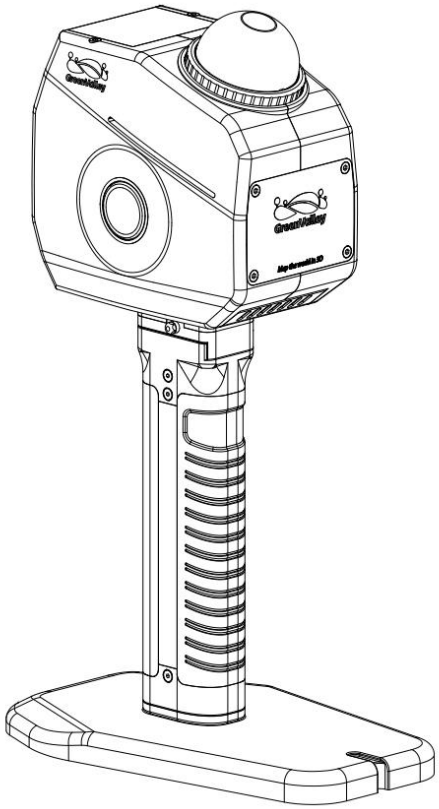
LiGrip SE Product User Manual



Preface

Purpose of the User Manual

This user manual describes the operation processes of the LiGrip SE, including assembly, data collection, processing, etc.

Scope of Application

Applicable to the LiGrip SE product.

Safety Technical Notices

Precautions: Please carefully read the areas where you need to pay attention during the operation. Failure to follow the instructions may result in device damage, data loss, incorrect data, system crashes and so on.

Disclaimer

Before operating the device, please make sure to carefully read this user manual, as it will help you use this product better. Our company is not responsible for any losses caused by operating this product without following the instructions in the manual or by misinterpreting the requirements of the user manual. Our company is committed to continuously improving product functions and performance, enhancing service quality, and reserves the right to change the content of the user manual without prior notice.

We have checked the consistency between the content described in the printed materials and the hardware and software, but deviations may still exist. The images in the manual are for reference only. If there are discrepancies with the actual product, please refer to the actual product.

Your Suggestions

Should you have any suggestions or comments regarding this manual, please contact us. Your feedback will significantly help improve the quality of our documentation.

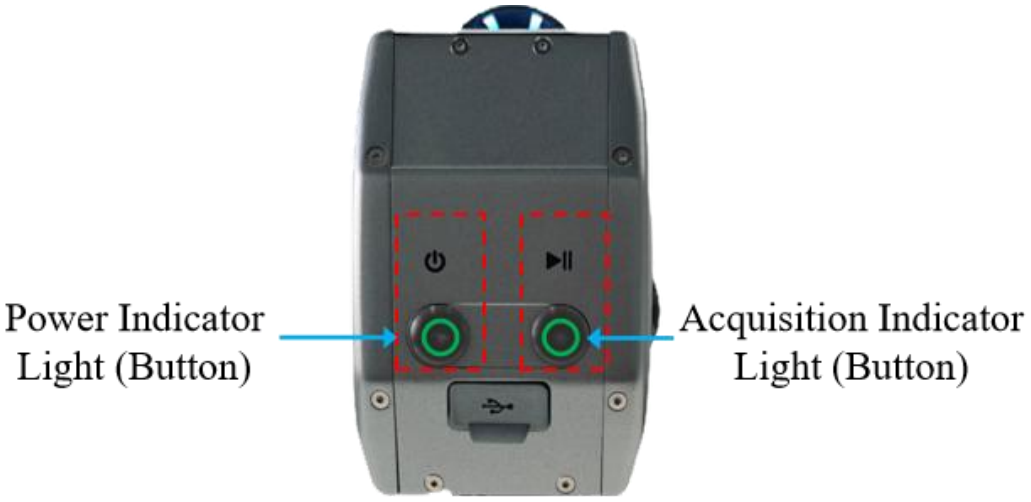
1. Product Structure

1. 1. Structural Diagram

1. 2. Packing List

 LiGrip SE Main Unit	 Smart Battery	 Base stand
 Charger (including power cord and adapter)	 USB Drive	 Protective Cover
 Mobile Phone Holder and Screws	 Packaging Box	 Data Cable

1. 3. Device Indicator Light Description



Power Indicator Light:	
Power Indicator Light (Button)	Used to control device power on/off and indicate power status
Off	The device is not powered
Green Fast Flash	Device is powering on or off
Solid Green	Device is powered on

collection Indicator Light:	
collection Indicator Light (Button)	Used to control collection and indicate device activation and collection status.
Off	Device is not powered
Solid Red	Device not activated; memory below 5%.
Solid Green	Device ready.
Green Fast Flash	Initializing or in GCP collection.
Green - Slow Flash	Collecting data

2. Control Software Download and Login

2. 1. Software Download

APP Requirements for Phone/Tablet:

Android Version: System version 8.0 or above; memory greater than 6GB.

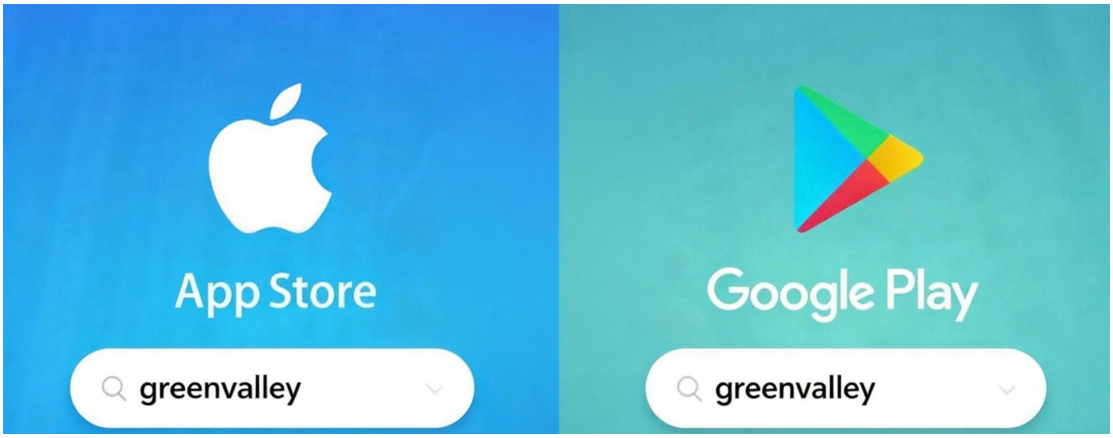
Apple Version: System version iOS 12 or above; processor A10 or above.

Please ensure the APP is up to date before collection; online upgrades can be performed via the "Version Upgrade" function.

Device registration, project management, coordinate system settings, RTK settings, and real-time point cloud browsing must be done through the GreenValley APP.

For iOS users, you can download it from the App Store.

For Android users, you can download it from Google Play.

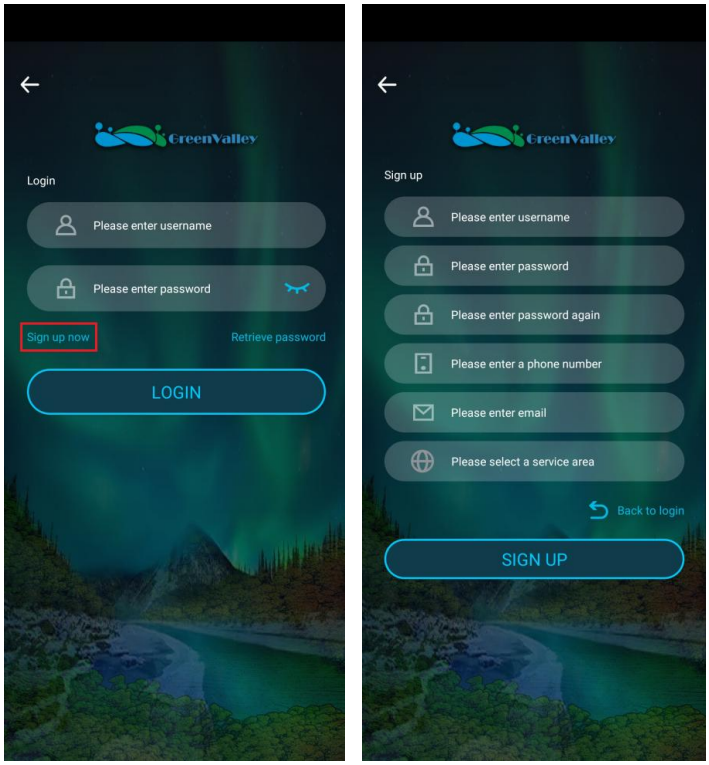


2. 2. Registration and Login

Register and activate using your email.

When logging into the APP for the first time, click 'Sign up now' on the login screen and enter basic information such as email, username, and password to complete registration.

Please ensure your email address is entered correctly. If you forget your password, it can be recovered via email.



3. Device Installation and Disassembly

3. 1. Installation

After unpacking the device, take out the main device, battery, and base stand. Proceed with installation as follows:

<table>
<tr>
<td> 

① Open the locking handle.</td>
<td> 

② Align the battery with the slot on the bottom of the device and slide it in.</td>
</tr>
<tr>
<td> 

③ Close the locking handle.</td>
<td> 
④ Align the base stand with the positioning hole at the bottom of the battery and secure by tightening.</td>
</tr>
</table>

3. 2. Disassembly

The antenna does not require disassembly. Please refer to the following steps for disassembly:

		
① Open the locking handle.	② Press the anti-drop button and slide out the battery	③ Loosen the base stand screws and remove the battery

4. Device Power On/Off

4. 1. Power On

Press and hold the power key until the power button flashes, then release. The device will power on automatically. When the power indicator and collection indicator lights remain solid green, startup is complete.

Press and hold the power key

Green light flashing

Power indicator and collection indicator lights steady on

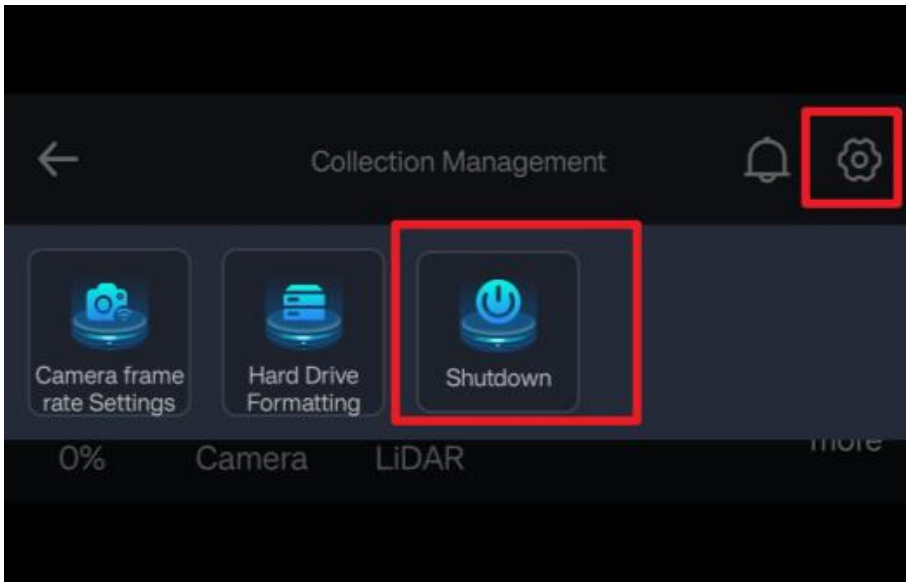
When the device is not activated or available memory is below 5%, the collection indicator light remains solid red

4. 2. Power Off

There are two methods to power off the device:

Method 1: Press and hold the power button until the indicator light flashes fast and then automatically turns off, indicating the device is powered off.

Method 2: After connecting the device to the APP, open the settings menu at the top right corner, select Shutdown, and wait for the indicator light to turn off automatically, indicating the device is powered off.



5. Device Connection

The device supports two connection modes: (1) device Wi-Fi connection; (2) Mobile Hotspot connection.

