

EMBEDDED GNSS-INERTIAL SYSTEMS FOR CONTINUOUS MOBILE POSITIONING AND DIRECT GEOREFERENCING APPLICATIONS

KEY FEATURES

Proven GNSS-Aided Inertial technology from Trimble Applanix

Centimeter level mobile positioning accuracy

Industry leading continuous positioning performance in GNSS denied environments

Full position and orientation solution for direct georeferencing of imaging systems

The Trimble AP10 GNSS-Inertial System is an embedded GNSS-Inertial OEM board set plus Inertial Measurement Unit (IMU) in a compact form factor. It is designed to give system integrators the ability to harness the best in GNSS multi-frequency positioning technology, with the superior capabilities of inertial data for continuous mobile positioning in poor signal environments and for the orientation of imaging sensors.

The Trimble AP10 features the high-performance precision BD960 GNSS receiver and the industry leading Applanix IN-Fusion™ GNSS-Inertial integration technology running on a powerful, dedicated Inertial Engine (IE) board. This flexible and modular design ensures the ability to perform full high-powered GNSS-inertial processing without sacrificing performance. It also provides an upgrade path to next generation GNSS boards as they become available.

PERFORMANCE YOU CAN TRUST

Whether it be guiding autonomous vehicles to winning finishes in the DARPA Urban challenge, navigating through tunnels, or georeferencing sensor data to centimeter level accuracy from high in the sky, Trimble GNSS with Applanix inertial technology has a proven track record of performance without compromise. With the Trimble AP products you know exactly what positioning performance you will get for your mobile application, period.



Trimble AP10 GNSS-Inertial
OEM System

TRIMBLE AP10 GNSS-INERTIAL OEM SYSTEM

TECHNICAL SPECIFICATIONS

- Advanced Applanix IN-Fusion™ GNSS-Inertial integration technology
- Advanced Trimble Maxwell® 6 Custom GNSS survey technology (two chipsets)
- 220 Channels: (per chipset)
 - GPS: L1 C/A, L2C, L2E (Trimble method for tracking unencrypted) L5
 - GLONASS: L1 C/A and unencrypted P code, L2 C/A and unencrypted P code, L3 CDMA⁹
 - GALILEO¹⁰: L1 CBOC, E5A, E5B, E5AltBOC⁹
 - QZSS: L1 C/A, L1C, L1 SAIF, L2C, L5, LEX11¹¹
 - SBAS: L1 C/A (EGNOS/MSAS), L1 C/A and L5 (WAAS)
 - L-Band: OmniSTAR VBS, HP, XP and G2
- 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
- Support for optional Distance Measurement Indicator (DMI) input
- Support for optional GNSS Azimuth Measurement System (GAMST™)
- Support for optional POSpac Mobile Mapping Suite post-processing software

INPUT/OUTPUT

LAN

Parameters	Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data (200 Hz), raw GNSS data (1 Hz)
Display Port	Low rate UDP protocol output (1 Hz)
Control Port	TCP/IP input for system commands
Primary Port	Real-time TCP/IP output (1 – 200 Hz)
Secondary Port	Buffered TCP/IP protocol output for data logging to external device (1 – 200 Hz)

Internal Logging (1 – 200 Hz)

Parameters	Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data (200 Hz), raw GNSS data (1Hz)
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RS232 Input

Parameter	AUX GPS Input (RTK, SBAS), CMR, CMR+, RTCM3, 18 & 19, RTCM1, RTCM9
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RS232 NMEA Output (1 – 50 Hz)

Parameter	Position (\$xxGGA), Heading (\$xxHDT), Track and Speed (\$xxVTG), Statistics (\$xxGST), Attitude (\$PASHR), Time and Date (\$INZDA), Events (\$EVT1, \$EVT2)
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Other I/O

1PPS	1 pulse-per-second Time Sync output, normally high, active low pulse (configurable)
Event Input (2)	Two time mark of external events. TTL pulses > 1 ms width, max rate 100 Hz.

Specifications subject to change without notice.

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PERFORMANCE SPECIFICATIONS¹ (RMS ERROR)

Terrestrial Applications, (DMI required)

System Accuracy - Full GNSS Availability		
Real time Correction Source	Horizontal Accuracy (RMS)	Heading Accuracy (RMS)
Omnistar XP	0.25 m	0.30 deg
Omnistar VBS	1.00 m	0.35 deg

System Accuracy - 20 second outage		
Real time Correction Source	Horizontal Accuracy (RMS)	Heading Accuracy (RMS)
Omnistar XP	2.00 m	0.50 deg
Omnistar VBS	2.50 m	0.55 deg

System Accuracy - 60 second outage		
Real time Correction Source	Horizontal Accuracy (RMS)	Heading Accuracy (RMS)
Omnistar XP	9.0 m	0.90 deg
Omnistar VBS	10.0 m	1.00 deg

¹ Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects. System requires heading initialization procedure.

PHYSICAL CHARACTERISTICS

Board Set

Size:	167 L x 100 W x 45 H mm
Weight:	0.68 kg
Power:	10 – 28 Volts DC, 20 Watts (max)
Connectors:	I/O: Samtec QSH-060-01-L-D-DP-A-RT1 Power: Samtec TFM-105-12-S-D-LC Antenna: MMCX receptacle

ENVIRONMENTAL CHARACTERISTICS

Temperature:	15 deg C to 30 deg C (optimal accuracy performance) -40 deg C to +75 deg C (Operational) -55 deg C to +85 deg C (Storage)
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www.trimble.com/gnss-inertial

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