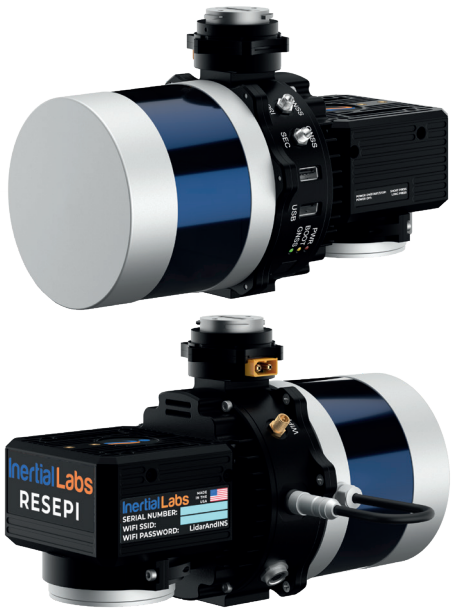
RESEPI

LiDAR Scanning & Mapping Solution



RESEPI™ LITE VELODYNE VLP-32C

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.

System

System Vertical Accuracy	3 - 5 cm[1]
Precision	4 - 6 cm[2]
Precision (1σ Noise Removal)	2 - 4 cm [3]
Recommended AGL	Up to 100 m
Weight	1.8 kg (with camera), 1.4 kg (without camera)
Dimensions	21.9 x 14.2 x 14.2 (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

Software

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

RESEPI WITH VELODYNE VLP-32C

RESEPI, equipped with VELODYNE's VLP-32C LiDAR, offers one of the most well-known VELODYNE lasers combined with RESEPI. Being the matured and systematically improved version of its predecessor, the VLP-16, this laser provides improved vertical FOV, point density, and range to assure users that all users are well equipped for any scan with a wide variety of flight parameters.

Applications

The RESEPI LITE VLP-32C was strategically integrated for its high vertical FOV of 40° and low beam divergence of 0.17° (H), 0.09° (V) for multiple application bases with mounting options for mobile vehicles, DJI supported drones (DJI M300, M600 Pro), custom drones, handheld platforms, autonomous vehicles, the Freefly Alta-X, and many more. Because of this diverse mounting portfolio and its 360 FOV, the RESEPI LITE VLP-32C can be used for many services, including construction volumetrics, site surveying, precision agriculture, forestry, and much more.

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.

LiDAR

Laser Range Capabilities	1.0m (min. range); 200m (max. range); 4mm (resolution)
Range Accuracy	+/- 3cm[4]
FOV (Horizontal)	360°
FOV (Vertical)	40°
Scan Angle (Vertical)	-25° to 15°
Beam Divergence	0.17° (H), 0.09°(V)[5]
Number of Laser	32
Number of Returns	2
Pulse Rate	600 k/s (single return); 1200 k/s (dual return)

Camera

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

[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]Typical, may vary based on range, temperature and target reflectivity.

[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.

GPS-Aided INS

GPS-Aided Inertial Navigation System

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)

Inertial Measurement Unit

IMU Type	Inertial Labs Kernel
Accelerometer	
Bias in-run stability (Allan Variance)	0.02 mg, 1σ
Noise. Velocity Random Walk (VRW)	0.045 m/sec/√hr, 1σ
Scale Factor (STD, over temperature range)	100 ppm, 1σ
Gyroscope	
Bias in-run stability (Allan Variance)	2 deg/hr, 1σ
Noise. Angle Random Walk (ARW)	0.23 deg/√hr, 1σ
Scale Factor (STD, over temperature range)	600 ppm, 1σ