5. 1. Device Wi-Fi Connection

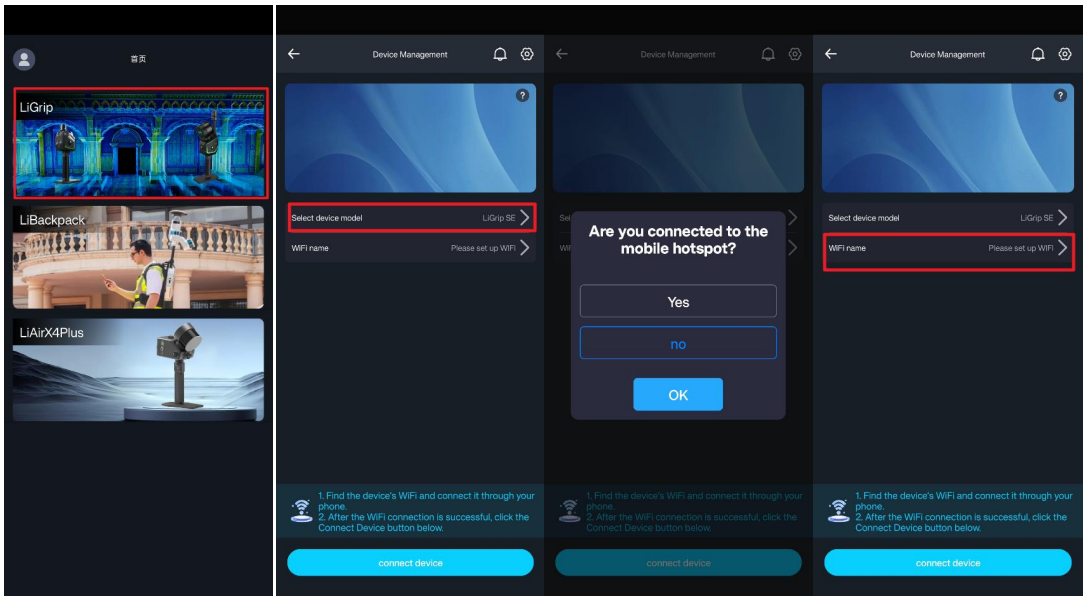
① Power on the device normally, open the GreenValley APP, and select LiGrip on the homepage;

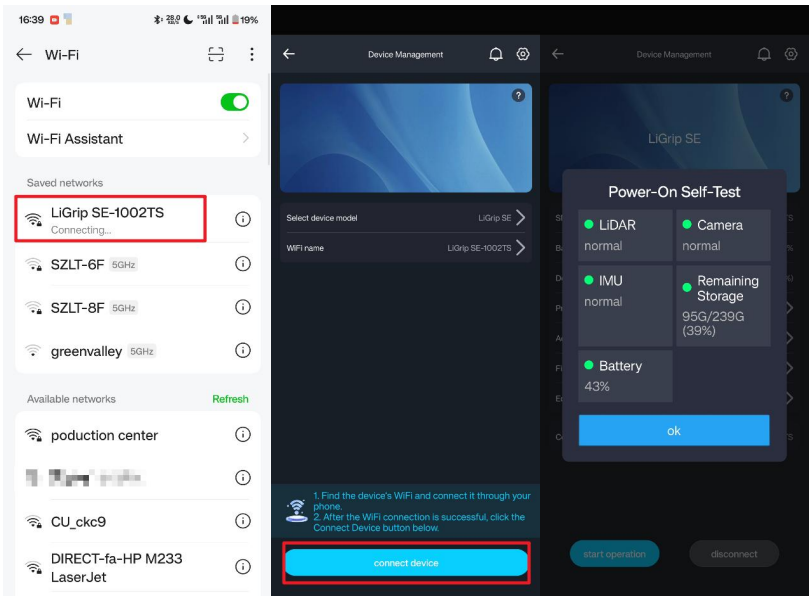
② Select the device model as LiGrip SE;

③ When prompted whether to connect to the mobile hotspot, select No;

④ Connect to the device's Wi-Fi; the device's Wi-Fi name is LiGrip SE-**** (last four digits of the SN), and the password is: greenvalley

⑤ After connecting to Wi-Fi, return to the APP and select Connect Device.





5. 2. Mobile Hotspot Connection

① Power on the device normally, open the GreenValley APP, and select LiGrip on the homepage;

② Select the device model as LiGrip SE;

③ When prompted to connect to the mobile hotspot, select Yes.

④ Connect to the device's Wi-Fi; the device's Wi-Fi name is LiGrip SE-**** (last four digits of the SN), and the password is: greenvalley

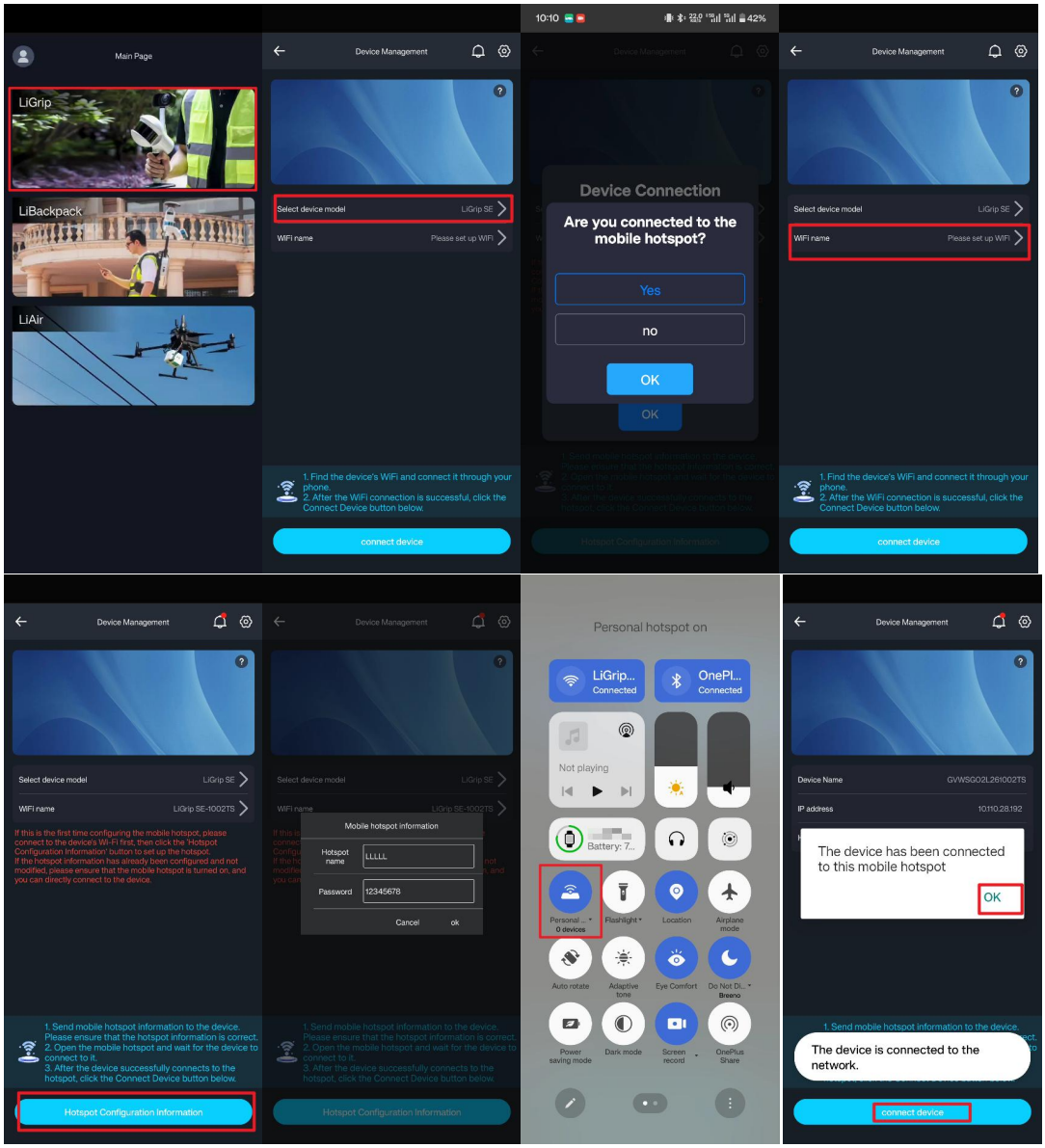
⑤ After connecting to Wi-Fi, return to the APP, configure, and send the mobile hotspot information to the device.

⑥ Turn on the mobile hotspot and wait for the device to connect automatically.

⑦ Once the hotspot connection is successful, select Connect Device to complete the connection.

If prompted to disable the phone's mobile network, please follow the instructions; after the device connects successfully, you may reactivate the mobile network.

Hotspot configuration is only required during the initial AP hotspot connection. Subsequently, if the hotspot or phone remains unchanged, there is no need to reconfigure. Once the mobile hotspot is enabled, the APP will automatically connect to the Device.



Connection FAQs:

1. Device Wi-Fi does not appear:

① Device connected to another mobile phone: Please verify whether nearby phones have their hotspots enabled and are connected to the Device. If so, disable the hotspot on that phone and restart the device to reconnect.

② Device accidentally connected to a public network: After powering on the device, press the power button three times to clear its connection history and reset the device's Wi-Fi.

2. Mobile phone cannot connect to the mobile hotspot:

① Please verify that the hotspot name and password are correctly configured;

② After correct configuration and successful transmission, for some iOS systems, once the hotspot is enabled on the mobile phone hotspot screen, wait for the hotspot to connect successfully before exiting the hotspot interface and returning to the GreenValley APP;

③ For iOS systems, please enable the hotspot's "Maximize Compatibility" option.

3. The device can successfully connect to the Mobile Hotspot, but the mobile phone fails to connect to the device:

① Wait a few seconds, then click to connect to the device again;

② Return to the previous menu or exit the app and reconnect (no need to configure the hotspot again).

4、How to connect the device if the mobile phone or tablet has no 4G signal?

Some mobile phones or tablets cannot emit a hotspot without a 4G signal. In this case, relay mode can be used to establish a connection.

Relay mode refers to using an intermediate Wi-Fi device (usually a Portable Wi-Fi) as a bridge, with both the mobile phone and device connecting to this intermediate Wi-Fi, thereby allowing control of the device. Please follow the steps below to connect.

① Turn on the Portable Wi-Fi and configure the hotspot settings. It is recommended to use a simple name and password for ease of entry;

② Power on the device and, once boot-up is complete, launch the app;

③ Connect to the device's Wi-Fi and transmit the Portable Wi-Fi hotspot credentials to the device;

④ After successful transmission, close the app;

⑤ Connect your phone to the Portable Wi-Fi and open the app; the app will indicate the connected hotspot;

⑥ Connection is established; you can now control the device via the relay Wi-Fi.

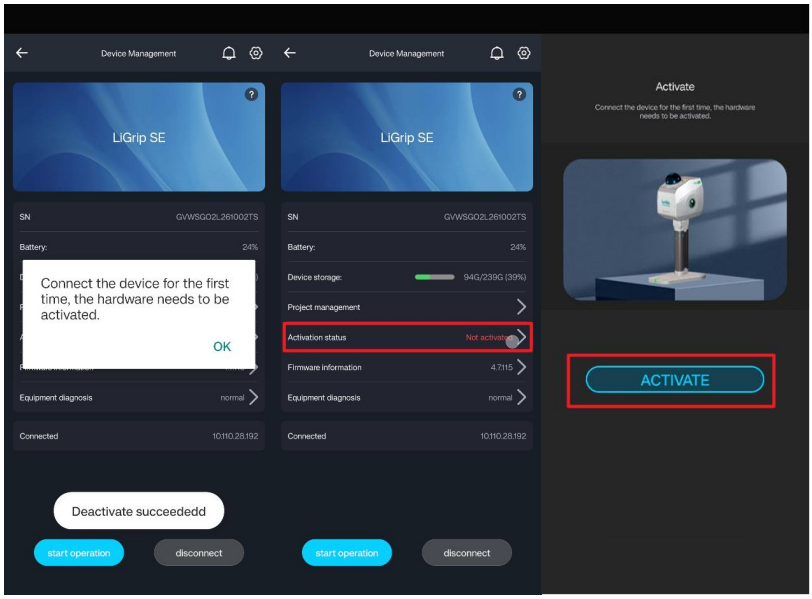
The following smartphones have been successfully tested for normal operation:

Brand	Model	Operating System	Processor	Memory (RAM)
Xiaomi	Redmi K70	Xiaomi SurgeOS 1.0.9	Snapdragon 8 Gen 2	16GB
Huawei	Mate 60pro	HarmonyOS 4.2.0	Kirin 9000S	12GB
Samsung	Galaxy A54	Android13	Samsung Exynos 1380	8GB
OPPO	OnePlus 12	ColorOS15	Snapdragon 8 Gen 3	16GB
Vivo	iQOO Neo5 SE	OriginsOS 4	Qualcomm Snapdragon 870	8GB
Apple	iPhone 13	iOS 18.4	Apple A15 Bionic	4GB

6. Activate Device

When connecting the device for the first time, the activation status bar will display 'Not Activated.' If connecting the device using a Mobile Phone AP Hotspot, you can directly tap the activation status to activate. Once the app displays the activation window, tap activate and wait for successful activation.

Ensure the device can access the internet via external WLAN through the mobile network during activation.



7. Collection Procedure

Please remove the LiDAR protective cover before starting collection.

The LiGrip SE supports two collection modes: collection via the app and collection using the device buttons.

Button-based collection enables operation without a mobile phone, providing greater freedom. App-based collection displays real-time pointclouds and device status, allowing for project management, pointcloud zooming, and other interactive functions.

7. 1. Using the app for collection

（1）Initialization position selection

The placement of the device before data collection, i.e., the selection of the initialization position, must meet the conditions for the initialization program to run, which is a prerequisite for obtaining better data.

