

LiGrip O2 Lite

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Introduction

LiGrip O2 Lite is the latest-generation handheld SLAM product from GreenValley International (GVI), utilizing MLF-SLAM (Multiple Localization Fusion-SLAM) multi-sensor fusion positioning technology. It overcomes mapping challenges in featureless environments such as airports, beaches, and rivers, achieving centimeter-level data collection in all scenarios.



Featureless Data Acquisition



Innovatively developed the MLF-SLAM algorithm: A breakthrough LiDAR SLAM algorithm that overcomes mapping challenges in weak or featureless environments (e.g., airports, beaches, water areas) , enabling high-precision data acquisition across all scenarios.

- *MLF-SLAM Algorithm*
- *Data Acquisition in Weak/Featureless Scenarios*

Precision Data, Outstanding Performance



Compact and Mighty: 3 cm absolute accuracy, high-fidelity point cloud with precise horizontal and vertical alignment, meeting surveying-grade standards and streamlining surveying tasks.

- *Absolute Accuracy: 3 cm*
- *Repeat Accuracy: 2 cm*
- *Relative Accuracy: 2 cm*
- *Horizontality/Verticality Precision: 0.025°*

High-definition Panoramic + Visual SLAM Camera

Dual 12 MP panoramic cameras: Microsecond-level synchronization to realistically restore scenes.
Visual SLAM (VSLAM) & LiDAR-SLAM Deep Fusion: Enables precise mapping in complex environments.

- *Dual 12 MP Panoramic Cameras*
- *1.3 MP Visual Camera*
- *Microsecond-level Synchronization*
- *Deep Fusion of VSLAM and LiDAR-SLAM for Mapping*



Real-time Processing and Colorization, Exportable for Use



Real-time true-color point cloud mapping: Ready for immediate export, supports multi-scenario applications such as earthwork calculation, individual tree segmentation, and topographic mapping.

- *Real-time Point Cloud Thickness: 3 cm*
- *Real-time Point Cloud Accuracy: 5 cm*

One-time Data Collection, Multi-dimensional Output



Integrated solution for multi-source data collection: Simultaneous output of 3D point clouds, panoramic images, 3DGS, MESH, and other data in one collection, breaking the limitations of traditional sequential operations and improving cost-efficiency.

Multi-form Data Collection

Supports various forms of data collection: Handheld, backpack, frontpack kit, and telescopic pole, allowing flexible adaptation to diverse customer collection scenarios.

- *Handheld, Backpack, Frontpack Kit, Telescopic Pole*



RTK-SLAM Collection Mode



Self-developed RTK-SLAM technology: In conjunction with a telescopic pole, enables full-range high-precision RTK data collection, with accuracy <5 cm in 1 minute without GNSS.

- *RTK-SLAM Deep Fusion Technology*
- *Accuracy <5 cm in 1 Minute Without GNSS*

Hardware Specifications

5-star 14-frequency high-precision RTK module

200,000 point frequency, maximum detection range 70 meters

Supports button-based rapid collection

512 GB SSD storage, Type-C interface

Dual 12MP panoramic cameras+Dual 1.3MP VSLAM cameras



Quick-release and locking battery mechanism to ensure stable power supply

Large-capacity lithium battery with a 2-hour runtime

Advanced base stand for easier GCP collection

Specifications

System Parameters

Absolute Accuracy	<3 cm [1]	**Protection Level**	IP64
Relative Accuracy	<2 cm [2]	**Storage Capacity**	512 GB SSD
Repeat Accuracy	<2 cm [3]	**Port**	Type-C
Horizontality/Verticality	<0.025° [4]	**Control Method**	APP, Button
Power Supply Method	Lithium Battery Powered	**Firmware Upgrade Method**	OTA, Offline
Battery Capacity	3450 mAh	**Operating Temperature**	-20°C ~40°C
Single Battery Life	2 h [5]	**Device Storage Temperature**	-40°C ~70°C
Weight	1.3 kg (with base, battery, and RTK module)	**Battery Storage Temperature**	Recommended Storage Temperature: 22°C ~ 30 °C [6]

LiDAR Sensor Parameters

Laser	Mid360	**Laser Wavelength**	905 nm
Scan Rate	200,000 pts/s	**Detection Range**	40 m @ 10% reflectivity; 70 m @ 80% reflectivity
LiDAR Accuracy	2 cm	**FOV**	Horizontal 360 ° , Vertical -7 ° ~ 52 °
Safety Level	Class 1 (Eye-safe)		

Camera Parameters

Number of Cameras	4	**Panoramic Camera**	12MP x 2
Visual Camera	1.3MP x 2	**Frame Rate**	Adjustable

[1] [2]: Measured in GreenValley's precision field; deviations may occur in some scenarios.

