control through SLAM GO is not being used.

For manual image-based acquisition, use the following sequence:

1. Start recording with the panoramic camera.
2. Start Pocket 3D acquisition.
3. Complete the scan and stop Pocket 3D acquisition.
4. Stop the panoramic-camera recording.

Coordinate the camera and scanner start and stop operations to occur within approximately 10 seconds of each other. Voice control may be used with supported panoramic cameras to reduce the need to physically operate the camera controls.



This graphic shows the concept of the video session spanning longer than the LiDAR session

Pocket 3D acquisition can be started by using the SLAM GO Start Work feature or by double-clicking the function/power button. You can also stop scanning with the SLAM GO mobile app or by double-clicking the button again. When operating the scanner manually, follow the same static-initialization requirements described in Section 5.4.

5.6 Control Points (Optional)

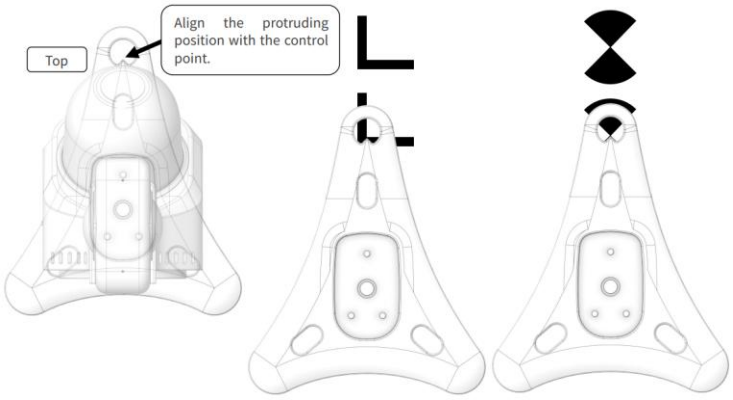
The Pocket 3D device does not have internal GNSS support, but you can add control points to your scan project to integrate the project with Survey control as a post process. To set control points during a scanning session, align the crosshair at the center of the Pocket 3D base directly over the control point. Use either of the following control-point acquisition methods to record the point. After the point is recorded, normal data acquisition may continue without an additional waiting period.

1. A control point can be recorded using the control-point acquisition function in the SLAM GO app.
2. For automatic control-point collection, allow the scanner to remain stationary over the point for approximately 10 seconds. The scanner detects the stationary condition and automatically records the control point.
    a. Note: If collecting control points for use in a survey integrated workflow, remain aware of this automatic functionality and avoid unintentionally occupying any prolonged static position to avoid collecting unplanned control points.

After a control point has been recorded, normal data acquisition can continue.

5.6.1 Control-point layout guidance:

- Acquire at least three control points.
- Do not arrange the control points in a single straight line. Feima recommends an L-shaped or otherwise well-distributed arrangement.
- Where multiple control points are used, distribute them across the project area rather than concentrating them in one location.
- During control-point acquisition, orient the scanner toward areas containing useful ground or environmental features and avoid moving objects immediately in front of the device.



5.7 Shutting Down the Scanner

Press and hold the Pocket 3D function/power button to shut down the scanner. Wait until the system/status indicator is completely off before removing the intelligent battery handle, disconnecting power, or handling the TF/microSD card.

IMPORTANT - Power off Pocket 3D before inserting or removing the TF/microSD card or before performing card-based data-copy operations. Hot swapping the card may damage the memory card or stored data.

6 Field Data Acquisition

This section provides a summary description of proper field operations for data acquisition. Please see the **3DGS Field Survey Procedure** manual for a more complete description of the suggested process.

6.1 Core Capture Philosophy

- Your first path of data collection should establish a complete overall collection of the scene before concentrating on close-range detail.
- Move slowly and smoothly enough to preserve useful imagery and stable pose estimation.
- Use overlap and loop closure deliberately to control accumulated SLAM error.
- Add close-range and multi-height imagery where the final deliverable requires it.
- Collect additional data with a purpose: coverage, viewpoint diversity, detail, occlusion recovery, or loop support.

6.2 Plan the Capture Path

When practical, choose a starting and ending location with good surrounding geometry and multiple possible directions of travel rather than a confined or visually limited location. A well-chosen start/end location provides useful overlap and makes it easier to close the acquisition route at the end of the scan.

For indoor capture, it is a best practice to open doors along the planned scanning route before beginning acquisition. Where rooms or other spaces are to be included in the project, open their doors in advance so the operator can move smoothly between spaces without interrupting the capture. Having the same door captured in a closed and open attitude can potentially be problematic.

For large or complex environments, particularly areas with limited or poorly defined features, plan the scanning route before beginning data acquisition. A planned route helps maintain useful coverage, overlap, and loop geometry while reducing the likelihood of missed areas.

Large scenes may also be divided into separate acquisition regions or datasets. When doing so, provide sufficient overlap between adjacent regions to maintain common scene coverage.

For close-range work, Feima recommends dividing the site into logical blocks no larger than approximately 20 m × 20 m (65 ft × 65 ft). These blocks are planning units, not separate scan projects; a continuous data-acquisition session can extend across many blocks. The block concept is simply a way to break a larger or irregular site into manageable areas for systematic capture. A block does not need to be square or rectangular and can follow the natural geometry of the site—for example, a room, hallway, section of a building, or other logical area.

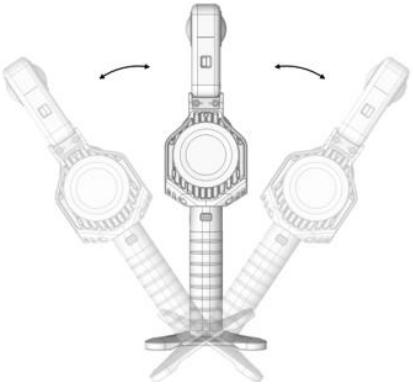
Capture each block broadly first, then return selectively for close detail. Establishing broad coverage before moving in for close detail also gives the SLAM system a stronger environmental reference. Close-range capture can substantially restrict the LiDAR field of view and may increase the risk of mapping error or drift if adequate surrounding geometry has not already been established.

Except in extremely narrow spaces, use an S-shaped or serpentine route rather than a single straight traverse. Keep adjacent passes no more than about 5 m (15 ft) apart. Closer pass spacing improves overlapping visual coverage and can produce clearer ground texture between adjacent routes.

Use relatively small loops and shared overlap rather than one very large loop. Feima recommends that a single closed loop not exceed approximately 200 m (650 ft).

6.3 Starting a Capture

Follow the typical initialization process, ensuring the camera is connected to the SLAM GO mobile app, that the scanner is in an appropriate static position before you issue the Start Work and begin the initialization. After static initialization, pick up the scanner and perform a controlled left-right tilting movement, changing the scanner's orientation by approximately 45° to each side. Complete one smooth back-and-forth motion in approximately 2–3 seconds. This alignment motion provides varied pose observations for time alignment between the panoramic camera and IMU and provides useful motion information to the SLAM processing system as data acquisition begins. The scanner must change orientation during the movement; simply moving it horizontally from side to side is not sufficient. Avoid abrupt or shaking motions.



Controlled left-right alignment motion.

After completing the alignment motion, sweep the starting area through a full 360° horizontal rotation. Complete the rotation slowly and smoothly, taking approximately 5 seconds. The purpose of this rotation is to capture the area behind the scanner that may have been obscured by the device or operator. A controlled body turn with the scanner held in front, or a small walking circle around the starting position, can be used to complete the sweep while maintaining smooth scanner motion.

6.4 Overall Scene Capture

Use smooth S-shaped or serpentine routes to establish broad, overlapping coverage. For general scene capture, Feima guidance is approximately 0.5-1 m/s (1.5-3 ft/s). For fine/detail capture, move no faster than approximately 0.3 m/s (1 ft/s). The practical objective is smooth, stable motion rather than maintaining an exact walking speed.

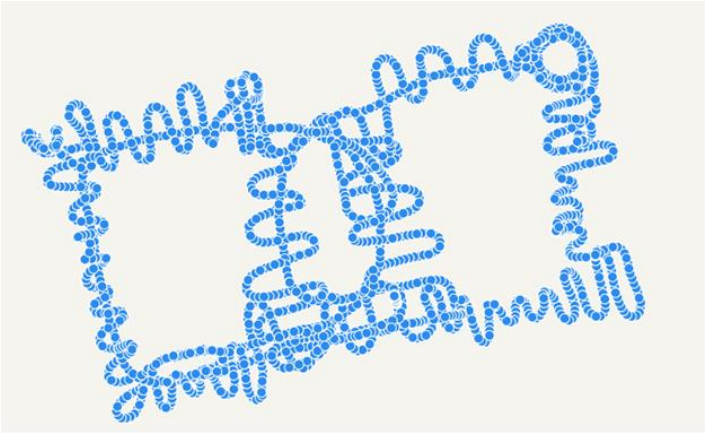
For scenes with significant occlusion or where visual quality is especially important, increase viewpoint diversity by using additional routes through the scene and varying the height of the scanner. Raising and lowering the scanner between passes provides viewing angles at different elevations and can help capture areas hidden from a single route or scanner height.

Where space permits during general scene capture, avoid walking immediately alongside walls and maintain reasonable separation from moving pedestrians. This helps preserve broader views of the surrounding environment and reduces obstruction by people moving through the scene.

During data acquisition, avoid directing the scanner primarily into open or featureless space. Whenever practical, maintain useful structural or environmental features within the scanner's field of view to provide geometry for SLAM positioning.

Vary the scanner’s orientation during capture to avoid maintaining exactly the same scanner orientation for extended portions of a 3DGS scan. Changing orientation and viewpoint often helps prevent the same scene features from repeatedly falling near the panoramic camera's image-stitching boundaries.

See the **3DGS Field Survey Procedure** for more complete descriptions of walking speeds.



Example of an S-shaped/serpentine collection trajectory.

6.5 Capturing Detail

Once the overall scene is established, return to targets requiring greater visual clarity. For normal close-detail capture, Feima recommends a target distance of approximately 0.3 m (1 ft) or greater and a speed no greater than approximately 0.3 m/s (1 ft/s). For signage, exhibits, architecture, and other detail-rich targets, use high, center, low, and grid-like viewpoints to capture the subject from multiple viewing angles and reduce areas that are visible from only a single perspective.

6.6 Manage Capture Size and Processing Workload

3DGS projects require substantially more processing than point-cloud generation alone. Long captures can create tens of gigabytes of imagery, and 3DGS training may continue for many hours; builds exceeding 24 hours are possible on large datasets. Collect sufficient, purposeful coverage rather than maximum capture. Where project requirements allow, use natural boundaries such as rooms, floors, wings, courtyards, or exterior zones as logical datasets.

6.7 Special Capture Situations

Ground walking-path coverage: The scanner, camera, and operator can obscure portions of the ground along the walking path. In normal multi-pass coverage, adjacent or crossing passes may provide the missing viewpoints. Special attention may be needed in narrow pathways, single-pass routes, or other locations where normal overlapping passes do not provide an alternate view of the ground. Where continuous ground appearance is important, add a supplementary pass with the scanner rotated approximately 45–90° sideways and travel generally parallel to the original path so that the previously obscured ground is viewed from the side.

Corridors and narrow spaces: orient the device approximately 45-90° sideways so a camera lens looks along the direction of travel. Where space permits, use a gentle serpentine path.

Doorways: Treat the doorway as an overlap zone. Slow down or pause briefly and orient the scanner so that one panoramic camera lens has a clear view through the doorway and into the space being entered. Move smoothly through the transition, then obtain a useful view back through the doorway into the previous space before continuing the planned capture.

Ceilings and overhead surfaces: When detailed overhead coverage is required, tilt the scanner upward so that a panoramic-camera lens has a clear view of the ceiling or other overhead surfaces. Add supplementary passes as needed to capture areas that are poorly visible from the normal scanner orientation.

Passing vehicles and other large moving objects: If a large vehicle or similar moving object passes through the immediate scanning area, avoid deliberately tracking it with the scanner. Instead, turn the scanner away from the moving object and temporarily direct it toward stable, stationary features in the surrounding environment. After the object has passed, return to the planned capture path and continue normal data acquisition.

Dynamic scenes: Where practical, minimize capture of scene elements that change substantially during acquisition, such as moving pedestrians and traffic, swaying vegetation, or changing content on large video displays. For 3DGS capture, a more visually consistent scene provides more consistent imagery for reconstruction.

Reducing operator visibility in the capture: When minimizing the operator's appearance in the resulting pano and 3DGS scenes is important, Pocket 3D can be raised above normal carrying height for selected portions of the capture. This can reduce the operator's presence in the panoramic imagery. A selfie pole or compatible vest/backpack mounting accessory can also be used to hold the scanner above the operator while providing a more comfortable and consistent elevated position. Whether handheld or accessory-mounted, maintain smooth, stable scanner movement and avoid abrupt changes in height or orientation.

Freestanding objects: Capture the object from multiple elevations by making separate lower, middle, and upper surround passes. Where practical, add elevated views angled downward toward the object at approximately 45° to capture upper surfaces that may not be visible from the surrounding passes.

High-detail planar surfaces: Where unusually high visual detail is required on a relatively flat surface, Feima guidance allows supplementary capture at approximately 0.2 m (8 in) from the target. Move the scanner slowly across the surface from multiple directions to obtain additional close-range imagery. This is a specialized detail-capture technique rather than the normal working distance for general scene acquisition.

Point-cloud-only capture: When the project requires only LiDAR point-cloud data and panoramic imagery or 3DGS output is not needed, the capture path can be simplified. In addition to the preferred S-shaped or serpentine route, Feima guidance allows straight-line travel while slowly varying the scanner height up and down to provide observations from different elevations. Height changes should be gradual and controlled rather than abrupt.

6.8 Field Best-Practice Summary

1. Plan the capture and final deliverable.
2. Initialize deliberately and complete the alignment motion and starting sweep.
3. Establish the overall scene first.
4. Maintain stable, controlled movement.
5. Maintain useful overlap and route geometry.
6. Add detail intentionally.
7. Adapt to special conditions such as corridors, doorways, ground occlusion, and reflective surfaces.
8. Control dataset growth and processing workload.
9. Verify critical coverage before leaving the site.

Best practice principle: Collect complete, stable, purposeful data. More capture is useful only when it adds information that improves coverage, reconstruction, or the final deliverable.

7 Data Transfer and Project Preparation

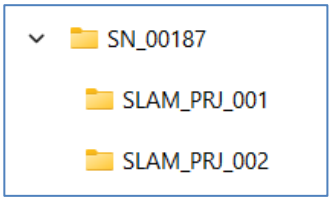
Before a Pocket 3D project can be processed in SLAM GO POST Pro, the collected data must be transferred to the processing computer and organized into a complete project. This involves copying the project data from the Pocket 3D microSD card, transferring the corresponding panoramic-camera recording from the camera, and placing the camera data into the appropriate Pocket 3D project folder. Once these files have been brought together in the required folder structure, the project is ready to open in SLAM GO POST Pro.

7.1 Copy the Raw Pocket 3D Data to the Processing Computer

Pocket 3D stores collected project data on its internal TF (microSD) card. After completing field data collection, transfer the scanner data to the computer that will be used for processing.

1. **Power off Pocket 3D.** Always shut down the scanner before removing the microSD card.
2. **Remove the microSD card from Pocket 3D** and insert it into the processing computer using the supplied card reader or another compatible reader.
3. **Locate the scanner session folder.** Each time Pocket 3D is powered on, it creates a new top-level scanner session folder using the naming format SN_nnnnnn, for example SN_00187.
4. **Copy the complete scanner session folder** to an appropriate working location on the processing computer. Do not process the project directly from the Pocket 3D microSD card.

Each scanning session performed while the scanner remains powered on is stored as a separate scan project folder within the scanner session folder. These folders use the format SLAM_PRJ_nnn, beginning with SLAM_PRJ_001 and incrementing for each new acquisition.



For example, if Pocket 3D was powered on and two separate scans were collected, the resulting structure would be as shown in the diagram. =>

In this example, SN_00187 represents the scanner operating session, while SLAM_PRJ_001 and SLAM_PRJ_002 are two separate scan projects collected during that session.

Keep this folder structure intact during the initial transfer. The panoramic-camera recordings will be added to the appropriate scan project folders in the next step.

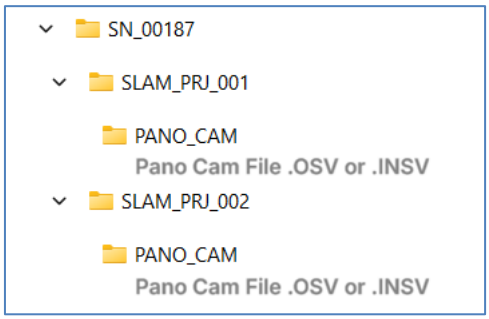
7.2 Match Panoramic Camera Recordings to Project

Each Pocket 3D scan project collected with a panoramic camera has a corresponding camera recording. Before processing, the correct camera recording must be transferred to the processing computer and placed in the PANO_CAM folder within its matching SLAM_PRJ project folder.

