

LiGrip O2

Flagship Handheld SLAM Laser Scanner

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LiGrip O2 is the flagship handheld SLAM laser scanner developed by GreenValley International, integrating laser scanner, panoramic and visual SLAM cameras, and GNSS antenna sensors. It breaks through spatiotemporal constraints to perform high-precision, all-round data acquisition, supporting diverse output formats including 3DGS, Mesh, Point clouds, and Panorama. This device is extensively applicable in surveying, forestry, utilities, building, mining, cultural tourism, and related sectors. The device is widely applicable in fields such as surveying and mapping, forestry, electric power, construction, mining and tunneling, as well as cultural tourism.








3×12 MP
Panorama Camera

640,000 pts/s
Highest Scan Rate

300meters
Max detection range

2×1.3 MP
VSLAM Camera

5-Constellation, 14-Frequency
High-precision RTK module

PPK and RTK
Support

Triple-Camera Coverage for Easier and Better Capture

3×12 MP Panorama Camera



- Triple-Camera Coverage: Wider and Sharper

Front, left, and right panoramic cameras offer full 3D coverage,simplifying data capture and enhancing coloring and 3DGS quality.



Left Front Right



Enables seamless panorama generation



Three-Camera colorization VS Dual-Camera colorization



Triple-camera Gaussian VS Dual-camera Gaussian

Dual-Camera VSLAM for Wider and More Stable Mapping

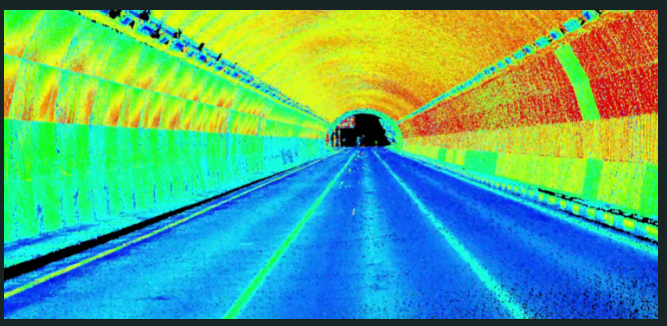
Dual 1.3MP cameras cover the full LiDAR range, improving stability inlow-feature areas like tunnels and underground spaces.



