



XTRAGEN XT-INS PRO+

Dual antenna multi frequency INS GNSS receiver

XT-INS Pro+ delivers reliable centimeter level positioning combined with 3D orientation in demanding environments. Its onboard inertial sensor provides orientation and positional deadreckoning, making it ideal for systems that require continuous positioning even during short GNSS outages. XT-INS Pro+ is the most flexible GNSS/INS solution offering full access to raw GNSS and INS data and allowing multiple antenna configurations.

Reliable and robust

The XT-INS Pro+ is a state-of-the-art GNSS/INS rover receiver designed to provide robust and reliable positioning and 3D attitude in the most challenging environments. Xtragen's multi-constellation, multi-frequency, accurate and reliable RTK is enhanced by a powerful GNSS/INS integration accurately measuring heading, pitch and roll. While a single antenna allows a lean configuration, the dual antenna enables heading measurement without the need for movement.

Key Features

- Centimeter-level GNSS positioning enhanced by an IMU and optionally vehicle velocity
- Full access to raw GNSS and IMU data
- Heading, pitch and roll on a single antenna for the most compact system
- Heading available immediately from initialization with dual antenna configuration
- Lightweight, low power and compact
- AIM+ advanced anti-jamming, anti-spoofing monitoring and mitigation technology, as part of the GNSS+ algorithm suite

Ideal for any integration

XT-INS Pro+ is not only delivering an already integrated position, but it also provides raw GNSS and IMU data, already synchronized and in a single data stream for customers that will integrate those components with other sensors for a larger data fusion system (i.e. lidar). Having GNSS and IMU hardware already integrated and data streams already synchronized enables users to focus on their own core technology without having to integrate GNSS and IMU sensors themselves.

FEATURES

GNSS signals

500 Hardware channels for simultaneous tracking of most visible signals

- ✓ GPS: L1 C/A, L1P, L2C, L2P, L5
- ✓ GLONASS: L1 C/A, L2C/A, L3, L2P
- ✓ BeiDou: B1I, B1C, B2a, B2b, B2I, B3
- ✓ Galileo: E1, E5a, E5b, E6, E5 AltBoc
- ✓ QZSS: L1 C/A, L1 C/B, L2C, L5
- ✓ SBAS: EGNOS, WAAS, GAGAN,
- ✓ MSAS, SDCM

GNSS+ technologies

- ✓ **AIM+** industry leading anti-jamming, anti-spoofing interference monitoring & mitigation technology
- ✓ **IONO+** advanced scintillation mitigation
- ✓ **APME+** a posteriori multipath estimator for code and phase multipath mitigation
- ✓ **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations
- ✓ **RAIM+** (Receiver Autonomous Integrity Monitoring)

FUSE+ fusion of RTK positioning with an inertial sensor and more

Formats

- Septentrio Binary Format (SBF), fully documented with sample parsing tools
- NMEA 0183, v3.01, v4.0
- RTCM v2.x, v3.x (MSM messages included)
- CMR v2.0 and CMR+

Connectivity

- 4 Hi-speed serial ports (LVTTTL)
- 1 USB device port (TCP/ IP communication and with 2 extra serial ports)
- xPPS output (max 100Hz)
- Ethernet port (TCP/IP, UDP, LAN 10/100 Mbps) 2 Event markers
- Outputs to drive external LEDs
- General purpose output NTRIP (client)

PERFORMANCE

RTK performance

Horizontal accuracy 0.6 cm + 0.5 ppm
Vertical accuracy 1 cm + 1 ppm
Initialisation 7 s

GNSS attitude accuracy

	Non RTK mode	RTK mode
Heading, dual antenna	0.3°	0.15°
Heading, single antenna	0.3°	0.2°
Pitch/roll, dual antenna	0.04°	0.02°

Position accuracy

	Horizontal	Vertical
Standalone	1.2 m	1.9m
SBAS	0.6 m	0.8 m
DGNSS	0.4 m	0.7 m

INS Velocity

Non RTK mode 0.05 m/s
RTK mode 0.02m/s

Maximum update rate

Integrated Position 100 Hz
Latency <20 ms
GNSS Measurements 2Hz
IMU raw data 200 Hz

Time precision

xPPS out 5 ns
Event accuracy <20 ns

Time to first fix

Cold start < 45 s
Warm start < 20 s
Re-acquisition avg. 1 s

Tracking performance (C/N0 threshold)

Tracking 20 dB-Hz
Acquisition 33 dB-Hz

PHYSICAL AND ENVIRONMENTAL

Input voltage 5VDC or 4.5–30VDC
(Adapter will be provided for 230V AC Supply)

Weight <1 Kg
Size 120.5 x 49.3x 53.2 mm
Cooling Passive cooling

Power Consumptions

GPS/GLO L1/L2 1.0 W
All signals, all GNSSconstellations 1.2 W

Antenna

Connectors 2 x TNC
Antenna supply voltage 3–5.5 VDC
Maximum antenna current 150 mA
Antenna Gain range 15–45 dB

Environment

Operating temperature -40° C to +85° C
Storage temperature -55° C to +85° C
Humidity 5% to 95% (non condensing)
Vibration Ingress MIL-STD-810G
Protection IP67

Certification

RoHS, WEEE, CE, FCC



Dead reckoning positioning and attitude accuracy GNSS/INS

Duration(s)	Horizontal(m)	Vertical(m)	Heading (deg)	Pitch/roll (deg)
5	0.106	0.04	0.35	0.04
10	0.306	0.06	0.35	0.06
30	3.006	0.25	0.4	0.1



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Enabling connectivity between Technology & People



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