Transfer the panoramic-camera recordings from the camera to the processing computer. Depending on the camera, this can be done by removing its memory card and using a card reader or by connecting the camera directly to the computer with a USB cable.

For each scan project:

1. Identify the panoramic-camera recording that corresponds to the Pocket 3D scan.
2. Open the matching SLAM_PRJ_nnn folder copied from the Pocket 3D microSD card.
3. Locate the PANO_CAM folder within that scan project folder.
4. Copy the corresponding panoramic-camera recording into PANO_CAM. Do not rename the camera files.



For example, if two scan projects were collected during the scanner session shown in Section 7.1, the completed project structure would look like this:

Be careful to place each camera recording in the PANO_CAM folder for the scan during which it was recorded. When several scans and camera recordings were collected during the same field session, their acquisition times can be used to identify the correct pairing.

When the panoramic camera was controlled through SLAM GO, each scan produces a corresponding automatically started and stopped camera recording, this provides a very consistent start/stop time offset for camera and scanning files, simplifying identification of the recording associated with each scan project.

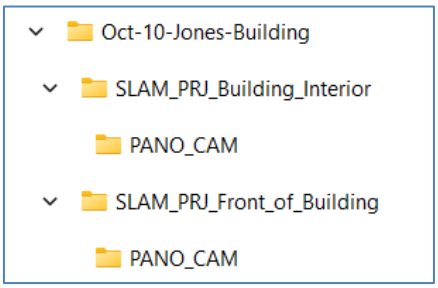
7.3 Rename Folders (Suggestion)

Pocket 3D automatically assigns numbered names to scanner session and scan project folders. These names are useful during data collection but can become difficult to identify later, particularly when multiple projects are stored on the processing computer.

After the scanner data and corresponding panoramic-camera recordings have been transferred and organized, it is recommended that you rename the folders using descriptive project names.

The top-level SN_nnnnnn scanner session folder can be renamed to identify the overall project or field session. For example: SN_00187 → October-10-Jones-Building

The individual SLAM_PRJ_nnn folders can then be renamed to describe the area or portion of the project captured during each scan. Retaining the SLAM_PRJ_ prefix makes these folders easy to recognize as Pocket 3D scan projects.



7.4 Project Directory and File Reference

Once the scanner data and panoramic-camera recordings have been organized as described above, the project is ready for use with SLAM GO POST Pro. The following files and folders are part of the Pocket 3D project structure and are provided here as a reference.

IMPORTANT: Preserve the original contents and internal folder structure of each SLAM_PRJ project folder. Other than renaming the project folders as described in Section 7.3 and adding the appropriate camera files to PANO_CAM, do not rename, move, or delete files within the project structure. When practical, retain an unchanged copy of the original field data until the project has been successfully processed.

File /Folder	Description
*.fmlidar	Raw Pocket 3D LiDAR/SLAM acquisition data
*.fmmark	Control-point data, when control points were collected
Description_File.txt	Project information, including acquisition timing used to help identify the corresponding camera recording
slam_calib.yaml	Scanner calibration information
PANO_CAM	Folder for the panoramic-camera recording associated with the scan project
*.OSV	DJI Osmo 360 camera recording
*.INSV	Insta360 camera recording

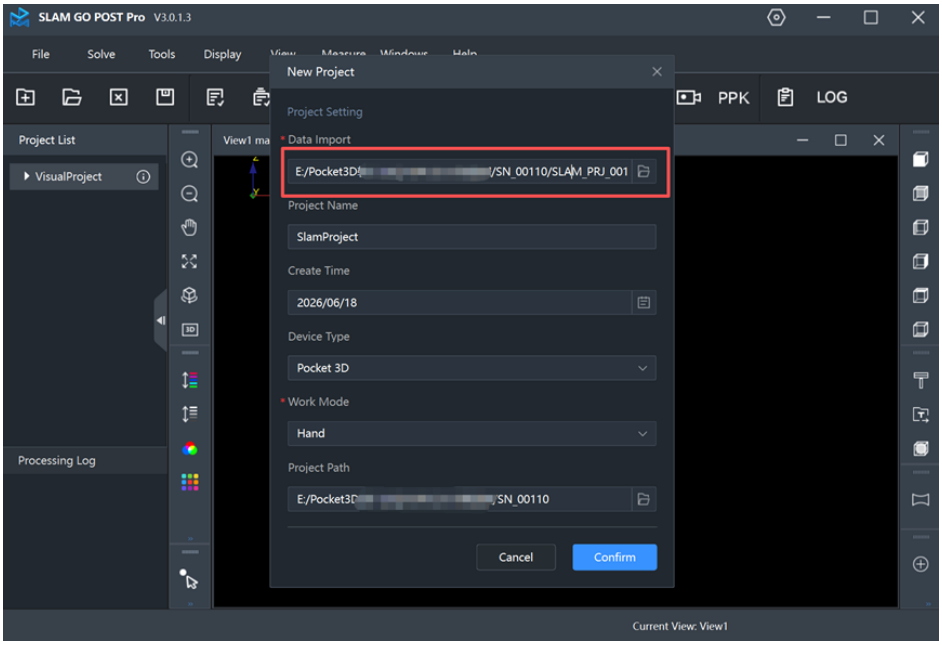
8 Processing Projects in SLAM GO POST Pro

8.1 Processing Overview

SLAM GO POST Pro can generate point clouds, optimized point clouds, panoramic imagery, colored point clouds, and 3DGS results. Processing can be performed without control points or with control points for oriented/georeferenced output. When control points are used, the correspondence between the surveyed control points and the points recorded during acquisition must be verified as part of the processing workflow.

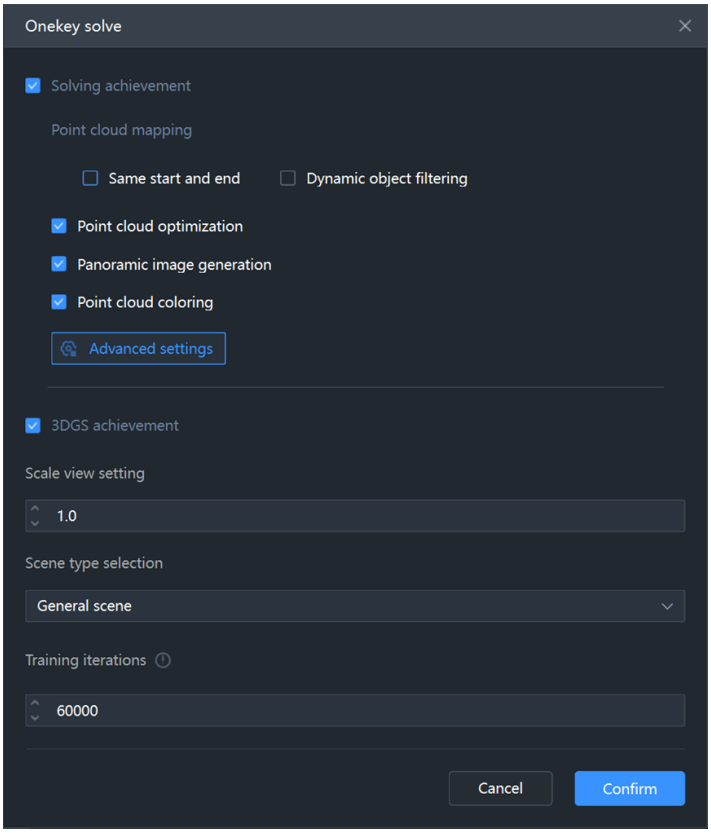
8.2 Create a Project

Choose File > New Project and select the organized raw project folder. The software identifies the device model and allows the project name and project path to be changed.



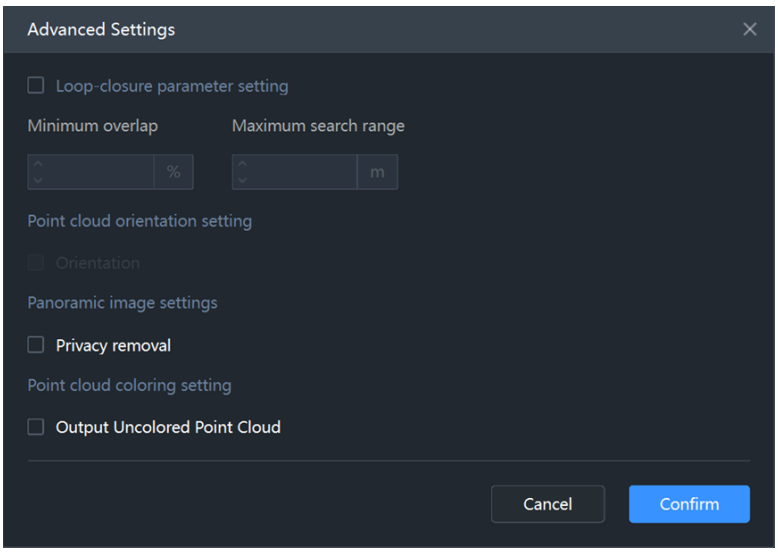
8.3 One-Key Solve - No Control Points

Choose Solve > One-click Solve. Available options include Point Cloud Mapping, Dynamic Object Filtering, Point Cloud Optimization, Panoramic Image Generation, Point Cloud Coloring, and 3DGS result settings.



8.4 Important Processing Settings

- Same Start and End - use only when the acquisition actually started and ended at the same location.
- Dynamic Object Filtering - filters moving objects such as pedestrians and vehicles.
- Panoramic Image Generation - generates imagery for scene roaming.
- Point Cloud Coloring - uses panoramic imagery to color the point cloud.
- Fisheye color mapping requires a valid panoramic-camera calibration.
- For DJI Osmo 360 3DGS output, the Feima source specifies colored point-cloud output with fisheye selected as the color-mapping image type.
- Set the panoramic-camera installation orientation to match the physical installation.





8.5 Point Cloud Optimization

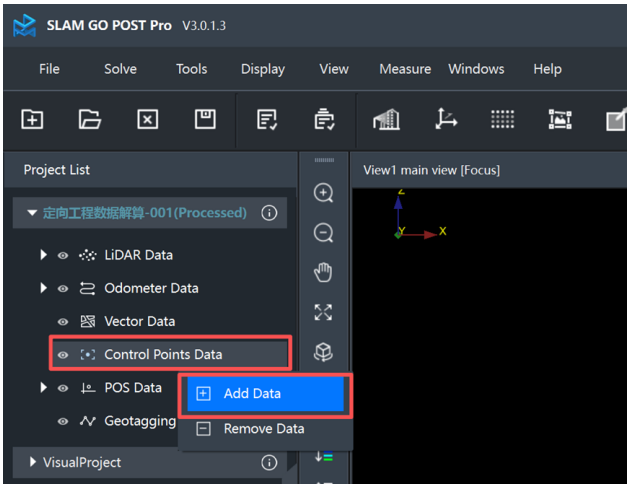
Point-cloud optimization is an optional secondary processing step and is not required for every project. First process and inspect the normal point-cloud result. If the point cloud shows local layering, misalignment, or similar registration problems, use Point Cloud Optimization in SLAM GO POST Pro and review the optimized result.

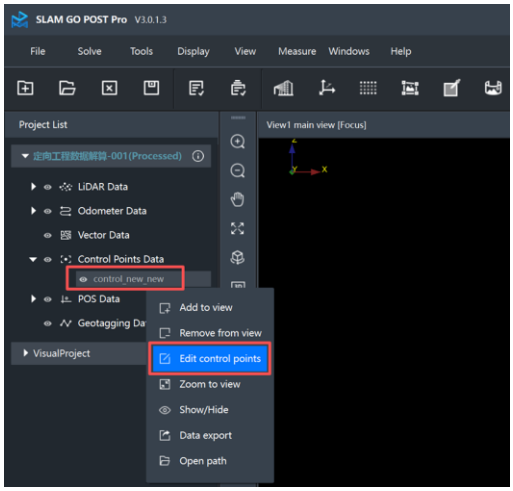
8.6 Processing with Control Points

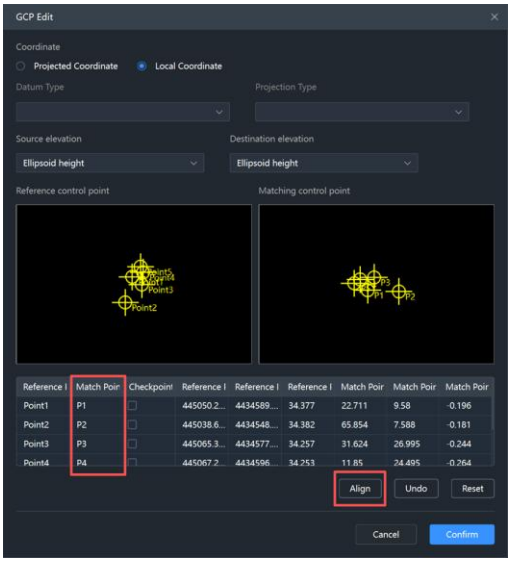
Import the surveyed control-point data by right-clicking Control Point Data in the project tree and selecting Add Data. The number of imported control points must correspond to the control points collected during field acquisition.

SLAM GO POST Pro automatically attempts to match the imported control points with the control points recorded by Pocket 3D. Verify these point correspondences before relying on the oriented/georeferenced results. Automatic matching may be incorrect when control points are closely spaced or when the distances between multiple control points are similar.

For greater control over the process, run Point Cloud Mapping first, then right-click the imported control-point data and select Edit Control Points. Review the automatically assigned matching-point serial numbers. If a correspondence is incorrect, reset or manually assign the correct matching point number, then confirm the control-point editing and process the remaining outputs.

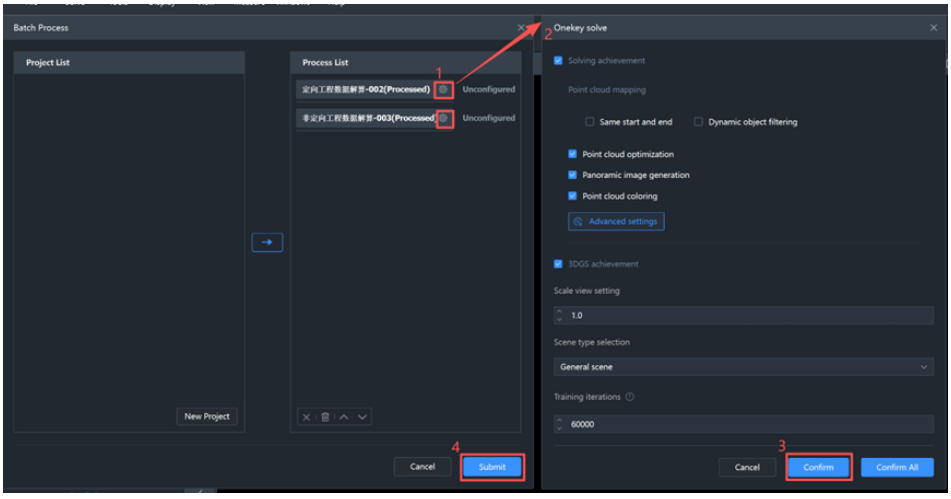






8.7 Batch Processing

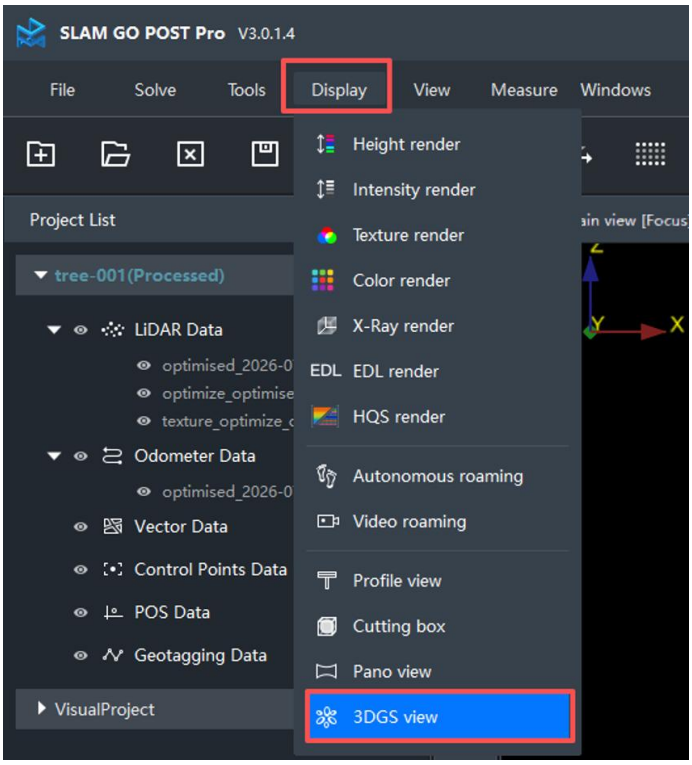
Use Solve > Batch Process to create multiple projects, move configured projects into the processing list, apply solving configurations, and submit them to the processing queue.