① Place the device on stable ground or a platform;

② **Keep the device stationary during initialization;**

③ Ensure there is no significant electromagnetic interference nearby;

④ Do not perform initialization facing moving objects, such as areas with heavy pedestrian

or vehicular traffic;

⑤ If the collection scene is a cave, orient the device toward the cave's forward direction during initialization;

⑥ Please do not perform initialization in vacant areas such as squares, playgrounds, or similar locations.

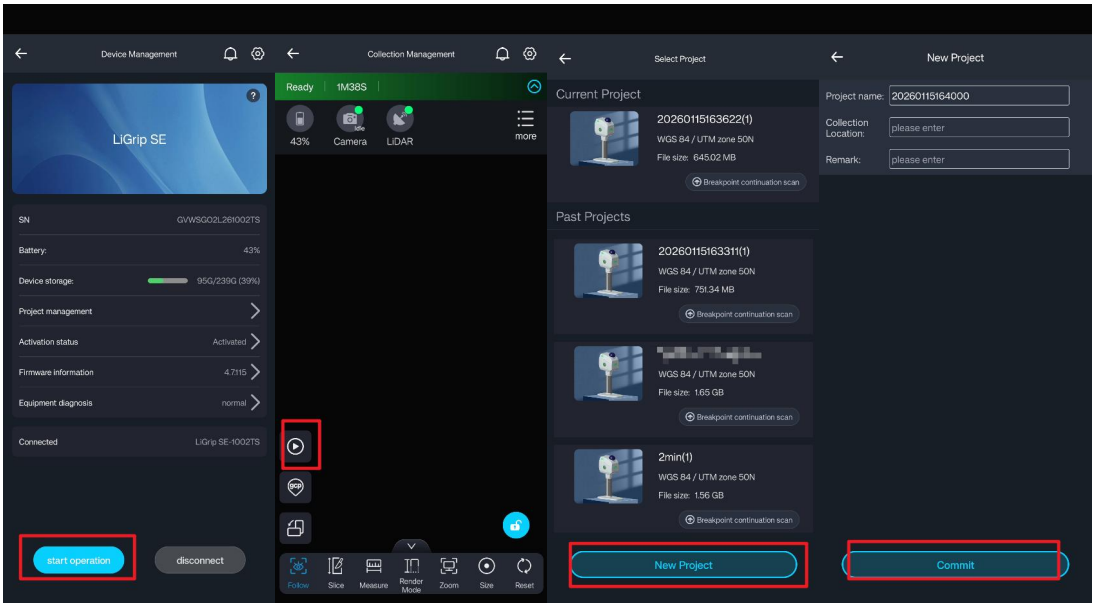
（2）New collection

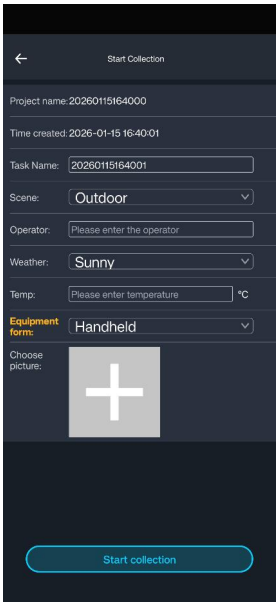
After connecting the device via the APP, click Start Operation to enter the control collection interface, then press the collection button. You may select an existing Historical Project from the screen or choose to create a New Project.

① If you choose New Project, complete the Project Name, collection Location, and set parameters such as the coordinate system. Then select the newly created Project and initiate a New collection task.

② If you choose a Historical Project, you can use an existing Project and subsequently create a new collection task.

All tasks are saved under the chosen Project; therefore, please ensure the correct Project is selected.





collection task information may include Task Name, Scene, Operator, Weather, Temperature, Device form factor, Real-time Pointcloud, On-site photos, and other relevant data.

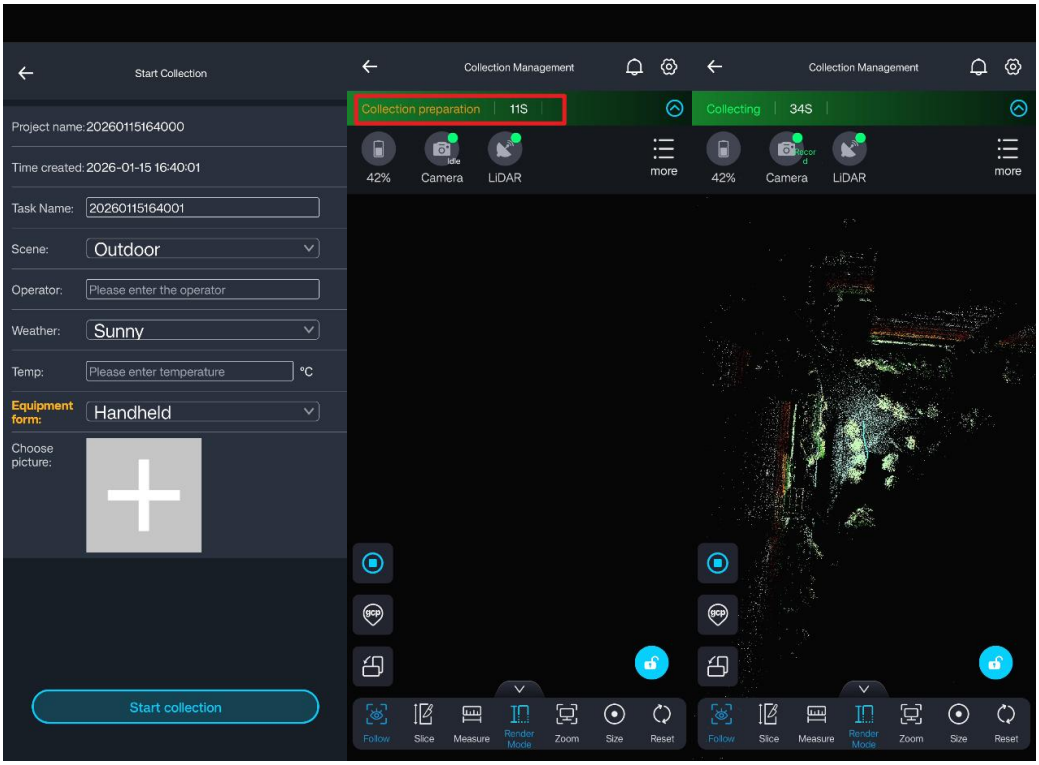
（1） Project Name: Displays the project associated with the current collection task.
（2） Creation Time: Displays the creation time of the current project.
（3） Task Name: The system automatically generates a default task name. Users may modify the name of the current collection task. The task name must not contain spaces.
（4） Scene: Select the collection environment of the current scene, including: Outdoor, Indoor, or Outdoor + Indoor.
（5） Operator (Optional): Records the current operator.
（6） Weather (Optional): Records the current weather conditions during the operation.
（7） Temperature (Optional): Records the current temperature during the operation.
（8） Device Form Factor: Select the device's operating mode. The device supports two modes: LiGrip handheld and pole-mounted.
（9） Select Picture (Optional): Capture an image of the current collection environment to document the scene.

Except for the Task Name, which is mandatory, all other options are optional. The device form factor and parameters vary by device. The LiGrip SE supports both LiGrip and Telescopic Rod modes. When used with a telescopic rod, please select Telescopic Rod mode; otherwise, use LiGrip mode.

（3）Initialization

After clicking 'Start collection' in the previous step, the device enters initialization. The app provides a voice prompt, and the collection indicator light flashes rapidly.

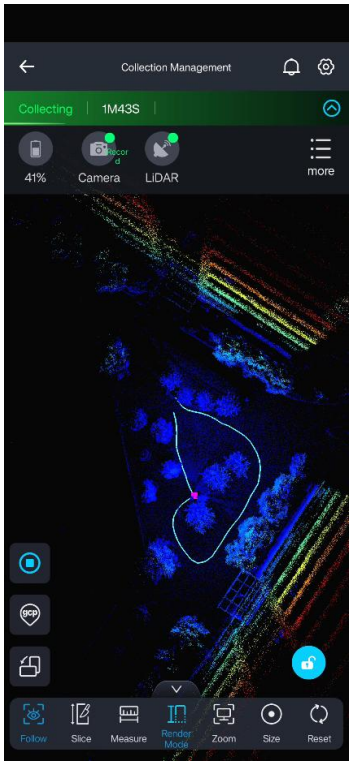
Wait for the app device status to change from 'Preparing for collection' to 'Acquiring'. When the app voice prompt states 'The device is acquiring' (the indicator light flashes slowly), initialization is complete.



The device must remain stationary during initialization.

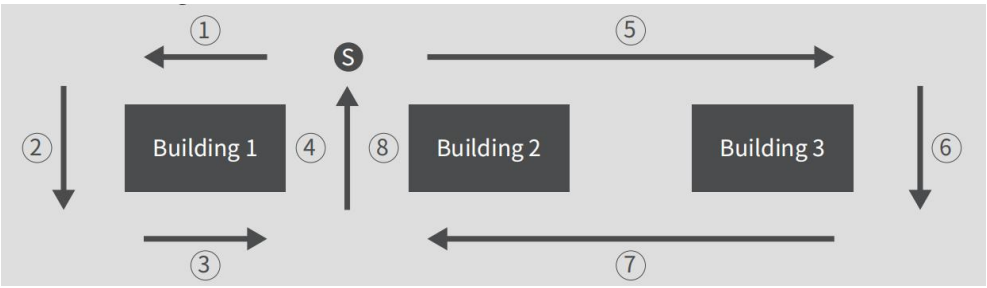
（4）Start collection

After initialization is complete, you may slowly lift the device and proceed with collection along the pre-planned route.



During collection, it is recommended to follow the close-loop rule. The route can be planned

according to the principles below:



As illustrated in the figure above, begin at point S, then perform close-loop operations as extensively as possible (the numbered points should be followed sequentially), and finally return to the starting point (repeating the path for 5 – 10 meters).

（5）GCP Collection (Optional Operation)

This option can be selected when introducing absolute coordinates into the data via control points or when eliminating cumulative errors.

During mobile collection, slowly squat down and align the GCP pointer with the position to be marked.

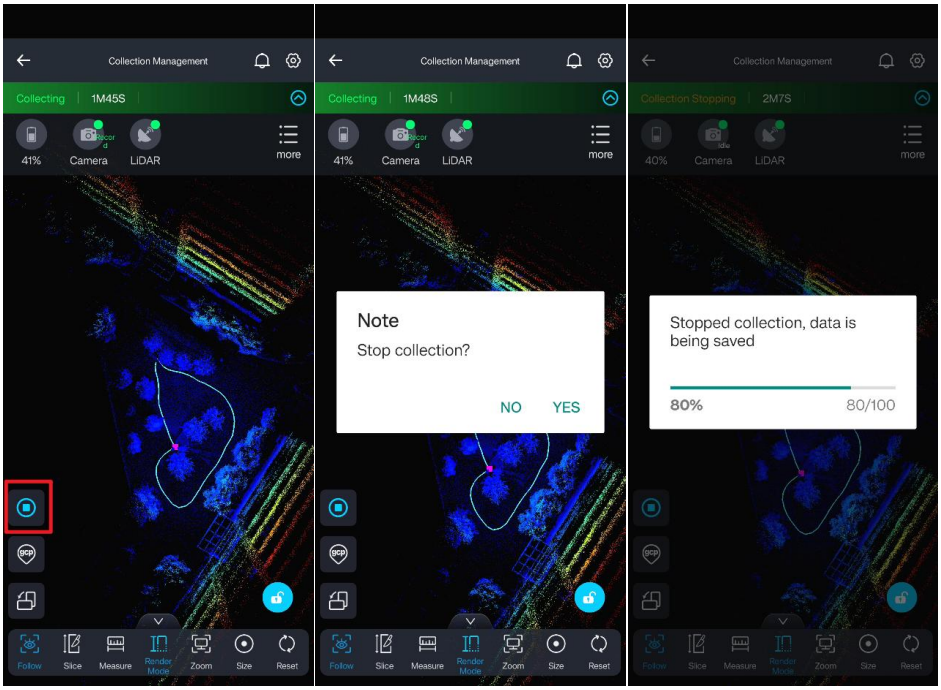
Note: Please keep the device stationary during GCP Collection and ensure that no personnel gather nearby to avoid compromising the accuracy of the data.

Tap the GCP Collection button on the app screen to mark the position of the GCP pointer. The default name is LiGrip *, which can be changed manually. The collection indicator light flashing fast indicates that collection is in progress. When the app indicates that GCP Collection is complete, or the status indicator light changes to slow flash, this signifies the end of collection, and you may continue collection.

（6）End collection

Tap the Stop collection button to confirm the end of collection. The device does not need to remain stationary during saving. Wait for the progress bar to complete, indicating the process has

finished. You may then proceed with a new collection or power off the device. During saving, the collection indicator light flashes fast. After saving is complete, the indicator light remains steadily lit.