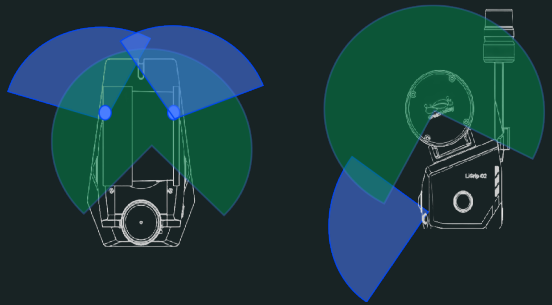
2×1.3MP VSLAM Camera

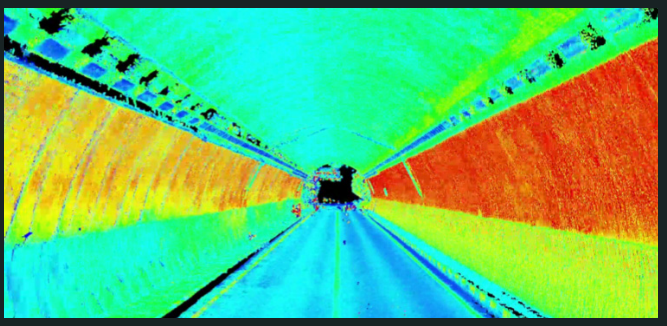
LiDAR scanning range

VSLAM Coverage Range



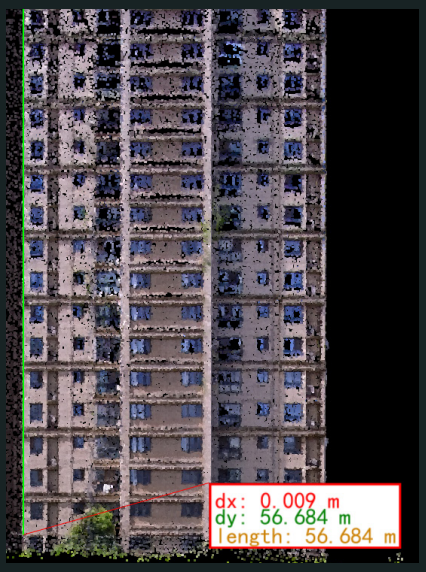
Changshan Tunnel





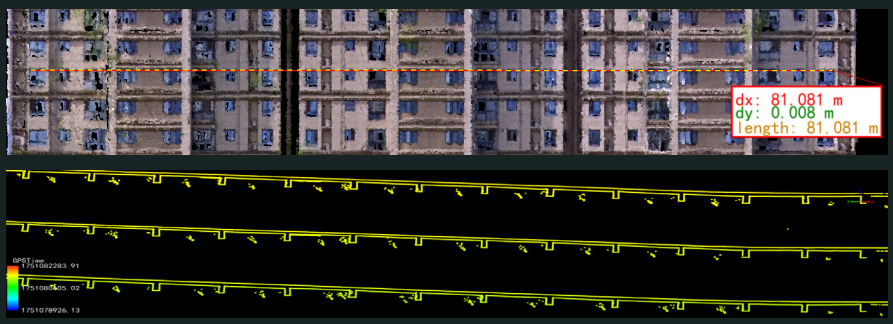
Huanglongshan Tunnel

Survey-Grade Accuracy



Powered by GVI's self-developed multi-sensor fusion SLAM technology, the system ensures survey-grade accuracy—regardless of operator, environment, path, or time.

- **Absolute accuracy: 3 cm**
- **Relative accuracy: 1 cm**
- **Repeat accuracy : 2 cm**
- **Vertical for Buildings, Horizontal for Basements**



Versatile Positioning for Every Scenario

Multiple Positioning Methods to Suit Various Application Scenarios

- RTK-SLAM

Applicable in areas with CORS signal coverage, such as urban, suburban, and peri-urban regions.

- PPK-SLAM

Applicable in areas without CORS signal or 4G network coverage, such as deserts, remote borderlands, and deep mountainous regions.

- MLF-SLAM

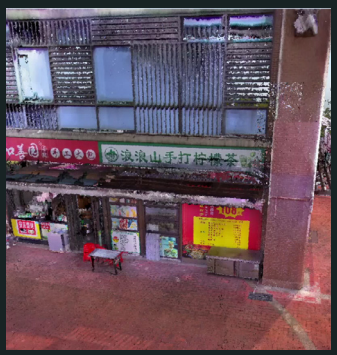
Suitable for open, featureless environments that require absolute positioning, such as highways, beaches, and bridges.

- SLAM

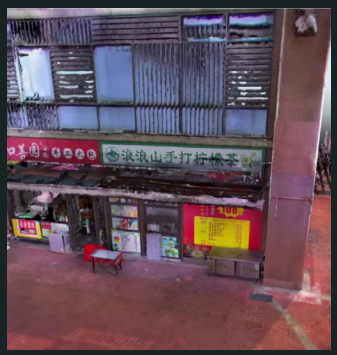
Ideal for GNSS-denied scenarios including tunnels, subsurface pipelines, and mining environments.

One-Time Collection, Multi-Dimensional Output

A single collection captures point cloud, panorama, 3DGS, MESH, and other outputs.



Point Cloud



MESH



3DGS



Panorama

Hardware Configuration



Detachable, Interchangeable GNSS antenna

512GB SSD storage, TYPE-C port

No configuration required; supports one-button quick data acquisition.

High-capacity lithium battery: 2h runtime, 4h with dual batteries.

Quick-release battery with lock, stable under vibration

Pointed GCP base for easier marking

Device Configuration - LiDAR

- XT16: 320,000 pts/s; 120 m range
- XT32M2X: 640,000 pts/s; 300 m range
- XT32: 640,000 pts/s; 120 m range



Device Configuration - GNSS Antenna



- Light

Suitbale for most scenes

Standard GNSS mini antenna



- High Accuracy

Applicable to urban areas with strong multipath effects, coastal regions, and environments with electromagnetic interference.

