

Airborne Lidar System

Applications

- Wide-area mapping
- Urban mapping
- Natural resource management
- Engineering & infrastructure modeling
- Powerline & transportation corridor

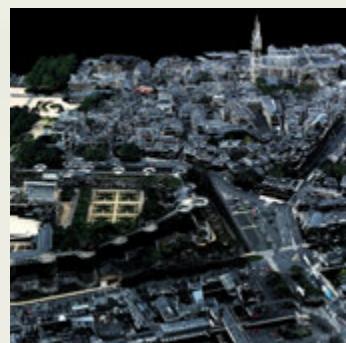


High-performance, ultra-compact, airborne lidar sensor for high-altitude, wide-area survey applications

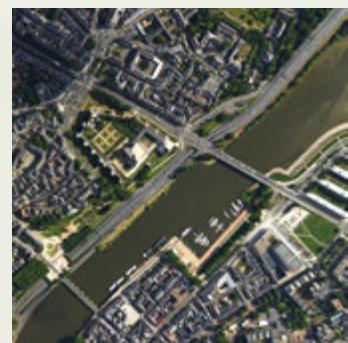
The new Optech Galaxy is the epitome of single-beam sensor design, rivaling much larger dual-beam sensors with its high point density and collection efficiency. A descendant of the popular Orion platform, Galaxy is quite simply the smallest sensor on the market with the greatest capability, representing a leap ahead of its competitors in every way. Whether gyro-stabilized or fixed-mounted, high-altitude or low, one camera or six, Galaxy offers incredible collection efficiency and configuration flexibility with the highest data precision and accuracy possible.



Continuous Operating Envelope



Increased Vertical Density



Seamlessly Integrated Cameras

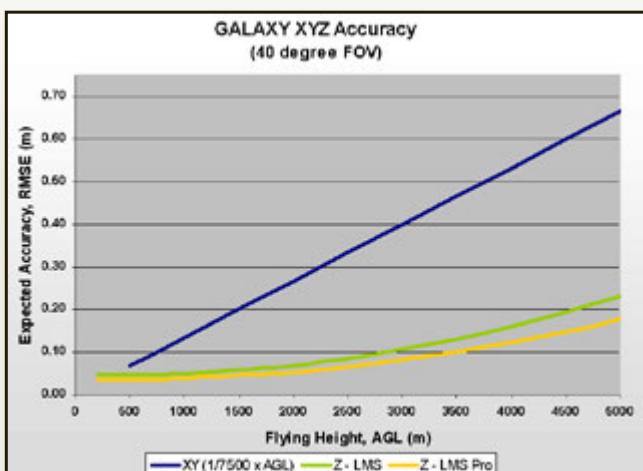
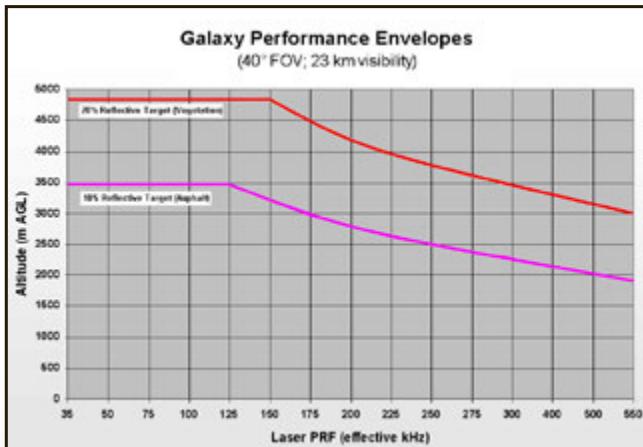


The Optech Galaxy Advantage

- High-performance laser and scanner provide exceptional performance for maximum application flexibility.
- Continuous operating envelope accommodates high-relief terrain with no data gaps or loss of density across multipulse transition zones.
- Capable of up to 8 returns per emitted pulse, Galaxy guarantees the highest vertical density possible without the processing and storage burden of voluminous waveform capture.
- Unique Swath Tracking mode maintains constant-width flightlines for consistent data density in variable terrain.
- Unique real-time sensor protocol enables in-air point cloud display for true-coverage verification and immediate rapid-response deliverables in LAS format.
- Optech FMS Flight Management Suite provides integrated planning with simultaneous control and monitoring capability for up to 8 sensors.



- Industry-leading data precision and accuracy enables survey-grade raw data for the highest quality map products possible.
- Gyro-stabilized and multi-sensor mounts maximize collection efficiency and enable custom sensor suites tailored to your application requirements.
- Powerful Optech LMS Lidar Mapping Suite automates sensor calibration, maximizes laser point accuracies and quantifies project accuracy deliverables.



What is the secret to Galaxy's performance advantage?

POWERED BY
PulseTRAK™



PulseTRAK™ is an innovative set of lidar technology enhancements that significantly increases sensor reliability and collection efficiency, improves data quality, and greatly simplifies the collection process.

