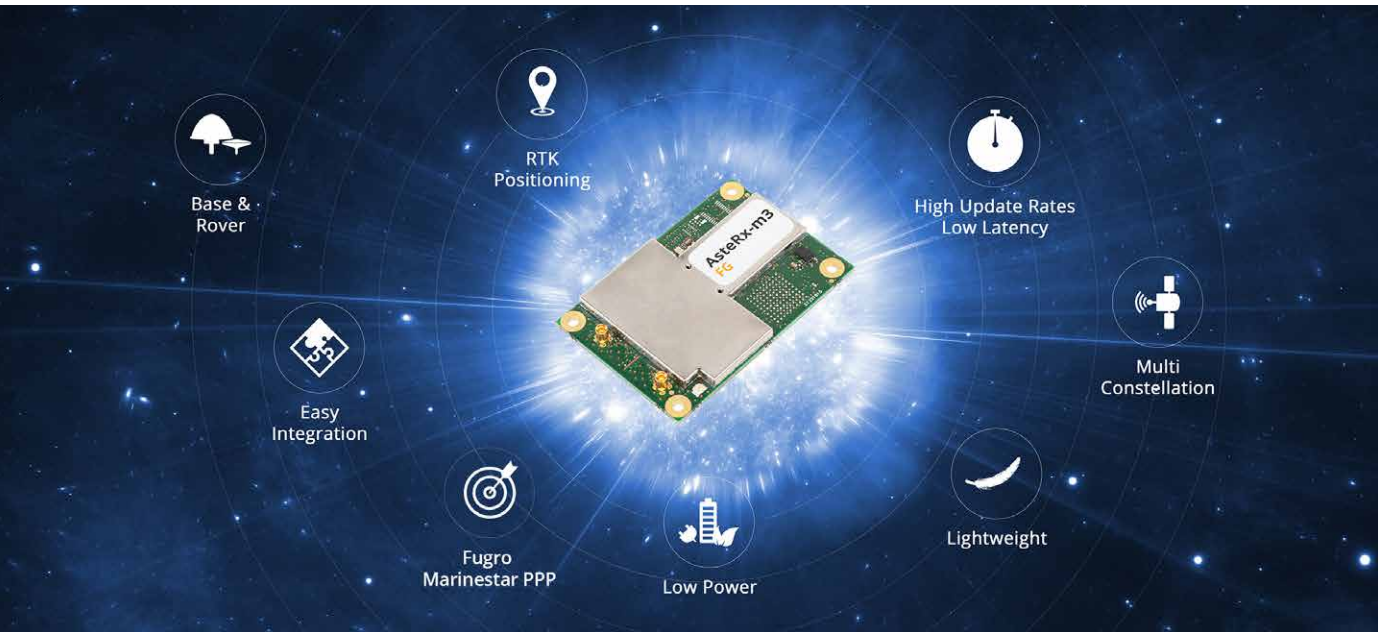
AsteRx-m3 Fg

Multi-frequency dual-antenna receiver for Fg applications



Fg

Offshore Operations

AsteRx-m3 Fg is Septentrio's best-in-class 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 as a rover. In dual antenna mode it provides heading & pitch or heading & roll information on top of reliable and accurate positioning. This receiver is specifically designed for Fg survey and construction with RTK as well as Fgstar PPP high-accuracy positioning.

KEY FEATURES

- **Flexibility of use and easy-to-integrate**
- **Best-in-class SWaP (Size, Weight and Power)**
- **AIM+ anti-jamming and monitoring system**
- **OSNMA Support**
- **Full-constellation, triple-frequency satellite tracking**
- **Sub-degree GNSS heading & pitch or heading & roll**
- **High update rate with low latency**
- **High-accuracy positioning at sea with Fugro Fgstar PPP corrections**

Top performance in challenging environments

The AsteRx-m3 Fg is designed to deliver reliable and robust positions even in challenging environments.
The GNSS+ toolset is the technology that allows AsteRx-m3 Fg 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

BENEFITS

State of the art with flexibility of use

The AsteRx-m3 Fg 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 dial 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 Fg 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 Fg 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 Fg is compatible with GeoTagZ Software and its SDK library for PPK (Post-processed kinematic) offline processing.

AsteRx-m3 Fg

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
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM
- Integrated 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)

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 (LVTTL)

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

Measurements only	100 hz
Position and Attitude	20hz

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
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[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

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