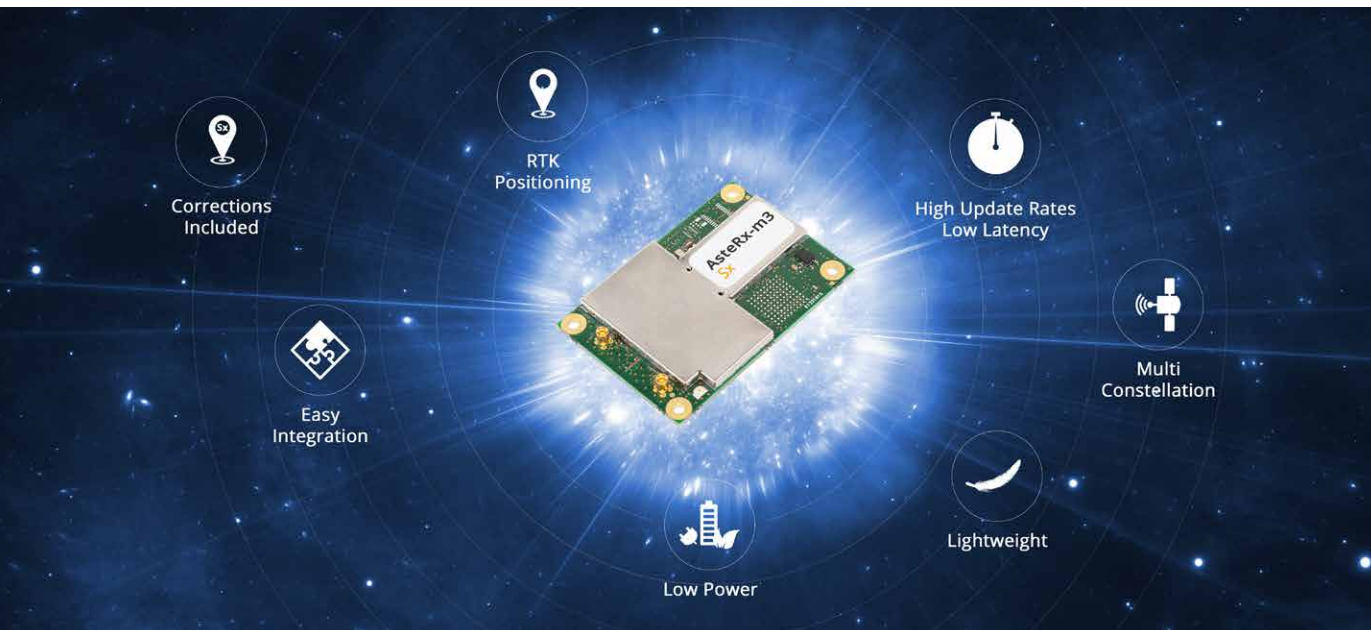


# AsteRx-m3 Sx

Multi-frequency GNSS receiver with always-on PPP-RTK accuracy



The AsteRx-m3 Sx is a compact, high performance, ultra-low power GNSS receiver ideal for integration into demanding industrial applications where power and space are at a premium. It delivers out-of-the-box sub-decimeter accuracy thanks to the built-in PPP-RTK (a.k.a. SSR) correction service that will be active for a five-year period.

## KEY FEATURES

- ▶ **Easy-to-integrate**
- ▶ **Best-in-class SWaP (Size, Weight and Power)**
- ▶ **AIM+ anti-jamming and monitoring system**
- ▶ **Full-constellation, triple-frequency satellite tracking**
- ▶ **Sub-decimeter accuracy out of the box, with no additional service subscription required**
- ▶ **Five-year PPP-RTK corrections included**

## Out-of-the-box sub-decimeter accuracy

The AsteRx-m3 Sx is an OEM member of the SECORX-S product family, offering out-of-the-box sub-decimeter accuracy and fast convergence time enabled by the built-in PPP-RTK corrections. This product is a unique high-accuracy positioning solution including high-performance GNSS hardware bundled with a lifetime correction service, removing the hassle of selecting, setting-up and maintaining any additional subscription services. PPP-RTK is the latest generation of GNSS correction services, which uniquely combines near-RTK accuracy with quick initialization times.

## BENEFITS

### Top performance in challenging environments

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

The GNSS+ toolset is the technology that allows AsteRx-m3 Sx 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 on-board anti-jamming and anti-spoofing technology in the market

### Ultra-low power design

The AsteRx-m3 Sx 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 Sx 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.



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## FEATURES

### GNSS signals

544 Hardware channels for simultaneous tracking of most visible signals:

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

### Septentrio's patented GNSS+ technologies

- ▶ **AIM+** unique anti-jamming and monitoring system against narrow and wideband interference with spectrum analyser
- ▶ **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)

PPP-RTK corrections delivered via NTRIP or L-band in EU and USA

### 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 (client)  
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

### PPP-RTK performance <sup>2,3</sup>

Horizontal accuracy <= 5 cm  
Initialisation / convergence <= 60 s  
Coverage EU and USA

### RTK performance <sup>2,3,4</sup>

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

### GNSS attitude accuracy <sup>1,2,3</sup>

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

### Position accuracy <sup>2,3</sup>

	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 <sup>2,3</sup>

0.03m/s

### Maximum update rate

Position 100 Hz  
Measurements 100 Hz

### Latency <sup>5</sup>

<10 ms

### Time precision

xPPS out<sup>6</sup> 5 ns  
Event accuracy < 20 ns

### Time to first fix

Cold start<sup>7</sup> < 45 s  
Warm start<sup>8</sup> < 20 s  
Re-acquisition avg. 1 s

### Tracking performance (C/N0 threshold)

Tracking 20 dB-Hz  
Acquisition 33 dB-Hz

## OPTIONAL ACCESSORIES

- ▶ Antennas
- ▶ GeoTagZ re-processing software and 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

Connectors<sup>9</sup> 2 x MMCX  
Antenna supply voltage 3-5.5 VDC  
Maximum antenna current 150 mA  
Antenna gain range 15-45 dB

### I/O connectors <sup>10</sup>

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



<sup>1</sup> Optional feature

<sup>2</sup> Open sky conditions

<sup>3</sup> RMS level

<sup>4</sup> Baseline < 40 Km

<sup>5</sup> 99.9%

<sup>6</sup> Including software compensation of sawtooth effect

<sup>7</sup> No information available (no almanac, no approximate position)

<sup>8</sup> Ephemeris and approximate position known

<sup>9</sup> Second connector for heading configuration

<sup>10</sup> Backwards compatible with AsteRx-m2 and AsteRx-m2a for easy replacement