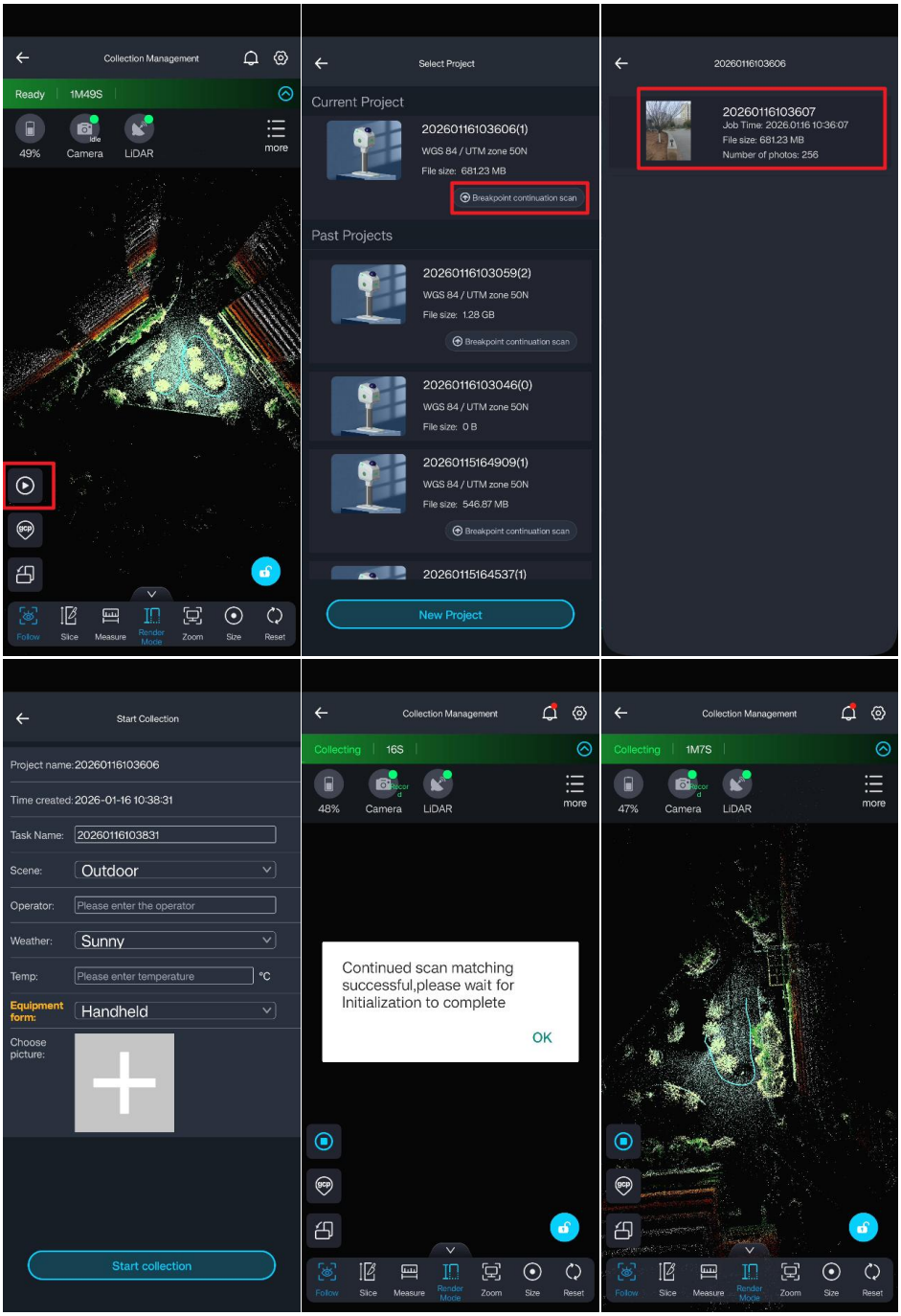
7. 1. 2. Other collection functions

（1）Breakpoint continuation scan (optional operation)

Breakpoint continuation scanning enables maintaining spatial continuity between pointcloud data from different scan sessions.

During breakpoint continuation scanning, the start point of the subsequent station should ideally be the end point of the previous station. Some deviation is permitted; however, the distance between these points must not exceed 2 meters, and the device's orientation difference must not exceed 15 degrees.

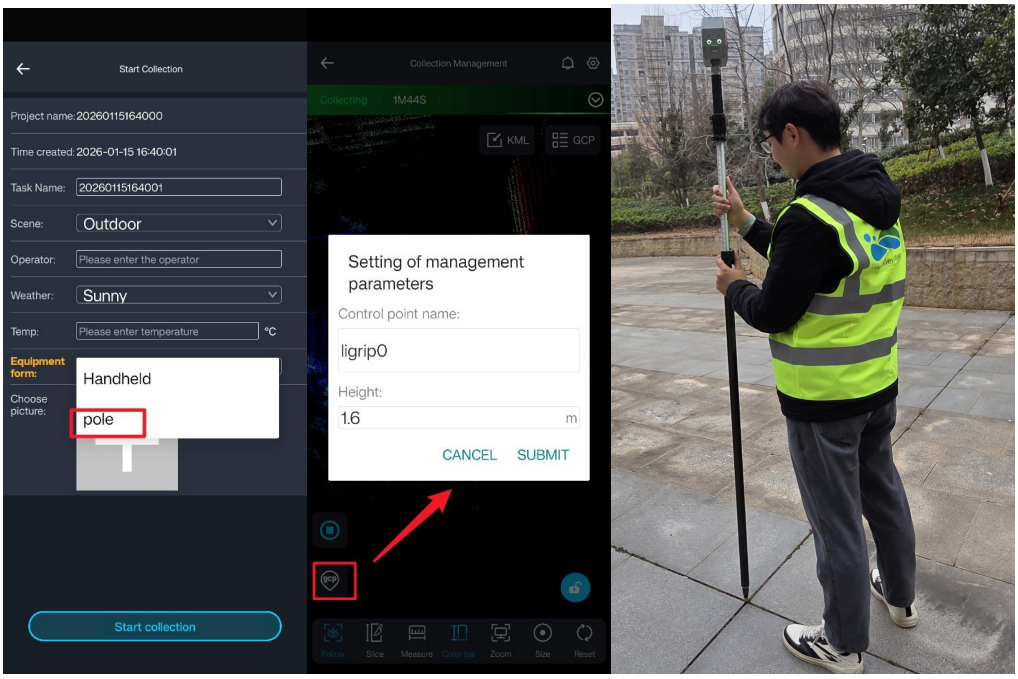
After completing the initial station collection normally, click to start collection again. In Historical Projects, select a project supporting breakpoint continuation scan, click Breakpoint Continuation Scan, and choose the task to continue scanning, thereby creating a continuation scan project. The device will then enter the continuation scan initialization phase. When the APP displays '**Breakpoint continuation match successful** ' and the status bar changes to 'Acquiring', normal collection may proceed.



（2）Telescopic Rod collection

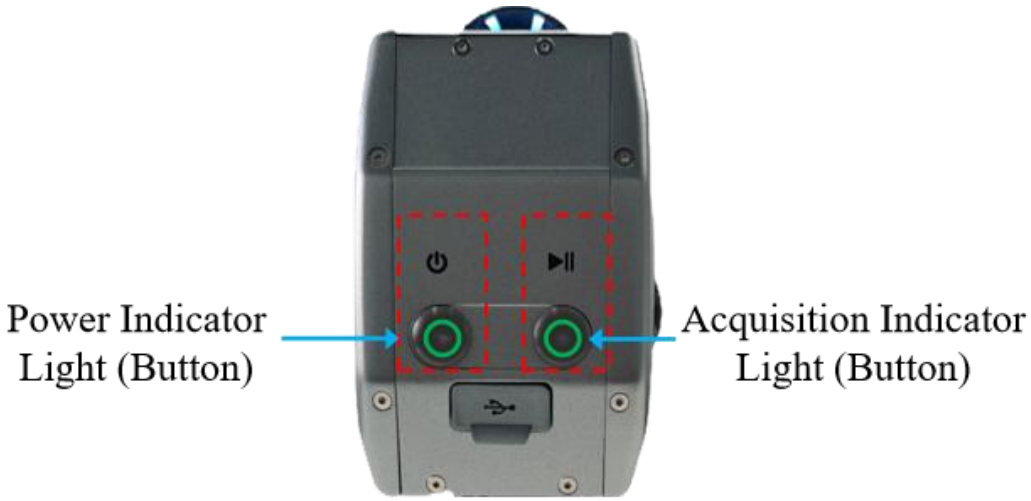
When used with the telescopic rod for collection, the rod can be extended to perform inclined or varied-height GCP collection.

During initialization and GCP collection, keep the device stationary and wait until initialization or GCP collection is complete before moving during collection.



7. 2. collection Using the Button

When acquiring data using the button, as there are no APP prompts or status displays, it is necessary to carefully observe the device's status indicator lights. Select a flat location, face the device toward terrain rich in feature points, place the device steadily, and press and hold the power button to turn it on.



(1) When powered on, after stabilizing the device, press and hold the collection button until a fast flash occurs, then release. The device will automatically create a collection task based on the system time.

(2) The collection indicator light flashes rapidly, indicating the device is initializing. Please do not move the device during initialization and wait until the collection indicator light transitions from rapid to slow flashing.

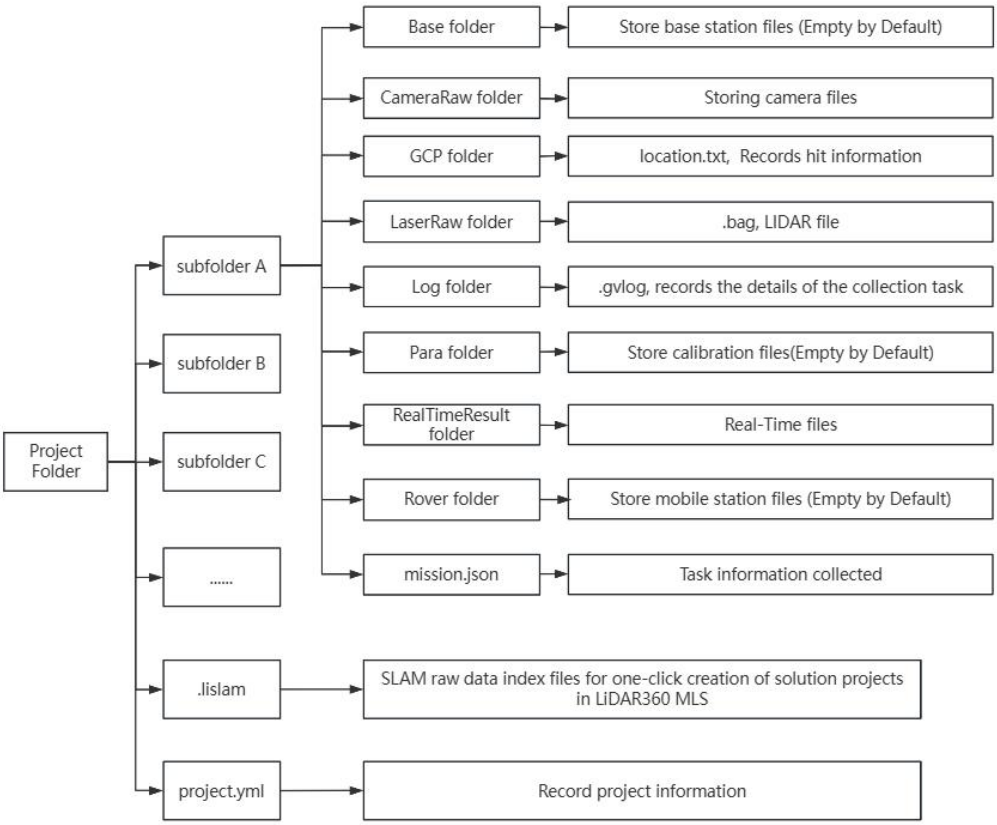
(3) When the collection indicator light flashes slowly, the device can be picked up and mobile collection may proceed.

(4) If GCP Collection is required, press the collection button once. The device status light will switch to **fast flash**. When the status light changes to **slow flash**, the GCP Collection is complete, and collection may continue.

(5) To end collection, press and hold the collection button until the light flashes rapidly, then release. collection will then enter the termination phase.

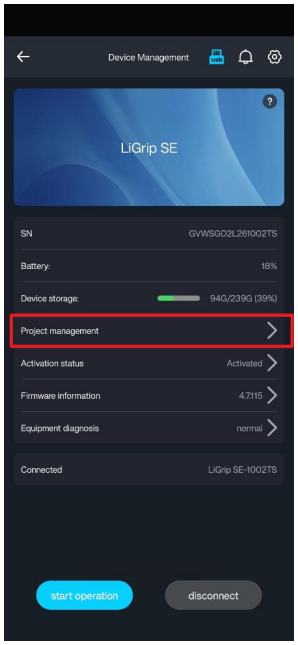
8. Project Management

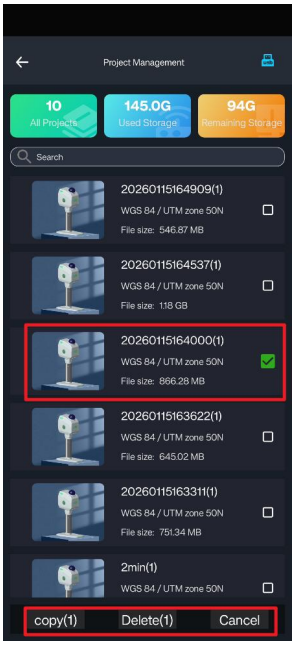
The project folder contains multiple subfolders of acquired tasks, as well as the project.json and .lislam files; The task folder contains the Base folder, CameraRaw folder (storing .bin camera files), RealTimeResult folder, and other folders, as well as files such as mission.json and .filesize. Refer to the diagram below for the detailed folder structure and descriptions.