Optional GNSS measure antenna

Device Parameters

System Parameters

Absolute Accuracy	<3 cm [1]	Protection Level	IP64
Relative Accuracy	<1 cm [2]	Storage Capacity	512 GB SSD
Repeat Accuracy	<2 cm [3]	Port	Type-C
Horizontality / Verticality°	<0.015° [4]	Control Method	APP, Button
Scan Rate	Up to 640,000 pts/s [5]	Detection Range	Up to 300 m [6]
Weight	As light as 2.2 kg[7](with base and battery)	Firmware Upgrade Method	Offline
Single-battery endurance	120 minutes [8]	Operating Temperature	-20°C ~40°C
Devixe Storage Temperature	-40°C ~70°C	Power Supply Method	Lithium Battery Powered
Battery Storage Temperature	Recommended: 22° ~30° [9]		

LiDAR Sensor Parameters

Supported Laser Models	XT16 XT32 XT32M2X	Laser Wavelength	905 nm
Scan Rate	320,000 pts/s 640,000 pts/s	Detection Range	120 m, 300 m
FOV	280° (Horizontal) × 360° (Vertical)	LiDAR Accuracy	0.5 cm
Safety Level	Class 1, Eye-Safe		

Camera Parameters

Number of Cameras	5	Panoramic Camera	12 MP × 3
Visual Camera	1.3 MP ×2	Frame Rate	Adjustable

IMU Parameters

Output Frequency	200 Hz	Post-processing Position Accuracy	Horizontal 0.005 m, Vertical 0.01 m
Post-processing Attitude accuracy	Roll/Pitch: 0.003°, Heading:0.01°		

Mapping Method

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

[1][2]: Measured in GreenValley's precision feld; 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]: XT16: 320,000 pts/s; XT32/XT32M2X: 640,000 pts/s;

[6]: XT16/XT32: Max range 120 m; XT32M2X: Max range 300 m;

[7]: XT16/XT32: 2.5 kg (without GNSS); XT32M2X: 2.2 kg (without GNSS);

[8]: Measured at 20°C, without camera recording or RTK connection;

[9]: Storage at -20°C to 45°C for less than 1 month; -20°C to 35°C for more than 1 month.

Output Specifications

Colored Point Cloud	LAS, LiData	Panoramic Images	Imglist+jpg
MESH	LOD-OSGB	3D Splatting	lisplat, ply

Telescopic Pole Adapter

Weight	300 g	Supported Telescopic Pole Diameter	25–25.5 mm
Compatibility	LiGrip O Series (includes O1 Lite and O2 Lite)		

Frontpack Kit Parameters

Weight	2.1 kg	Outer Packaging Dimensions	560×340×160 mm
Compatibility	LiGrip H Series, LiGrip O Series		

Backpack Kit Parameters

Weight	3.9 kg	Dimensions	580×303×145 mm
Dual Battery Power Display	Supported	Hot Swap	Supported
Compatibility	LiGrip O2 Series		

Vehicle Kit Parameters

Surpported Vehicles	Magnetically attachable vehicles	Kit Weight	3.9 kg
Kit Dimensions	332×332×178 mm	Mounting Method	Magnetic Attachment
Vehicle Speed	Max 40 km/h, recommended below 20 km/h		

Drone Kit Parameters

Supported Drone Models	M300[1] / M350 / M400[2]	Kit Weight (including mount, power cable, GNSS antenna)	440 g
Takeoff Weight	2.2-2.5 kg[3]	Flight Height	Not exceeding 80 m, recommended below 50 m
Power Supply	Drone-powered	Flight Speed	Not exceeding 7 m/s, recommended below 5 m/s
Kit Dimensions	218×131×216 mm	Endurance	25-35 minutes[4]

Robot Dog kit Parameters

Supported Devices	O2 O2-Lite, SE[5]	Power Supply	Robot dog's built-in power supply
Compatible Robot Dog Models	ZsiBot ZSL-1, DEEPRobotics Lynx M20[6]		