9 Viewing and Working with Results

Point cloud and pano view is done in the main window. Right click the optimized point cloud in the project list and “Add to View” to display.

More complete instructions pending in the next version.



9.1 3DGS Viewer

Choose Display > 3DGS view to open the 3DGS browser for the active project. The 3DGS data for the active project loads automatically.

Control		Action
Left mouse		Rotate View
Right mouse		Pan View
Mouse wheel		Move Forward / Backward
W/A/S/D		Move Forward / Move Left / Move Backward / Move Right
Q/E		Descend / Ascend
Shift		Fast Movement
Alt		Slow Movement
Shift+F		Reset Camera

For more keyboard shortcuts, refer to Help > Keyboard Shortcuts in the browser menu bar.

10 Open Data and Advanced Export

SLAM GO POST Pro can expose intermediate and processed data for third-party workflows, including colored point clouds, optimized odometry, fisheye video frames and masks, camera POS data, COLMAP-format data, XML/BlocksExchange data, MipMap configuration files, and masked undistorted images.

SLAM GO POST Pro can generate and expose processed results and intermediate data for use in third-party photogrammetry, mesh-modeling, and 3D Gaussian Splatting (3DGS) workflows. This section describes the principal open-data outputs identified in the Feima source manual, where they are stored, and the additional processing steps used to prepare selected third-party datasets.

10.1 Open Data Outputs and Required Processing

The availability of each output depends on which processing steps have been completed. The Feima source identifies the following data products and related processing requirements.

Data product	Required / related processing
Colored point cloud	Point-cloud mapping and point-cloud coloring
Odometer	Point-cloud mapping
Panoramic-camera video frames	Point-cloud mapping; fisheye frames may also be used for coloring and 3DGS
Panoramic-camera video-frame masks	Point-cloud mapping; used with fisheye imagery and 3DGS workflows
Panoramic-camera POS data	Point-cloud mapping; associated with camera video frames
COLMAP-format data	Point-cloud mapping and 3DGS training/pre-training; also used for masked-image workflows
MipMap configuration	Point-cloud mapping and 3DGS training/pre-training
XML / BlocksExchange file	Point-cloud mapping, 3DGS training/pre-training, and XML export
Masked undistorted images	Point-cloud mapping, 3DGS training/pre-training, and masking of undistorted images

10.2 Colored Point Cloud

After point-cloud coloring is completed, the colored point-cloud result is stored in the processing project directory:

/texture

The colored point-cloud files are stored as files with the .fmi suffix.

10.3 Odometer Data

Optimized odometry is stored in:

/odometer/optimised_odometry.txt

The odometry record fields are:

ID, time, x, y, z, roll, pitch, yaw, Qx, Qy, Qz, Qw

10.4 Panoramic-Camera Video Frames and Masks

Camera video-frame data generated for 3DGS processing is stored in:

/3DGS/3DGS/images

Folder /0 contains video-frame data from the left fisheye lens.

Folder /1 contains video-frame data from the right fisheye lens.

The corresponding video-frame masks are stored in:

/3DGS/3DGS/mask

Folder /0 contains masks corresponding to left-fisheye video frames.

Folder /1 contains masks corresponding to right-fisheye video frames.

10.5 Camera POS Data

POS data corresponding to the panoramic-camera video frames is stored in:

/3DGS/3DGS/sfm_pos/sfm_data_double.txt

The record fields are:

image_name, time, x, y, z, Qw, Qx, Qy, Qz

10.6 COLMAP-Format Data

COLMAP-format data is stored in:

/3DGS/3DGS/sfm_pos/3DGS

The directory contains:

images - undistorted images

masks - mask files corresponding to the undistorted images

sparse - sparse reconstruction data

cameras.txt - camera intrinsic parameters, including focal length, principal-point coordinates, distortion model, and related camera information

images.txt - image exterior-orientation elements and extracted 2D feature points

points3D.txt - reconstructed 3D-point coordinates, colors, and reprojection errors

10.7 XML / BlocksExchange Data

The XML aerotriangulation file is a BlocksExchange-style exchange file used to transfer photogrammetric aerotriangulation information. The Feima source describes it as containing camera internal parameters, image exterior-orientation elements, tie/control information, and spatial-reference information.

The XML file is written to a user-selected output location.

10.8 MipMap Configuration Data

MipMap-related files are stored in:

/3DGS/3DGS/sfm_pos

mipmap.mpl - records information related to the colored point cloud, fisheye-camera video frames, and corresponding mask files.

sfm_data_mipmap.txt - records fisheye-camera video-frame pose data in a format identified by the Feima source as compatible with MipMap.

The pose-data fields are:

image_name, time, x, y, z, Qw, Qx, Qy, Qz

10.9 Masked Undistorted Image Data

Masked undistorted-image output is written to a user-selected location. The resulting dataset includes an images folder containing masked, undistorted images and a sparse folder containing the associated sparse reconstruction.

10.10 Prepare Data for Third-Party Workflows

Before using the third-party workflows described in Section 11, the panoramic camera must be installed and calibrated and the required Pocket 3D and panoramic-camera data to be organized for processing.

10.10.1 Basic Calculation

Organize the raw scanner project and panoramic-camera data and import them into SLAM GO POST Pro. Run the required point-cloud calculation and 3DGS preparation steps to generate the outputs needed by the intended third-party workflow.

Use:

Solve > One-click Solve

Select the required processing steps. If fisheye imagery from the panoramic camera is to be used for point-cloud colorization, select fisheye as the coloring image type in the advanced coloring settings.

Advanced Settings > Image Coloring Type > Fisheye

10.10.2 3DGS Pre-Training

After the required one-click calculation is complete, run 3DGS Pre-Training. The Feima source describes the following settings:

Panoramic Camera Folder - defaults to the PANO_CAM folder in the original project directory.

Panoramic Camera Installation Orientation - set this manually to match the actual physical camera installation.

Scene Type Selection - General Scene for most environments; Open Scene for feature-poor environments such as golf courses and lawns; Night Mode for low-light environments such as underground garages and museums.

Zoom View Setting - default 1.0; the source states that modification is normally not required.

10.10.3 Export XML

After completing the required calculations, select:

Tools > Export XML

These are the available settings:

3DGS Directory - defaults to Solver Project/3DGS/3DGS/sfm_pos/3DGS/temp and is automatically recognized by the software.

Output File Path - select the desired location for the exported XML file.

The resulting XML is intended for exchange of aerotriangulation information with compatible third-party applications.

10.10.4 Mask Undistorted Images

There is an additional image-processing utility, image_processing_gui.exe, for applying masks to undistorted images before certain third-party workflows.

Input Directory - set to SolverProject/3DGS/3DGS/sfm_pos/3DGS.

Output Directory - create and select a new output folder. The result includes an images folder containing masked undistorted images and a sparse folder containing sparse reconstruction data.

After the utility reports that image processing is complete, the source instructs the user to use a rename tool to change the image-file extensions in the output images folder to ".jpg".

10.10.5 Relationship to Third-Party Software

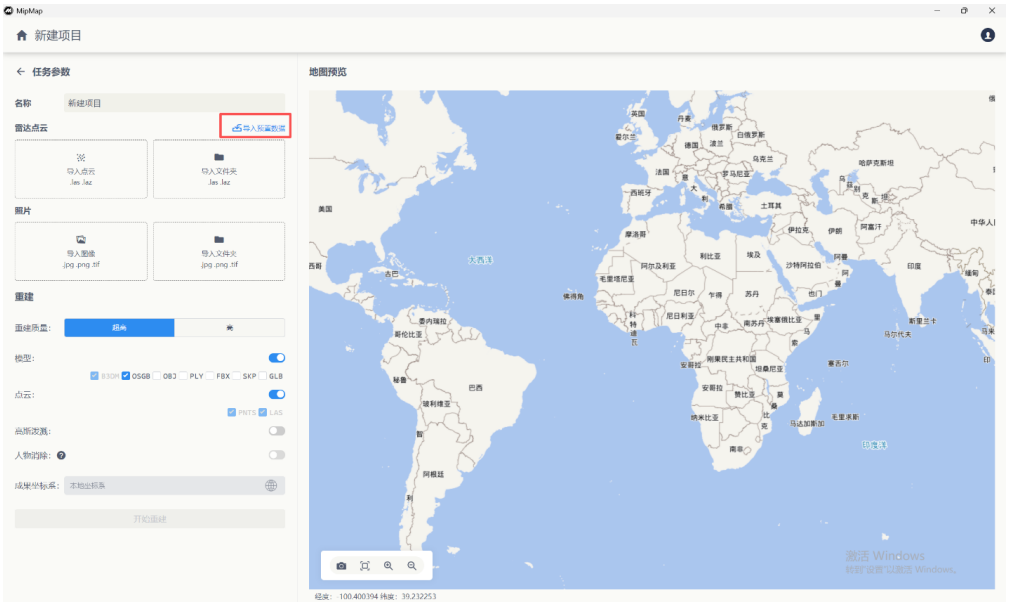
The outputs described in this section provide the source data used by the third-party workflows in Section 11. Depending on the application, those workflows may use the MipMap configuration files, BlocksExchange XML,

colored point cloud, odometry, camera POS, masked undistorted images, COLMAP-style sparse reconstruction, or combinations of these outputs.

11 Third-Party Software Workflows

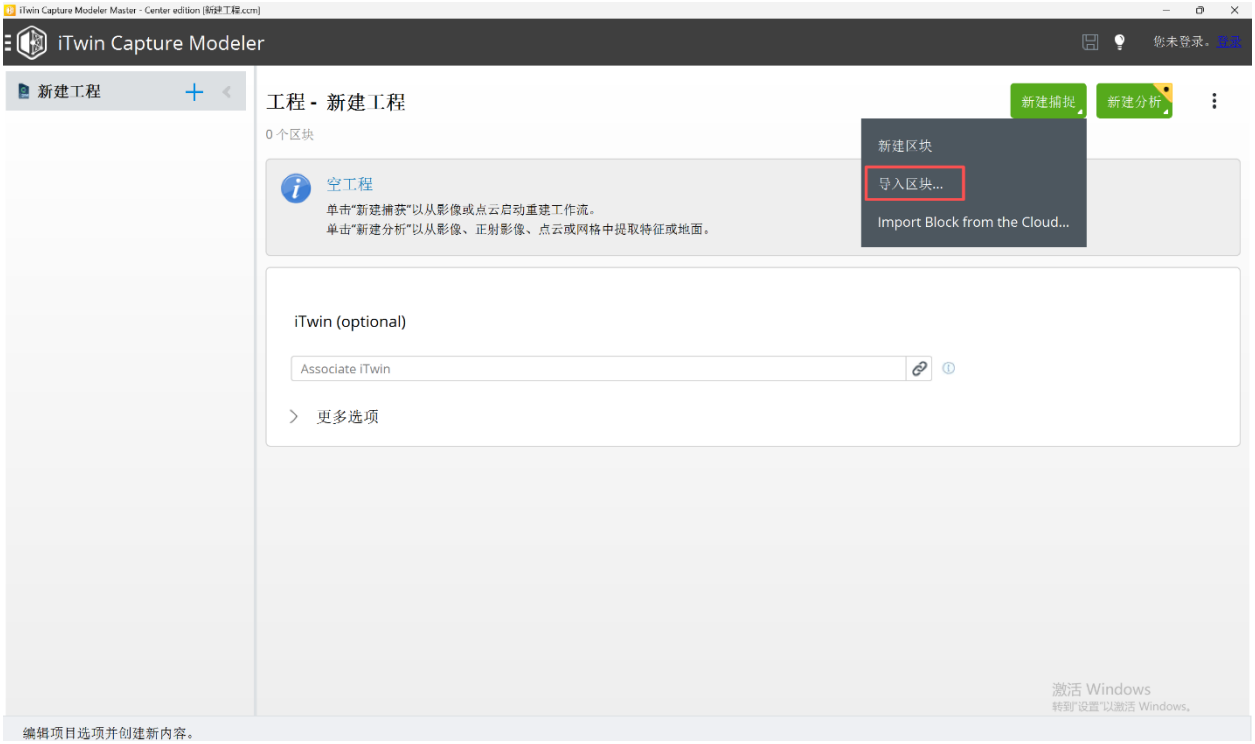
11.1 MipMap

After creating a LiDAR project, click [Import Preset Data], and import the mipmap. mpl file (for details, see Open Data Access and Definition/MipMap Software Configuration File), then you can proceed with Mesh model production.



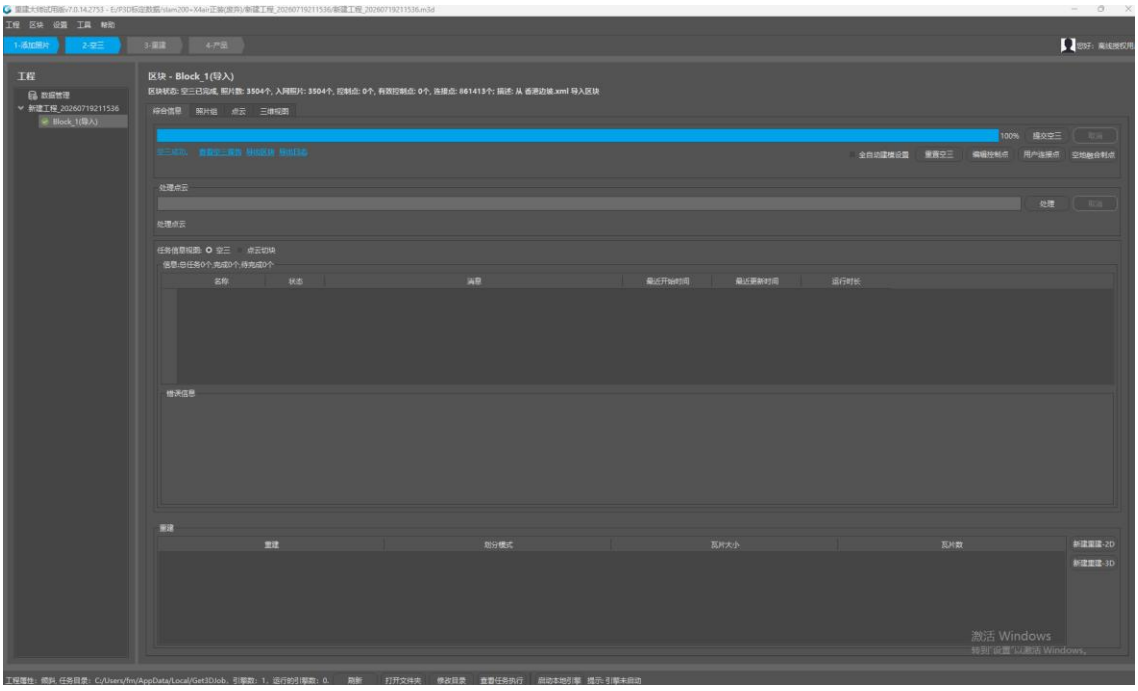
11.2 iTwin Capture Modeler（ContextCapture）

After creating a project, click [New Capture] - [Import Block], and after importing the XML file (for details, see Open Data Access and Definition), you can proceed with Mesh model production.



11.3 Reconstruction Master（重建大师）

After creating a project, click [Block] - [Import Block], import the XML file (for details, see Open Data Access and Definition), then import the colored point cloud file and odometry file (for details, see Open Data Access and Definition), and you can proceed with Mesh model generation.



