TELEDYNE OPTECH
Everywhereyoulook™
Part of the Teledyne Imaging Group

NEW

NEW Boost Mode and 6,000m AGL!

Galaxy PRIME Airborne Lidar Terrain Mapper

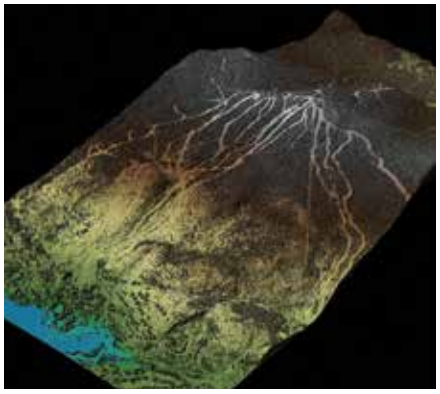
Maximum productivity for wide-area, mountain, urban and corridor survey applications

The new ALTM Galaxy PRIME is the ultimate wide-area lidar sensor, with best-of-class collection efficiency, smallest form factor and highest quality data sets to meet rigorous USGS lidar standards. Now with a 6000m AGL collection envelope and 1-MHz "on-ground" collection rate, Galaxy is quite simply the most productive sensor available with the lowest SWaP for maximum application and platform flexibility.

Whether gyro-stabilized or fixed-mounted, high-altitude or low, one camera or six, full waveform or discrete, Galaxy PRIME excels in all application areas with unmatched configuration flexibility, while providing the highest data precision and accuracy available.

APPLICATIONS

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



Continuous Operating Envelope

Increased Vertical Density

Seamlessly Integrated Cameras

www.teledyneoptech.com

What is the secret to **Galaxy's** performance advantage?

POWERED BY PulseTRAK™ POWERED BY SwathTRAK™

Galaxy PRIME includes an innovative set of lidar technology enhancements that significantly increases sensor performance and collection efficiency, improves data quality, and greatly simplifies the collection process.

THESE NEW ENHANCEMENTS INCLUDE:

1. 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 dataset, 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.

2. Dynamic Field of View (FOV)

Galaxy, with SwathTRAK™ technology, is the only sensor to incorporate a real-time dynamic FOV that maintains fixed-width swaths, even in varying terrain heights.

» Maintains regular point distribution and improves point density consistency despite changes in terrain height.

» Fewer number of flightlines, compared to fixed-FOV sensors, for maximum collection efficiency.

» 40-70% collection cost savings, depending on terrain variability, over fixed-FOV sensor designs.

3. Boost Mode

This new feature enables enhanced range performance and maximum detectability, day or night, when applications demand it.

» Improved range performance

» Improved small target detection

» Improved vegetation penetration

4. Real-time Sensor Protocol

Galaxy incorporates a real-time sensor protocol 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 multipulse 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.

5. High-Performance Scanner

A new, high-performance galvanometric 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. Improved scanner stability produces maximum calibration consistency.

» Improves XY point distribution at higher PRF sample rates.

» Enables faster aircraft velocities and wider scan FOVs, as well as dramatic increases in point density at lesser FOVs.