5G Data Backhaul Module

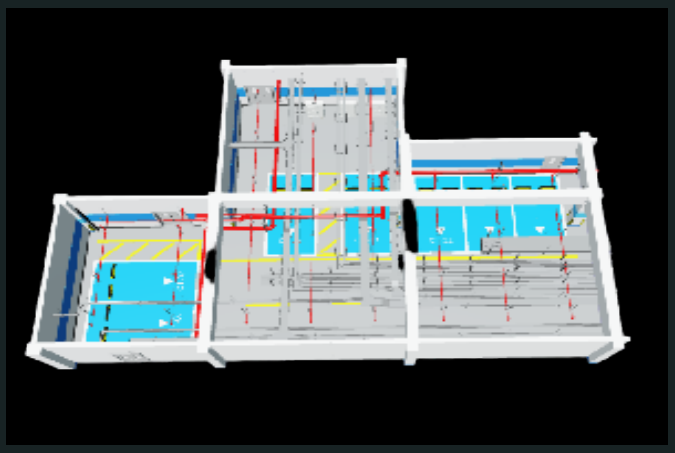
Network source	SIM card	Supported Bands	Full band support
Power supply	Power bank / Robot dog's built-in power supply		

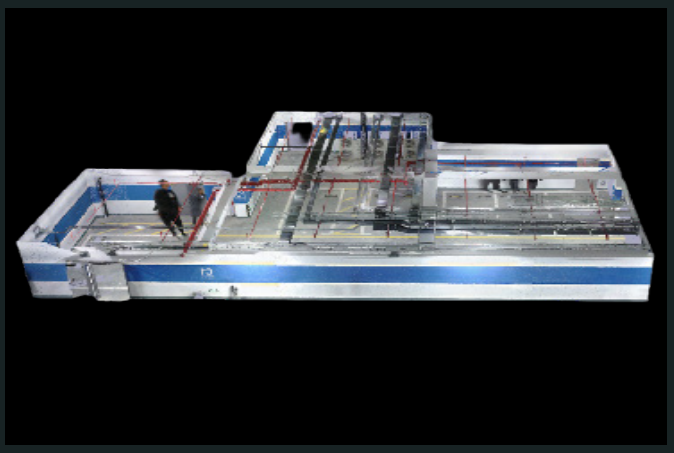
1: When mounting on M300, please pay attention to the drone's flight status
2: The drone kit for M400 is not interchangeable with that for M300/M350
3: XT32M2X: 2.2 kg; XT16 and XT32: 2.5 kg
4: Depends on the O2 model carried and the drone platform
5: SE does not support 5G data backhaul
6: M20 Pro supports autonomous navigation