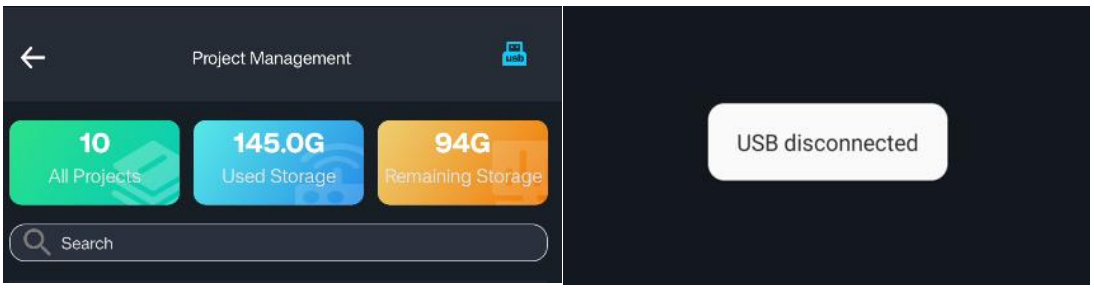
8. 1. Data Transfer via Type-C USB Drive

After powering on the device, insert a Type-C USB drive or external hard drive into the main unit's Type-C port. Use the GreenValley APP to connect to the device and enter the Project Management interface. Click Device Management – Project Management, select one or more projects from the project list, and copy the selected projects to the USB drive; Wait until the transfer process completes and displays '**Project Copied Successful**', then remove the card reader.





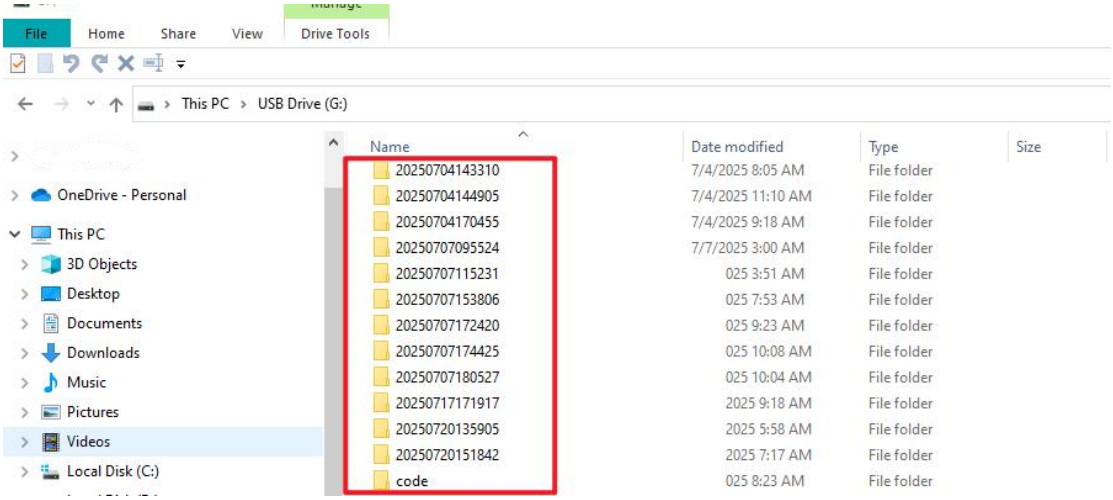
To safely eject the removable storage device, click the USB icon and wait for the system to confirm successful removal.



8. 2. Data Transfer via Data Cable

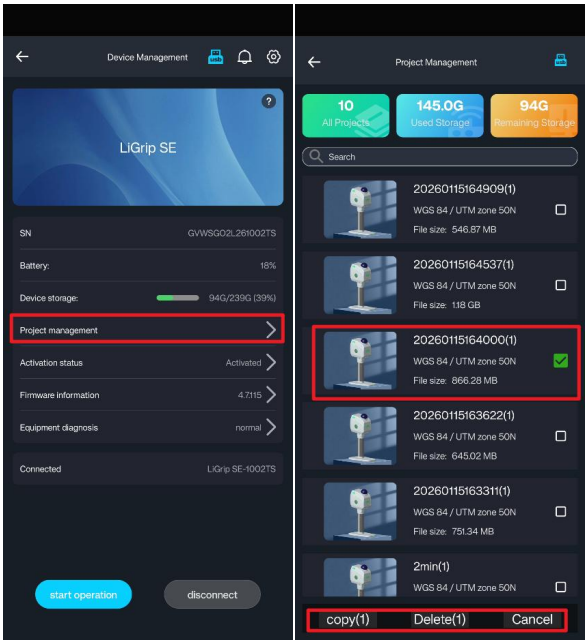
After powering on the device, connect one end of the Type-C data cable to the device's Type-C port and the other end to the computer. The computer will automatically recognize the device's internal storage, enabling direct copying to the computer as required.

Data transfer via the data cable is write-only; writing data into the device's internal storage is not permitted.

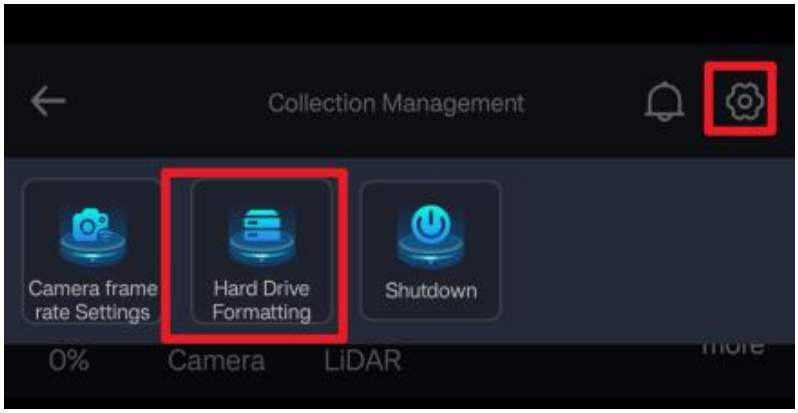


8. 3. Project Deletion

Within the device management interface, navigate to Project Management. Long-press to select a project or swipe left on a project to choose it for deletion.



To format the memory, click the settings icon at the top right and select '**Hard Drive Formatting**'.



9. Firmware Upgrade

Ensure the APP is updated to the latest version. Firmware upgrades require the device to have at least 30% battery charge. Firmware upgrade supports three types: Online upgrade, Offline upgrade, and Camera calibration parameter upgrade.

9. 1. Online upgrade

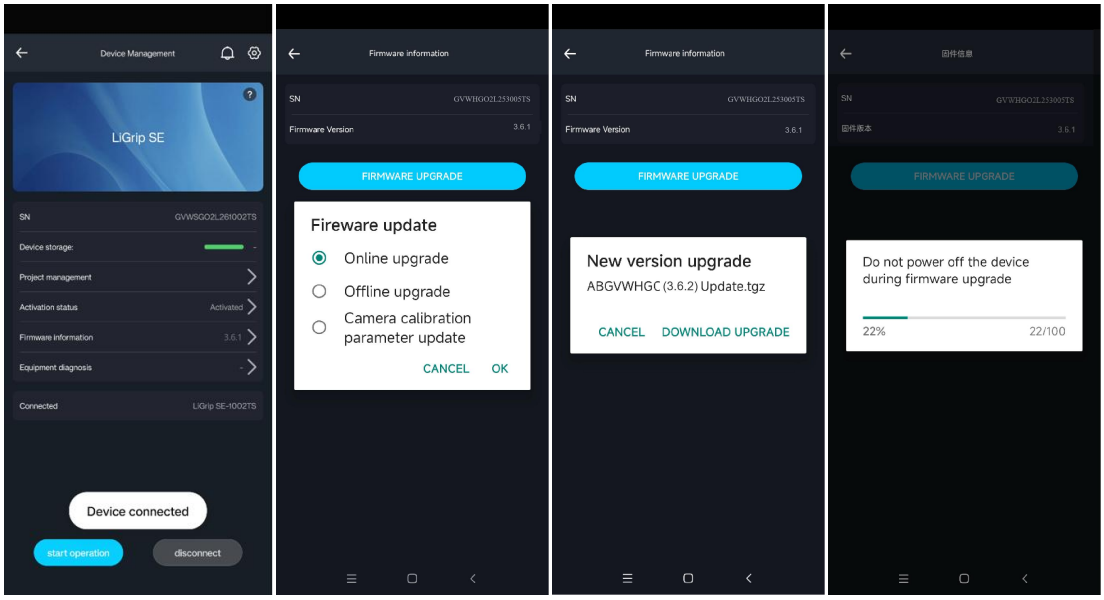
(1) Ensure your phone or tablet can access the Internet via 4G/5G or other Wi-Fi connections;

(2) Once the device is connected, go to the device management interface, click "Firmware Information," and select "Online upgrade." Follow the software prompts to download the updated firmware package;

(3) After the download is complete, select upgrade. The software will prompt whether to upload to the device—choose upload;

(4) Once uploading is complete, the software will prompt whether to update the firmware immediately. Select update to initiate the device firmware upgrade;

(5) Do not power off during the upgrade process. After completion, the device will automatically shut down. Please power it on manually and verify whether the upgrade was successful.



9. 2. Offline upgrade

（1）Obtain the latest firmware package from technical support or after-sales service and perform

the following steps under their technical guidance;

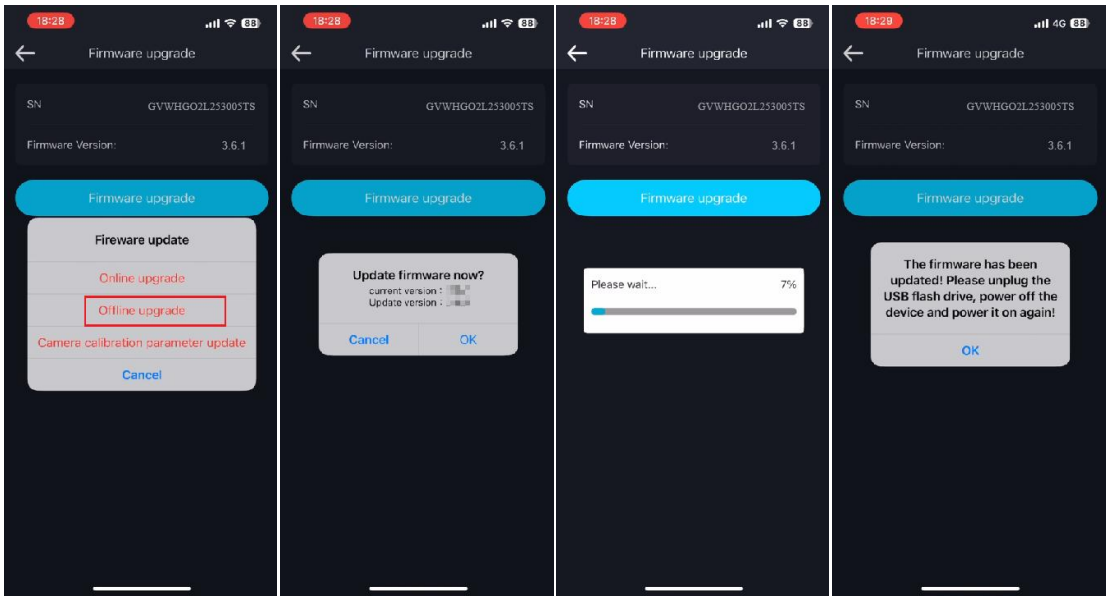
（2）Place the firmware package in the root directory of the USB drive;

（3）Power on the device and connect to it using the GreenValley APP;

（4）Insert the USB drive **(Note: insert it after the device has fully powered on)** ;

（5）In the device management interface, click 'Firmware Information', then select 'Offline upgrade'. Follow the software prompts to upgrade the firmware;

（6）Do not power off the device during the upgrade process. After completion, the device will shut down automatically. Please power it on manually and verify that the upgrade was successful.