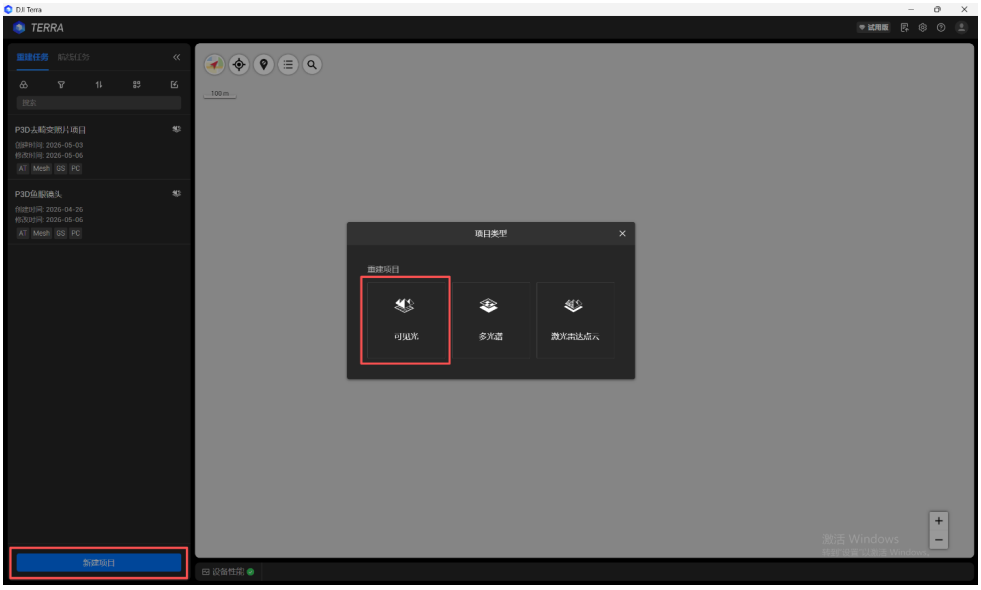
11.4 DJI Terra(大疆智图)

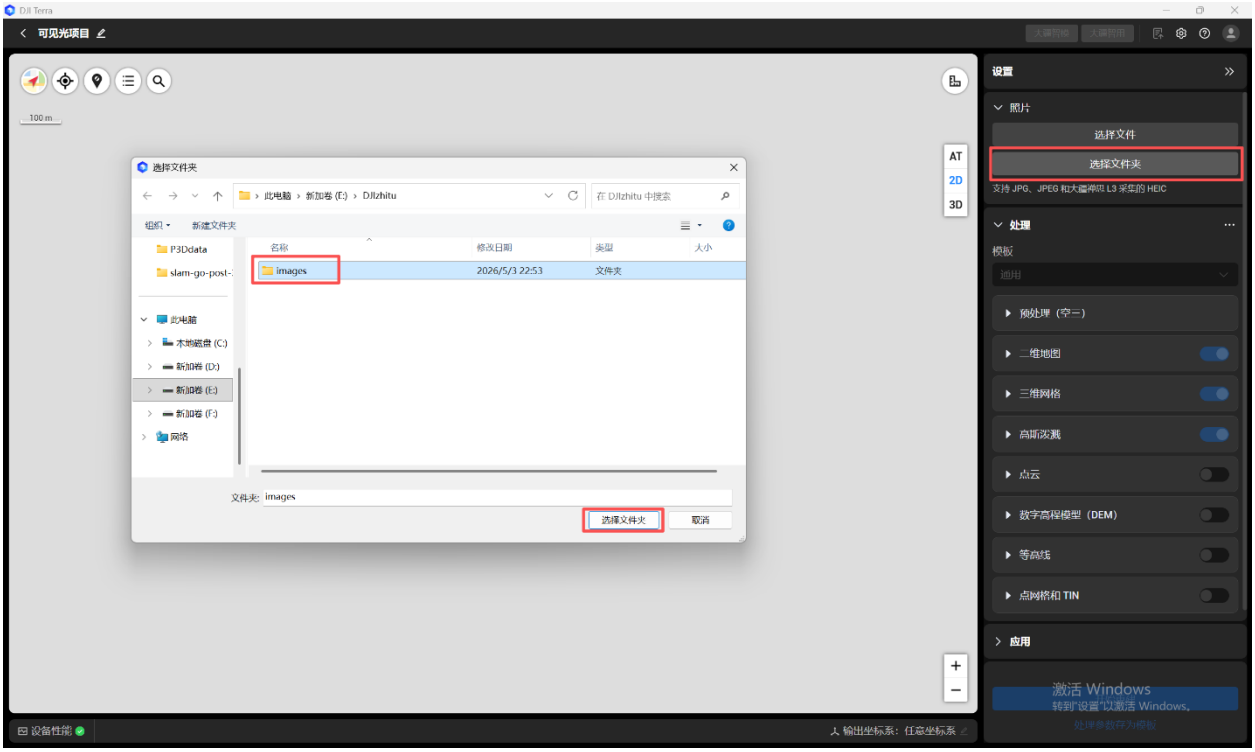
- Create a "visible light" project in the DJI Terra software.

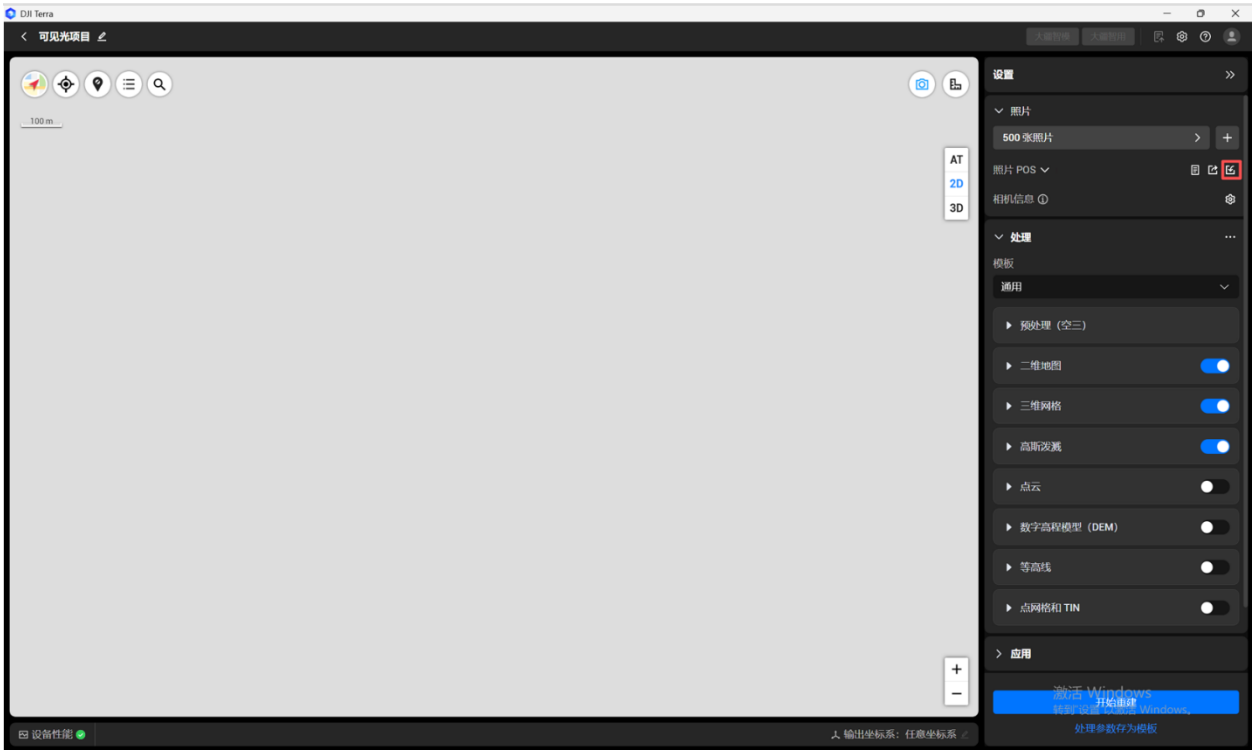
- Import photos: Import the organized folder "images" containing mask-removed and distortion-corrected images into the software;
- Import Photo POS: Import the POS data corresponding to the video frames of the panoramic camera into the software;
- Edit camera information: set the 35mm equivalent focal length, set the lens type to "Standard", set the internal parameter unit to "px", set the fixed parameter to "Not Fixed", and fill in the camera lens parameters according to the information in{Project Directory}/3DGS/3DGS/sfm_pos/3DGS/sparse/cameras. txt;

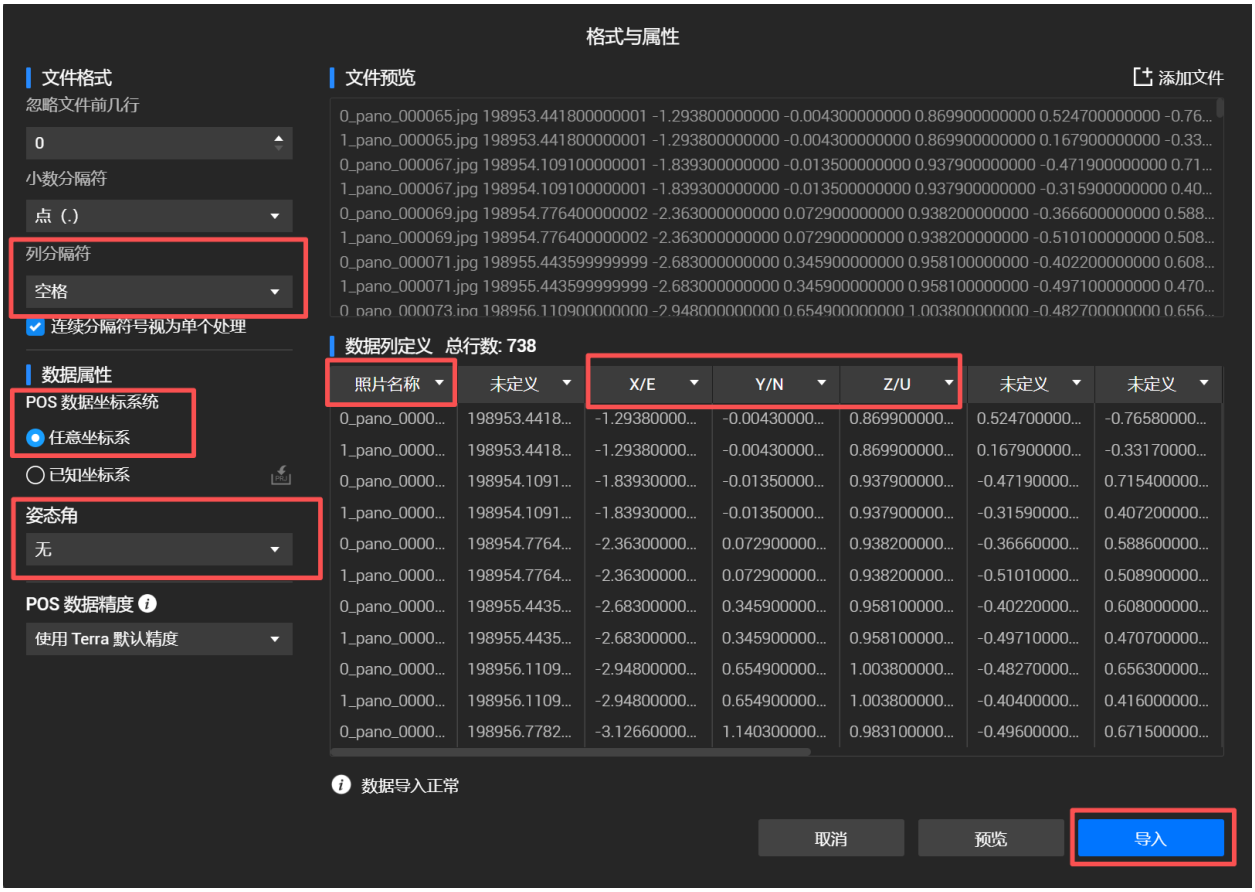
Camera Type	**35mm equivalent focal length**
insta X4	6.7mm
insta X4-Air	6.4mm
insta X5	6mm
OSMO 360	8mm

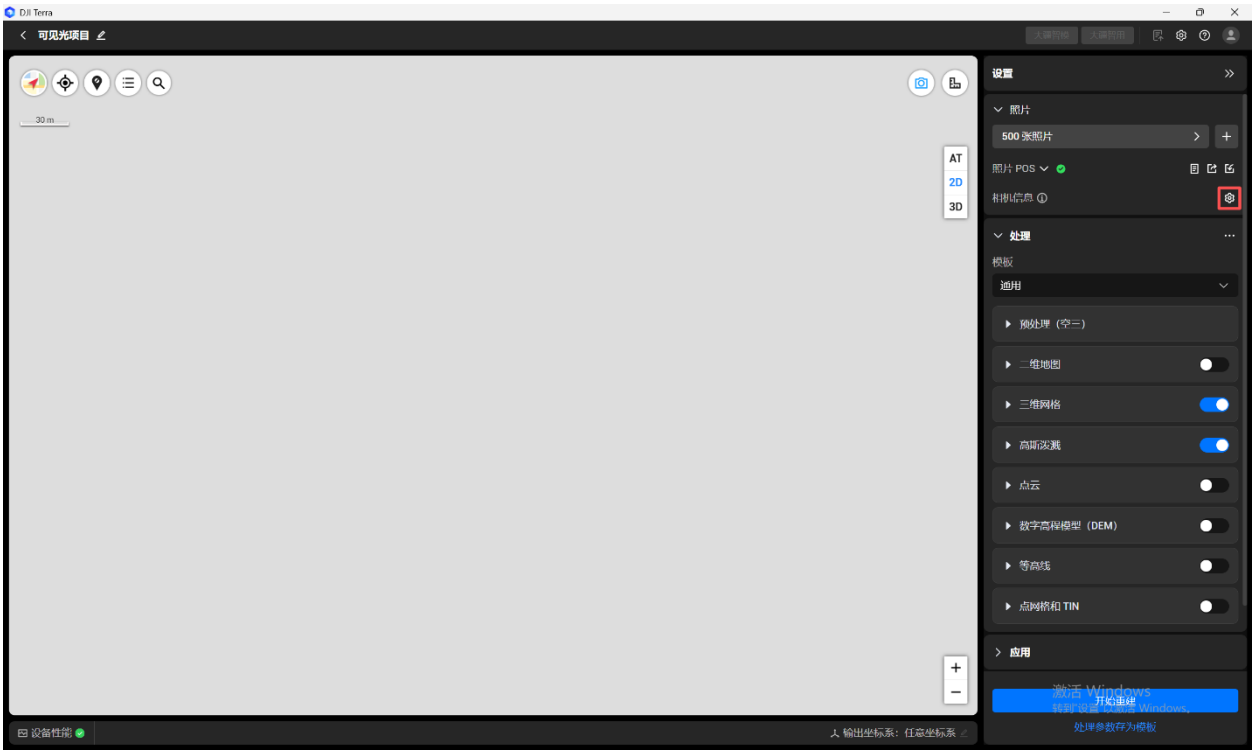
- Set reconstruction parameters: set the calculation mode of preprocessing (aerotriangulation) to "standalone computing", set the route type to "ordinary scene", set the feature point density to "high", enable the "3D mesh" option, and check other parameters as needed.

