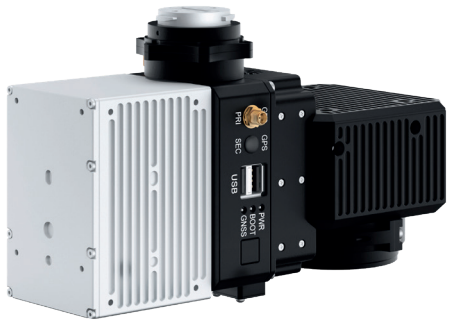
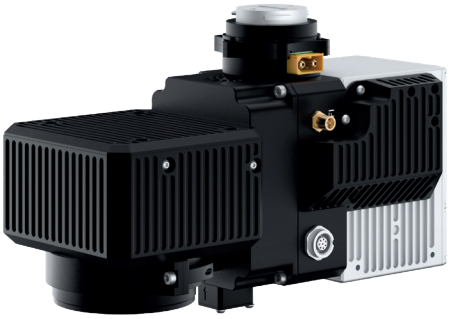
Inertial Labs
Attitude is Everything

LiDAR Scanning & Mapping Solution

RESEPI™ LIVOX AVIA





RESEPI Overview

RESEPI™ (Remote Sensing Payload Instrument) is a sensor-fusion platform designed for accuracy-focused remote sensing applications. RESEPI utilizes a high-performance Inertial Labs INS (GPS-Aided Inertial Navigation System) with a tactical-grade IMU and a high-accuracy single or dual-antenna GNSS receiver, integrated with a Linux-based processing core and data-logging software. The platform also provides a WiFi interface, optional imaging module, and external cellular modem for RTCM corrections. RESEPI can be operated by a single hardware button or from a wirelessly connected device via a simple web interface.

RESEPI WITH LIVOX AVIA

RESEPI equipped with AVIA LiDAR is the lightest configuration, coming in at below 1 kg. It enables longer flight times and increases the selection of drone platforms, including those with lower payload capacity. The narrow scan field of view concentrates laser measurements, resulting in a higher ground point density. RESEPI AVIA is a compact, lightweight, and competitively priced scanning and mapping solution.

System

System Vertical Accuracy	3 - 5 cm[1]
Precision	4 - 5 cm[2]
Precision (1σ Noise Removal)	2 - 3 cm[3]
Recommended AGL	Up to 85 m
Weight	1.2 kg (with camera), 0.9 kg (without camera)
Dimensions	20 x 13 x 9.2 (cm)
Max Flight Time (DJI M300)	33 minutes
External Storage	256 GB USB Included
System Computer	Quad Core, 1GB RAM, 8GB eMMC
Operational Voltage Range	9-45V
Power Consumption	16W

Applications

RESEPI AVIA excels at surveying thin objects such as powerlines. Utility lines are long with a small diameter and can be challenging for some lasers to track. AVIA's high point density causes the lines to stand out and appear more clearly in point cloud data. Another great application is surveying long distances over large tracts of land, such as airport runways or racetracks. RESEPI AVIA can be flown at higher speeds, and the narrow Field of View allows for preserving point cloud density. Coupled with the lighter weight of the payload, available flight time is improved.

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.

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LiDAR

Laser Range Capabilities	190m @ 10% ref. (all channels); 320m @ 80% ref. (all channels)
Range Accuracy	+/- 2 cm
FOV (Horizontal)	70.4°
FOV (Vertical)	4.5° / 77.2°[4]
Scan Angle (Vertical)	N/A
Beam Divergence	0.03° (H), 0.28°(V)[5]
Number of Laser	6
Number of Returns	3
Pulse Rate	240k/s (single return); 480k/s (dual return); 720k/s (triple return)

Camera

Model	24MP RGB Mapping Camera
Lens	Sony E-Mount 16mm, 70° FOV
Max Trigger Rate	2 seconds
External Camera Support	Yes[6]

Software

Field Checks	Yes, Included
Pre-Processing	Yes, Included
Post-Processing	Yes, Supported

GPS-Aided INS

GPS-Aided Inertial Navigation System

IMU	Inertial Labs Tactical Grade IMU-P
GNSS	Single or Dual Antenna
Constellations	GPS, GLONASS, Galileo, BeiDou, QZSS, NavIC (IRNSS), SBAS, L-Band[7]
Frequencies	L1, L2, L5[8]
Operation Modes	RTK and PPK
Output Rates	Up to 200Hz (INS); Up to 2,000Hz (IMU)
Pitch/Roll Accuracy	0.03° (RTK); 0.006° (PPK)[9]
Heading Accuracy	0.15° (RTK); 0.03° (PPK)[10]
Velocity Accuracy	<0.03 m/s
Position Accuracy	1cm + 1ppm (RTK); 0.5cm (PPK)

[1][2]Single Pass, 50m AGL, 5m/s, Nadir, Values Based on Inertial Labs Test Conditions.

[3]Single Pass, 50m AGL, 5m/s, Nadir, Single Noise Removal, Values Based on Inertial Labs Test Conditions.

[4]Dependent upon scanning pattern used.

[5]Varies by measurement range.

[6]For select models.

[7][8]Maximum available; dependent on receiver configuration.

[9]Dynamic accuracy is dependent on type of motion.

[10]Dynamic accuracy is dependent on type of motion; RTK with a 1-meter baseline