Application Scenarios

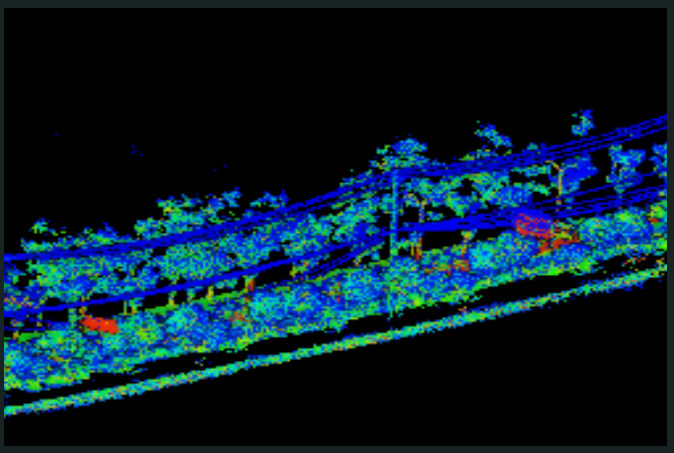
Building modeling





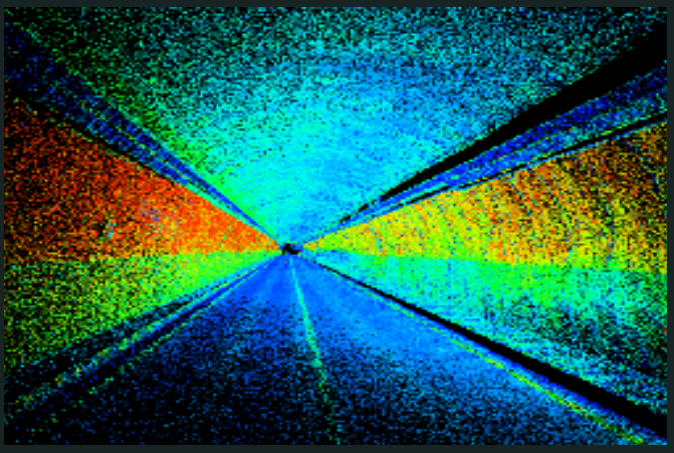
No-fly zone powerline inspection





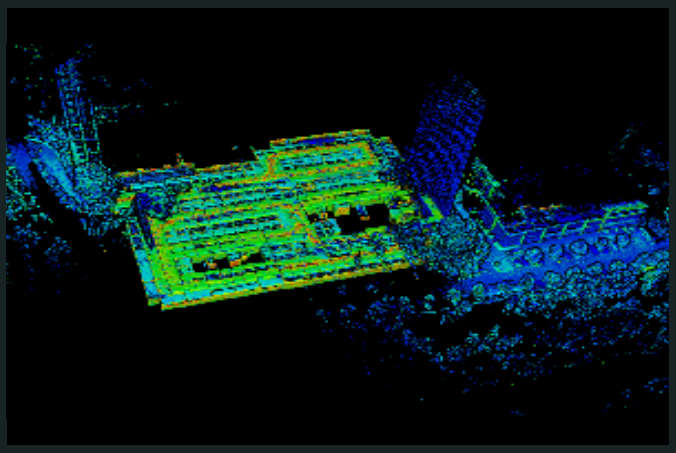
Tunnel surveying





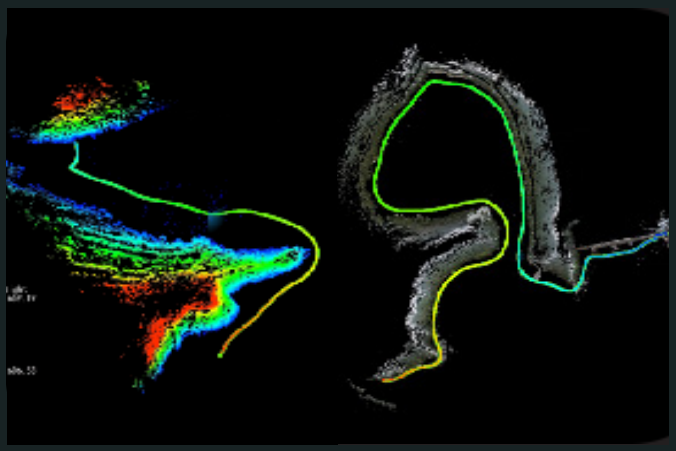
Supporting low-altitude economy with precise air corridor mapping



