

# 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.



### 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 DEM construction for terrain-following flight, meets 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 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.

#### I 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.

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

#### I Supports handheld mode, integrated air-ground operations

Optional handheld kit is available, which combines GNSS and LiDAR SLAM algorithms to meet diverse scanning needs, maximizing the device's value.

# 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 °C	Storage Temperature	-30~60 °C

## 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)		

