



TELEDYNE EchoONE

POWERED BY INERTIAL LABS RESEPI™
SECURE LIGHTWEIGHT AIRBORNE LASER SCANNER



TELEDYNE EchoONE OVERVIEW

NDAA compliant

EchoONE is compliant with FY2020 NDA Sec 848 and FY2023 NDA Sec 817. EchoONE is designed, developed and manufactured to be compliant with projects requiring the safety and security of data.

Long-range lidar with up to 8 returns per laser pulse

Powerful eye-safe laser with 270m range to 20% reflectivity targets. Flexibility to map large areas quickly from a high operating altitude, capture narrow electric utility conductors or wires, and penetrate thick vegetation with returns from both tree structure and ground.

Wide-angle perspective

90 deg horizontal field of view with 4 unique +/- 10 deg vertical scan angles. Wide horizontal field of view maximizes swath reducing flight time. Vertical field of view captures utility poles and building walls.

Precise data

5mm lidar ranging precision and 1.5cm georeferenced accuracy. Low noise data results in crisp, detailed scans for modelling applications in utilities and transportation.

Ultra-lightweight design

Echo is the lightest weight UAV laser scanner with its performance. Capture larger areas with increased flight time before needing battery swaps. Compatible with smaller airline transportable UAVs and fewer transportation cases.

Realtime georeferenced point cloud

Georeferenced point cloud generated on-sensor in realtime. Pilot QC review of LAS file to ensure project coverage prior to leaving site. Realtime API for third-party customized solutions.

High-accuracy inertial measurement unit

EchoONE includes the Inertial Labs KERNEL-210 tactical grade IMU. High accuracy inertial measurements ensure the accuracy and reliability of lidar point clouds when verified to ground control points.

Integrated colorization camera

EchoONE includes a 5MP global shutter camera and optional 61MP camera. Colorized point clouds provide additional context not available with intensity alone. Optional 61MP allows for simultaneous capture of high-resolution imagery for orthomosaics and inspection.

SYSTEM PERFORMANCE

System Accuracy	1.5cm RMSEz @ 120m ⁽¹⁾
Example Area Coverage 30min, 120m agl, 8m/s, 20% sidelap	814 acres / 329 ha

ENVIRONMENTAL

Operating Temperature	-10C to +50C
Storage Temperature	-40C to +85C
Ingress Rating	IP54
Compliance	CE, RoHS, WEEE REACH, NDA

PHYSICAL

Size	L: 170mm H: 144mm W: 110mm
Weight	1.2kg
Power	Up to 60W, 9-50V

OPERATIONAL

Communication	WLAN, Wifi
Onboard Storage	512GB
Removable Storage	USB



About Inertial Labs

Inertial Labs is at the forefront of developing and manufacturing position and orientation technologies for the commercial sector, government, defense, and aerospace. Inertial Labs' product catalog includes Inertial Measurement Units (IMU), Inertial Navigation Systems (INS), Motion Reference Units (MRU), and Wave Sensors (WS) along with RESEPI, our LiDAR scanning and mapping package. We supply solutions for land, sea, and air to exacting customers from some of the largest organizations in the world.

LASER

Laser Pulse Repetition Frequency (kHz)	400kHz	600kHz
Effective Pulse Repetition Frequency (kHz)	316kHz	474kHz
Max Measuring Range 20% targets ⁽²⁾	270m	225m
Max Operating Altitude Agl, 20% targets ⁽³⁾	205m	170m
Max Returns Per Pulse	8	
Range Accuracy / Precision, 1sigma ⁽¹⁾	10mm/5mm	
Laser beam divergence 1/e ²	0.5mrad	
Minimum Range	3.0m	
Horizontal Field of View	90deg	
Vertical Scan Lines (Nadir) ⁽⁵⁾	-10deg, -4deg, +4deg, +10deg	
Lines Per Second	Up to 250	
Wavelength	1535nm	
Laser Product Classification	Class 1 (IEC 60825-1:2014)	

SOFTWARE

Inertial Labs PCMaster Pro	One-click post-processing Post-Processing inertial data Colorization Point cloud visualization and measurement Automation tools
Teledyne LMS Pro (Optional)	Multiple coordinate reference systems Lidar system calibration Boresight calibration Strip alignment Control point report Visual quality control tools

OPTIONS

Skyport Payload Interface
Smart Dovetail Payload Interface
Gremsy Payload Interface
Sony ILX-LR1 61MP Camera
External Multiple Service Plans
Training

INS

Constellations	GPS, GLONASS, Galileo, BeiDou, QZSS, NavIC (IRNSS), SBAS, L-Band ⁽⁴⁾
Frequencies	L1, L2, L5 ⁽⁴⁾
Pitch / Roll Accuracy	0.03° (RTK); 0.006° (PPK)
Heading Accuracy	0.08° (RTK); 0.03° (PPK)

CAMERA

Internal	5MP Global Shutter, 80deg FOV
External	Optional Sony ILX-LR1

⁽¹⁾Under Teledyne Geospatial test conditions

⁽²⁾Nominal, Target size >= laser footprint, perpendicular angle of incidence, 23 km clear visibility

⁽³⁾Nadir +/- 40 deg, +/-5 deg roll

⁽⁴⁾Maximum available, dependent on receiver configuration

⁽⁵⁾At Nadir