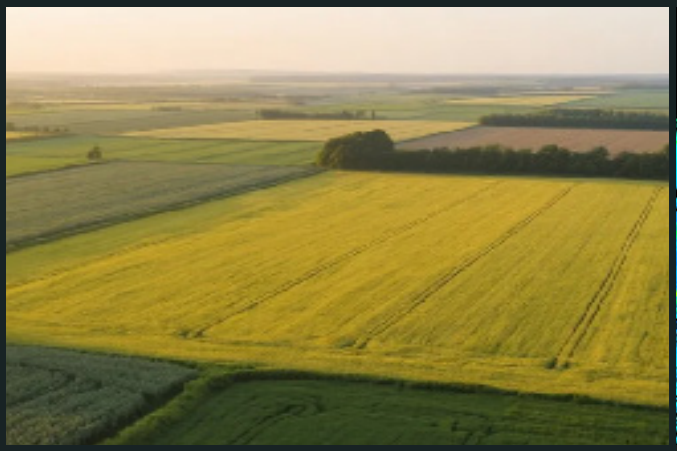


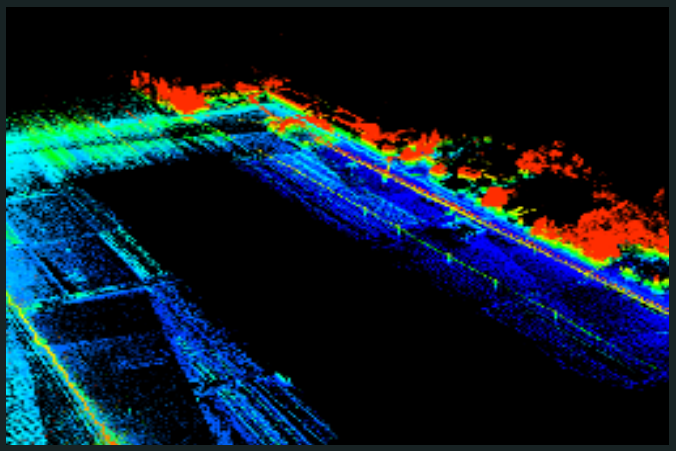
River, lake, and coastal shoreline measurement





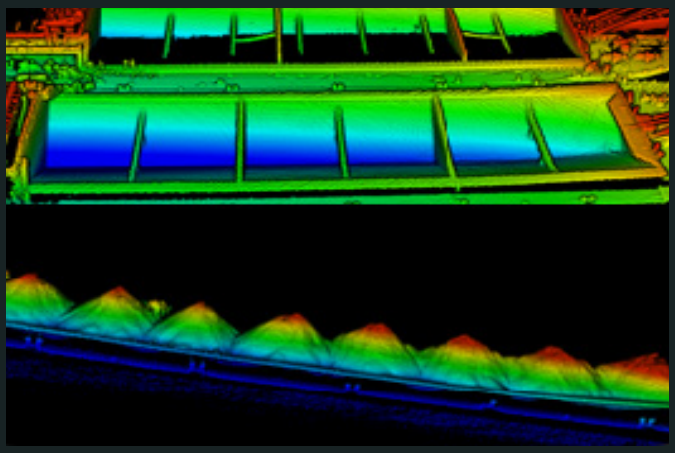
High-standard farmland surveying





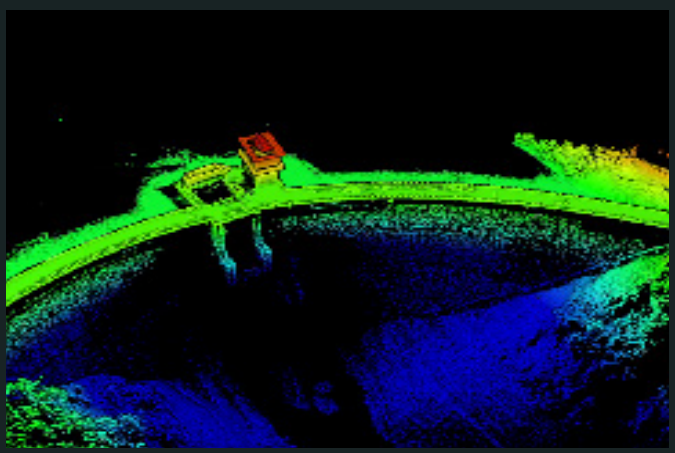
Stockpile volume measurement on sand transport vessels





