TRIMBLE AP+ 60 AIR

NEXT GENERATION EMBEDDED GNSS-INERTIAL SOLUTION FOR ROBUST AIRBORNE POSITIONING AND DIRECT GEOREFERENCING

POWERFUL ENOUGH FOR USE ON CREWED PLATFORMS YET SMALL ENOUGH FOR USE ON UNCREWED AERIAL VEHICLES (UAVS)

The Trimble AP+Air GNSS-inertial system is comprised of next-generation compact, low-power hardware, featuring dual embedded survey-grade GNSS chipsets, an onboard inertial measurement unit (IMU), an external IMU, and the all-new Applanix IN-Fusion+ GNSS-aided inertial firmware.

**INTEGRATE ONCE, USE MANY**

The “Integrate once, use many” concept means a single hardware platform can be used to build a complete range of mapping payloads, from UAV to crewed aircraft, using the same design. This consistency saves costs associated with design and integration.

The Trimble AP+Air is configurable to support the Direct Georeferencing accuracy demands of everything from low-flying UAVs to high-altitude crewed platforms. Compatible with photogrammetric cameras, LiDAR, hyperspectral and multispectral cameras, Synthetic Aperture Radar and virtually any other type of airborne remote sensor, the Trimble AP+Air is a powerful, compact, and versatile solution. Easily integrated with any type of platform, AP+Air saves significant costs in all types of surveys.

**THE BEST SOLUTION JUST GOT BETTER**

The Trimble AP+Air OEM solution is fully supported by the industry-leading Applanix POSPac MMS post-processing software, featuring Post-Processed Trimble CenterPoint® RTX™ for centimeter position accuracy without base stations, making it the ultimate solution for integrators wishing to produce a highly efficient airborne mapping system. For LiDAR integrators, the Trimble AP+Air OEM is fully compatible with the POSPac MMS LiDAR QC Tools for UAV.

**Key Features**

- “Integrate once, use many” concept means a single platform can be used to build a complete range of mapping payloads, from UAV to crew operated aircraft, using the same design, which saves costs.
- **Reduced SWAP**
  - 54% smaller footprint, 64% lighter, 75% less power
- Next generation, survey-grade GNSS receiver
- Dual inertial support (onboard and external) for simple gimbal mount support
- Two antenna heading support
- Next generation In-Fusion+Aided-Inertial Firmware
- Completely configurable, from entry-level UAV applications, all the way up to high-accuracy solutions for high altitude LiDAR mapping
TECHNICAL SPECIFICATIONS

System Summary
- Applanix In-Fusion™ GNSS-inertial integration technology
- Onboard IMU with solid-state MEMS inertial sensors and Applanix SmartCal™ compensation technology
- High performance external IMU
- Advanced Trimble Maxwell Custom GNSS survey technology with 2 x 336 tracking channels
- Optional Dual Antenna, GAMS (GNSS Azimuth Measurement System) included

Primary Antenna
- GPS: L1C/A, L2C, L2E, L5
- GLONASS: L1C/A, L2C/A, L3, CDMA
- Galileo: E1, E5a, E5b, E5a/b, E6
- IRNSS: L5
- QZSS: L1C/A, L1S, L1C, L2C
- L5, LEX
- SBAS: L1C/A, L5

Secondary Antenna:
- GPS: L1C/A, L2C, L2E, L5
- GLONASS: L1C/A, L2C/A, L3, CDMA
- Galileo: E1, E5a, E5b, E5a/b, E6
- IRNSS: L5
- QZSS: L1C/A, L1S, L1C, L2C, L5, LEX
- SBAS: L1C/A, L5

Post-Processed correction service, typical airborne results, subject to regional coverage.

0.030
GLONASS: L1 C/A, L2 C/A, L3
0.025
GPS: L1 C/A, L2C, L2E, L5
0.0025
n/a
SBAS: L1 C/A, L5
0.005
0.005
QZSS: L1 C/A, L1S, L1C, L2C
0.005
RTX

Weight (kg)
- 8
- 0.005
- 0.005
- 0.010
- 0.030

Temp °C (Operational)
- 6
- 0.003
- -40 to +60
- 0.005

Size (L x W x H) mm
- 85 Leek Crescent
- Richmond Hill, Ontario
- L4B 3B3, Canada
- +1-289-695-6000 Phone

www.applanix.com
airborne@applanix.com

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OTHER INPUT/OUTPUT

PPS (pulse-per-second) Time synchronization
- Event Input (2)
- Digital I/O (3) Two time marks for external events, TTL 3.3V, 50 Hz max rate
- LED drivers with dedicated functionalities for system integrators
- External IMU Interface
- Dedicated signals for external IMU support

LOGGING

Internal Logging
- 6 GB flash memory
- USB 2.0 host configuration support for removable USB device

External Logging
- Parameters
  - Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data (200 Hz), raw GNSS data (5 Hz)

ENVIRONMENTAL CHARACTERISTICS
- Temperature: -40°C to +75°C (Operational)
- -55°C to +85°C (Storage)
- GNSS Operating Limit: 515 m/s, 18,000 m

ADDITIONAL ACCESSORIES
- Evaluation Kit
  - Includes development board, power supply, and short antenna cables (sold separately)

INERTIAL MEASUREMENT UNITS (IMUS)

<table>
<thead>
<tr>
<th>Type</th>
<th>Range</th>
<th>Temp °C (Operational)</th>
<th>Power</th>
<th>Size (L x W x H) mm</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Onboard IMU-79</td>
<td>+/- 6 g</td>
<td>-40 to +75</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>External IMU-57</td>
<td>+/- 30 g</td>
<td>-40 to +60</td>
<td>8 to 36V DC</td>
<td>179 x 126 x 127</td>
<td>2.6</td>
</tr>
</tbody>
</table>

Specifications subject to change without notice.

1. Typical performance. Actual results are dependent on satellite configuration, atmospheric conditions and other environmental effects.
2. Typical mission profile. Max RMS error (GAMS not required).
3. Real-time Trimble CenterPointRTX™ conformance service. Typical airborne results, subject to regional coverage. Subscription sold separately, requires RTX license.
4. POSPac MMS, Single-Base station or SmartBase.
5. POSPac MMS, Post-processed CenterPointRTX™, typical mission performance subscription sold separately.
6. The accuracy is subject to quality of GNSS, data set duration, and regional coverage.
7. Developed under a license of the European Union and the European Space Agency.
8. The hardware of this product is designed for BeiDou B3 compatibility (trial version) and its Firmware will be enhanced to fully support such new signal as soon as officially published ICD becomes available.
9. Does not include external IMU.
10. Performance based upon external IMU.
11. May require local gravity model to achieve full accuracy.
12. Subject to regional coverage.