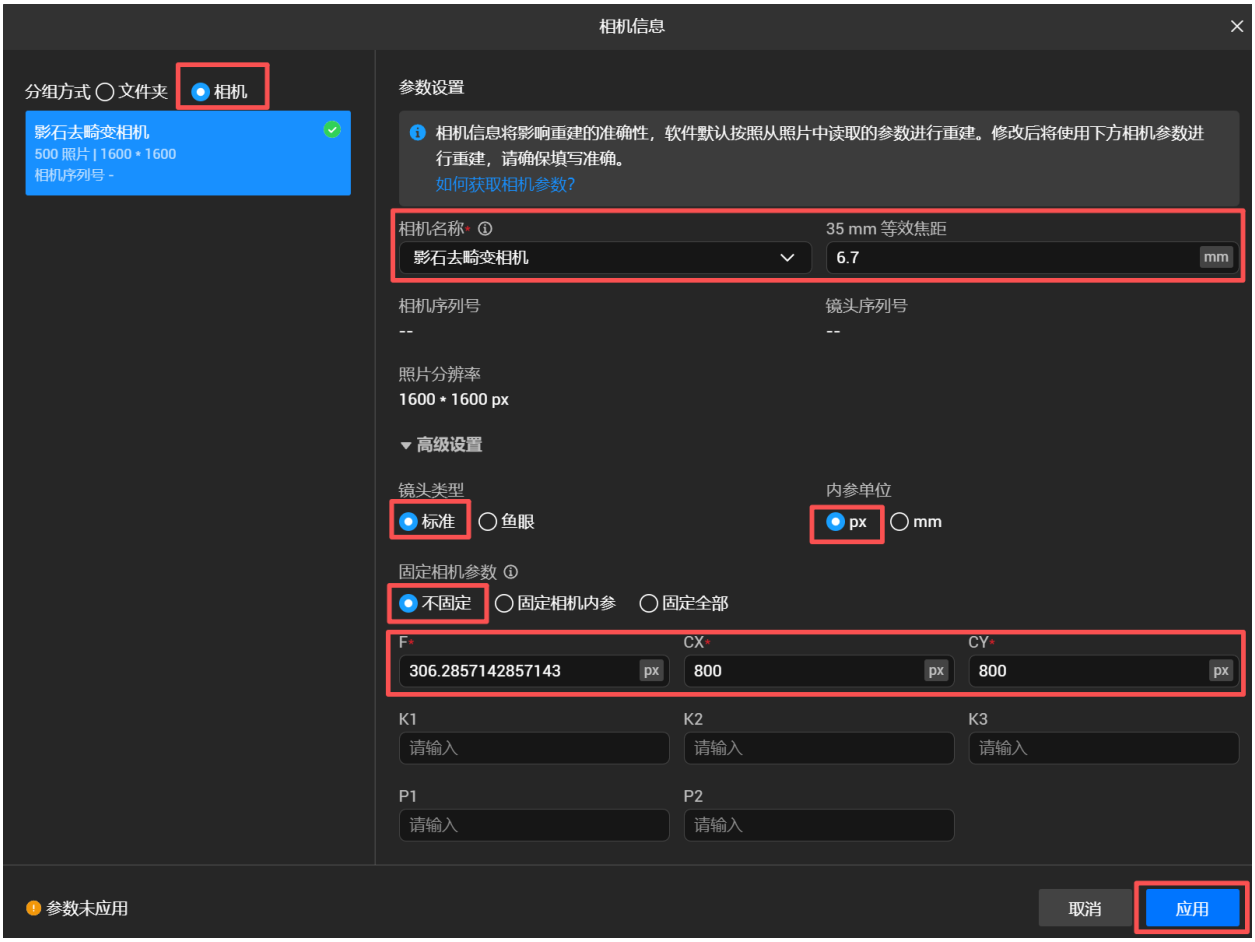


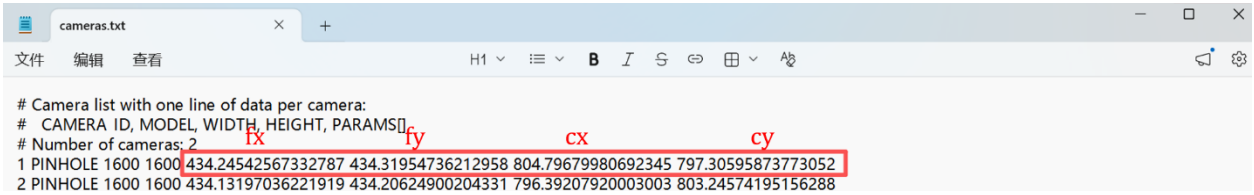

DJI Terra
可见光项目
设置
照片
选择文件
选择文件夹
支持 JPG、JPEG 和大疆精简 L3 采集的 HEIC
处理
模板
通用
预处理（空三）
二维地图
三维网格
高斯泼溅
点云
数字高程模型（DEM）
等高线
点网格和 TIN
应用
选择文件夹
此电脑 › 新加卷 (E:) › DJIzhitu
在 DJIzhitu 中搜索
组织
新建文件夹
名称
修改日期
类型
大小
images
2026/5/3 22:53
文件夹
P3Ddata
slam-go-post-
此电脑
本地磁盘 (C:)
新加卷 (D:)
新加卷 (E:)
新加卷 (F:)
网络
文件夹: images
选择文件夹
取消
AT
2D
3D
100 m
设备性能
输出坐标系：任意坐标系
激活 Windows
转到"设置"以激活 Windows。
处理参数存为模板

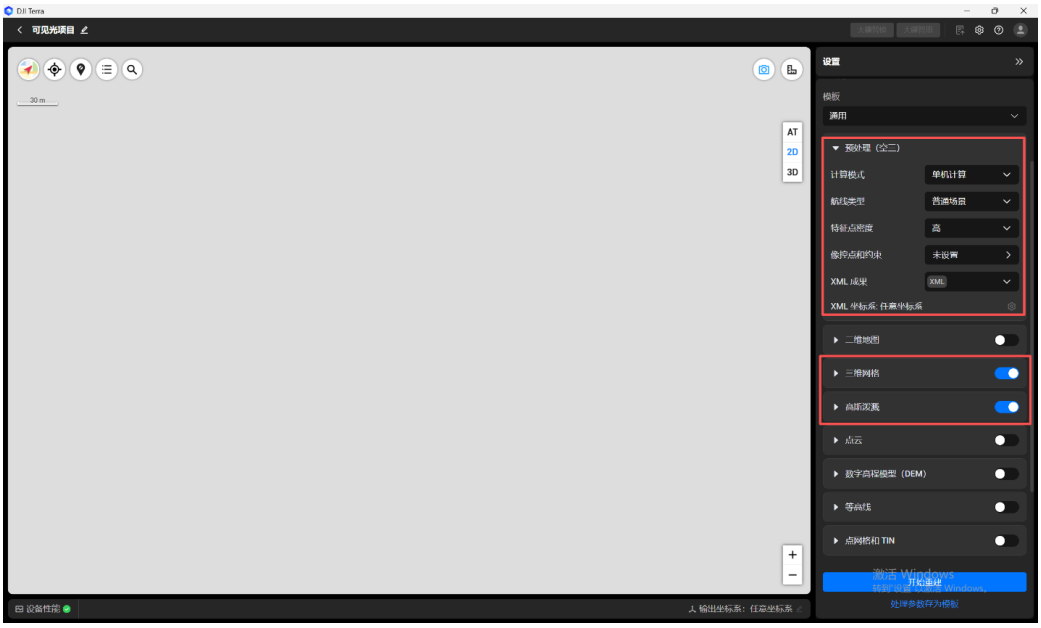

DJI Terra
可见光项目
设置
照片
500 张照片
照片 POS
相机信息
处理
模板
通用
预处理（空三）
二维地图
三维网格
高斯泼溅
点云
数字高程模型（DEM）
等高线
点网格和 TIN
应用
AT
2D
3D
100 m
设备性能
输出坐标系：任意坐标系
开始重建
处理参数存为模板


格式与属性
文件格式
忽略文件前几行
0
小数分隔符
点 (.)
列分隔符
空格
连续分隔符号视为单个处理
数据属性
POS 数据坐标系统
任意坐标系
已知坐标系
姿态角
无
POS 数据精度
使用 Terra 默认精度
文件预览
添加文件
0_pano_000065.jpg 198953.441800000001 -1.293800000000 -0.004300000000 0.869900000000 0.524700000000 -0.76...
1_pano_000065.jpg 198953.441800000001 -1.293800000000 -0.004300000000 0.869900000000 0.167900000000 -0.33...
0_pano_000067.jpg 198954.109100000001 -1.839300000000 -0.013500000000 0.937900000000 -0.471900000000 0.71...
1_pano_000067.jpg 198954.109100000001 -1.839300000000 -0.013500000000 0.937900000000 -0.315900000000 0.40...
0_pano_000069.jpg 198954.776400000002 -2.363000000000 0.072900000000 0.938200000000 -0.366600000000 0.588...
1_pano_000069.jpg 198954.776400000002 -2.363000000000 0.072900000000 0.938200000000 -0.510100000000 0.508...
0_pano_000071.jpg 198955.443599999999 -2.683000000000 0.345900000000 0.958100000000 -0.402200000000 0.608...
1_pano_000071.jpg 198955.443599999999 -2.683000000000 0.345900000000 0.958100000000 -0.497100000000 0.470...
数据列定义 总行数: 738
照片名称
未定义
X/E
Y/N
Z/U
未定义
未定义
0_pano_0000... 198953.4418... -1.29380000... -0.00430000... 0.869900000... 0.524700000... -0.76580000...
1_pano_0000... 198953.4418... -1.29380000... -0.00430000... 0.869900000... 0.167900000... -0.33170000...
0_pano_0000... 198954.1091... -1.83930000... -0.01350000... 0.937900000... -0.47190000... 0.715400000...
1_pano_0000... 198954.1091... -1.83930000... -0.01350000... 0.937900000... -0.31590000... 0.407200000...
0_pano_0000... 198954.7764... -2.36300000... 0.072900000... 0.938200000... -0.36660000... 0.588600000...
1_pano_0000... 198954.7764... -2.36300000... 0.072900000... 0.938200000... -0.51010000... 0.508900000...
0_pano_0000... 198955.4435... -2.68300000... 0.345900000... 0.958100000... -0.40220000... 0.608000000...
1_pano_0000... 198955.4435... -2.68300000... 0.345900000... 0.958100000... -0.49710000... 0.470700000...
0_pano_0000... 198956.1109... -2.94800000... 0.654900000... 1.003800000... -0.48270000... 0.656300000...
1_pano_0000... 198956.1109... -2.94800000... 0.654900000... 1.003800000... -0.40400000... 0.416000000...
0_pano_0000... 198956.7782... -3.12660000... 1.140300000... 0.983100000... -0.49600000... 0.671500000...
数据导入正常
取消
预览
导入


可见光项目
设置
照片
500 张照片
照片 POS
相机信息
处理
模板
通用
预处理（空三）
二维地图
三维网格
高斯泼溅
点云
数字高程模型（DEM）
等高线
点网格和 TIN
应用
开始建处
处理参数存为模板
AT
2D
3D
设备性能
输出坐标系：任意坐标系


相机信息
分组方式 文件夹 相机
影石去畸变相机
500 照片 | 1600 * 1600
相机序列号 -
参数设置
相机信息将影响重建的准确性，软件默认按照从照片中读取的参数进行重建。修改后将使用下方相机参数进行重建，请确保填写准确。
如何获取相机参数?
相机名称*
影石去畸变相机
35 mm 等效焦距
6.7
mm
相机序列号
--
镜头序列号
--
照片分辨率
1600 * 1600 px
高级设置
镜头类型
标准
鱼眼
内参单位
px
mm
固定相机参数
不固定
固定相机内参
固定全部
F*
306.2857142857143
px
CX*
800
px
CY*
800
px
K1
请输入
K2
请输入
K3
请输入
P1
请输入
P2
请输入
参数未应用
取消
应用

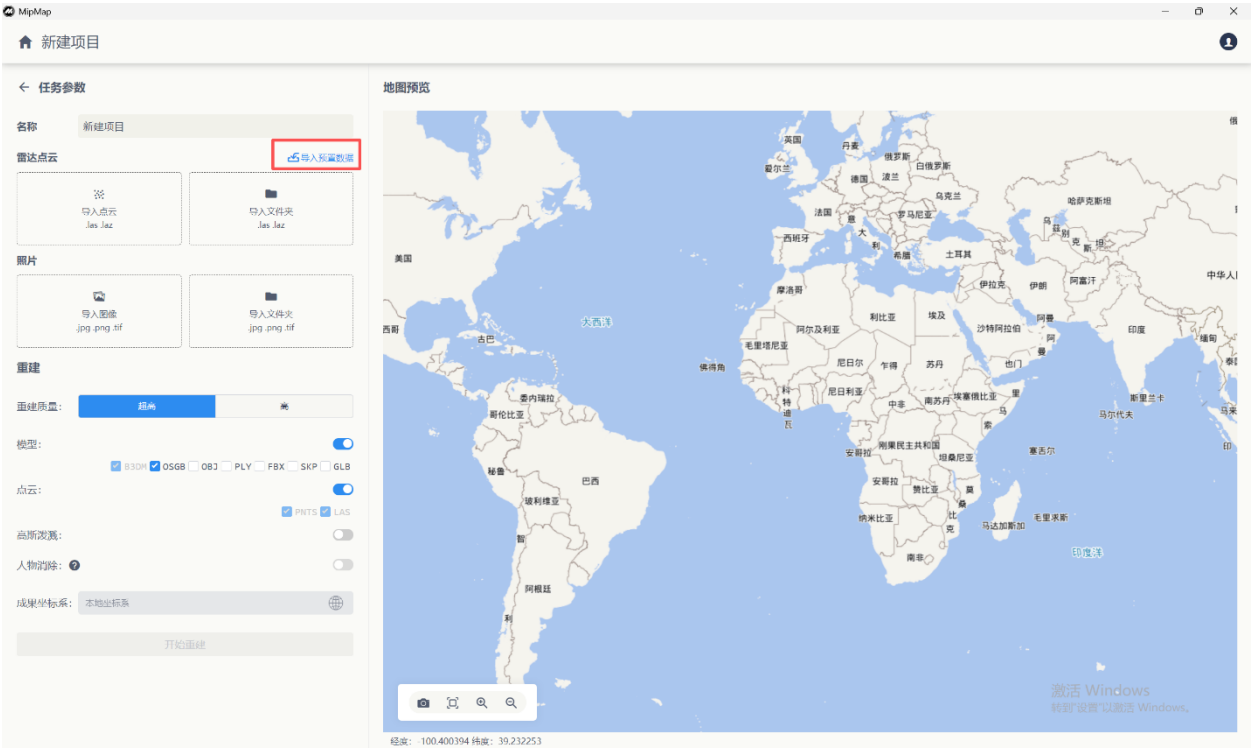

cameras.txt
文件
编辑
查看
Camera list with one line of data per camera:
CAMERA ID, MODEL, WIDTH, HEIGHT, PARAMS[]
Number of cameras: 2
fx
fy
cx
cy
1 PINHOLE 1600 1600 434.24542567332787 434.31954736212958 804.79679980692345 797.30595873773052
2 PINHOLE 1600 1600 434.13197036221919 434.20624900204331 796.39207920003003 803.24574195156288


可见光项目
设置
模板
通用
预处理（空三）
计算模式
单机计算
航线类型
普通场景
特征点密度
高
像控点相约束
未设置
XML 成果
XML
XML 坐标系: 任意坐标系
二维地图
三维网格
高斯泼溅
点云
数字高程模型（DEM）
等高线
点网格和 TIN
开始重建
处理参数存为模板
AT
2D
3D

11.5 3DGS modeling with third-party software

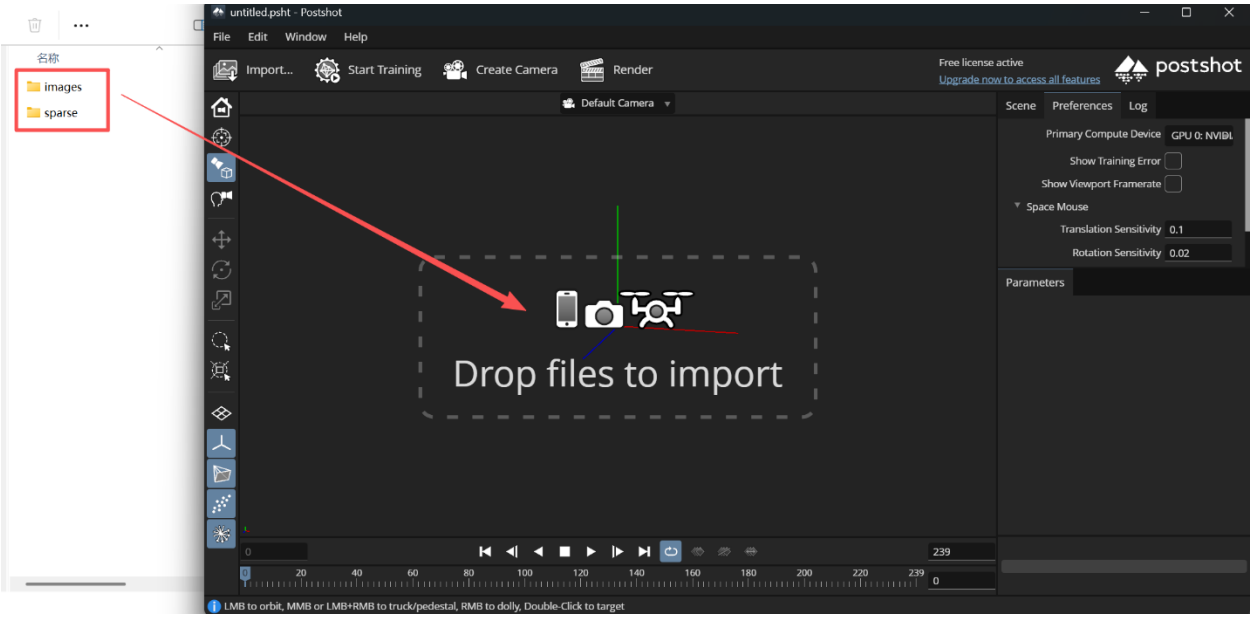
11.5.1 MipMap

After creating a LiDAR project, click [Import Preset Data] and import the /mipmap. mpl file (for details, refer to Open Data Access and Definition), then you can proceed with 3DGS model production.



