



System

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|---------------------------------|--|
| 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 |

Software

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

RESEPI™ LITE 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.

Applications

RESEPI LITE 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. RESEPI LITE 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 LITE 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.

LiDAR

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|--------------------------|--|
| 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

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|-------------------------|----------------------------|
| 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⁾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.

Estimated post-processed accuracy in controlled aerial mission.

GPS-Aided INS

GPS-Aided Inertial Navigation System

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|---------------------|---|
| 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); 0.004° (PPK) ⁽⁹⁾ |
| Heading Accuracy | 0.1° (RTK); 0.02° (PPK) ⁽⁹⁾ |
| Velocity Accuracy | <0.03 m/s |
| Position Accuracy | 1cm + 1ppm (RTK); 0.5cm (PPK) |

Inertial Measurement Unit

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| 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 |

