TRIMBLE AP+ 30 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 crewed 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
DATASHEET

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: L1 C/A, L2C, L2E, L5
  - GLONASS: L1 C/A, L2C, L3CDMA
  - Galileo: E1, E5A, E5B, E5AltBOC, E6
  - IRNSS: L1, L5
  - QZSS: L1 C/A, L1, L5, L2C, L5, LEX
  - SBAS: L1 C/A, L5
- Secondary Antenna:
  - GPS: L1 C/A, L2C, L2E, L5
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA
  - Galileo: E1, E5A, E5B, E5AltBOC, E6
  - IRNSS: L5
  - QZSS: L1 C/A, L1, L5, L2C, L5, LEX
  - SBAS: L1 C/A, L5

- MSS L-Band: Trimble RTX

- High precision multiple correlator for GNSS pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurements data with low noise, low multipath error, low time domain and high dynamic response
- Very low noise GNSS carrier phase measurements with ~1 mm precision in a 1 Hz bandwidth
- Proven Trimble low elevation tracking technology
- Real-time GNSS L1, SBAS positioning mode
- Real-time 100 Hz position, attitude output, dual IMU 200 Hz data rate logging
- Navigation output format: ASCII (NMEA-0183), binary (Trimble GSOF)
- RTK license support for Reference Inputs CMR, CMR+, sCMRx, RTCM 2.1, 2.2, 2.3, 3.1, 3.2, sold separately

Supervised by POSPac, MMS
- No export permit required

LAN INPUT/OUTPUT
All Ethernet functions are supported through dedicated IP address (static or DNS) simultaneously including web-based control GUI access and real-time data streaming

TCP/IP and UDP
- ASCII and binary data streaming (Time tag, PPS sync, status, position, attitude, velocity, track and speed, dynamics, performance metrics, GNSS data), configuration messages

HTTP
Web-based control software (GUI) for easy system configuration and low rate display. Support for all common browsers (IE, Safari, Mozilla, Google Chrome, Firefox)

SERIAL INPUT/OUTPUT
RS232 ports
- (baud rates up to 460,800)

USB 2.0 Device Configuration
- ASCII and binary data streaming (time tag, PPS sync, status, position, attitude, velocity, track and speed, dynamics, performance metrics, GNSS data), configuration messages

OTHER INPUT/OUTPUT

PPS (pulse-per-second) Time synchronization
- Event Input (2)
- Digital I/O (3)
- LED drivers with dedicated functionalities for system integrators

External IMU Interface
- Dedicated signals for external IMU support

LOGGING

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

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

PERFORMANCE SPECIFICATIONS

Absolute Accuracy Specifications\(^1\) ( RMS)

<table>
<thead>
<tr>
<th>Absolute Accuracy Specifications</th>
<th>SPS</th>
<th>SBAS(^3)</th>
<th>RTX</th>
<th>Post-Processed-RTX</th>
<th>Post-Processed(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position (m)</td>
<td>1.5 H</td>
<td>0.50 H</td>
<td>0.95 H</td>
<td>0.04 H</td>
<td>0.03 H</td>
</tr>
<tr>
<td>Velocity (m/s)</td>
<td>0.95</td>
<td>0.50</td>
<td>0.50</td>
<td>0.20</td>
<td>0.10</td>
</tr>
<tr>
<td>Roll &amp; Pitch (deg)</td>
<td>0.20</td>
<td>0.15</td>
<td>0.30</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>True Heading (deg)</td>
<td>0.10</td>
<td>0.08</td>
<td>0.05</td>
<td>0.02</td>
<td>0.025</td>
</tr>
</tbody>
</table>

PHYSICAL CHARACTERISTICS

Size\(^8\) | 300 x 60 x 21 mm

Power\(^6\) | 7W max, 8-34V DC or 3.3V DC

Connectors | Samtec LSHM-140-03.0-L-DV-A-N

Antenna Port | 2 x MMCX receptacle

Output Voltage: Primary 75 VDC
Secondary 5 VDC
Maximum Current: 400 mA
Minimum Input Signal Strength: 32 dB (>35 dB recommended)

ENVIRONMENTAL CHARACTERISTICS

Temperature | -40°C to +75°C (Operational)
-55°C to +85°C (Storage)

GNSS Operating Limit | 3 m/s/sec, 18,000 m

ADDITIONAL ACCESSORIES

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

ADDITIONAL ACCESSORIES

INERTIAL MEASUREMENT UNITS (IMUS)

Specifications subject to change without notice.

TRIMBLE APPLANIX
85 Leek Crescent
Richmond Hill, Ontario
L4B 3B3, Canada
+1-289-695-6000 Phone
www.applanix.com
airborne@applanix.com

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