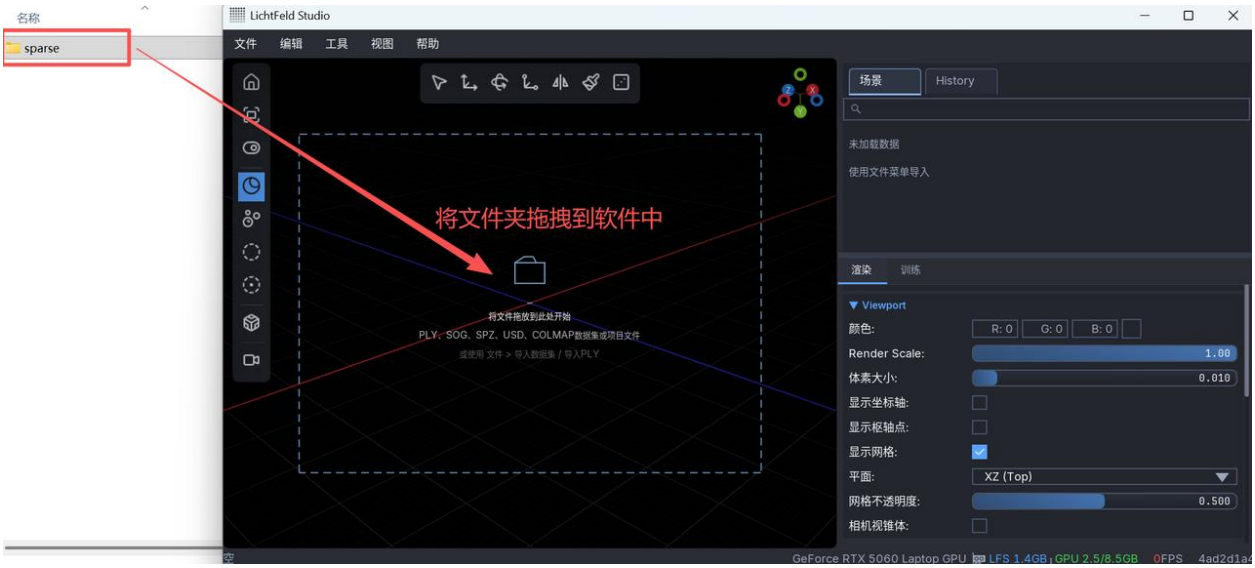
11.5.2 Postshot

Import the organized folder of masked undistorted images and the sparse reconstruction /sparse folder into the software. After configuring the parameters, click the "Import" button, and the software will automatically perform 3DGS Model Training.



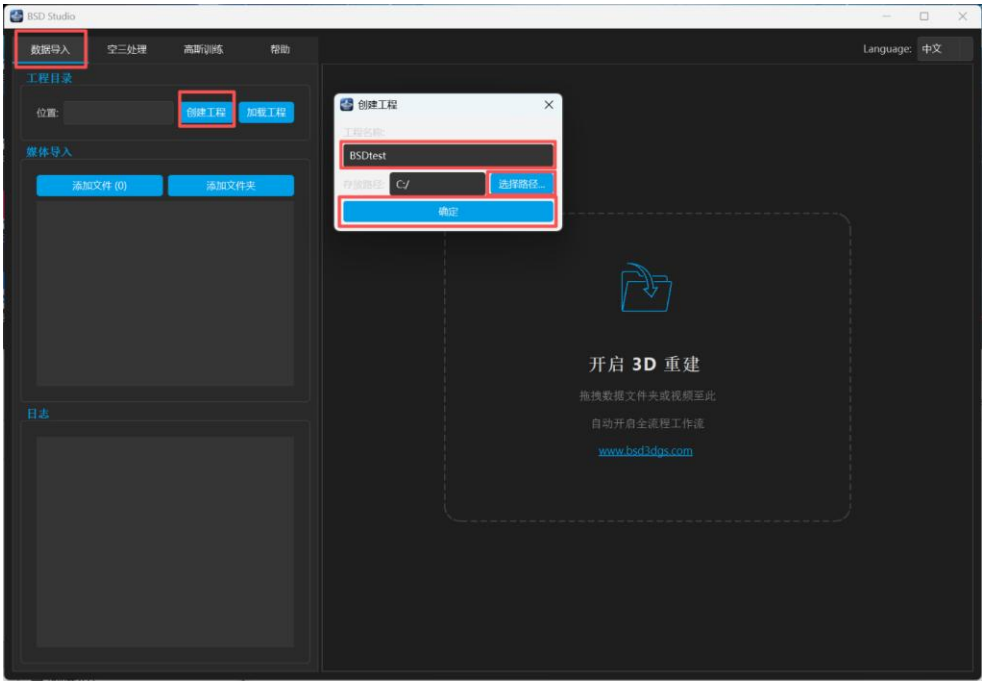
11.5.3 Lichtfeld Studio

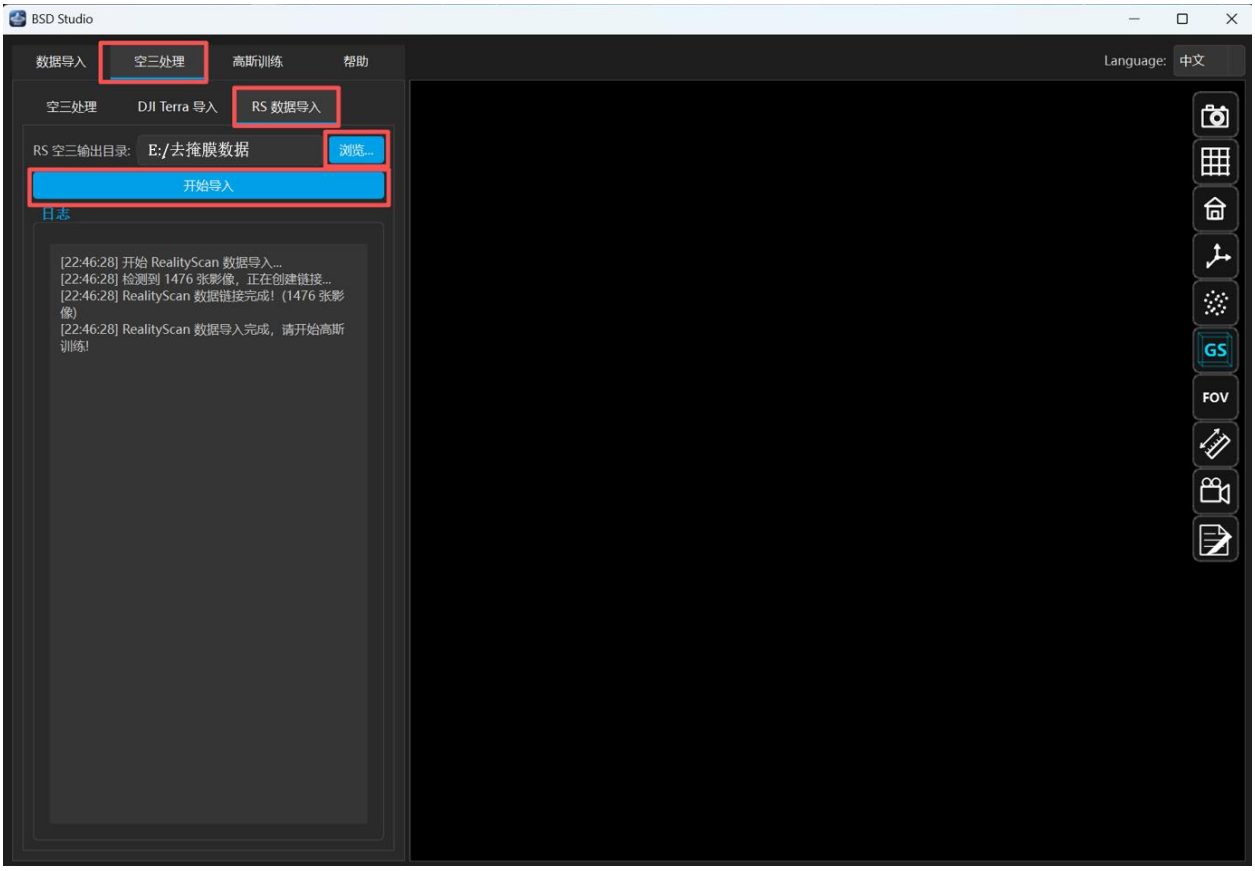
Place the organized masked undistorted images in the /images folder into the sparse reconstruction /sparse folder, then drag the sparse folder into the Lichfeld Studio software, set the output directory and training parameters, and click "Start Training" to generate the 3DGS model.

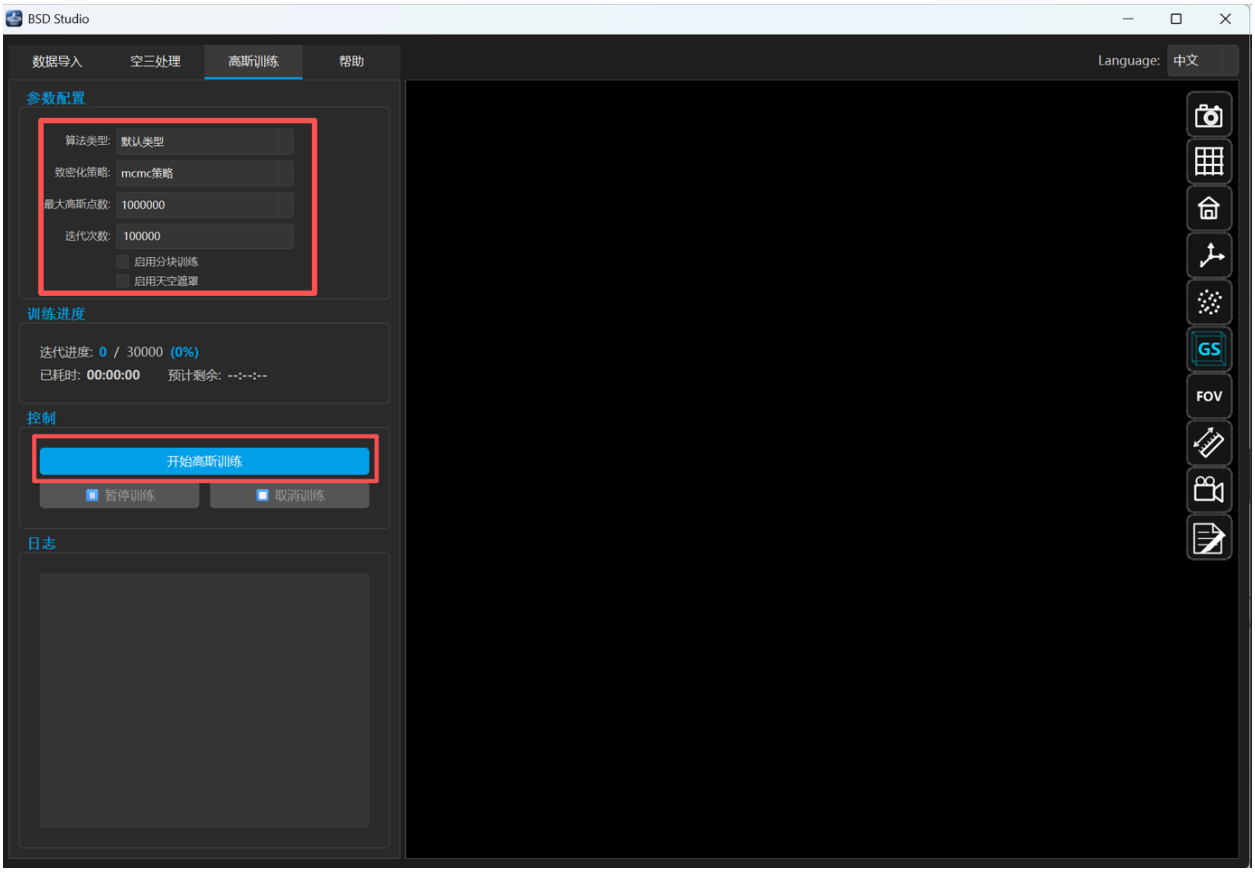


11.5.4 BSD Studio

- Click "Data Import -> Create Project" and set the project name and storage path;
- Click "Aerial Triangulation -> RS Data Import", and set the path where the sorted results are located (the /images folder and the path where the /sparse folder are located) as the "RS Aerial Triangulation Output Directory", then click "Start Import" to import the mask-removed data results into the software;
- Click "Gaussian Training" to configure the training parameters;
- After configuring the parameters, click "Start Gaussian Training".




BSD Studio
数据导入
空三处理
高斯训练
帮助
Language:
中文
空三处理
DJI Terra 导入
RS 数据导入
RS 空三输出目录:
E:/去掩膜数据
浏览...
开始导入
日志
[22:46:28] 开始 RealityScan 数据导入...
[22:46:28] 检测到 1476 张影像，正在创建链接...
[22:46:28] RealityScan 数据链接完成！(1476 张影像)
[22:46:28] RealityScan 数据导入完成，请开始高斯训练!
GS
FOV

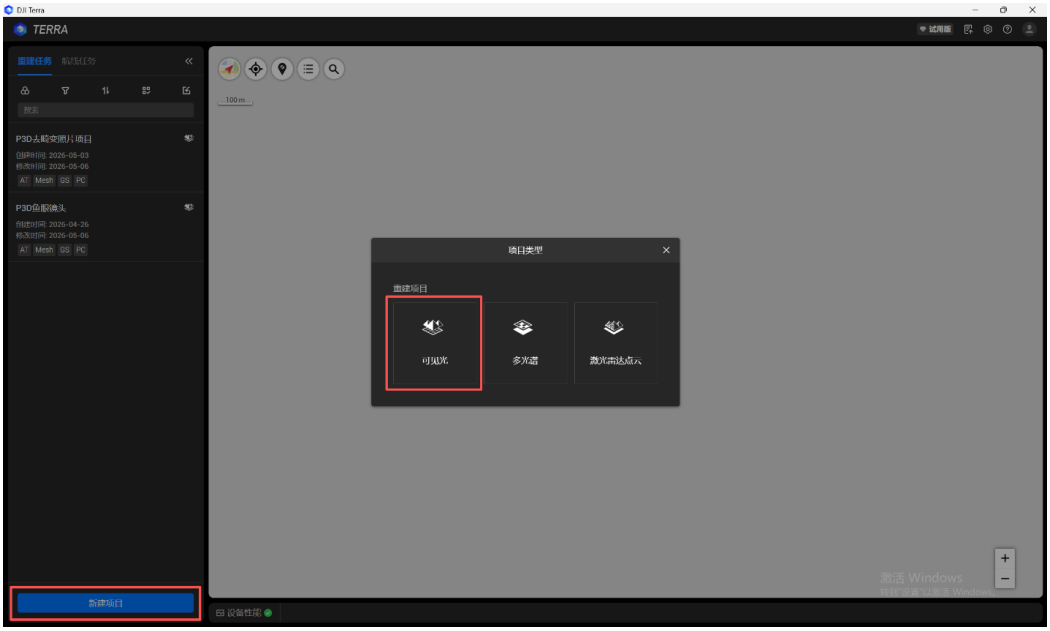

BSD Studio
数据导入
空三处理
高斯训练
帮助
Language:
中文
参数配置
算法类型:
默认类型
致密化策略:
mcmc策略
最大高斯点数:
1000000
迭代次数:
100000
启用分块训练
启用天空遮罩
训练进度
迭代进度: 0 / 30000 (0%)
已耗时: 00:00:00
预计剩余: --:--:--
控制
开始高斯训练
暂停训练
取消训练
日志
GS
FOV

