DATASHEET

APX-15 LAND

SINGLE BOARD GNSS-INERTIAL SOLUTION

The Applanix APX-15 Land is a GNSS-Inertial OEM solution that enables a new class of small, portable mobile mapping systems and field robotics applications. Comprised of a small single OEM board containing a precision RTK-capable GNSS receiver and inertial sensor components plus optional post-mission Differential GNSS-Inertial office software, the Applanix APX-15 allows system integrators to utilize the benefits of an accurate position and orientation solution in a small, compact form, reducing size, weight, and power versus existing products.

HIGH ACCURACY, EXTREMELY SMALL PACKAGE

Measuring just 60 x 67 mm and weighing only 60 grams, the Applanix APX-15 UAV provides High-performance Position and Orientation solution for improved efficiency and accuracy of modular mobile mapping platforms and field robotics applications:

- Robust POSE in all land vehicle applications
- DMI support and on-board magnetometer support for low-dynamic and stationary initialization

Key Features

- Compact Single-Board OEM module complete with survey-grade multifrequency GNSS receiver and MEMS inertial components
- Applanix IN-FusionTM GNSS-Inertialand SmartCalTM compensation technology for superior position and orientation performance
- POSPac MMS Differential GNSS Inertial post-processing software for highest accuracy
- RTK real-time position for precision field robotics applications
- High-accuracy real-time orientation

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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
- 220 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[1]: E1, E5A, E5B, E5AltBOC
  - QZSS: L1 C/A, L1 SAIF, L1C, 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
- Magnometer heading initialization
- 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 MMS post-processing software[2]
- 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)
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 level port
TTL level (3.3 V) port

Parameters	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.

OTHER INPUT/OUTPUT

PPS (pulse-per-second)	Time Sync Pulse output
Event Input (2)	Two time mark of external events TTL 3.3 V pulses, max rate 50 Hz
DMI Input	Encoder pulse input, 3.3 V TTL
Digital I/O (3)	LED drivers with dedicated functionality for systems integrators

LOGGING

Internal Logging	6 GByte Flash memory
External Logging	USB 2.0 Device port
Parameters	Timetag,status,position,attitude,velocity,trackandspeed, dynamics, performance metrics, raw IMU data (200 Hz), raw GNSS data (5 Hz)

PERFORMANCE SPECIFICATIONS[3] (RMS ERROR)

Land Vehicle Applications

	SPS	DGPS	RTK[5]	Post-Processed[6]
Position (m)	1.5 - 3.0	0.5 - 2.0	0.02 - 0.05	0.02 - 0.05
Velocity (m/s)	0.05	0.05	0.02	0.015
Roll & Pitch (deg)	0.04	0.03	0.03	0.025
True Heading[4] (deg)	0.30	0.28	0.18	0.080

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	I/O: 44 Pin Header Samtec TMM-122-03-S-S-MW (mating part FCI 90311-044LF)
Antenna Port:	Connector: MMCX receptacle Output Voltage: 3.3 V DC to 5 V DC Maximum Current: 400 mA Minimum Input Signal Strength: 28.5 dB

ENVIRONMENTAL CHARACTERISTICS

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

ADDITIONAL ACCESSORIES[8]

Evaluation Kit (Development Board)
Mounting option with test cable

POSPAC MMS 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 dynamic models
- Single Base and SmartBase Differential GNSS-Inertial processing
- Forward and reverse processing with optimal Smoother

1 Developed under a License of the European Union and the European Space Agency
2 Optional, not included.
3 Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects
4 Typical survey mission profile, max RMS error. Heading error will increase for low speed Land Vehicle applications and when stationar
5 Requires base station and radio link, sold separately
6 POSPac MMS, short base line operation
7 Sensor bandwidth (-3 dB amplitude) ~ 50 Hz
8 Sold separately

Specifications subject to change without notice.

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