

TRIMBLE APX-18 RT LAND

Single board dual antenna GNSS-inertial solution for robust real-time positioning and orientation on ground vehicles

The Trimble® APX-18 RT Land is an OEM GNSS-inertial solution with dual GNSS antenna input, that enables a new class of small, portable mobile mapping systems. Comprised of a small single OEM board containing a precision GNSS receiver with RTK support, onboard IMU and two antenna heading, the Trimble APX-18 RT Land uses the new Applanix® IN-Fusion®+ firmware featuring Trimble ProPoint® GNSS technology to achieve unsurpassed positioning and orientation accuracy and robustness, while Trimble IonoGuard™ protects RTK GNSS from ionospheric disturbances.

Measuring just 100 x 60 mm and weighing only 62 grams, the APX-18 RT provides unparalleled performance in an extremely small package. With a compact footprint, ease of integration, and fast setup, the APX-18 RT Land uses on-board inertial sensor calibration with the Applanix SmartCal™ software compensation technology for superior performance to meet the needs of real-time ground vehicle applications in rail, mining, pavement management, fleet management, robotics and vehicle testing.

Easily integrated with many types of sensors, including optical, infrared, and LiDAR, the APX-18 RT Land delivers high accuracy positioning and orientation information in a small, lightweight form factor.

The APX-18 RT Land product uses state-of-the-art low noise multi-frequency Trimble Maxwell™ GNSS technology, and tracks all current satellite signals including GPS L1/L2/L2C/L5 and GLONASS L1/L2, QZSS, Beidou, IRNSS, and Galileo, and supporting SBAS, RTK, and Trimble CenterPoint® RTX positioning modes.

Whether it is for autonomous vehicle development, ground truth or enabling vehicles to navigate themselves through difficult driving conditions, the Trimble RT product line provides best in class navigation and positioning solutions (up to 100 Hz), lowering costs and potential rework.

Key Features

- Compact single-board OEM module complete with survey-grade multifrequency GNSS receiver and MEMS inertial components
- IonoGuard support
- Free demo subscription to CenterPoint RTX
- Applanix POSPac™ Assure available for Quality Control and calibration
- Two antenna heading support
- SmartCal compensation technology for superior position and orientation performance
- High accuracy orientation
- RTK option for real-time precision positioning
- Next generation In-Fusion+ GNSS-aided inertial firmware featuring ProPoint GNSS Technology



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Single board dual antenna GNSS-inertial solution

**PERFORMANCE SPECIFICATIONS³ (RMS ERROR)
NO GNSS OUTAGES, STANDARD ROAD VEHICLE DYNAMICS**

	SPS	SBAS	RTK
X, Y Position (m)	1.5 H	0.5 H	0.02 H
Z Position (m)	3.0 V	0.85 V	0.03 V
Velocity	0.01	0.01	0.01
Roll & Pitch (deg)	0.04	0.03	0.03
True Heading ⁴ (deg)	0.12	0.09	0.09

1 KM OR 1 MINUTE GNSS OUTAGE, STANDARD ROAD VEHICLE DYNAMICS⁵

	SPS	SBAS	RTK
X, Y Position (m)	2.0 H	2.0 H	2.0 H
Z Position (m)	5.0 V	1.0 V	1.0 V
Roll & Pitch (deg)	0.09	0.09	0.09
True Heading ⁴ (deg)	0.35	0.35	0.30

