

EDGE LIDAR

2-in-1 bathymetric + topographic mapping



PLATFORM AGNOSTIC

Pictured above, EDGE conducting a coastal survey on a Skyfront P8 drone. The high-resolution system supports numerous applications, including coral reef mapping.

UNDERWATER APPLICATIONS

- Streams, rivers, ponds and lakes
- Near-shore/coastal environments
- Water resource management
- Natural disaster assessment and recovery
- Underwater infrastructure inspection
- Military logistics

The EDGE™ LiDAR from Orion Space Solutions, an Arcfield Company is the world's first small-scale bathymetric and topographic scanning LiDAR capable of integration with an uncrewed aerial vehicle (UAV). Fully autonomous and platform agnostic, EDGE can be deployed with common-use UAVs to detect small underwater objects, measure shallow water depth and survey critical underwater infrastructure with high precision. Its two-in-one LiDAR capabilities can produce accurate, high-resolution point clouds using measurements collected above or below the water's surface, even in environments that traditional LiDAR systems are unable to survey.

ABOUT ORION SPACE SOLUTIONS

Building on a foundation of science and technology, Orion Space Solutions delivers the most comprehensive actionable data intelligence through the design, development, and deployment of models, spacecraft, and sensors to accelerate the pace of innovation for our government and commercial customers and partners. EDGE LiDAR combines our knowledge of compact satellite systems with the ability to reduce the size and weight of high-performance sensors. Using novel LiDAR optical capabilities, we give our customers the tools to see beyond the surface.

SYSTEM INFORMATION

EDGE is a low-size, low-weight and low-power LiDAR system, making it perfect for small form-factor UAVs. Its compact and platform-agnostic design allows access to previously inaccessible locations such as shallow-water environments. Additionally, compared to traditional LiDAR systems, EDGE deploys faster, enables safer data collection, and delivers higher precision at lower costs.

COMPONENTS AND FEATURES

- Lightweight internal IMU/GPS (SBG or Applanix)
- Internal downward-pointing camera
- Dual GPS antennas with mounting booms
- Mounting hardware for UAV integration
- Removable USB data storage
- Two rechargeable lithium-ion batteries with chargers
- Pelican case for safe storage and transport
- Customizations at time of order: pulse repetition rate, beam footprint and scan rate

EYE SAFE LASER SYSTEM

EDGE is a Class 3R eye-safe laser system, as defined by the Food and Drug Administration. This allows for safe operability in collecting 3D point cloud data.

UNPRECEDENTED RESOLUTION

EDGE is the highest resolution bathymetric LiDAR system on the market, capable of capturing point densities of > 300 points/m². Its linear scan pattern gives a near-constant point density, and the 30° scan angle range maps out a swath width that is half the flight altitude. The images below demonstrate the difference in resolution between traditional airborne bathymetric LiDAR (left image) and EDGE (right image).

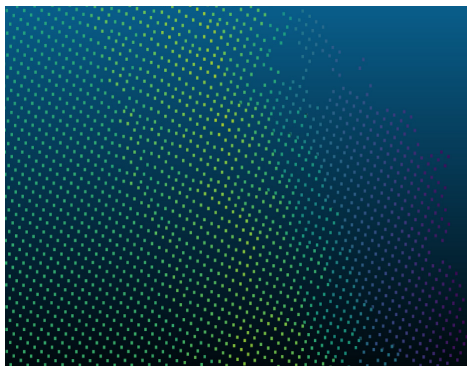
AWARDS AND RECOGNITIONS

2022 JALBTCX Technical Achievement Award

2020 ILMF Lidar Leader Award Finalist: Outstanding Commercial Innovations

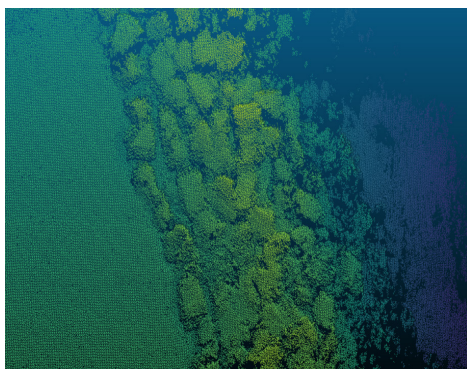
4 POINTS/M²

Traditional Airborne Bathymetric LiDAR



>300 POINTS/M²

Distance underwater: Yellow (1.5') – green (3') – blue/purple (23')



SHALLOW WATER PRECISION

The EDGE's performance in shallow waters is unmatched, providing simultaneous water and bottom-surface detection with sub-centimeter accuracy and precision. The green (532 nm) wavelength penetrates through water and provides bottom surface returns greater than 1.5 Secchi depth.

EDGE SPECIFICATIONS

Weight	5 kgs
Dimensions	27 cm x 23 cm x 19 cm
Power supply	Internal Li-Ion Battery – 1.5-hour lifetime
Data interface	USB
Data volume	1 GB / 10 minutes
Laser class	Class 3R Laser Product according to IEC 60825-1:2007
NOHD for 3R model	3 m: (Eye safe at > 3 m) distance from observer

SCANNER PERFORMANCE

Scan pattern	Linear cross-track
Scan angle range	± 15° = 30°
Scan rate	70 Hz

IMU PERFORMANCE

Position accuracy	2 cm
Roll/pitch	0.05°
Heading	0.2°

EDGE PERFORMANCE

Accuracy	1 cm
Precision	0.5 cm
Laser wavelength	532 nm
Altitude	Bathy: 30m; Topo: 50m
Depth penetration	> 1.5 Secchi Depth
Pulse repetition rate	20 kHz
Laser beam footprint	12 cm at 10 m
Laser class	3R or 3B - design option