10. SLAM process

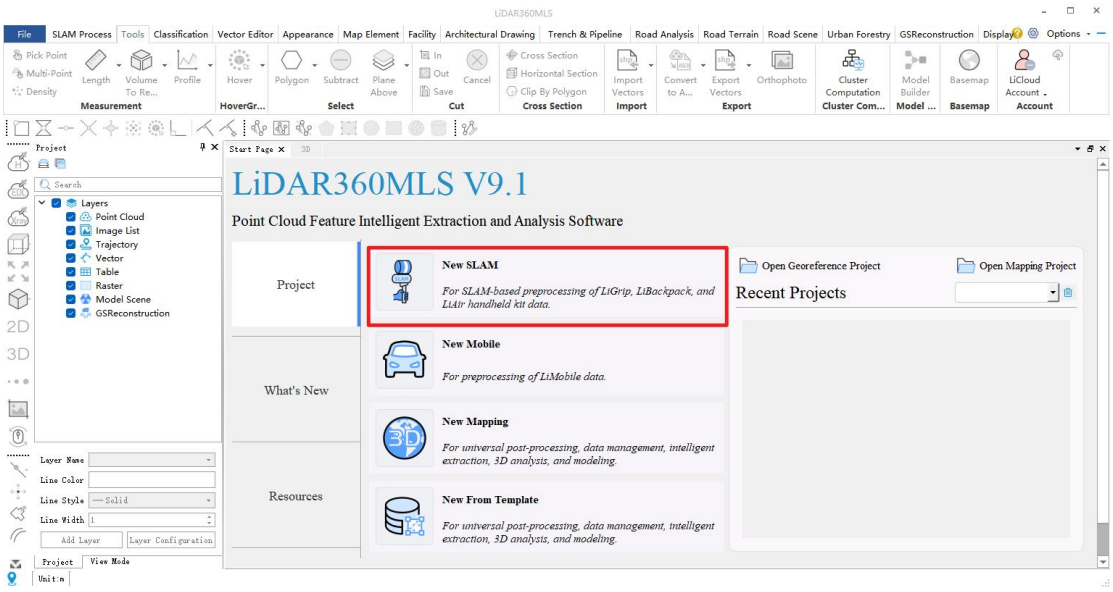
Please use LiDAR 360MLS version 9.1 or later for the SLAM process. For hardware requirements of the processing software, refer to the LiDAR 360MLS software user manual.

The following process is for reference only. For detailed description and usage of the processing software, please consult the LiDAR 360MLS product manual.

10. 1. Create SLAM process project

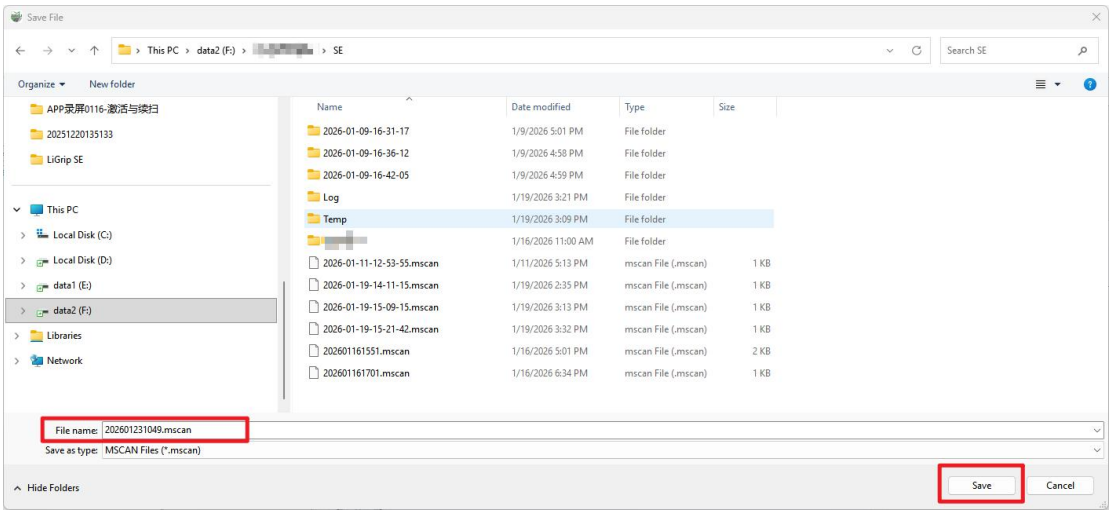
（1）Create a new SLAM process project

After launching the LiDAR360MLS software, click 'New SLAM' on the startup screen, or create a SLAM process project via 'File' > 'New SLAM'.



（2）Select project save path

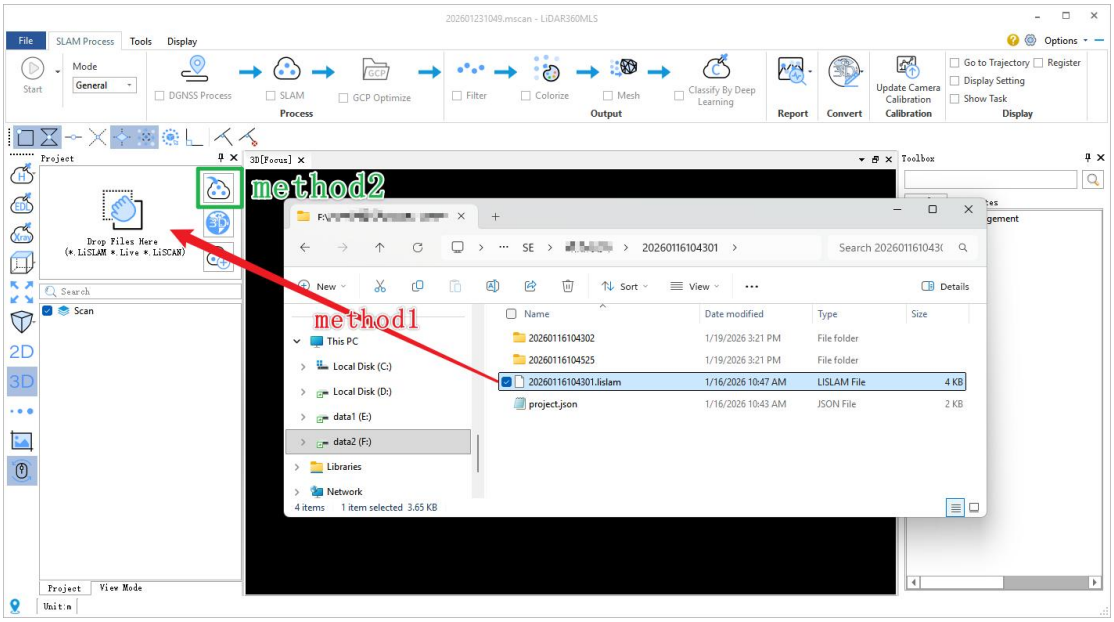
Select the project save path. The software will create an msacn project using the current timestamp.



10. 2. Add process project

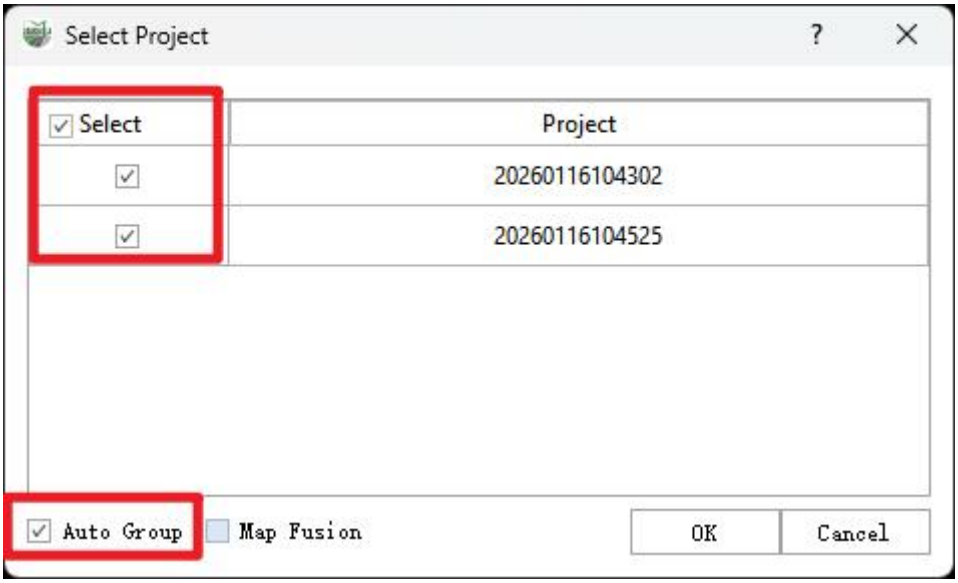
（1）Import lislam file

You can drag the collection project index file xxx.lislam into the project window, or click the "Add" button to select the project index file.

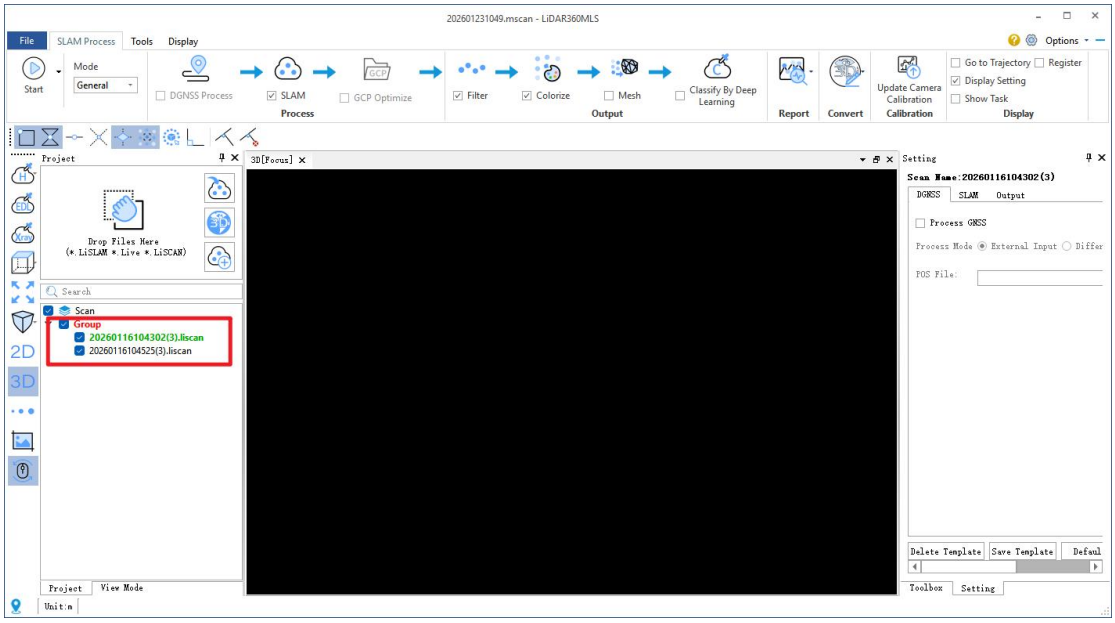


（2）Select to import projects and group configurations

If the index contains multiple collection tasks, you may select which to import and automatically create groups; once grouped, the projects will be placed in the same group upon addition.

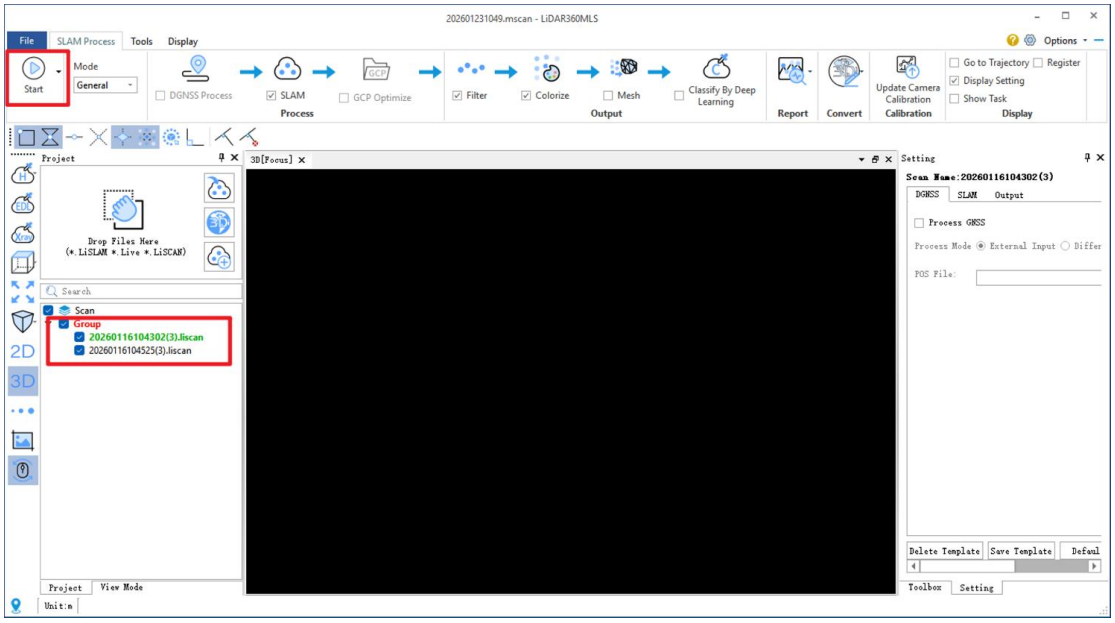


Automatically grouped projects:



10. 3. Start Processing

After configuring the project for processing, click the "**Start**" button at the top left; the software will commence the SLAM process.