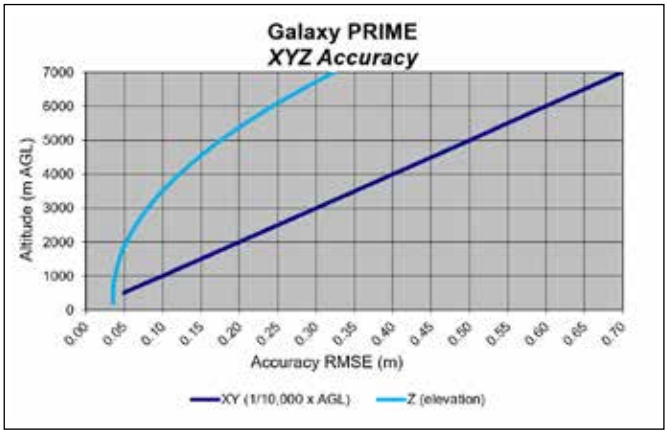
Galaxy PRIME Advantage

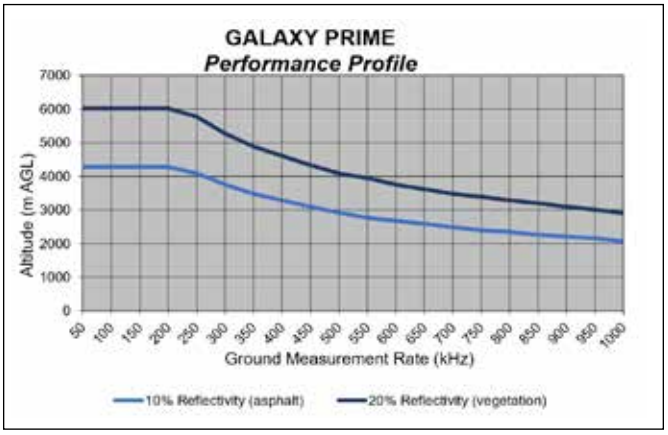
- 1-MHz "on-ground" collection rate enables unprecedented point density.
- Large performance envelope ensures collection confidence in both flat and rugged terrain types.
- PulseTRAK™ technology enables a continuous operating envelope that can accommodate high-relief terrain with no data gaps or loss of density across multipulse transition zones.
- SwathTRAK™ technology can reduce operating costs by as much as 70% by maintaining fixed-width flightlines for consistent point density and fewer flightlines in variable terrain.
- Innovative "Boost Mode" feature increases range performance by as much as 20%.
- 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 (full waveform capture optionally available).
- Unique real-time sensor protocol enables in-air point cloud display for true-coverage verification and immediate rapid-response deliverables in LAS format.
- Optech Flight Management Suite provides integrated planning (with immersive 3D capabilities), navigation, and simultaneous control and monitoring for up to 8 sensors.
- Industry-leading raw data precision and accuracy enables survey-grade deliverables for complete USGS Lidar Base Specification compliance (QL0/QL1/QL2) and 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.

GALAXY PRIME PRODUCTIVITY EXAMPLES [1, 2]

	BOOST MODE	STANDARD MODE	STANDARD MODE			
Average Point Density	**2 pts/m²**		**8 pts/m²**	**20 pts/m²**	**60 pts/m²**	**180 pts/m²**
Flight Altitude (AGL)	9810 ft / 2990 m	8333 ft / 2540 m	5216 ft / 1590 m	3773 ft / 1150 m	1640 ft / 500 m	1640 ft / 500 m
Ground Speed	315 kn	315 kn	210 kn	115 kn	115 kn	60 kn
Swath Width	2790 m	2370 m	1160 m	840 m	270 m	175 m
Instantaneous Coverage Rate	1465 km²/hr	1245 km²/hr	450 km²/hr	180 km²/hr	60 km²/hr	20 km²/hr
Ground Measurement Rate (kHz)	900,000 meas./sec	750,000 meas./sec	1,000,000 meas./sec	1,000,000 meas./sec	1,000,000 meas./sec	1,000,000 meas./sec

1. Calculated for 20% reflective targets; 99% detection probability, full footprint interception
2. Corrected for 10% flightline sidelap for 2 and 8 pts/m² (scanner roll compensation enabled)





Galaxy PRIME
Technical Specifications

Parameter	Specification
Sensor Performance	
Performance envelope [1, 2, 3, 4]	150-6000 m AGL, nominal
Absolute horizontal accuracy [2, 3]	1/10,000 × altitude; 1 σ
Absolute elevation accuracy [2, 3]	< 0.03-0.25 m RMSE from 150-6000 m AGL
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)
Pulse repetition frequency (effective)	Programmable, 50-1000 kHz
Beam divergence	0.25 mrad (1/e)
Laser range precision [5]	< 0.008 m, 1 σ
Minimum target separation distance	< 0.7 m (discrete)
Range capture	Up to 8 range measurements, including last
Intensity capture	Up to 8 intensity measurements, including last (12-bit)
Sensor Configuration	
Position and orientation system	POS AV™ AP60 (OEM); 220-channel dual frequency GNSS receiver; GNSS airborne antenna with Iridium filters; high-accuracy AIMU (Type 57); non-ITAR
Scan angle (FOV)	10-60°
Swath width	10-115% of altitude AGL
Scan frequency	0-120 Hz advertised (0-240 scan lines/sec)
Scan product	2000 maximum
Flight management system	Optech FMS (Airborne Mission Manager and Nav) with operator console
SwathTRAK™	Dynamic FOV for fixed-width data swaths in variable terrain
PulseTRAK™	Multipulse tracking algorithm with no density loss across PIA transition zones
Roll compensation	±5° minimum
Data storage	Removable SSD (primary); internal SSD (spare)
Power requirements	28 V; 400 W
Dimensions and weight	Sensor: 0.34 × 0.34 × 0.25 m, 27 kg — PDU: 0.42 × 0.33 × 0.10 m, 6.5 kg
Operating temperature	0 to +35°C
Optional Peripherals	
External data storage	Ruggedized, removable 2.5" SSD
Image capture	Compatible with all Optech CS-Series and most 3rd party digital metric cameras (integration kits available)
Full waveform capture	12-bit Optech IWR-3 Intelligent Waveform Recorder with removable SSD
Gyro-stabilization	SOMAG GSM4000 integration kit
Multi-sensor mounts and pods	Machined aluminum sensor mounts (aircraft and/or helicopter) Carbon-fiber sensor mounts supporting nadir and fore/aft oblique cameras Heli-pod mount options for Bell 206/407 (FAA-approved)

1. Target reflectivity ≥20%; 99% detection probability
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 ≤20°
4. Target size ≥ laser footprint
5. Under Teledyne Optech test conditions, 1 sigma

Printed in Canada. 190121