AsteRx-m2 Sx

Sub-decimeter accuracy GNSS receiver & corrections bundle

septentrio

Tien TRAN/Naïo Technologies

UAV

Precision Agriculture

Logistics

Automation

Rail

The **AsteRx-m2 Sx is a compact, high performance, ultra-low power GNSS receiver ideal for integration in UAS, handheld devices and other 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 the whole five-year lifetime.**

KEY FEATURES

▶ **Sub-decimeter accuracy out of the box, with no additional service subscription or maintenance required**

▶ **Five-year lifetime PPP-RTK corrections included**

▶ **Best-in- class reliable and scalable position accuracy**

▶ **AIM+ anti-jamming and anti-spoofing system**

▶ **Industry-leading ultra-low power consumption**

▶ **All-in-view multi-constellation, multi-frequency satellite tracking**

▶ **Easy-to-integrate**

BENEFITS

Out-of-the-box sub-decimeter accuracy
The AsteRx-m2 Sx is an OEM member of the SECORX-S product family, which offers 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.

Feature rich
The GNSS+ toolset means that the AsteRx-m2 Sx comes into its own in difficult conditions:
▶ **LOCK+** for robust tracking during high vibrations and shocks
▶ **APME+** to disentangle direct signals from those reflected off nearby structures
▶ **IONO+** provides advanced protection against ionospheric disturbance

Two electronically identical antenna connectors support both passive and active antennas.

Ultra-low power design
The AsteRx-m2 Sx provides PPP-RTK positioning with power consumption, which is lower than 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-m2 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 to help integrators create professional custom applications. The AsteRx-m2 Sx is compatible with GeoTagZ Software and its SDK library for PPK (Post-Processed Kinematic) offline processing.

AsteRx-m2 Sx

FEATURES

GNSS technology

448 Hardware channels for simultaneous tracking of all visible satellite signals:

- GPS: L1, L2, L5
- GLONASS: L1, L2, L3
- Galileo[1]: E1, E5a, E5b, AltBoc
- BeiDou[1]: B1, B2
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- QZSS: L1, L2, L5
- Integrated dual-channel L-band receiver

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)
RTK (base and rover)[1]
PPP (Precise Point Positioning)[1,2]
Moving base[1,3]

Formats

Septentrio Binary Format (SBF), fully documented with sample parsing tools
NMEA 0183, v2.3, v3.01, v4.0
RINEX[1] (obs, nav) v2.x, v3.x
RTCM v2.x, v3.x (MSM messages included)
CMR v2.0 and CMR+ (CMR+ input only)

Connectivity

4 Hi-speed serial ports (LVTTL)
1 USB device port (micro USB with access to internal disk, 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[1]
SDIO interface for logging (covers µSD, SD, eMMC)
Outputs to drive external LEDs
General purpose output
Time and frequency synchronisation inputs
NTRIP (server, client, caster)
FTP server, FTP push[1], SFTP

PERFORMANCE

PPP-RTK performance [4,5]

Horizontal accuracy	<= 10 cm at 2 sigma
Initialisation/convergence	<= 60 s
Coverage	EU and USA

RTK performance [4,5,7]

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

Position accuracy [4,5]

	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 [4,5]

	0.03m/s

Maximum update rate

Position	100 Hz
Measurements	100 Hz

Latency [8]

	<10 ms

Time precision

xPPS out[9]	5 ns
Event accuracy	< 20 ns

Time to first fix

Cold start[10]	< 45 s
Warm start[11]	< 20 s
Re-acquisition	avg. 1 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

SUPPORTING COMPONENTS

- Web UI for easy configuration and monitoring via Ethernet or USB connectivity.
- 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.

Optional accessories

- Antennas
- GeoTagZ re-processing software and SDK library for aerial mapping
- AsteRx-m2 OEM development kit

PHYSICAL AND ENVIRONMENTAL

Size

	47.5 x 70 x 7.6 mm
	1.87 x 2.75 x 0.29 in

Weight

	28 g / 0.987 oz

Input voltage

	3.3 VDC ± 5%

Power consumption

GPS/GLO L1/L2	770 mW
All signals, all GNSS constellations	950 mW
All signals, all constellations + L-band	1050 mW
Shutdown power mode	10 mW

Antenna

Connectors[12]	2 x U.FL
Antenna supply voltage	3-5.5 VDC
Maximum antenna current	200 mA
Antenna gain range	passive 0 to 50 dB active

Auto-detection of external antenna

I/O connectors

30 Pins Hirose DF40 socket[13]
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

[1] Optional feature
[2] Service subscription required
[3] Output rate 20 Hz
[4] Open sky conditions
[5] RMS level
[6] After convergence
[7] Baseline < 40 Km
[8] 99.9%
[9] Including software compensation of sawtooth effect
[10] No information available (no almanac, no approximate position)
[11] Ephemeris and approximate position known
[12] Second connector for alternative external antenna
[13] Backwards compatible with AsteRx-m for easy replacement

EMEA (HQ)
Greenhill Campus
Interleuvenlaan 15i
3001 Leuven, Belgium

+32 16 30 08 00

septentrio.com

Americas
Suite 200
23848 Hawthorne Blvd
Torrance, CA 90505, USA

+1 310 541 8139

sales@septentrio.com

Asia-Pacific
Shanghai, China
Yokohama, Japan
Seoul, Korea

septentrio