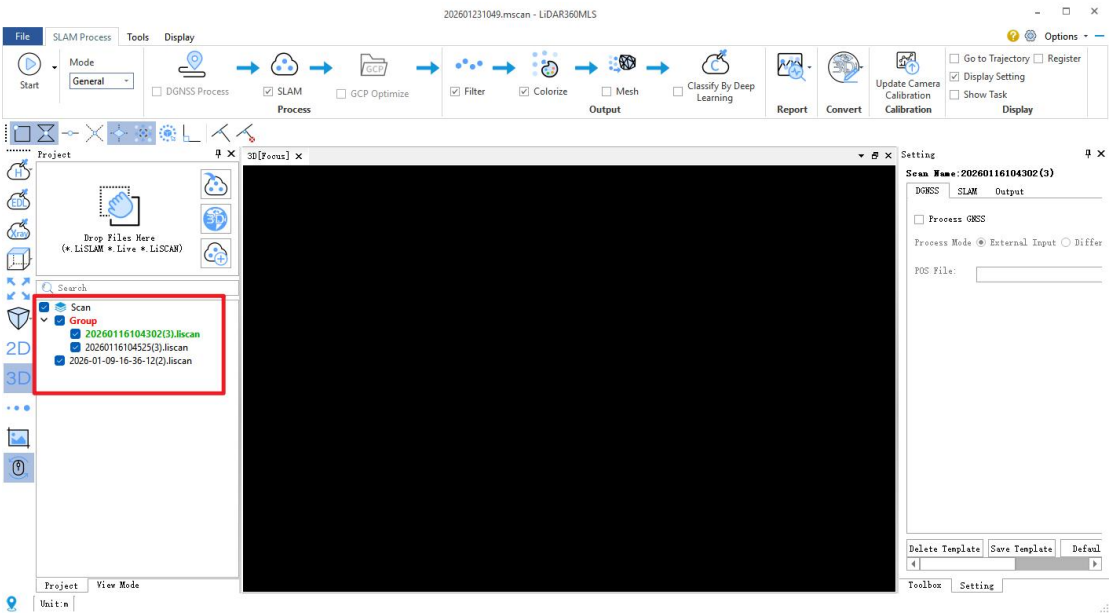
Upon completion of the program, the data processing results will be available.

10. 4. Batch process (optional)

① A single lislam index may include multiple sub-projects; select the required projects to add;

② After adding projects from one lislam index, you may continue adding projects from other lislam indexes;

③ All completed projects are listed in the directory tree on the left. When you click Start Process, the projects checked in the directory tree will be processed sequentially.

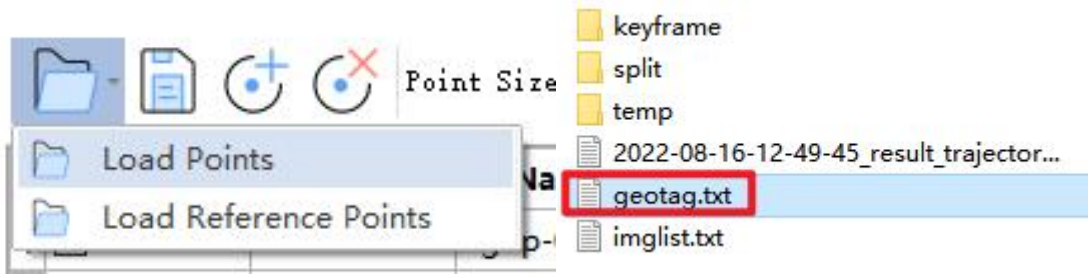


10. 5. GCP Registration (Optional)

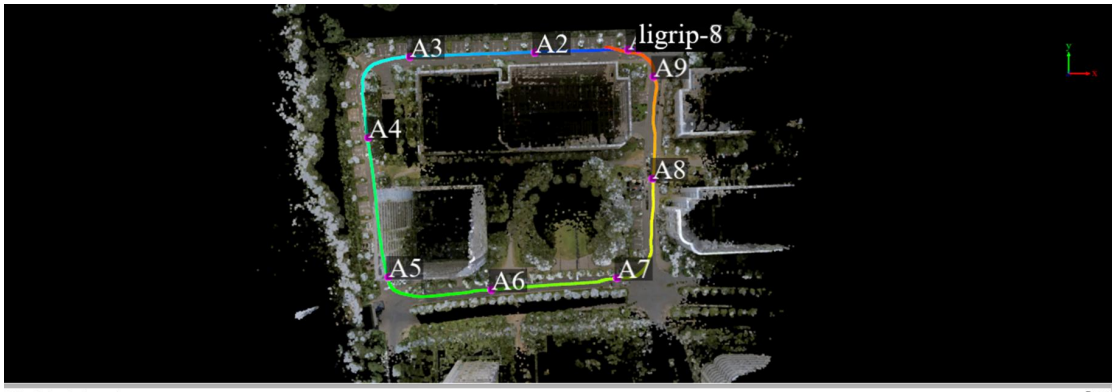
Please complete the SLAM data processing in advance to obtain the processed project.

（1）Enable the GCP function

For the processed project, click GCP Optimization in the processing workflow on the MLS interface. GCP优化 In the registration interface, the software will automatically load the points pending registration; you may also manually select geotag.txt or other files containing points pending registration.



The interface displayed after opening is as follows:



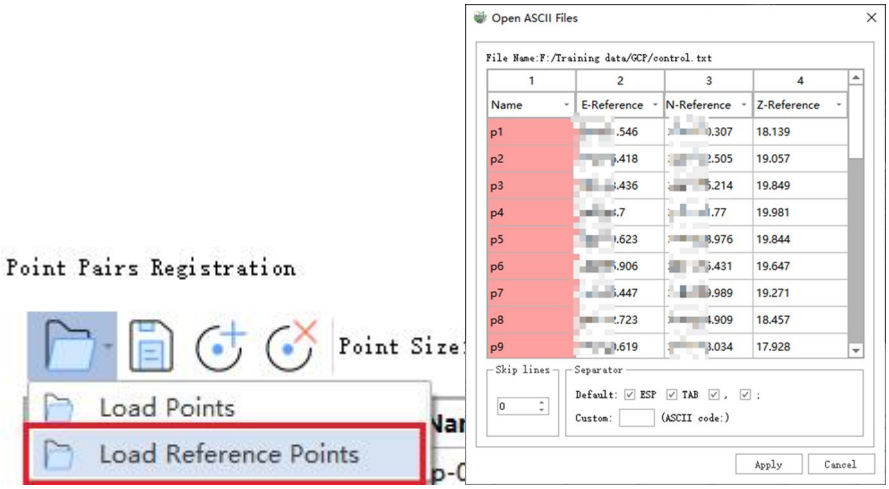
Point Pairs Registration

Point Size: 10

	Selected	ID	Name	E-[Reference]	N-[Reference]	Z-[Reference]	X-[Alignment]	Y-[Alignment]	Z-[Alignment]	Error	Dx	Dy	Dz
1	☑	1	ligrip-0	0.000	0.000	0.000	-4.880	-0.197	-0.114	0.000000	0.000000	0.000000	0.000000
2	☑	2	ligrip-1	0.000	0.000	0.000	-49.501	-1.653	-0.053	0.000000	0.000000	0.000000	0.000000
3	☑	3	ligrip-2	0.000	0.000	0.000	-109.457	-3.598	-0.394	0.000000	0.000000	0.000000	0.000000
4	☑	4	ligrip-3	0.000	0.000	0.000	-129.474	-42.298	-0.702	0.000000	0.000000	0.000000	0.000000
5	☑	5	ligrip-4	0.000	0.000	0.000	-119.831	-109.136	-0.855	0.000000	0.000000	0.000000	0.000000
6	☑	6	ligrip-5	0.000	0.000	0.000	-70.376	-115.127	-0.274	0.000000	0.000000	0.000000	0.000000
7	☑	7	ligrip-6	0.000	0.000	0.000	-10.269	-109.405	0.457	0.000000	0.000000	0.000000	0.000000
8	☑	8	ligrip-7	0.000	0.000	0.000	6.736	-61.979	0.171	0.000000	0.000000	0.000000	0.000000
9	☑	9	ligrip-8	0.000	0.000	0.000	7.332	-13.114	-0.199	0.000000	0.000000	0.000000	0.000000

（2）Load reference points

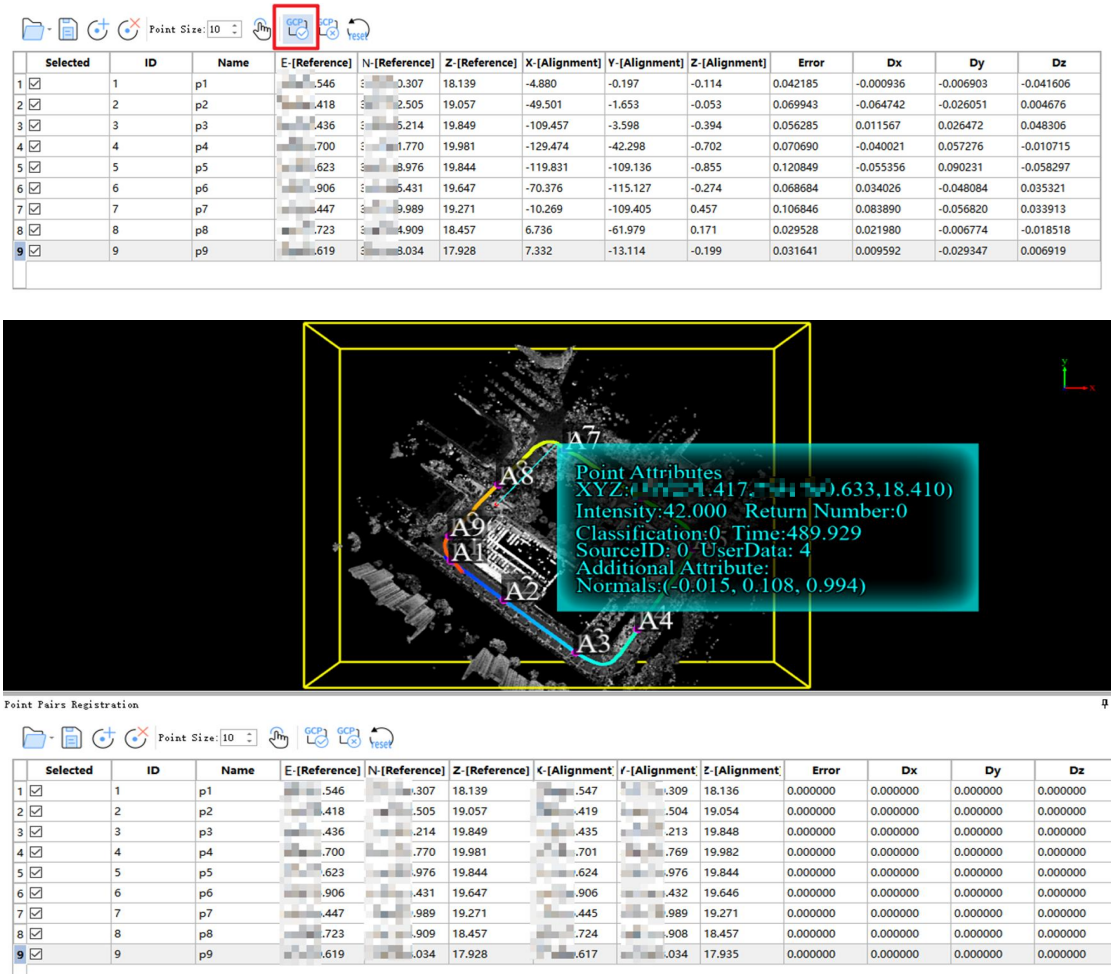
In the Point Pairs Registration interface, click Load Reference Points and select the Control Point file. Control Points require configuring the NEZ columns accordingly; after configuration, click Apply.