[3]: Two scans with GNSS, with GNSS disconnection not exceeding 100 meters.

[4]: Requires measurement of absolutely horizontal and vertical objects such as building walls and interiors.

[5]: Battery life tested at 20°C without camera recording or RTK connection.

[6]: -20°C to 45°C for <1 month; -20°C to 35°C for >1 month.

Equipment Specifications

RTK Parameters

Satellite Systems	BDS B1I, B2I, B3I, B1C, B2b; GPS L1C/A, L2C, L2P(Y), L5; GLONASS G1, G2; Galileo E1, E5a, E5b, E6*; QZSS L1C/A, L2C, L5 ; SBAS L1C/A	**RTK Accuracy**	Horizontal: 0.8 cm + 1 ppm Vertical: 1.5 cm + 1 ppm
Channels	1408	**Differential Data**	RTCM V3.X
RTK Differential Protocol	NTRIP	**RTK Data Format**	.rtk

IMU Parameters

Output Frequency	200 Hz	**Post-Processing Position Accuracy**	Horizontal: 0.01 m, Vertical: 0.02 m
Post-Processing Attitude Accuracy	Roll/Pitch: 0.005°, Heading: 0.01°		

Mapping Method

Mapping Principles	MLF-SLAM, PPK-SLAM, RTK-SLAM, SLAM	**Real-Time Processing**	Supported
Real-Time Colorization	Supported		

Output Specifications

Colored Point Cloud	LAS, LiData	**Panoramic Image**	imglist + JPG
MESH	LOD-OSGB	**Gaussian Splatting**	lisplat, ply

Telescopic Pole Adapter

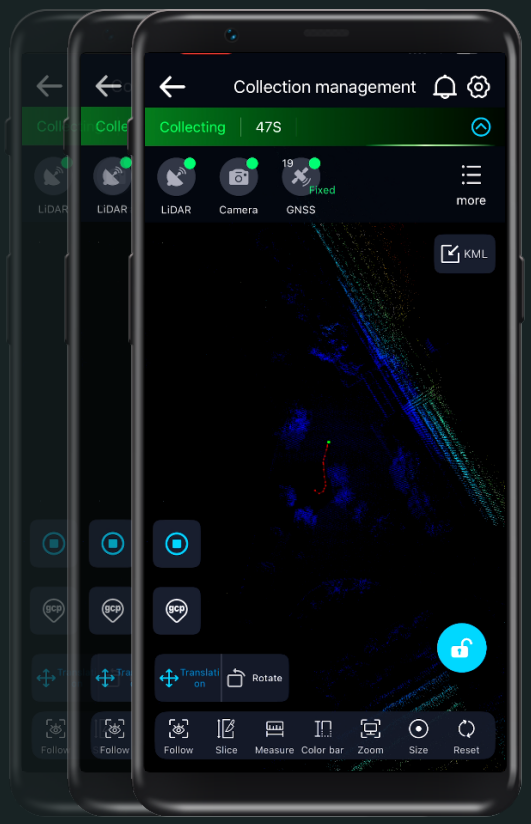
Weight	300 g	**Supported Telescopic Pole Diameter**	25-25.5 mm [7]
Compatibility	LiGrip O Series (includes O1 Lite and O2 Lite)		

Frontpack Kit Parameters

Weight	2.1 kg	**Outer Packaging Dimensions**	560 x 340 x 160 mm
Compatibility	LiGrip H Series and O Series		

[7]: Only supports the outer diameter of the telescopic part in the range of 25-25.5 mm for RTK telescopic poles; The locking device does not support RTK telescopic poles with a protruding circular ring on the top contact surface.

Supporting Software



GreenValley App

- Collection control software, compatible with both Android and iOS platforms.