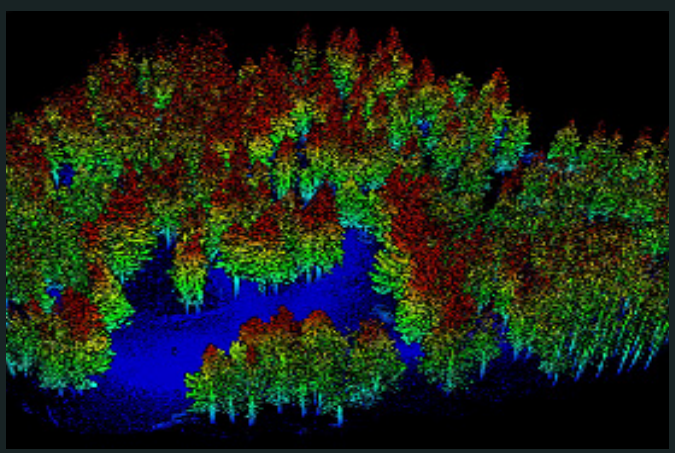
Topographic map revision & supplement



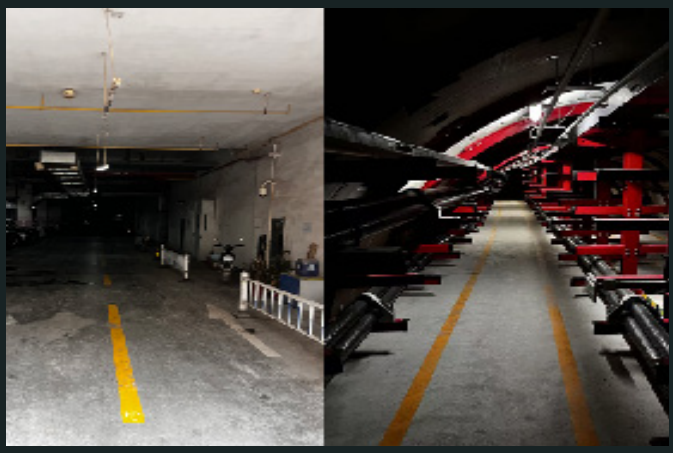


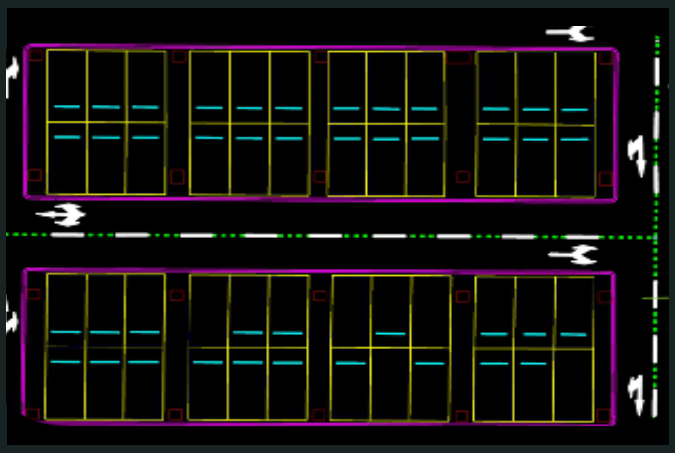
Forestry survey





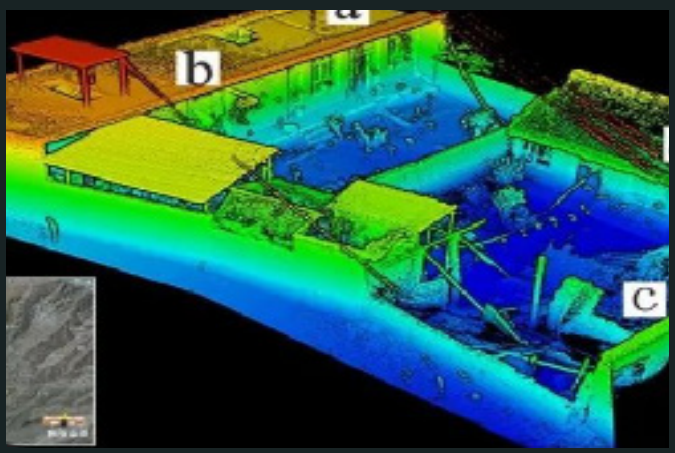
Underground space information collection





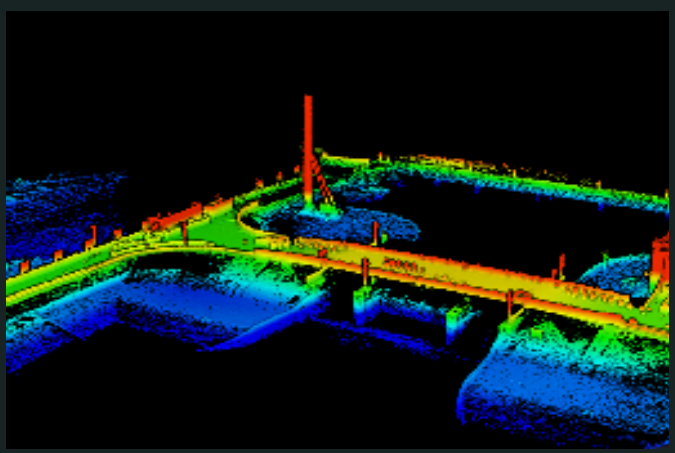
Fire incident scene investigation





Construction site surveying





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