



RESEPI™ LITE XT-32M2X



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

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| System Vertical Accuracy | 2 - 3 cm ⁽¹⁾ |
| Precision | 2 - 4 cm ⁽²⁾ |
| Precision (1 σ Noise Removal) | 1.5 - 2.5 cm ⁽³⁾ |
| Recommended AGL | Up to 150m |
| Weight | 1.4 kg (with camera), 1.0 kg (without camera) |
| Dimensions | 20.8 x 16.5 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 | 17W |

Software

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

RESEPI WITH XT-32M2X

RESEPI with XT-32M2X makes use of enhanced M2X LiDAR scanner features lighter weight and extended detection over the XT-32 LiDAR. It enables an M2X-equipped RESEPI to fly longer, combined with a higher recommended AGL and wider vertical FOV to more effectively map larger areas and sites with dense vegetation cover. It is an all-around desirable system, offering the benefits of best-in-class data accuracy, better detection range, high point density, and versatility.

Applications

The RESEPI LITE XT-32M2X was strategically designed for multiple application bases with mounting options for mobile vehicles, DJI supported drones (DJI M300, M600 Pro), custom drones, handheld platforms, vehicles, the Freefly Alta-X, and many more. Because of this diverse mounting portfolio, the RESEPI LITE XT-32M2X can be used for many services including utilities mapping (power lines), construction volumetrics, site surveying, precision agriculture, forestry, mining operations, 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 | 80m @ 10% ref. (all channels); 0.05 to 300m |
| Range Accuracy | +/- 1 cm |
| FOV (Horizontal) | 360° |
| FOV (Vertical) | 40.3° |
| Scan Angle (Vertical) | -20.8° to 19.5° |
| Beam Divergence | 0.056° (H), 0.1°(V) ⁽⁴⁾ |
| Number of Laser | 32 |
| Number of Returns | 3 |
| Pulse Rate | 640k/s (single return); 1280k/s (dual return); 1920k/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 ⁽⁵⁾ |

⁽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⁾Varies by measurement range.

⁽⁵⁾For select models.

^{(6) (7)}Maximum available; dependent on receiver configuration.

⁽⁸⁾Dynamic accuracy is dependent on type of motion. Estimated post-processed accuracy in controlled aerial mission.

GPS-Aided INS

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| GPS-Aided Inertial Navigation System | |
| GNSS | Single or Dual Antenna |
| Constellations | GPS, GLONASS, Galileo, BeiDou, QZSS, NavIC (IRNSS), SBAS, L-Band ⁽⁶⁾ |
| Frequencies | L1, L2, L5 ⁽⁷⁾ |
| 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) ⁽⁸⁾ |
| Heading Accuracy | 0.1° (RTK); 0.02° (PPK) ⁽⁸⁾ |
| 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 |