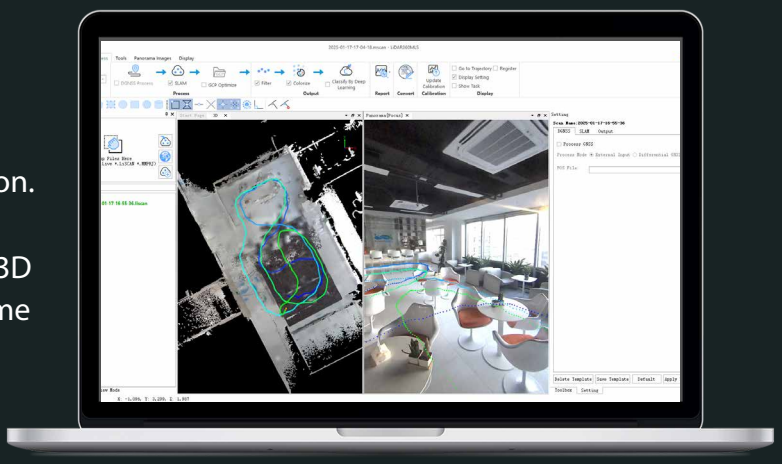
- Supports collection control, project management, real-time point cloud browsing, and firmware upgrades, etc.

LiDAR360MLS (PC)

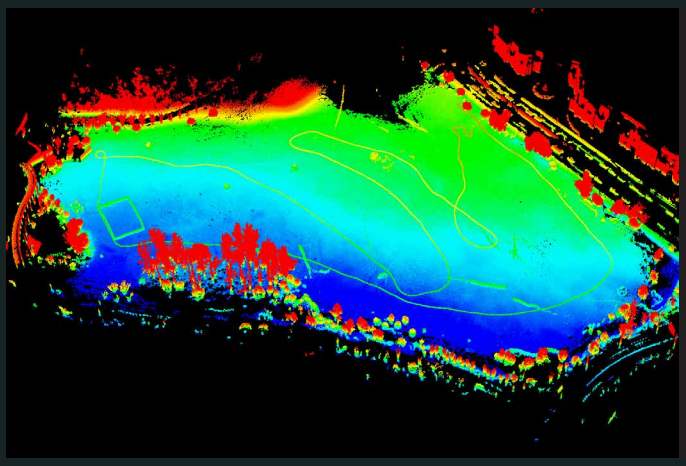
- Enables precise floor plans and elevation drawings for efficient BIM model construction.

- Supports Gaussian model reconstruction, 3D MESH generation, accurate earthwork volume calculations, and change detection.

- AI-powered point cloud classification.

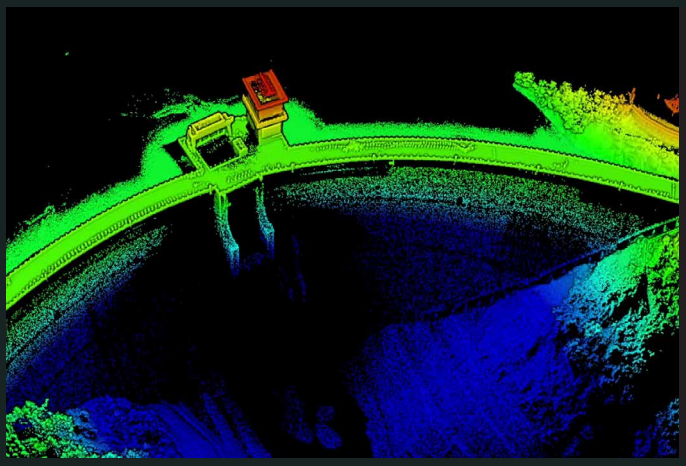


Application Scenarios



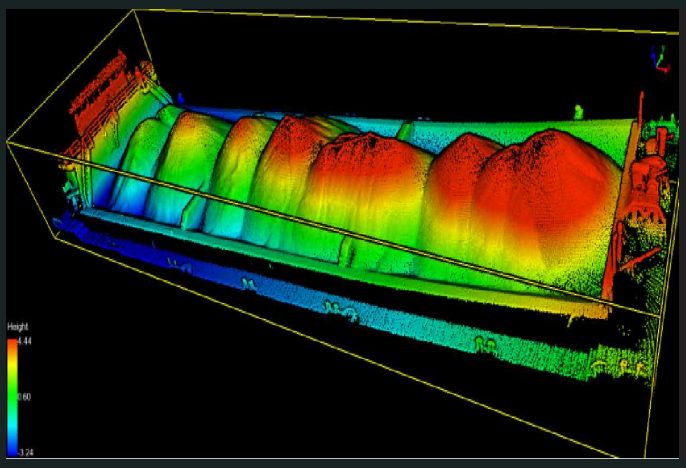
Open Scene Measurement

Data collection in weak/ featureless areas such as highway surveys, no-fly zones, reclamation areas, shoals, mines, and riverbank measurements.



