APX-15 UAV
VERSION 2, SINGLE BOARD GNSS-INERTIAL SOLUTION

The Trimble APX-15 UAV (V2) is a GNSS-Inertial OEM solution designed to reduce the cost and improve the efficiency of mapping from small Unmanned Aerial Vehicles (UAVs). Comprised of a small single OEM board containing a precision GNSS receiver and inertial sensor components plus post-mission Differential GNSS-Inertial office software, the Trimble APX-15 UAV eliminates the need to survey extensive Ground Control Points (GCP’s), and reduces the amount of sidelap to be flown, thus increasing the area flown per mission.

**HIGH ACCURACY, EXTREMELY SMALL PACKAGE**

Measuring just 6 cm x 6.7 cm and weighing only 60 grams, the Applanix APX-15 UAV provides unparalleled performance in an extremely small package. And with the included POSPac UAV postmission software, it produces a highly accurate position and orientation solution for direct georeferencing of cameras, LIDARs and other UAS sensors.

**THE APX-15 UAV BRINGS ALL THE BENEFITS OF DIRECT GEOREFERENCING TO UAV PLATFORMS:**

- High-performance Direct Georeferencing solution for improved efficiency and accuracy of mapping from small Unmanned Aerial Vehicles
  - Reduce/eliminate GCP’s
  - Reduce sidelap
  - Accurate LIDAR georeferencing
- Compact single-board OEM module complete with survey-grade multifrequency GNSS receiver and MEMS inertial components
- Applanix IN-Fusion™ GNSS-Inertial and SmartCal™ compensation technology for superior position and orientation performance
- POSPac UAV Differential GNSS Inertial post-processing software for highest accuracy
- RTK real-time position for precision landing applications
TRANSFORMING THE WAY THE WORLD WORKS

**APX-15 UAV**

**TECHNICAL SPECIFICATIONS**

**System Summary**
- Advanced Applanix IN-Fusion™ GNSS-Inertial integration technology
- Solid-state MEMS inertial sensors with Applanix SmartCal™ compensation technology
- Advanced Trimble Maxwell Custom GNSS survey technology
- 336 Channels
  - GPS: L1 C/A, L2C, L2E (Trimble method for tracking unencrypted L2P), L5
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA
  - BeiDou: B1, B2
  - Galileo: E1, E5A, E5B, E5A/BOC
  - QZSS: L1 C/A, L1 SAIF, L2C, L5
  - SBAS: L1 C/A, L5
- High precision multiple correlator for GNSS pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurements data for low noise, low multipath error, low time domain correlation 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
- 100 Hz position, roll, pitch and heading output
- IMU data rate 200 Hz
- Navigation output format: ASCII (NMEA-0183), Binary (Trimble GSOF)
- Supported Reference input: CMR, CMR+, sCMRx, RTCM 2.1, 2.2, 2.3, 3.0, 3.1
- Support for POSPac UAV post-processing software (included)
- No export permit required

**LAN INPUT/OUTPUT**

All Ethernet functions are supported through dedicated IP address (Static or DNS) simultaneously.

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

**HTTP configuration**

Support for POSPac UAV post-processing software (included)

**SERIAL INPUT/OUTPUT**

RS232 level port
- ASCII and Binary data streaming (Time tag, PPS sync, status, position, attitude, velocity, track and speed, dynamics, performance metrics, GNSS data)
- Reference input (CMR, CMR+, sCMRx, RTCM), configuration messages

**EXTERNAL LOGGING**

- Internal Logging: 6 GByte Flash memory
- External Logging: USB 2.0 Device port

**PERFORMANCE SPECIFICATIONS**

**Unmanned Airborne Vehicle Applications**

**LOGGING**

<table>
<thead>
<tr>
<th></th>
<th>SPS</th>
<th>DGPS</th>
<th>RTK*</th>
<th>Post-Processed†</th>
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</thead>
<tbody>
<tr>
<td>Position (m)</td>
<td>1.5</td>
<td>0.3</td>
<td>0.02</td>
<td>0.02 - 0.05</td>
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<tr>
<td>Velocity (m/s)</td>
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<td>0.02</td>
<td>0.025</td>
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<td>Roll &amp; Pitch (deg)</td>
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<td>0.03</td>
<td>0.03</td>
<td>0.025</td>
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<tr>
<td>True Heading* (deg)</td>
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<td>0.28</td>
<td>0.18</td>
<td>0.080</td>
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</tbody>
</table>

**PHYSICAL CHARACTERISTICS**

- Size: 67 L x 60 W x 15 H mm (nominal)
- Weight: 60 grams
- Power: Wide range input 8-32 V DC, typical power consumption of 3.5W at room temperature
- Connectors: 44 Pin Header Samtec TMM-122-03-S-S-MW (mating part FCI 90311-044LF)
- Antenna Port: Connector: MMCX receptacle

**ENVIRONMENTAL CHARACTERISTICS**

- Temperature: -40 deg C to +75 deg C (Operational) / -55 deg C to +85 deg C (Storage)
- Measurement Range: +/- 6g, +/- 300 dps
- Mechanical Shock: +/- 7g per axis
- Operating Humidity: 5% to 95% R.H. non-condensing at +60 deg C
- Maximum Operating Limits: 515 m/sec 18,000 m

**ADDITIONAL ACCESSORIES**

- Evaluation Kit (Development Board)

**POSPAC UAV OFFICE SOFTWARE**

- Post-processed Differential GNSS-Inertial SW for APX-15
- 200 Hz Navigation solution (Position, Velocity, Orientation, Rates, Accelerations)
- Applanix IN-Fusion GNSS-Integration technology
- Full support for UAV dynamic models
- Single Base Differential GNSS-Inertial processing
- Forward and reverse processing with optimal Smoother
- Support for Applanix SmartBase virtual reference station module

Specifications subject to change without notice.

1 Developed under a License of the European Union and the European Space Agency
2 Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects
3 Typical survey mission profile, max RMS error. Heading error will increase for low speed rotor applications and when hovering
4 Requires base station and radio link, sold separately
5 POSPac UAV, short base line operation
6 Sensor bandwidth (±3 dB amplitude) ~ 50 Hz
7 Sold separately

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