TECHNICAL SPECIFICATIONS

- Applanix IN-Fusion+ GNSS-inertial integration firmware featuring Trimble ProPoint GNSS technology
- Trimble IonoGuard support
- Onboard IMU with solid-state MEMS inertial sensors with Applanix SmartCal compensation technology
- Advanced Trimble GNSS survey technology
- Position antenna based on 336 Channels Trimble Maxwell 7 chip:
 - GPS: L1 C/A, L2E, L2C, L5
 - BeiDou: B1, B1C, B2, B2A, B3¹
 - GLONASS: L1 C/A, L2 C/A, L3 CDMA²
 - Galileo: E1, E5A, E5B, E5AltBOC, E6²
 - IRNSS: L5
 - QZSS: L1 C/A, L1 SAIF, L1C, L2C, L5, LEX
 - SBAS: L1 C/A, L5
 - MSS L-Band: Trimble OmniSTAR®, Trimble RTX®
- Vector Antenna based on second 336 Channel Maxwell 7 chip:
 - GPS: L1 C/A, L2E, L2C, L5
 - BeiDou B1, B1C, B2, B2A, B3¹
 - GLONASS: L1 C/A, L2 C/A, L3 CDMA²
 - Galileo: E1, E5A, E5B, E5AltBOC, E6²
 - IRNSS L5
 - QZSS: L1 C/A, L1 SAIF, L1C, L2C, L5, LEX
- High precision multiple correlator for GNSS pseudorange measurements
- Advanced RF Spectrum Monitoring and Analysis
- 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 real-time position and orientation 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, 3.2
- Support for Distance Measurement Indicator (DMI) input (sold separately)
- No export permit required
- POSPac Assure post-processing available for quality control and calibration. (POSPac MMs not supported)

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)

LOGGING:
Internal Logging 6 GByte Flash memory
External Logging USB 2.0 Device port
Parameters Time tag, status, position, attitude, velocity, track and speed, dynamics, performance metrics, raw IMU data (200 Hz), raw GNSS data (5 Hz)

SERIAL INPUT/OUTPUT

2 x RS232 ports
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 I/O

PPS (pulse-per-second) Time Sync Pulse output
Event Input (2) Two time mark of external event
DMI Input Quadrature pulse with reference voltage

PHYSICAL CHARACTERISTICS

Size 100 L x 60 W x 12 H mm (nominal)
Weight 0.62 kg
Power 3.3 V DC +5%/-3%, typical power consumption of 4 W at room temperature
Connectors I/O: 44 Pin Header Samtec TMM-122-03-S-S-MW (mating part FCI 90311-044LF) DMI: DE9
Antenna Port: Connector: 2 x MMCX receptacle
Output Voltage: 3.3 V DC to 5 V DC
Maximum Current: 400 mA
LNA gain: 32 dB (> 35 dB Recommended)

ENVIRONMENTAL CHARACTERISTICS

Temperature -40 °C to +75 °C (Operational)
..... -55 °C to +85 °C (Storage)
Measurement Range +/- 6g^s, +/- 350 dps
Mechanical Shock +/- 75g Survival
Operating Humidity 5% to 95% R.H. non-condensing at +60 °C
Maximum Operating Limits 515 m/sec
..... 18,000 m alt

ADDITIONAL ACCESSORIES

Evaluation Kit: Includes development board and power supply
DMI: External wheel-mounted DMI and cable
GNSS Antennas: Survey-grade GNSS antennas and cables

- 1 The hardware of this product is designed for Beidou B3 compatibility (trial version) and its firmware will be enhanced to fully support such new signals as soon as the officially published signal interface control documentation (ICD) becomes available
- 2 There is no public GLONASS L3 CDMA or Galileo E6 ICD. The current capability in the receivers is based on publicly available information. As such, Trimble cannot guarantee that these receivers will be fully compatible
- 3 Typical performance over all dynamic conditions. Actual performance can be better depending on usage. Results also dependent upon satellite configuration, atmospheric conditions and other environmental effects
- 4 Using GAMS option and two metre antenna baseline
- 5 With DMI option (DMI sold separately)
- 6 Sensor bandwidth (-3 dB amplitude) ~ 50 Hz

Specifications subject to change without notice.

APPLANIX

Canada:
85 Leek Crescent,
Richmond Hill,
ON Canada L4B 3B3
T+1-289-695-6000

United Kingdom:
Forester's House,
Old Racecourse,
Oswestry UK SY10 7PW
T+44-1691-700500

USA:
15840 FM 529 Rd, Suite 316,
Houston, Texas, 77095
T+1-713-936-2990

