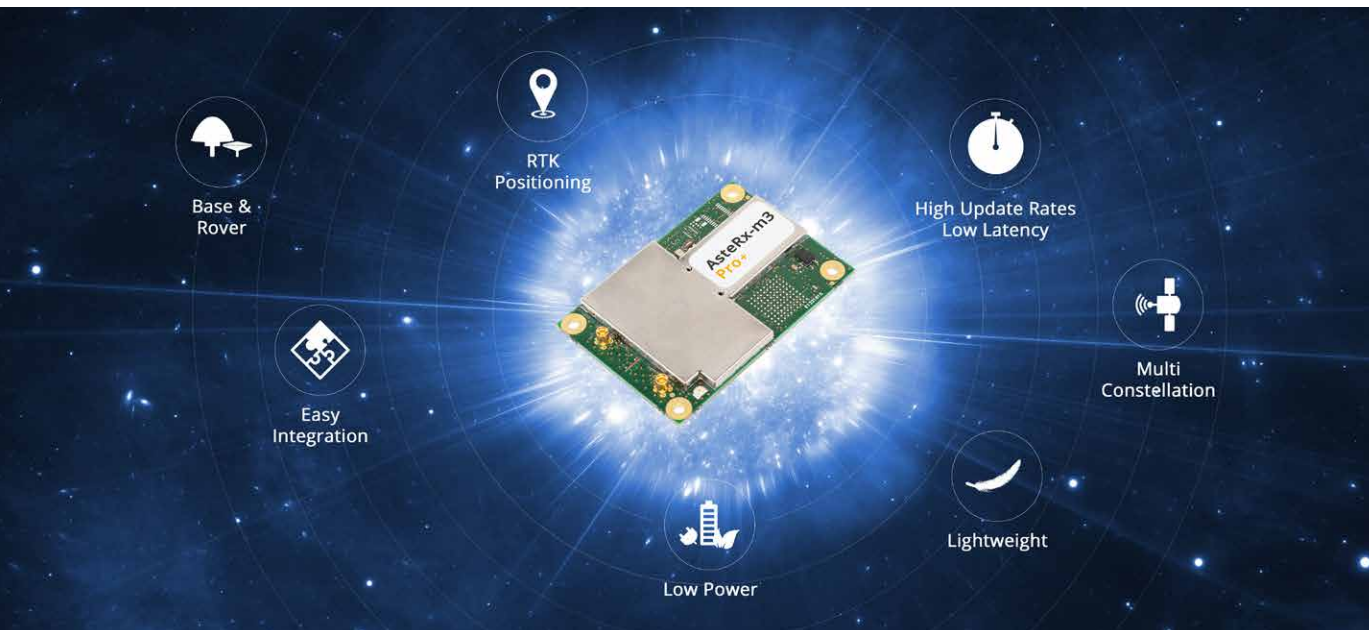


AsteRx-m3 Pro+

Best-in-class dual-antenna multi-frequency GNSS receiver



AsteRx-m3 Pro+ is Septentrio's best-in-class versatile OEM board. It is a multi-frequency multi-constellation GNSS receiver featuring top positioning performance with flexibility to be used either as a base station or a rover receiver. In dual antenna mode it provides heading & pitch or heading & roll information on top of reliable and accurate positioning.

KEY FEATURES

- ▶ **Flexibility of use and easy-to-integrate**
- ▶ **Best-in-class SWaP (Size, Weight and Power)**
- ▶ **AIM+ industry-leading anti-jamming, anti-spoofing technology**
- ▶ **OSNMA Support**
- ▶ **Full-constellation, triple-frequency satellite tracking**
- ▶ **Sub-degree GNSS heading & pitch or heading & roll**
- ▶ **High update rate with low latency**

Top performance in challenging environments

The AsteRx-m3 Pro+ is designed to deliver reliable and robust positions even in challenging environments.

The GNSS+ toolset is the technology that allows AsteRx-m3 Pro+ to be reliable also in challenging environments where the GNSS signal is disturbed or the receiver is subject to shocks and vibrations:

- ▶ **LOCK+** for robust tracking during high vibrations and shocks
- ▶ **APME+** to disentangle direct signal and those reflected from nearby structures
- ▶ **IONO+** provides advanced protection against ionospheric disturbance
- ▶ **AIM+** most advanced anti-jamming, anti-spoofing on-board interference mitigation technology on the market (narrow and wide band, chirp jammers).

