



RESEPI™ LITE VELODYNE VLP-16



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 (1 σ Noise Removal)	2 - 4 cm ⁽³⁾
Recommended AGL	Up to 65 m
Weight	1.7 kg (with camera), 1.3 kg (without camera)
Dimensions	20.5 x 14.2 x 14.1 (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	15W

Software

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

RESEPI WITH VELODYNE VLP-16

RESEPI, equipped with VELODYNE's VLP-16 LiDAR, is a well-known staple in the industry. For years, the VELODYNE VLP-16 has been known for its affordability and reliability and was a pioneer in the remote sensing industry. With its high accuracy and performance at lower altitudes, it will be a perfect fit for users that execute data collection with consistent flight parameters at lower altitudes.

Applications

The RESEPI LITE VLP-16 has ideal use cases in applications including but not limited to utility mapping (power lines), construction volumetrics, site surveying, precision agriculture, forestry, and mining operations. It's reliable vertical accuracy and low beam divergence of 0.17° (H), 0.09° (V) made it a suitable system to be selected for integration into the mapping and surveying solutions. This system has many different mounting options and can be used with mobile vehicles, DJI-supported drones (DJI M300, M600 Pro), custom drones, handheld platforms, vehicles, the Freefly Alta-X, and many 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.

Laser Range Capabilities	1.0m (min. range); 100m (max. range); 2mm (resolution)
Range Accuracy	+/- 3 cm ⁽⁴⁾
FOV (Horizontal)	360°
FOV (Vertical)	30°
Scan Angle (Vertical)	-15° to 15°
Beam Divergence	0.17° (H), 0.09°(V) ⁽⁵⁾
Number of Laser	16
Number of Returns	2
Pulse Rate	300k/s (single return); 600k/s (dual return)

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

⁽¹⁰⁾Dynamic accuracy is dependent on type of motion; RTK with a 1-meter baseline.

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)

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

