DATASHEET

Trimble PX-1 RTX

A subscription based solution for real-time applications

Trimble® PX-1 RTX is a small format OEM GNSS-INS module designed to provide robust and accurate real-time position and orientation information to aid safe drone operations. With Trimble CenterPoint® RTX corrections, PX-1 RTX delivers consistent navigation without the need of additional infrastructures. PX-1 RTX is designed with drone integrators in mind as the industry begins to take on more demanding missions in more challenging environments.

Flexible business model

PX-1 RTX is offered through a subscription model aimed to reduce upfront investment and maintenance costs for integrators. Through a yearly subscription, Integrators will have unlimited access to precise and reliable positioning.

Robust solutions for challenging environments

Powered by Applanix IN-Fusion+™ technology, the PX-1 RTX takes high rate measurement inputs from GNSS and IMU sensors, combines with RTX correction to compute accurate real time navigation solution with centimeter level position, precise heading and attitude information ready for autopilot use. This makes PX-1 more resistant to multipath, spoofing and GNSS signal obstructions.

PX-1 RTX Centimeter positioning without base stations

Trimble CenterPoint RTX provides high-accuracy corrections via L-band or NTRIP to the PX-1 RTX; delivering centimeter real-time positioning accuracy without the need for base station infrastructures.

Small form factor for UAV integration

Measuring just 60x 67 mm and weighing only 60 grams, the Trimble PX-1 RTX provides unparalleled performance in a compact form factor.

Key Features

- Precise solution with single GNSS antenna and IMU heading without magnetic interference
  - Accurate takeoff and landing in GNSS-challenged environments
- Centimeter level positioning accuracy with Trimble RTX®
  - Reduce additional infrastructure requirements
- Applanix IN-Fusion+ multi-sensor aided inertial technology
  - Consistent performance in all environments
- Subscription business model offers a new level of flexibility

advancedairmobility.trimble.com

Trimble®

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SYSTEM SUMMARY

- Advanced Trimble- Applanix IN-Fusion+ multi-sensor aided inertial integration technology
- State of the art Trimble Maxwell™ 7 GNSS tracking technology
- Trimble ProPoint™ GNSS positioning technology
- 336 Channels
  - GPS: L1 C/A, L2C, L2E, L5
  - GLONASS: L1 C/A, L2 C/A, L3 CDMA[4]
  - BeiDou: B1, B1C, B2, B2A, B2B
  - Galileo: E1, E5A, E5B, E5AltBOC
  - QZSS: L1 C/A, L1 SAIF, L1C, L2C, L5, LEX
  - SBAS: L1 C/A, L5
  - MSS L-band: 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
- 100 Hz position, roll, pitch and heading output
- Up to 100Hz Navigation output for autopilot support
- IMU data rate 200 Hz
- Navigation output format: ASCII (NMEA-0183), Binary (Trimble GSOF)

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), configuration messages, Gimbal Encoder and Autopilot input support.

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

PERFORMANCE SPECIFICATIONS[1] (RMS ERROR)

Uncrewed Airborne Vehicle Applications

	REAL TIME RTX[5]
Position (m)	0.03-0.06
Velocity (m/s)	0.04
Roll & Pitch (deg)	0.09
True Heading[2] (deg)	0.4

PHYSICAL CHARACTERISTICS

Size ..... 67 L x 60 W x 15 H mm (nominal)
Weight ..... 60 grams
Power ..... Wide range input 9-30 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: 32 dB

ENVIRONMENTAL CHARACTERISTICS

Temperature ..... -40 °C to +75 °C (Operational)
-55 °C to +85 °C (Storage)
Measurement Range ..... +/- 10g[3], +/- 300 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

ADDITIONAL ACCESSORIES

- Evaluation Kit (Development Board)

1 Typical performance, after dynamic alignment, RTX initialization and with continuous RTX corrections. Actual results are dependent upon satellite configuration, atmospheric conditions and other environmental effects such as multipath. CenterPoint RTX subscription included with product.
2 Max RMS error, for typical dynamic profiles after alignment and RTX initialization. Heading error will increase for low speed rotor applications, long constant speed flight lines, and extended hovering periods.
3 Sensor bandwidth (-3 dB amplitude) ~ 50 Hz.
4 There is no official GLONASS L3CDMA. The current tracking capability is based on publicly available information. Full receiver compatibility cannot be guaranteed.
5 Requires valid subscription to operate and output data. Typical initialization time to full position performance in fast regions is < 3 minutes. Actual initialization time subject to geographical location, atmospheric conditions and multipath environment. RTX corrections available over L-band and IP. L-band coverage is limited to specific geographic locations.

Specifications subject to change without notice.

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