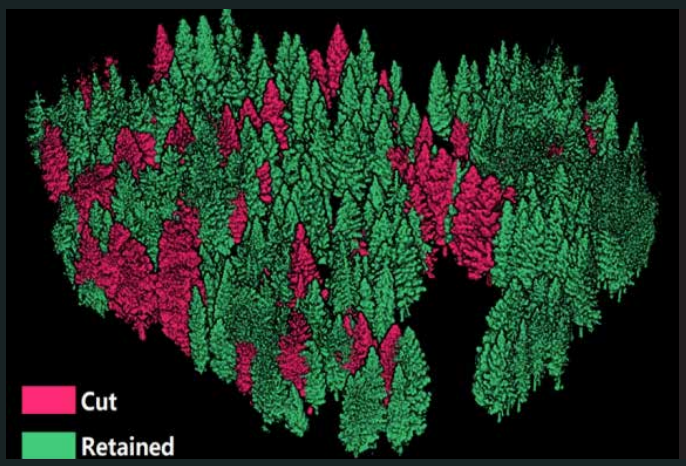
Topographic Surveying

Meets the demand for high-precision point clouds in topographic map revision, with final results (point cloud and MESH) meeting 1:500 topographic map requirements.



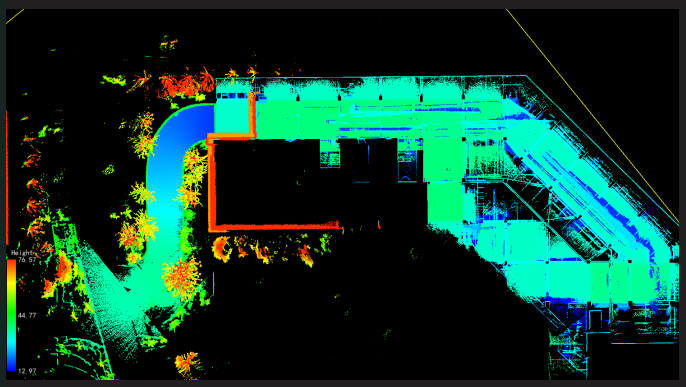
Stockpile Measurement

The real-time point cloud generated by the device can directly achieve high-precision volume measurement of stockpiles, with an accuracy of up to 1%. When used with an extendable pole, it can fully capture the 3D spatial data of stockpiles over 5 meters in height.



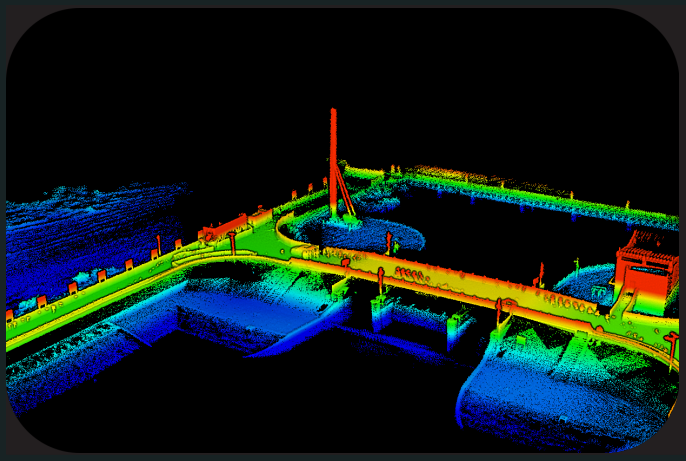
Forestry Survey

Handheld scanning of forest stands/ large forest areas is possible. Based on the LiDAR360 forestry module, it can quickly count the number of trees in forest stands/ large forest areas, as well as the position of individual trees, tree height, crown width, diameter at breast height, and tree species.



