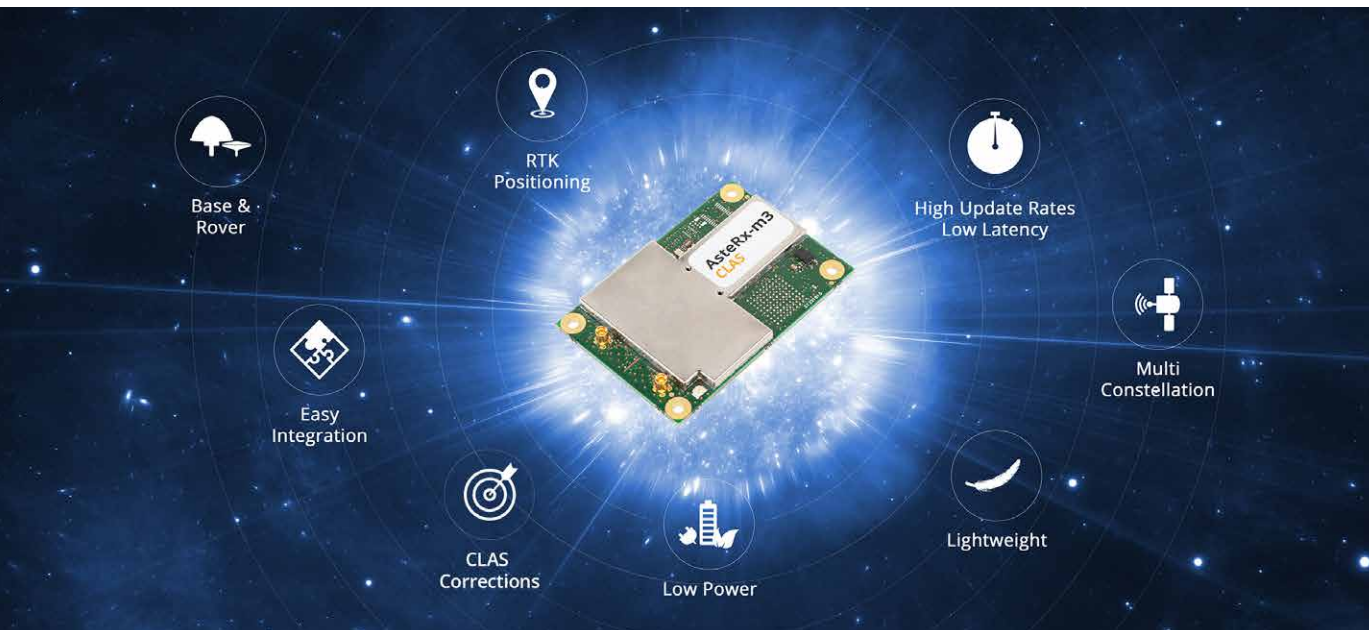


AsteRx-m3 CLAS

Single or Dual-antenna multi-frequency receiver with integrated corrections for Japan



AsteRx-m3 CLAS is Septentrio's best-in-class versatile OEM board. It is a multi-frequency GNSS receiver featuring top positioning performance with flexibility to be used either as a base station or as a rover receiver. In dual antenna mode¹⁰ it provides heading & pitch or heading & roll information on top of reliable and accurate positioning. It offers the convenience of plug-and-play sub-decimeter accuracy, thanks to the integrated PPP-RTK correction service from Centimeter Level Augmentation Service (CLAS) of Japan's Quasi-Zenith Satellite System (QZSS).

KEY FEATURES

- ▶ Flexibility of use and easy-to-integrate
- ▶ Best-in-class SWaP (Size, Weight and Power)
- ▶ Full-constellation, triple-frequency satellite tracking
- ▶ Sub-degree GNSS heading & pitch or heading & roll¹⁰
- ▶ OSNMA Support
- ▶ High update rate with low latency
- ▶ Japan Centimeter Level Augmentation Service (CLAS) integrated

Easy-to-integrate

The AsteRx-m3 CLAS 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.

BENEFITS

Top performance in challenging environments

The AsteRx-m3 CLAS is designed to deliver reliable and robust positions even in challenging environments. The GNSS+ toolset is the technology that allows AsteRx-m3 CLAS to be reliable also in challenging environments where the GNSS signal is disturbed or the receiver is subject to shocks and vibrations:

- ▶ **AIM+** most advanced on-board anti-jamming and anti-spoofing technology in the market
- ▶ **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

State of the art with flexibility of use

The AsteRx-m3 CLAS 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 mode¹⁰ 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.

Ultra-low power design

The AsteRx-m3 CLAS 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.

AsteRx-m3 CLAS

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, L1C, L2C, L5, L6
- ▶ 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)

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 ^{1,2,10}

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 out ⁵	5 ns
Event accuracy	< 20 ns

Time to first fix

Cold start ⁶	< 45 s
Warm start ⁷	< 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
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Input voltage	3.3 VDC ± 5%
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Power consumption

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

Antenna

Connectors ⁸	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, 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

¹⁰ Optional feature

EMEA

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

Espoo, **Finland**

Americas

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

septentrio.com/contact

Asia-Pacific

Shanghai, **China**
Yokohama, **Japan**
Seoul, **Korea**

septentrio.com



septentrio