BENEFITS

State of the art with flexibility of use

The AsteRx-m3 Pro+ is a state-of-the-art GNSS receiver using triple frequency and multi-constellation GNSS technology both for maximal positioning availability and reliability in challenging conditions. It can be used as a base station or a rover receiver in single or dual antenna configuration. In dual antenna mode GNSS heading provides unmatched performance in both static and dynamic conditions removing the reliance on vehicle dynamics or magnetic sensors.

Such a versatile receiver allows integrators to keep a single item in stock which can be used in a multitude of applications. During the manufacturing process the needed features can be activated depending on the intended application.

Ultra-low power design

The AsteRx-m3 Pro+ provides RTK positioning at the lowest power consumption of any comparable device on the market. This means longer operation on a single battery charge, smaller batteries and greater usability.

Easy-to-integrate

The AsteRx-m3 Pro+ comes with fully documented interfaces, commands and data messages. The included RxTools software allows receiver configuration and monitoring as well as data logging and analysis. An SDK is provided, which allows integrators to create professional custom post-processing applications. AsteRx-m3 Pro+ is compatible with its SDK library for PPK (Post-processed kinematic) offline processing.

AsteRx-m3 Pro+

FEATURES

GNSS signals

544 Hardware channels for simultaneous tracking of most visible signals:

- ▶ GPS: L1 C/A, L1C, L2C, L2 P(Y), L5
- ▶ GLONASS: L1 C/A, L2C/A, L3, L2P
- ▶ BeiDou: B1I, B1C, B2a, B2b, B2I, B3I
- ▶ Galileo: E1, E5a, E5b, E6
- ▶ QZSS: L1 C/A, L1 C/B, L2C, L5
- ▶ NavIC: L5
- ▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM

Septentrio's patented 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)
OSNMA Support

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+ (CMR+ input only)

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 (server, client, caster)
FTP server, FTP push, SFTP

SUPPORTING COMPONENTS

Web UI with full control and monitoring functionality.

RxTools, a complete and intuitive GUI tool set for receiver control, monitoring, data analysis and conversion.

GNSS receiver communication SDK. Available for both Windows and Linux.

PERFORMANCE

RTK performance ^{1,2,3}

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

GNSS attitude accuracy ^{1,2}

Antenna separation	Heading	Pitch/Roll
1 m	0.15°	0.25°
5 m	0.03°	0.05°

Position accuracy ^{1,2}

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

Velocity accuracy ^{1,2}

0.03m/s

Maximum update rate

Position 100 Hz
Measurements 100 Hz

Latency ⁴

<10 ms

Time precision

xPPS out⁵ 5 ns
Event accuracy < 20 ns

Time to first fix

Cold start⁶ < 45 s
Warm start⁷ < 20 s
Re-acquisition avg. 1 s

Tracking performance (C/N0 threshold)

Tracking 20 dB-Hz
Acquisition 33 dB-Hz

OPTIONAL ACCESSORIES

- ▶ Antennas
- ▶ SDK library for UAS applications
- ▶ Robotics interface board

PHYSICAL AND ENVIRONMENTAL

Size 47.5 x 70 x 9.32 mm
1.87 x 2.75 x 0.36 in

Weight 27 g / 0.952 oz

Input voltage 3.3 VDC ± 5%

Power consumption

GPS L1/L2 750 mW
GPS/GLO L1/L2 800 mW
All signals, all GNSS constellations 1000 mW

Antenna

Connectors⁸ 2 x MMCX
Antenna supply voltage 3-5.5 VDC
Maximum antenna current 150 mA
Antenna gain range 15-45 dB

I/O connectors ⁹

30 Pins Hirose DF40 socket
60 Pins Hirose DF40 socket for expanded connectivity

Environment

Operating temperature -40° C to +85° C
-40° F to +185° F
Storage temperature -55° C to +85° C
-67° F to +185° F
Humidity 5% to 95% (non-condensing)
Vibration MIL-STD-810G

Certification

RoHS, WEEE, CE, FCC, UKCA, ISO 9001-2015



¹ Open sky conditions

² RMS level

³ Baseline < 40 Km

⁴ 99.9%

⁵ Including software compensation of sawtooth effect

⁶ No information available (no almanac, no approximate position)

⁷ Ephemeris and approximate position known

⁸ Second connector for heading configuration

⁹ Backwards compatible with AsteRx-m for easy replacement

EMEA

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