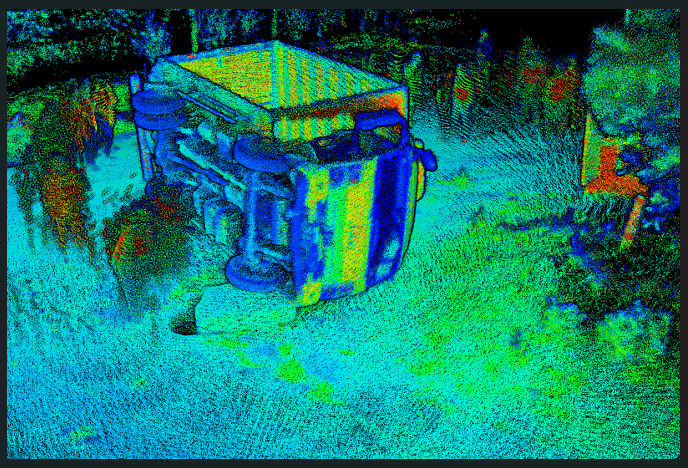
Underground Space Information Collection

Applicable to the measurement of enclosed areas such as underground parking lots, power utility tunnels, air-raid shelters, shopping malls, caves, etc., providing accurate 3D spatial information for subsequent design and planning.



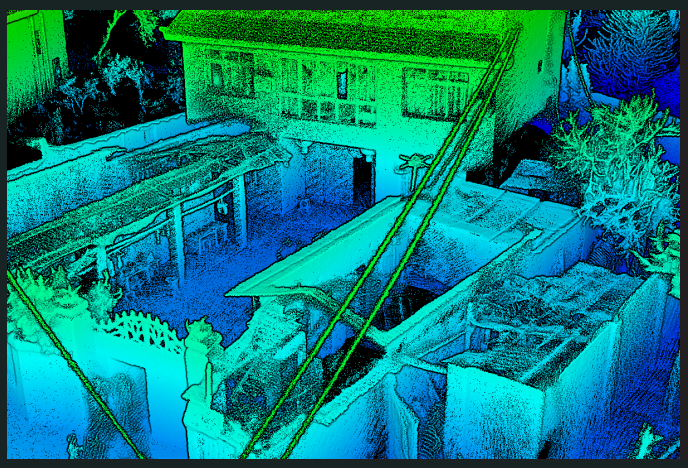
Construction Surveying

- Pre-construction: site investigation, design review, construction plan optimization, etc.
- During construction: project progress monitoring, quality control, safety management, etc.
- Post-construction: completion acceptance, maintenance, asset management, etc.



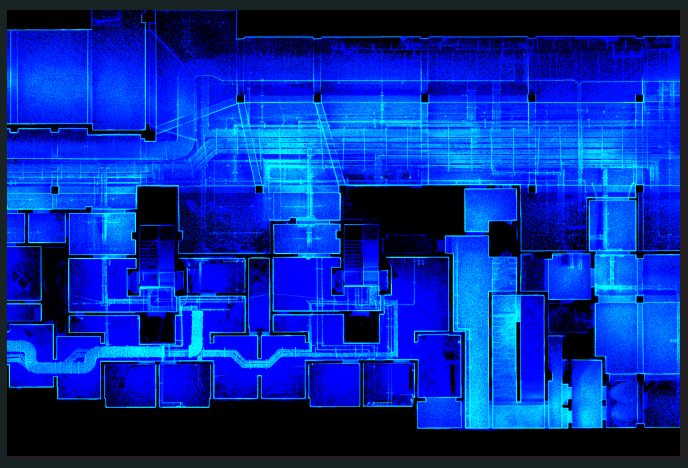
Traffic Accident Investigation

Quickly and comprehensively acquire point cloud and photo data from the scene and generate realistic colored point cloud and 3DGS data to facilitate accident investigation and responsibility determination.



Emergency Firefighting

Fully utilize the advantages of O2 Lite's rapid mapping capabilities, allowing firefighters to quickly understand the site layout. The collected data can also assist disaster investigators in qualitative and quantitative analysis.



Real Estate Surveying

With its rapid and high-precision characteristics, O2 Lite can quickly construct a 3D structure of the property, generating the original data needed for real estate surveying, providing reliable data support for real estate surveying, engineering audit settlement, renovation, and design.

Map The World In 3D
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