These new enhancements include:

1. High-Performance Scanner

A new, high-performance galvometric scanner forms the foundation of Galaxy's exceptional performance capability. Featuring extremely high torque and minimal electrical inductance, the new scanner provides superior scan speeds at reduced voltages for a significant boost in performance, reliability, and scan linearity, enhancing data quality and point distribution. Coupled with an innovative atmospheric point inhibitor, Galaxy provides the highest quality data possible right out of the box.

- Higher scan velocity and scan product for efficient point distribution at faster laser sampling rates.
- Improved scanner stability produces maximum calibration consistency.
- Innovative atmospheric point inhibitor enables "cleaner" raw data and reduces post-processing filtering.

2. Continuous Operating Envelope

PulseTRAK™ technology enables a truly continuous operating envelope by eliminating the data coverage gaps and irregular point density commonly found with other multipulse-equipped sensors. This feature greatly simplifies mission planning and produces consistent data distribution throughout the entire data set, even across receiver "blind" zones.

- Enables consistent point density with no more receiver "blind" zones.
- Complete collection freedom irrespective of terrain variability significantly enhances efficiency.
- Greatly simplifies mission planning.

3. Swath Tracker

PulseTRAK™ technology enables Swath Tracking mode by using the programmable galvometric scanner to create a real-time dynamic FOV that maintains constant swath width and point distribution in varying terrain heights.

- Maintains regular point distribution and constant-width flightlines despite changes in terrain height.

4. Real-time Sensor Protocol

PulseTRAK™ technology now incorporates Optech's real-time sensor protocols to enable in-air target observation and collection monitoring, significantly increasing collection confidence.

- Real-time XYzi point display enables true-coverage verification over the entire operating envelope, even across multi-pulse transition zones.
- In-air target detection and monitoring confirms detection of small targets such as powerlines in real-time.
- Real-time LAS file generation produces immediate data deliverables.

Optech Galaxy Specifications

| Parameter | Specification |
|--------------------------------------|---|
| Laser Configuration | |
| Topographic laser | 1064-nm near-infrared |
| Laser classification | Class IV (US FDA 21 CFR 1040.10 and 1040.11; IEC/EN 60825-1) |
| Beam divergence | 0.25 mrad (1/e) |
| Operating altitudes (1,2,3,4) | 150-4700 m AGL, nominal |
| Effective pulse repetition frequency | Programmable, 35-550 kHz |
| Laser range precision (5) | < 0.008 m, 1 σ |
| Scan angle (FOV) | Programmable, 0-60° |
| Swath width | Programmable, 0-115% of AGL |
| Scan frequency | Programmable, 0-100 Hz advertised (0-200 scan lines/sec) |
| Sensor scan product | 1400 maximum |
| Absolute horizontal accuracy (2,3) | 1 / 7,500 \times altitude; 1 σ |
| Absolute elevation accuracy (2,3) | < 0.03-0.20 m RMSE from 150-5000 m AGL |
| Sensor Configuration | |
| Position and orientation system | POS AV™ AP50 (OEM); 220-channel dual frequency GNSS receiver; GNSS airborne antenna with Iridium filters; high-accuracy IMU (IMU-8) |
| Flight management system | Optech FMS |
| PulseTRAK™ | Continuous operating envelope; Swath Tracker mode; real-time XYZi |
| Range capture | Up to 8 range measurements, including last |
| Intensity capture | Up to 8 intensity returns for each pulse, including last (12-bit) |
| Roll compensation | Programmable; $\pm 5^\circ$ at 50° FOV; increasing as FOV is reduced from 50° |
| Minimum target separation distance | < 0.7 m (discrete) |
| Data storage | Internal solid state drive SSD (SATA II) |
| Power requirements | 28 V; 300 W; 12 A |
| Dimensions and weight | Sensor: 0.34 \times 0.34 \times 0.25 m, 27 kg — PDU: 0.42 \times 0.33 \times 0.10 m, 6.5 kg |
| Operating temperature | 0 to +35°C |
| Optional Peripherals | |
| ITAR-free IMU | FMU-301 (IMU-46) |
| External data storage | Ruggedized, removable 2.5" SSD (SATA II) |
| Image capture | Compatible with all Optech CS-Series and most 3rd party digital metric cameras |
| Full waveform capture | 12-bit Optech IWR-2 Intelligent Waveform Recorder with removable SSD |
| Gyro-stabilization | SOMAG GSM 3000/4000 integration kit |
| Multi-sensor mounts and pods | 2 and 4-station machined aluminum sensor mounts (aircraft and/or helicopter) Carbon-fiber heli-pod sensor mount supporting nadir and fore/aft oblique cameras Heli-sensor pod and mount options for Bell 206 (includes STC) |

1. Target reflectivity $\geq 20\%$.

2. Dependent on selected operational parameters; assumes nominal FOV of up to 40° in standard atmospheric conditions (i.e. 23-km visibility) and use of Optech LMS Professional software suite.

3. Angle of incidence $\leq 20^\circ$

4. Target size \geq laser footprint

5. Under Optech test conditions, 1 sigma