（3）Apply GCP transformation

Click 

Apply GCP transformation



（4）GCP restore (optional step)

If the result after applying GCP transformation is unsatisfactory or if the Control Points are entered incorrectly, you can click 

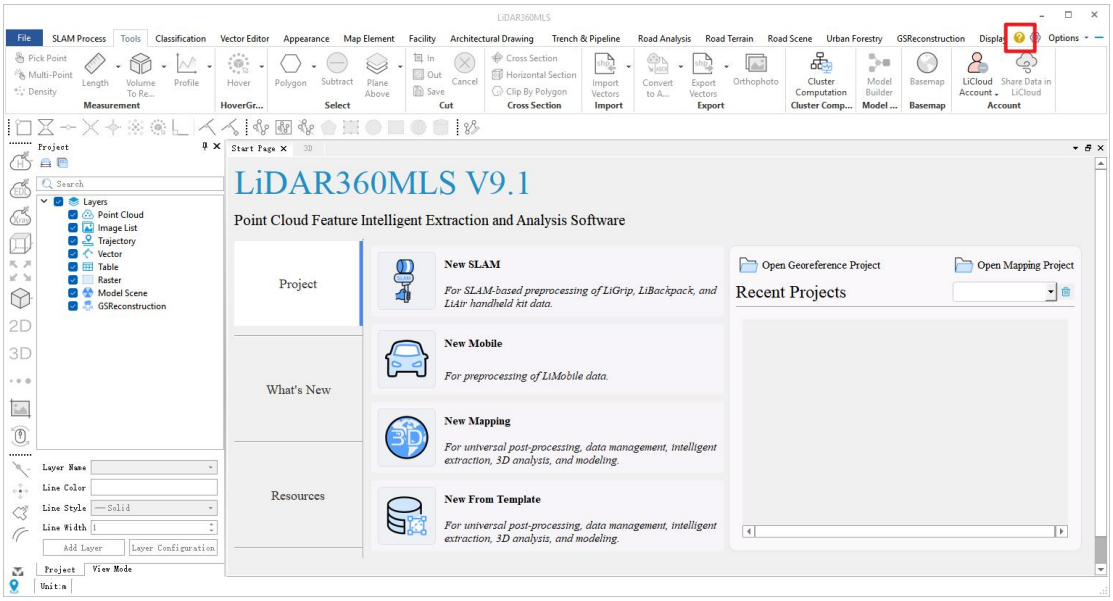
to restore the point cloud to its original state.

11. Other LiDAR360MLS tools

For functions such as data export, accuracy verification, pointcloud extraction, and merging, please refer to the LiDAR360MLS product manual.

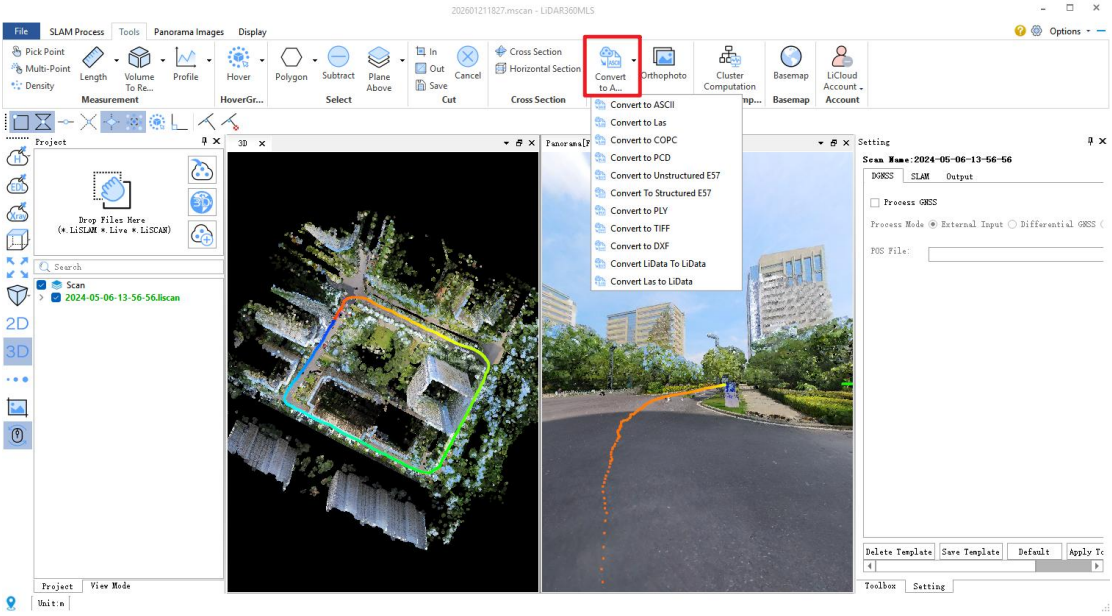
11. 1. Open LiDAR360MLS manual

After launching the software, click the Help button in the upper right corner  button.



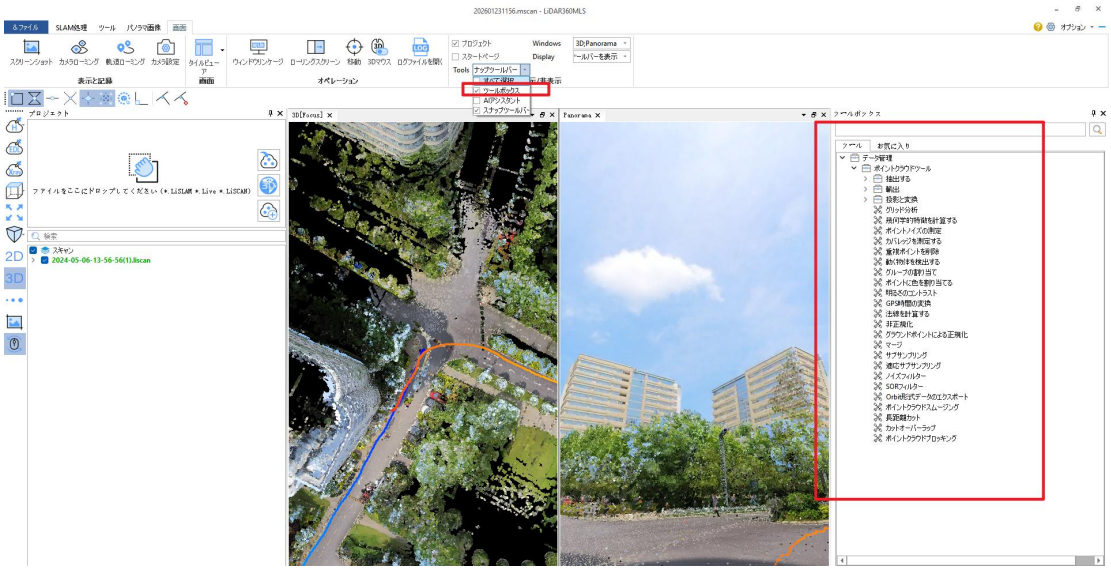
11. 2. Data export

In the Tools tab, the Export function enables exporting point clouds in ASCII, LAS, COPC, PCD, E57, PLY, TIFF, and other formats.



11. 3. Toolbox

The toolbox includes pointcloud extraction, export, projection, coordinate transformation, and other pointcloud tools.



12. Description of Other Device Forms (Accessories)

12. 1. Pole Mode (Telescopic Rod and Adapter)

The LiGrip SE can mount a telescopic rod via the telescopic rod adapter, supporting data collection and GCP collection in Pole Mode.

12. 1. 1. Telescopic Rod Kit Installation

(Except for the main device, assembly order is not strictly required)

① Tighten the adapter at its interface with the telescopic rod.

② Insert the telescopic rod battery fixture, ensuring the narrow opening is downward and the wide opening is upward.

③ Remove the base stand for GCP Collection, align the battery's bottom screw hole with the adapter, and tighten securely.

④ Slide the telescopic rod battery fixture upward to engage behind the handle battery, then close both wrenches to fix it in place.

⑤ Loosen the telescopic rod knob, adjust to the desired height, then tighten it to secure.

		
① Screw on the telescopic rod adapter.	② Insert the telescopic rod fixture with the narrow opening facing downward.	③ Tighten the screws on the Battery and Adapter.
		
④ Secure the Battery and Telescopic Rod using the fixture.	⑤ Adjust the height of the Telescopic Rod.	Installation complete.

12. 1. 2. Telescopic Rod kit disassembly

Disassembly steps are the reverse of the installation steps.

① Shorten the extension rod (not necessarily to the shortest length) and tighten securely.

② Release the battery fixture latch to loosen the fixture.

③ Unscrew the Battery and Telescopic Rod interface screws and remove the Battery and Device.

④ Slide up and remove the battery fixture.

⑤ Unscrew and remove the Adapter nut.

① Shorten the telescopic rod.

② Loosen the battery fixture.

③ Unscrew and remove the battery and device.

④ Remove the battery fixture.

⑤ Remove the adapter.

12. 2. Wearing Mode (Frontpack Kit Vest)

The Frontpack Kit vest secures the device and phone, allowing adjustment of angles up, down, left, and right, fully freeing both hands for flexible operation.

12. 2. 1. Frontpack Kit Installation

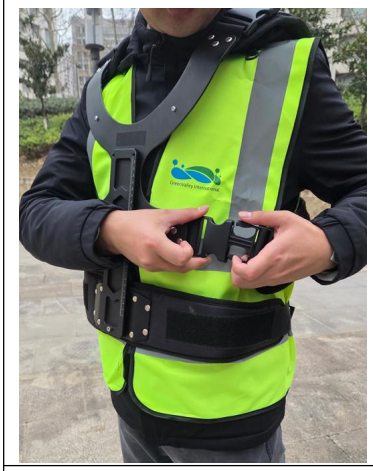
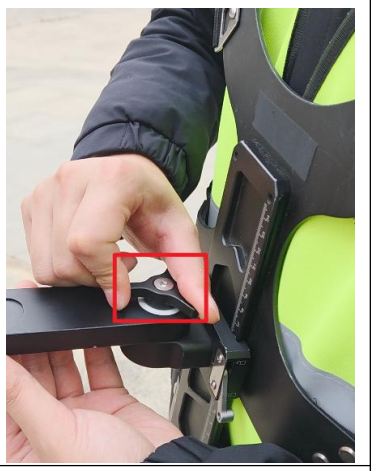
① Wear the Frontpack Kit vest and fasten all buckles.

② Open the support device lock, slide the support device into the corresponding slot from the top, and fix the lock once positioned appropriately.

③ Tighten the support device fixing screw to prevent horizontal movement.

④ Align the Battery with the support bracket positioning hole and tighten the screw to secure it.

⑤ Align the holes to install the Mobile Phone Holder and tighten the knob (the Mobile Phone Holder can be omitted if not required).

		
① Wear the Frontpack Kit vest.	② Secure the support device.	③ Tighten the horizontal nut.
		
④ Install the handle battery.	⑤ Install the mobile phone holder.	Installation complete.

12. 2. 2. Frontpack Kit disassembly

① Loosen the Mobile Phone Holder knob and remove the Mobile Phone Holder.

② Loosen the Device Battery fixing knob and remove the Device.

③ Pry open the securing buckle upward, then slide up to remove the support rod.

④ Release all buckles on the vest and remove the vest.

<table>
<tr><td>  </td><td>  </td><td> 
</td></tr>
<tr><td>① Remove the Mobile Phone Holder.</td><td>② Loosen the knob and remove the device.</td><td>③ Remove the support rod.</td></tr>
<tr><td colspan="3">  </td></tr>
<tr><td colspan="3">④ Release all buckles and take off the vest.</td></tr>
</table>

12. 3. Backpack Mode (Backpack Kit)

The Backpack Kit supports extended device carrying collection and dual-battery power supply.

The Backpack Kit is intended solely for carrying collection; no additional settings are required during collection; however, ensure the device remains stationary during initialization.

12. 3. 1. Backpack Kit Installation

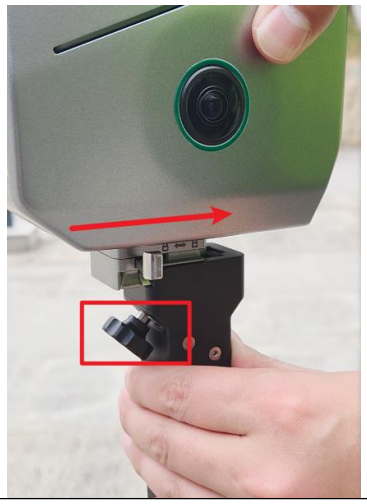
① Unfold the support legs on both the left and right sides at the bottom of the kit.

② Extend the folding rod until it is vertical.

③ Rotate and tighten the folding rod locking knob.

④ Open the battery locking handle, install the battery, and close the locking handle (up to two batteries can be installed).

⑤ Install the main device, secure the locking handle, then tighten the locking knob.

		
① Unfold the support base.	② Extend the folding rod.	③ Secure the folding rod.
		
④ Install the battery.	⑤ Install the device.	Assembly complete.

12. 3. 2. Backpack Kit Disassembly

① Unscrew the device locking knob and open the main unit locking wrench.

② Press the anti-drop button and slide out the device (ensure the device is held securely).

③ Open the battery locking wrench, press the battery anti-drop button, and remove the two batteries in sequence.

④ Loosen the folding rod locking knob.

⑤ Pull open the folding rod locking latch and lower the folding rod.

⑥ Push up the left and right base wrenches in succession to fold the base.

		
① Release the knob and locking wrench.	② Slide out the device.	③ Remove the two batteries.
		
④ Loosen the folding rod knob.	⑤ Fold the folding rod.	⑥ Lift the wrench upward to fold the base.

13. Note:

For detailed instructions on the LiDAR360MLS software, please refer to the "LiDAR360MLS_UserGuide."

For operational precautions and common troubleshooting of the device, please refer to the "LiGrip General FAQ."