GreenValley International

LiAir X4

Autonomous Flight LiDAR Data Acquisition System

LiAir X4 is the latest generation of autonomous flight LiDAR data acquisition system developed by GVI. It integrates a lightweight 32-line laser scanner, a high-precision inertial navigation system, a 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.

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 DEM construction for terrain-following flight, meets the demand of large height difference terrain data collection for short-range LiDAR system.

Advantages

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.

Supports 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.

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, better assisting them in inspecting and assessing the powerline route.

GreenValley new design, focusing on work quality

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 the on-site evaluation of the point cloud quality.

Handheld Accessories

The handheld kit is an optional accessory for the X4 product. When paired with the X4 device, it enables high-precision 3D point cloud data acquisition in GNSS-denied environments.

Standard Version

Panoramic Camera Version

Multiple Options Available

The system offers two optional kit configurations: standard version and panoramic camera version. Panoramic camera version integrates dual 12-megapixel panoramic cameras, enabling synchronous capture of 3D point clouds and realistic texture data to construct high-fidelity 3DGS models.

Lightweight and Easy to Disassemble

The handheld kit weighs 1.9kg (including the panoramic camera) and features an ergonomic design for comfortable grip. The system delivers 2.5-hour runtime per battery, featuring one-button operation and plug-and-play installation for immediate deployment readiness.

High-Efficiency Performance

Point cloud thickness <2cm, vertical accuracy <5cm, and point density exceeding 10,000 pts/m^2, achieving coverage capacity of 100,000 m^2 per hour of operation.

High-Precision Fusion

Combining self-developed SLAM algorithms with GNSS modules, the system directly captures georeferenced ground point cloud data in areas without GNSS signals, enabling centimeter-level integration with airborne point cloud datasets.

729 Heinz Ave. Ste 9, Berkeley, CA 94710, USA I www.greenvalleyintl.com I info@greenvalleyintl.com

Specifications

System Specifications			
Detection Range	80 m @ 10% reflectivity 200 m @ 54% reflectivity 300 m @ 90% reflectivity	System Accuracy (Vertical)	<5 cm @ 100 m
Typical Flight Speed	5-10 m/s	Storage	256 GB TF Card+512 GB Internal SSD
Weight	1.44 kg	Dimensions	210×120×183 mm
Voltage	12~28 V	Power Consumption	31 W
Operating Temperature	-20~50 ℃	Storage Temperature	-30~60 ℃
LiDAR Sensor Parameters			
Wavelength	905 nm	Number of Channels	32
Laser Class	Class1	FOV	360° (Horizontal)×40.3° (Vertical)
Scan Rate	1,920,000 pts/s (Triple Return)	Number of Returns	3
Inertial Navigation System			
GNSS	GPS, GLONASS, Galileo, BDS	Azimuth Accuracy	0.038°
Attitude Accuracy	0.008°	IMU Data Frequency	200 Hz
Camera Parameters			
Pixels	26 MP	Focal Length	16 mm / 24 mm (Equiv. Focal Length)
Image Resolution	6252×4168		
Software			
Control Software	GreenValley	Pre-Processing	LiGeoreference
Post-Processing	LiDAR360 / LiPowerline (Optional)		

Handheld Accessories			
System Parameters			
Handheld Size	241.3×119.8×378.8 mm (Standard) 222.9×119.8×515.5 mm (Panoramic Camera)	Battery Box Size	134×64.6×167 mm
Handheld Weight	1.7 kg (Standard ,excluding battery) 1.9 kg (Panoramic Camera, excluding battery)	Panoramic Camera Pixel	12MP×2
Panoramic Camera FPV	H190°×V190°	Voltage	15.2 V
Battery Capacity	5870 mAh	Antenna	HX-CH7609A
Protection Level	IP54	Working Time of One Battery Block	2.5 h
Maximum Continuous Operation Time	Maximum 55 min		
Mapping Method			
Mapping Principle	SLAM、PPK-SLAM	Real-Time Calculation	Not Supported
Data Results			
Absolute Accuracy	<5 cm	Point Cloud Thickness	< 2 cm
Point Cloud Format	LAS, LiData		