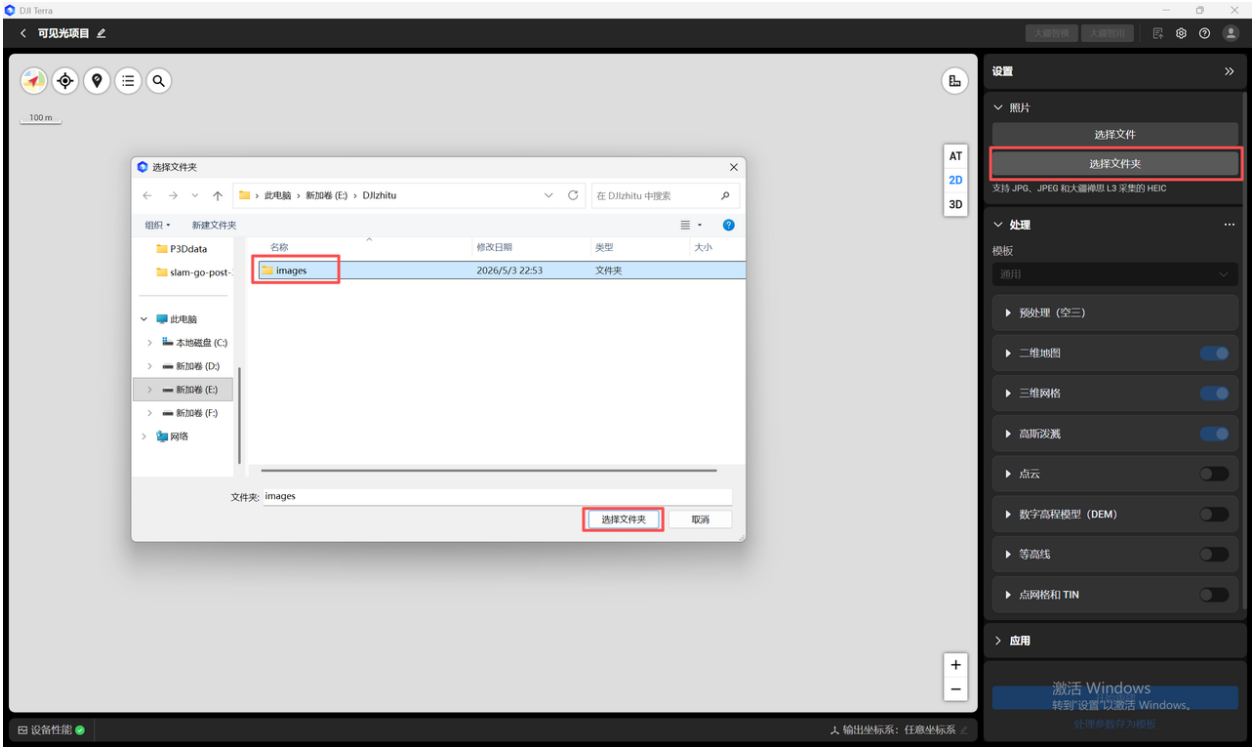
11.5.5 DJI Terra

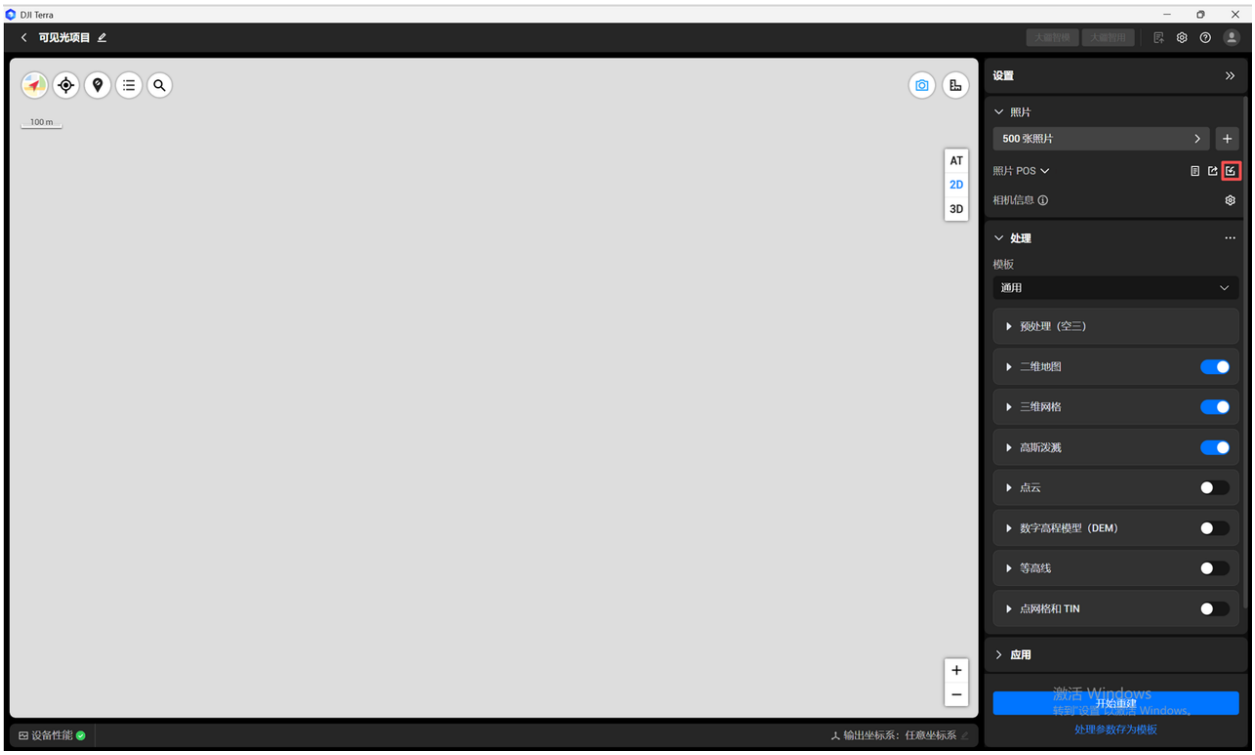
- Create a "visible light" project in the DJI Terra software.
- Import Photos: Import the organized mask-removed and distortion-corrected image folder /images into the software;
- Import Photo POS: Import the POS data corresponding to the video frames of the panoramic camera into the software;
- Edit camera information: set the 35mm equivalent focal length, set the lens type to "Standard", set the internal parameter unit to "px", set the fixed parameter to "Unfixed", and fill in the camera lens parameters according to the information in{Project Directory}/3DGS/3DGS/sfm_pos/3DGS/sparse/cameras. txt;

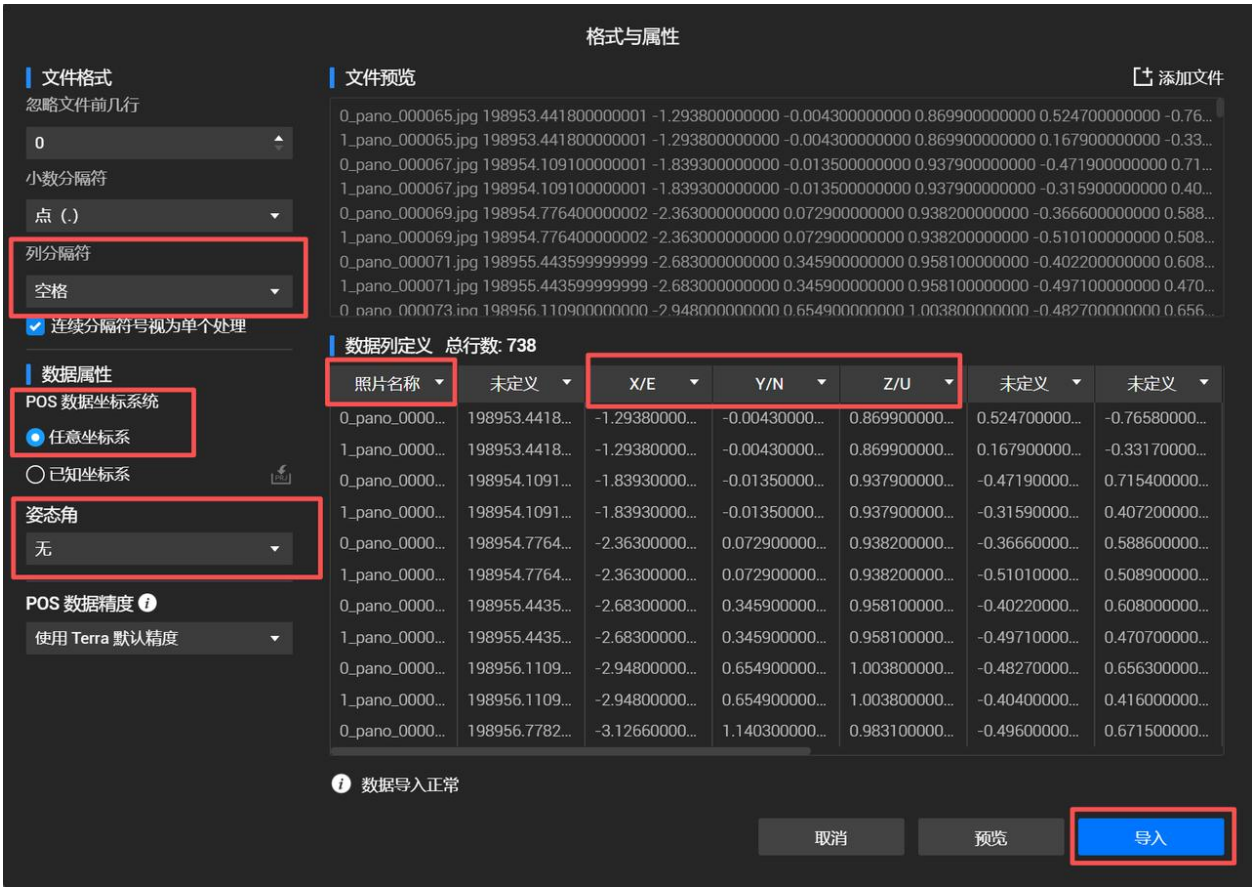
相机类型	**35mm 等效焦距**
insta X4	6.7mm
insta X4-Air	6.4mm
insta X5	6mm
OSMO 360	8mm

- Set reconstruction parameters: set the calculation mode of preprocessing (aerotriangulation) to "standalone computing", set the route type to "common scene", set the feature point density to "high", enable the "Gaussian splatting" option, and check other parameters as needed.




DJI Terra
可见光项目
设置
照片
选择文件
选择文件夹
支持 JPG、JPEG 和大疆禅思 L3 采集的 HEIC
处理
模板
通用
预处理（空三）
二维地图
三维网格
高斯泼溅
点云
数字高程模型（DEM）
等高线
点网格和 TIN
应用
选择文件夹
此电脑 › 新加卷 (E:) › DJIzhitu
在 DJIzhitu 中搜索
组织
新建文件夹
名称
修改日期
类型
大小
P3Ddata
slam-go-post-
images
2026/5/3 22:53
文件夹
此电脑
本地磁盘 (C:)
新加卷 (D:)
新加卷 (E:)
新加卷 (F:)
网络
文件夹: images
选择文件夹
取消
激活 Windows
转到"设置"以激活 Windows。
处理参数存为模板
设备性能
输出坐标系：任意坐标系
100 m
AT
2D
3D


DJI Terra
可见光项目
设置
照片
500 张照片
照片 POS
相机信息
处理
模板
通用
预处理（空三）
二维地图
三维网格
高斯泼溅
点云
数字高程模型（DEM）
等高线
点网格和 TIN
应用
开始重建
激活 Windows
转到"设置"以激活 Windows。
处理参数存为模板
设备性能
输出坐标系：任意坐标系
100 m
AT
2D
3D


格式与属性
文件格式
忽略文件前几行
0
小数分隔符
点 (.)
列分隔符
空格
连续分隔符号视为单个处理
数据属性
POS 数据坐标系统
任意坐标系
已知坐标系
姿态角
无
POS 数据精度
使用 Terra 默认精度
文件预览
添加文件
0_pano_000065.jpg 198953.441800000001 -1.293800000000 -0.004300000000 0.869900000000 0.524700000000 -0.76...
1_pano_000065.jpg 198953.441800000001 -1.293800000000 -0.004300000000 0.869900000000 0.167900000000 -0.33...
0_pano_000067.jpg 198954.109100000001 -1.839300000000 -0.013500000000 0.937900000000 -0.471900000000 0.71...
1_pano_000067.jpg 198954.109100000001 -1.839300000000 -0.013500000000 0.937900000000 -0.315900000000 0.40...
0_pano_000069.jpg 198954.776400000002 -2.363000000000 0.072900000000 0.938200000000 -0.366600000000 0.588...
1_pano_000069.jpg 198954.776400000002 -2.363000000000 0.072900000000 0.938200000000 -0.510100000000 0.508...
0_pano_000071.jpg 198955.443599999999 -2.683000000000 0.345900000000 0.958100000000 -0.402200000000 0.608...
1_pano_000071.jpg 198955.443599999999 -2.683000000000 0.345900000000 0.958100000000 -0.497100000000 0.470...
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Y/N
Z/U
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未定义
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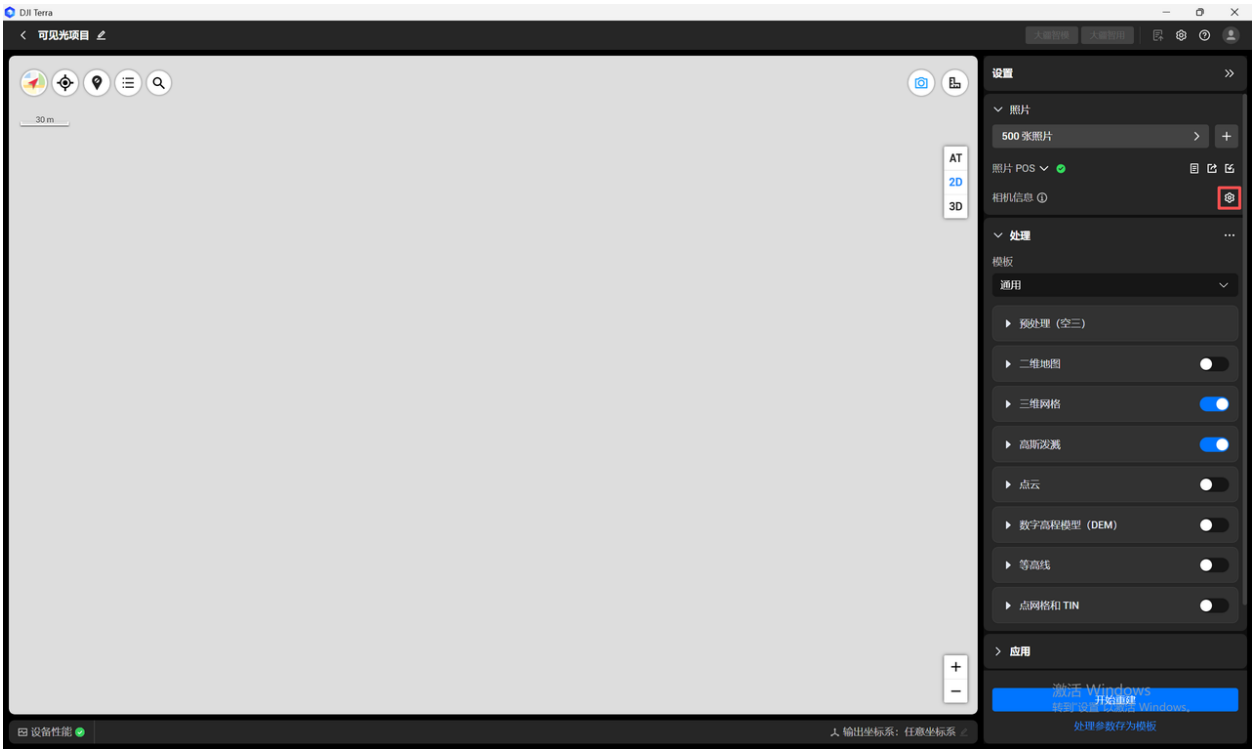
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照片 POS
相机信息
处理
模板
通用
预处理（空三）
二维地图
三维网格
高斯泼溅
点云
数字高程模型（DEM）
等高线
点网格和 TIN
应用
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设备性能
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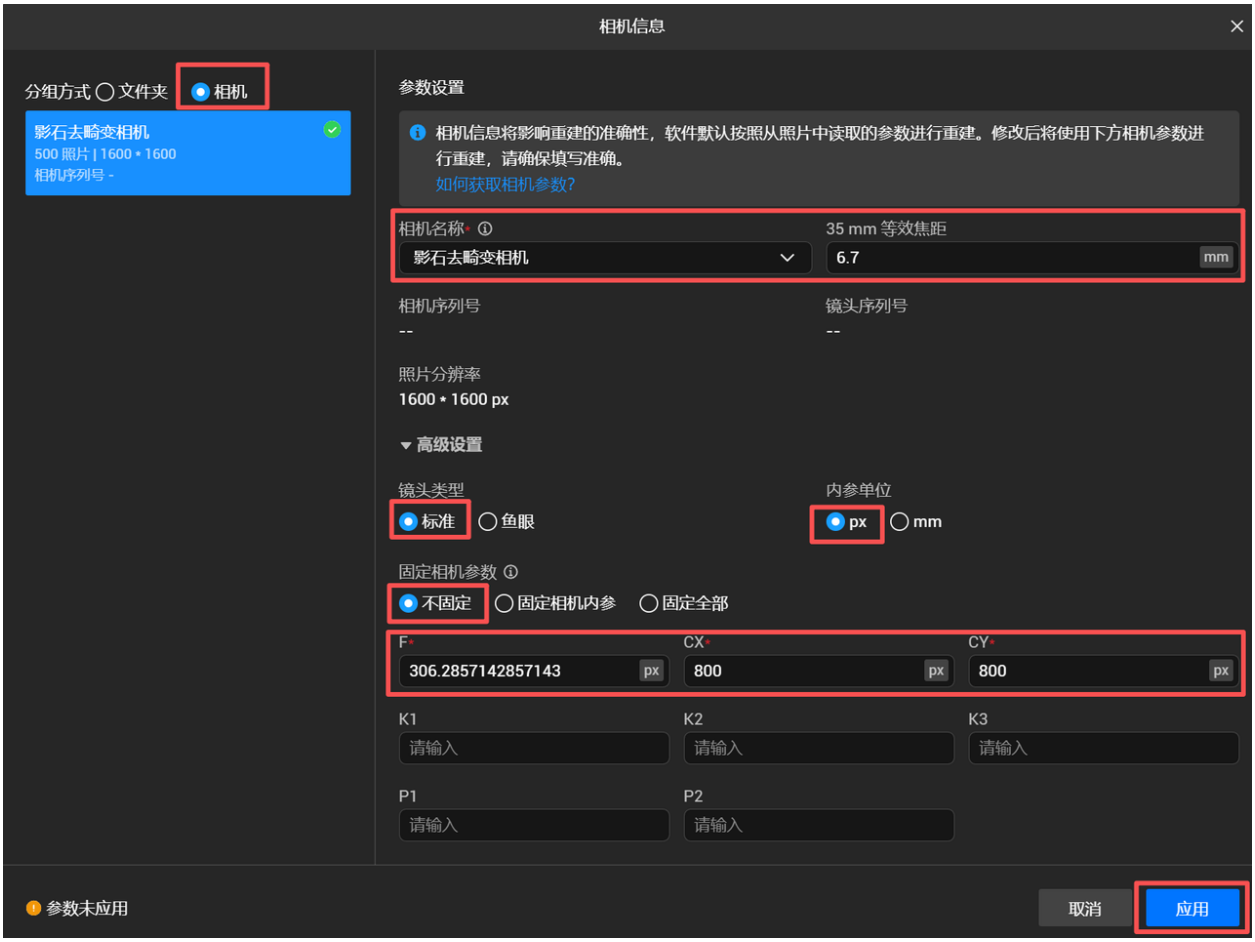
AT
2D
3D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如何获取相机参数?
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mm
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照片分辨率
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标准
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内参单位
px
mm
固定相机参数
不固定
固定相机内参
固定全部
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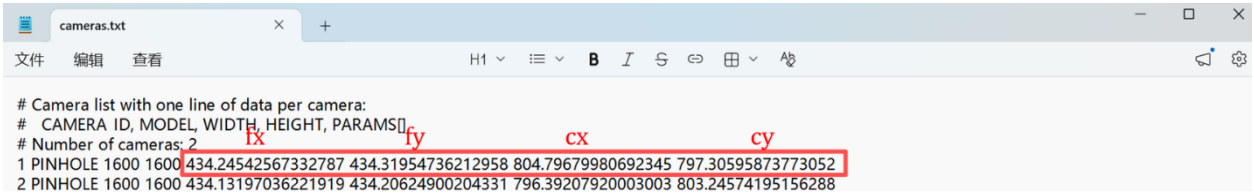
cameras.txt
文件 编辑 查看
Camera list with one line of data per camera:
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Number of cameras: 2
fx fy cx cy
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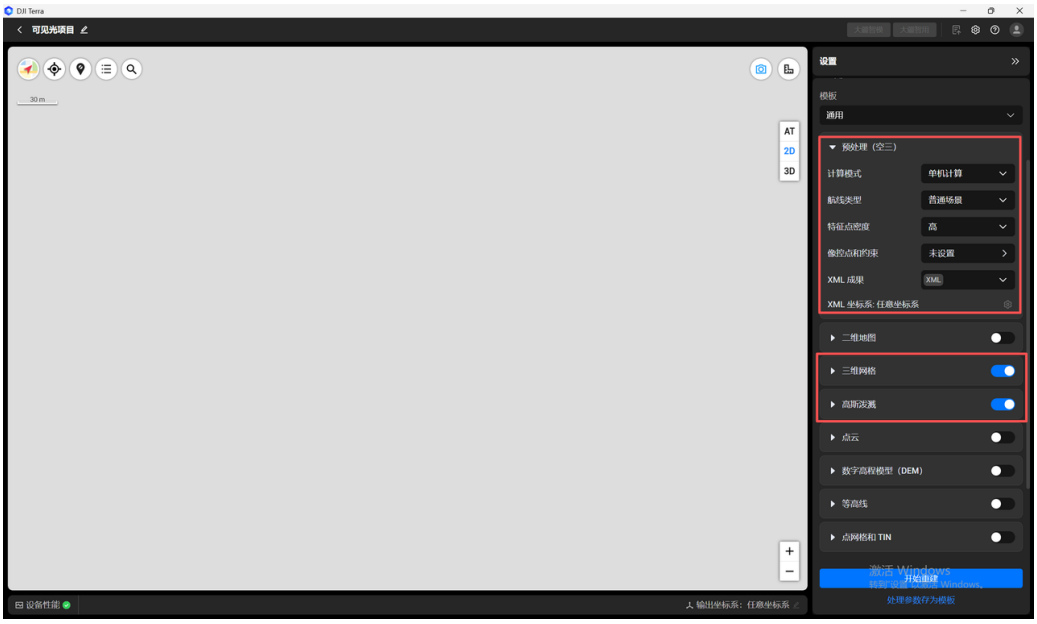
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特征点密度
高
像控点和约束
未设置
XML 成果
XML
XML 坐标系: 任意坐标系
二维地图
三维网格
高斯泼溅
点云
数字高程模型（DEM）
等高线
点网格和 TIN
开始重建
处理参数存为模板

