

LiAIR X4

Autonomous Flight LiDAR Data Acquisition System



LiAIRX4 is the new generation of autonomous flight LiDAR data acquisition system developed by GreenValley International. It integrates a lightweight 32-line laser scanner, high-precision inertial navigation system, high-resolution camera, and a high-performance cutting edge computing platform. The rotary laser scanner design enables X4 full 360-degree point cloud scanning capability. Through the self-developed AirPilot autonomous flight algorithm, it can achieve autonomous obstacle avoidance flight. It not only improves operational efficiency and safety, but also reduces labor costs, making it an important tool for future smart inspections.



I Autonomous Flight Function



- **Above Powerline Following Flight**

Automatic line intersection identification, autonomous crossing of intersections, real-time tree obstacle reporting and pole/tower log generation, and automated pole/tower identification and photography.



- **Side Powerline Following Flight**

Capture RGB photos of conductors, autonomous tower crossing and line switching.



- **Real-time Terrain Following Flight**

Real-time DSM construction for terrain-following flight, meet the demand of large height difference terrain data collection for short-range LiDAR system.

Advantages

I AirPilot algorithm upgraded, fully autonomous obstacle avoidance released

Powered by the self-developed high-precision integrated motor, the scanner achieves 360°x 270° omnidirectional scanning. During autonomous flight, the system can detect obstacles along the flight path and autonomously climb or maneuver to avoid them, without the need for human intervention. This resolves the issue of the inability to fully autonomously cross powerlines during electrical infrastructure inspections.

I Support GNSS antenna-free solution, simplifying the installation process

When mounting the system on DJI M300/M350RTK aircraft, there is no need to install external antennas, yet it can still acquire high-precision GNSS information. Post-processing can then generate a centimeter-level high-precision point cloud.

I GreenValley new design, focusing on work quality

The system has adopted a brand-new interface design and layout, which supports real-time playback of the point cloud data according to the project. After landing, users can instantly review the operational situation and confirm the completeness of the data. The system has also added support for real-time true-color point cloud display, allowing users to switch between three display modes: intensity, height, and true color. This better assists the inspection personnel in on-site evaluation of the point cloud quality.

I High-performance AI chip with a powerful 40 TOPS computing capability

The AirPilot algorithm processing speed has increased by 2 times, the maximum autonomous flight speed has increased to 10 m/s, work efficiency has improved by 50%, and daily inspection mileage for powerline inspections now exceeds 20 kilometers.

I 26MP mapping camera upgraded, supporting real-time video stream transmission

The camera supports 720P/30FPS video real-time transmission to the GreenValley flight control software. This allows the flight personnel to clearly view the trend of the powerlines and the surrounding environment through the flight control software, which better assists them in inspecting and assessing the powerline route.

I Support handheld mode, integrated air-ground operations

Optional handheld kit, fusion of GNSS and LiDAR SLAM algorithms to meet diverse scanning needs, maximizing the value of the device.

Specifications

System Specifications

Detection Range	80 m @ 10% reflectance 200 m @ 54% reflectance 300 m @ 90% reflectance	System Accuracy (Vertical)	<5cm @ 100m
Typical Flight Speed	8m/s	Internal Storage	256GB TF Card + 512GB Internal SSD
Weight	1.44kg	Dimensions	210×120×183mm
Voltage	12~28V	Power Consumption	31W
Operating Temperature	-20~50°C	Storage Temperature	-30~60°C

Laser Scanner Parameters

Wavelength	905nm	Number of Channels	32
Laser Class	Class1	FOV	360°(Horizontal) ×40.3°(Vertical)
Scan Frequency	5Hz~20Hz	Returns	3
Point Rate	1920 kHz(Triple Return)		

Inertial Navigation System

GNSS	GPS, GLONASS, Galileo, BeiDou	Azimuth Accuracy	0.038°
Attitude Accuracy	0.008°	IMU Data Frequency	200HZ

Camera

Pixels	26MP	Focal Length	16mm/24mm(Equiv. Focal Length)
Image Size	6252x4168		

Software

Control Software	GreenValley	Pre-Processing	LiGeoreference
Post-Processing	LiDAR360/LiPowerline (Optional)		

