TRIMBLE AP15

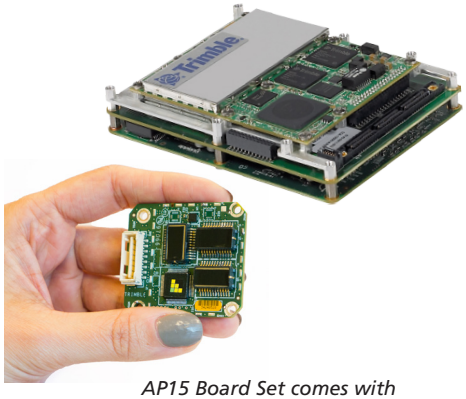
NEW

DATASHEET

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 remote sensing systems
- Fully supported for all dynamic environments: terrestrial, airborne and marine
- High-performance GNSS two antenna heading aiding from single receiver
- Solid-state, purpose-built ruggedized MEMS IMU featuring Applanix SmartCal™ compensation technology



AP15 Board Set comes with remote IMU Board

Trimble GNSS OEM

The Trimble AP15 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 AP15 features a high-performance precision GNSS receiver and the industry leading Applanix IN-Fusion™ GNSS-Inertial integration technology running on a powerful, dedicated Inertial Engine (IE) board. This flexible, modular design ensures the ability to perform full high-powered GNSS-inertial processing without sacrificing performance, and 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 airborne laser scanners to centimetre 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

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היפר-טק מערכות

TRIMBLE AP15 GNSS-INERTIAL OEM SYSTEM

TECHNICAL SPECIFICATIONS

- Advanced Applanix IN-Fusion™ GNSS-Inertial integration technology
- Solid-state MEMS IMU with Applanix SmartCal™ compensation technology
- Advanced Trimble Maxwell Custom GNSS survey technology (two chipsets)
- 220 Channels (per chipset):
  - GPS: L1 C/A, L2C, L2E (Trimble method for tracking unencrypted L2P), L5
  - GLONASS: L1 C/A, L1 P, L2 C/A L2 P code
  - BeiDou: B1, B2
  - Galileo[9]: L1 CBOC, E5A, E5B & E5AltBOC
  - QZSS: L1 C/A, L1 SAIF, L2C, L5
  - SBAS: L1 C/A (EGNOS/MSAS), L1 C/A and L5 (WAAS)
  - L-Band: OmniSTAR VBS, HP, XP and G2, Trimble CenterPoint RTX
- 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
- Two antenna heading aiding (GNSS Azimuth Measurement System, GAMS™)
- Support for optional Distance Measurement Indicator (DMI) input
- Support for optional POSPac Mobile Mapping Suite post-processing software
- No export permit required

INPUT/OUTPUT

LAN

Parameters	Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data (200 Hz), raw GNSS data (5 Hz)
Display Port	Low rate UDP protocol output (1 Hz)
Control Port	TCP/IP input for system commands
Primary Port	Real-time TCP/IP protocol output (1 – 200 Hz)
Secondary Port	Buffered TCP/IP protocol output for data logging to external device (1 – 200 Hz)

Internal Logging, 4 GByte (1 – 200 Hz)

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

RS232 Input

Parameter	AUX GPS Input (RTK, SBAS), CMR, CMR+, RTCM3, 18 & 19, RTCM1, RTCM9

RS232 NMEA Output (1 – 50 Hz)

Parameter	Position ($INGGA), Heading ($INHDT), Track and Speed ($INVTG), Statistics ($INGST), Attitude ($PASHR), Time and Date ($INZDA), Events ($EVT1, $EVT2)

Other I/O

1 pulse-per-second	Time Sync output, normally high, active low pulse
Event Inputs (6)	Six time mark of external events. TTL pulses > 1 msec width, max rate 100 Hz.

PHYSICAL CHARACTERISTICS

Board Set

Size	130 L x 100 W x 39 H mm (nominal) 130 L x 100 W X 43 H mm (with optional connector board)
Weight	0.28 kg (nominal) 0.38 kg (with optional connector board)
Power	10 – 28 Volts DC, 20 Watts (max, with GAMS)
Connectors (no connector board)	I/O ..... Samtec QSH-060-01-L-D-DP-A-RT1 Power ..... Samtec TFM-105-12-S-D-LC Antenna ..... MMCX receptacle (x 2)
Connectors (with connector board)	Power..... Samtec IPBT-103-H2-X-D-3 IMU ..... Molex 87833-2620-1 Ethernet ..... Molex 87833-1020-1 IO1/2 ..... Molex 87833-2020-1/2 USB..... Samtec USBR-A DMI/LED ..... Molex 87833-3020-1 Antenna ..... MMCX receptacle (x 2)

ENVIRONMENTAL CHARACTERISTICS

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

INERTIAL MEASUREMENT UNIT (IMU)

Type	Range[10]	Temperature	Power	Size (L x W x H) mm	Weight
IMU-55	+/- 2g, +/- 125 dps	-20 deg C to + 55 deg C	+ 12 Vdc, 1.8 W (max)	89 x 94 x 65	0.61 kg
IMU-69	+/- 6g, +/- 350 dps	-20 deg C to + 55 deg C	+ 4.5 Vdc to 16Vdc, 1 W (max)	43 x 47 x 12	0.015 kg

PERFORMANCE SPECIFICATIONS[1] (RMS ERROR)

Airborne Applications

	SPS	RTX	RTX Post-Processed[3]	SmartBase Post-Processed[4]
Position (m)	1.5 H 3.0 V	<0.1 H <0.2 V	<0.1 H <0.2 V	<0.05 H <0.1 V
Velocity (m/s)	0.05	0.03	0.015	0.015
Roll & Pitch (deg)	0.04	0.03	0.025	0.025
True Heading[2] (deg)	0.30	0.18	0.080	0.080

Terrestrial Applications[7], No GNSS Outages

	SPS	VBS[8]	IARTK[6]	Post-Processed[4]
Position (m)	1.5 – 3.0	0.1 – 0.5	0.02 – 0.05	0.02 – 0.05
Velocity (m/s)	0.05	0.15	0.015	0.015
Roll & Pitch (deg)	0.04	0.03	0.03	0.025
True Heading[2] (deg)	0.25	0.20	0.15	0.08
True Heading[5] (deg)	0.12	0.09	0.09	0.06

Terrestrial Applications[7], 1 km or 1 minutes GNSS outage

	SPS	VBS[8]	IARTK[6]	Post-Processed[4]
Position (m)	2 - 5	2 - 3	1 – 3	0.2 – 0.8
Position[5] (m)	2 - 3	1 - 2	1 - 2	0.2 – 0.8
Roll & Pitch (deg)	0.09	0.09	0.09	0.05
True Heading[2] (deg)	0.35	0.35	0.30	0.20
True Heading[5] (deg)	0.35	0.35	0.30	0.20

(1)Typical performance. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects
(2) Typical mission profile, max RMS error
(3) Trimble RTX service, typical airborne results, subject to regional coverage. Subscription sold separately.
(4) POSPac MMS
(5) With GAMS option, 2 m baseline
(6) Applanix IN-Fusion Inertially-Aided RTK, typical results
(7) With DMI option
(8) Virtual Base Station corrections
(9) Developed under a License of the European Union and the European Space Agency.
(10) Sensor bandwidth (-3 dB amplitude) ~ 50 Hz.

Trimble
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Specifications subject to change without notice.