12 Equipment Care, Charging, and Packing

This section consolidates Feima guidance for charging, battery care and storage, battery-status indicators, transportation, disposal, and packing Pocket 3D. Follow the safety notices at the beginning of this manual in addition to the procedures below.

12.1 Charging and Power

Pocket 3D charges through its USB-C port and requires a USB-C Power Delivery (USB-PD) charger that supports 20 V output.

Recommended: Use a reputable 30 W or higher USB-C PD fast charger with 20 V output capability.

Minimum requirement: The charger must support USB Power Delivery and provide a compatible 20 V charging mode. A typical phone charger that provides only 5 V USB output is not suitable.

Many modern chargers marketed as USB-C Fast Chargers or USB-C PD Chargers meet these requirements. Check the output specifications printed on the charger for 20 V support rather than relying only on the advertised wattage.

Use a good-quality USB-C cable rated for the charger's power output. Underrated cables can result in slow or unreliable charging and may generate excessive heat.

Pocket 3D is powered by the SP20 intelligent battery handle. Feima specifies an operating voltage of 7.2 V, approximately 180 minutes of continuous operation per battery under normal conditions, and at least 500 charge-discharge cycles under normal maintenance and use.

12.2 Charging Safety and Temperature

- After operation, if the battery is hot, allow the intelligent battery handle to cool to room temperature before charging.
- Feima specifies an ambient charging-temperature range of +5°C to +40°C (41°F to 104°F).
- Charge in an isolated area away from flammable materials.
- Do not open or disassemble the charger.
- Do not use inferior, unidentified, damaged, or parameter-mismatched charging equipment.

12.3 Routine Battery Maintenance and Storage

- Recharge the battery promptly after operation. Do not leave the battery at a low state of charge for an extended period.
- For long-term storage, charge the battery to more than 50% and perform charge-discharge maintenance approximately every three months.
- Store the battery out of reach of children and pets.
- Store in a cool, dry location protected from direct sunlight and heat sources. Feima identifies 22°C to 28°C (72°F to 82°F) as the ideal storage range and states that the battery should never be stored above +45°C (113°F).
- Avoid storage environments that repeatedly alternate between high and low temperatures.
- Do not store a fully charged battery in a shipping container when the battery temperature exceeds +45°C (113°F).
- Do not store the battery for an extended period after it has been fully discharged. Long-term low-charge storage can cause over-discharge and may result in battery failure.

- Keep sharp objects away from the battery. Do not puncture, drop, or subject the battery to impacts.

The Feima source additionally states that batteries should be stored in an explosion-proof box in a cool, dry location. This requirement is reproduced here from the source guidance.

12.4 Battery Status LEDs

The intelligent battery handle uses four LEDs to indicate charging progress, remaining charge, and protection/fault conditions.

12.4.1 Charging Display

Battery level	LED1	LED2	LED3	LED4
0-24%	LED1->LED4 marquee	LED1->LED4 marquee	LED1->LED4 marquee	LED1->LED4 marquee
25-49%	Steady on	Steady on	LED2->LED4 marquee	LED2->LED4 marquee
50-74%	Steady on	Steady on	LED3->LED4 marquee	LED3->LED4 marquee
75-99%	Steady on	Steady on	Steady on	Blink 1 Hz
100%	Steady on	Steady on	Steady on	Steady on

12.4.2 Battery-Level Display During Discharge / Query

Battery level	LED1	LED2	LED3	LED4
0-12%	Flash 1 Hz	Off	Off	Off
13-24%	On	Off	Off	Off
25-37%	On	Flash 1 Hz	Off	Off
38-49%	On	On	Off	Off
50-62%	On	On	Flash 1 Hz	Off
63-74%	On	On	On	Off
75-87%	On	On	On	Flash 1 Hz
88-100%	On	On	On	On

When battery level is queried by pressing the battery button, Feima states that the LEDs illuminate for six seconds. The first three seconds display battery level. During the next three seconds, a normal battery continues to display the battery level; if a protection condition is present, the LEDs display the applicable protection status.

12.4.3 Battery Protection / Fault Display

Condition	LED1	LED2	LED3	LED4
Discharge - undervoltage	Flash 5 Hz	Flicker 1 Hz	Off	Off
Discharge - low temperature	Flash 5 Hz	Off	Flicker 1 Hz	Off
Discharge - over-temperature	Flash 5 Hz	Off	Off	Flicker 1 Hz
Discharge - overcurrent	Flash 5 Hz	Flicker 1 Hz	Flicker 1 Hz	Off
Discharge - short circuit	Flash 5 Hz	Flicker 1 Hz	Flicker 1 Hz	Flicker 1 Hz
Charging - overvoltage	Flicker 1 Hz	Off	Off	Flash 5 Hz
Charging - low temperature	Off	Flicker 1 Hz	Off	Flash 5 Hz
Charging - over-temperature	Off	Off	Flicker 1 Hz	Flash 5 Hz
Charging - overcurrent	Flicker 1 Hz	Flicker 1 Hz	Off	Flash 5 Hz

12.5 Transportation

During transportation, place batteries in secure protective packaging to prevent contact with liquids and collision with hard objects. Do not immerse the battery in water or allow it to become wet. The Feima source warns that water entering the battery can cause a decomposition reaction that may lead to spontaneous combustion or explosion.

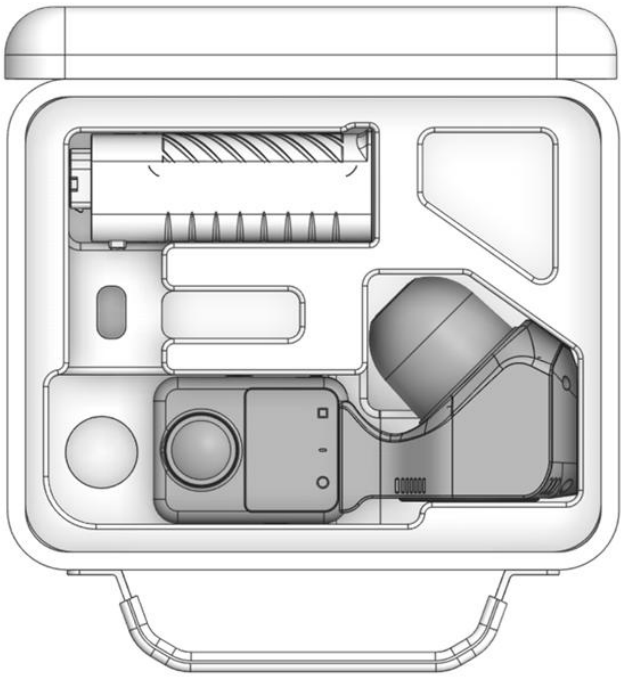
12.6 Battery Disposal

- Do not disassemble, impact, squeeze, puncture, or throw the battery into fire, and do not place it in a high-temperature environment.
- Do not continue using a battery that is swollen, leaking, or has a damaged outer casing. Dispose of it appropriately.
- Follow applicable local laws and regulations for lithium-battery recycling and disposal. Do not discard the battery in ordinary trash.

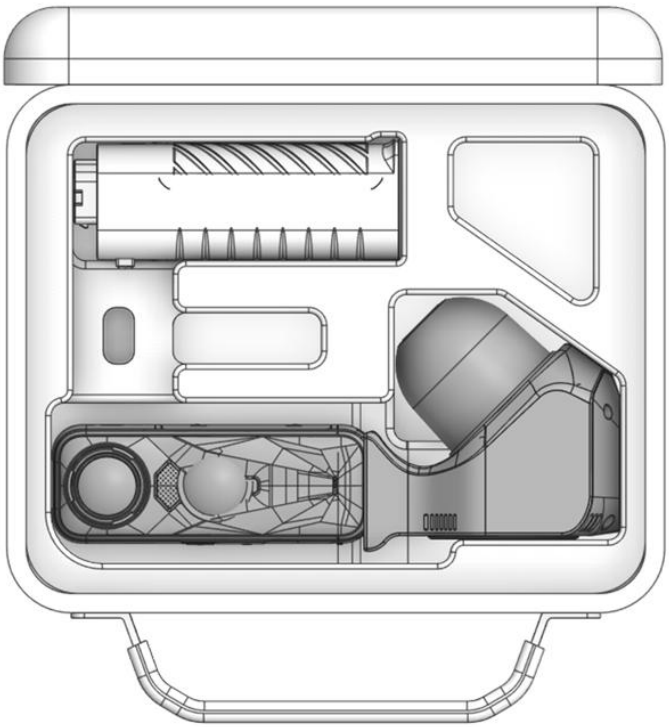
The Feima source instructs users to completely discharge the battery before placing it in a designated battery-recycling bin and, if the battery cannot be fully discharged, to contact a professional battery-recycling company rather than placing it directly in the recycling bin. Local battery-handling requirements may differ; follow applicable local requirements.

12.7 Packing Pocket 3D

The supplied soft case is designed to accommodate Pocket 3D with a supported panoramic camera installed. This allows the scanner to be stored and transported without removing the camera, helping preserve the calibrated relationship between the camera and scanner.



Pocket 3D packed with DJI Osmo 360 camera attached.



Pocket 3D packed with Insta360 camera attached.

12.8 GCP Base Packing

Store the GCP base in the designated compartment in the soft-case lid.

12.9 Shutdown Before Handling

Always shut Pocket 3D down using the power button. Wait until the system/status indicator is completely off before removing the intelligent battery handle, disconnecting external power, inserting or removing the TF/microSD card, or performing card-based data-copy operations.

13 Troubleshooting and Reference

13.1 System/Status Indicator

Indicator	Meaning
Off	Shutdown
Steady red	Powering on
Flashing red	Startup/shutdown process
Steady green	Standby
Fast-flashing green	Initialization
Slow-flashing green	Scanning/acquisition
Flashing yellow	Abnormal condition
Flashing white	System upgrade

13.2 Common Field Problems

Problem	Likely field cause	Corrective practice
Blurred/unclear detail	Movement too fast or abrupt	Reduce speed and keep motion smooth.
Texture discontinuity	Abrupt turns or environmental transition	Change orientation progressively.
SLAM drift / layered point cloud	Weak geometry, long route, poor loop closure	Use blocks, overlap, and shorter loops.
Missing ground appearance	Camera/device occlusion	Plan supplementary lateral coverage.
Poor fine detail	Insufficient proximity or viewpoints	Use slower close multi-view coverage.
Excessive 3DGS processing time	Large or redundant image set	Use logical datasets and dense capture selectively.
Color mapping ghosting	Calibration failure or camera moved	Recalibrate and keep the camera rigidly mounted.

14 Appendix A - Field Quick Reference

Task	Method	Metric / Approx. U.S.	Purpose
Alignment motion	Tilt left/right	45°, 2-3 sec	Camera/IMU time alignment
Starting sweep	Broad body turn / small circle	360°, ~5 sec	Cover starting area and rear blind zone
Close-range block	Overall first, then detail	≤20 m x 20 m / ≤65 ft x 65 ft	Control close-range work
Overall route	S-shaped / serpentine	0.5-1 m/s / 1.5-3 ft/s	Broad scene coverage
Pass spacing	Adjacent route legs	≤5 m / ≤16 ft	Improve visual/ground coverage
Detail	Slow multi-view	≤0.3 m/s; ≥0.3 m / ≤1 ft/s; ≥1 ft	Preserve detail
Corridor	Side orientation	Slow/stable	Improve useful scene geometry
Loop control	Close within blocks	≤200 m / ≤650 ft	Limit accumulated error