

AsteRx-U MARINE

Multi-constellation, dual-antenna receiver for marine applications



Marine



Offshore
Operations



The AsteRx-U MARINE is designed for marine survey and construction users. It is a multi-frequency GNSS receiver offering GNSS Heading, Iridium and Inmarsat uplink interference mitigation.

KEY FEATURES

- ▶ **544 channels for tracking all known and planned signals from GPS, GLONASS, Galileo, BeiDou, IRNSS, QZSS and SBAS on both antennas**
- ▶ **GNSS Heading and Pitch/Roll**
- ▶ **Centimetre-level (RTK) and sub decimetre-level (PPP) position accuracy**
- ▶ **L-band reception, robust against Inmarsat uplink interference**
- ▶ **Dual L-band channel with support for VERIPOS, FUGRO Marinestar and SECORX corrections**
- ▶ **Septentrio GNSS+ algorithms for reliable performance**
- ▶ **Integrated cellular modem, Bluetooth, WiFi and UHF radio**

BENEFITS

Consistently accurate now and into the future

The AsteRx-U MARINE is powered by the AsteRx4: the most advanced multi-constellation dual-antenna receiver from Septentrio. Its multi-frequency engine can track all current and planned Global Navigation Satellite System (GNSS) constellations - GPS, GLONASS, Galileo, BeiDou, IRNSS and QZSS - on both antennas. This guarantees you reliable and accurate GNSS positioning now and into the future.

Centimetre-level scalable accuracy

Septentrio's knowledge and experience in the GNSS industry ensures that the AsteRx-U MARINE offers you the highest possible accuracy, scalable to a centimetre. LOCK+ technology maintains tracking during heavy vibration and IONO+ ensures position accuracy even under periods of elevated ionospheric activity. The AsteRx-U MARINE offers the very latest in interference mitigation technology to filter out ambient intentional and unintentional RF interference. The specially designed L-band receiver module is robust against interference from Inmarsat uplinks.

Any device, any platform

Use any device with a web browser to operate the AsteRx-U MARINE without any special configuration software via the Web UI accessible over WiFi network or USB connection.

AsteRx-U MARINE

FEATURES

GNSS Technology

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

- ▶ GPS: L1, L2, L5
- ▶ GLONASS: L1, L2, L3
- ▶ Galileo¹: E1, E5ab, AltBoc, E6
- ▶ BeiDou¹: B1, B2, B3
- ▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- ▶ IRNSS: L5^{1,15}
- ▶ QZSS: L1, L2, L5, L6¹⁵

Septentrio's patented GNSS+ technologies:

- ▶ **AIM+** unique anti-jamming and monitoring system against narrow and wideband interference
 - ▶ **APME+** a posteriori multipath estimator for code and phase multipath mitigation.
 - ▶ **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations
 - ▶ **IONO+** advanced scintillation mitigation
 - ▶ **RAIM** (Receiver Autonomous Integrity Monitoring) RTK (base and rover)¹
- Integrated dual-channel L-band receiver
Support for VERIPOS and FUGRO Marinestar services^{1,2}
Support for PPP (SECORX-60)^{1,2}
Moving base^{1,3}
Heading GNSS attitude¹
8 GB internal memory

Formats

Septentrio Binary Format (SBF), fully documented with sample parsing tools
RTCM v2x and 3x (MSM included)
CMR 2.0 and CMR+ (CMR+ input only)
NMEA 0183, v2.3, v3.01, v4.0 (output only)
UHF¹: Satel, Trimtalk (450S_P, 450S_T) Pacific Crest (GMSK, 4FSK, FST)
CAN 1939

Connectivity

3 Hi-speed serial ports (RS232)
Ethernet port (TCP/IP and UDP)
Full-speed USB
2 Event markers
xPPS output (max. 100 Hz)
Integrated Bluetooth (2.1 + EDR/4.0)
4G LTE models:

EU 4G¹⁶:

4G LTE CAT4 (B1, B3, B5, B7, B8, B20)
3G UMTS/HSDPA/HSUPA (850/900/1900/2100)
2G GSM/GPRS/EDGE (850/900/1800/1900)

NA 4G¹⁷:

4G LTE CAT4 (B2, B4, B5, B7, B17)
3G UMTS/HSDPA/HSUPA (850/900/
AWS1700/1900/2100)
2G GSM/GPRS/EDGE (850/900/1800/1900)
Integrated WiFi (802.11 b/g/n)
Integrated UHF (406-470 MHz)

PERFORMANCE

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
SECORX-60 (PPP) ^{2,6}	4 cm	6 cm

RTK Performance 4,5

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

GNSS attitude accuracy 4,5

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

Velocity accuracy 4,5

	0.03 m/s
--	----------

Maximum Update Rate 13

Position	50 Hz
Position and attitude	20 Hz
Measurements	100 Hz

Latency 9,15

	<20 ms
--	--------

Time accuracy

xPPS Out ¹⁰	10 ns
Event accuracy	< 20 ns

Time to first fix

Cold Start ¹¹	< 45 s
Warm Start ¹²	< 20 s
Re-acquisition	avg. 1 s

Tracking performance (C/N0 threshold)¹⁴

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

MODELS

AsteRx-U MARINE: Enabled for PPP using SECORX-60 or VERIPOS correction data

AsteRx-U MARINE (Fg): Enabled for PPP using FUGRO Marinestar correction data

PHYSICAL AND ENVIRONMENTAL

Size	174 x 166 x 53 mm 6.85 x 6.54 x 2.09 in
-------------	--

Weight	1.5 kg / 3.30 lb
---------------	------------------

Input Voltage	9-36 VDC
----------------------	----------

Power Consumption	7 W typical
--------------------------	-------------

Operating temperature	-30° C to +65° C -22° F to 149° F
------------------------------	--------------------------------------

Storage temperature	-40° C to +75° C -40° F to 167° F
----------------------------	--------------------------------------

Humidity	MIL-STD810H, Method 507.5, Procedure I
-----------------	--

Dust	MIL-STD-810H, Method 510.5, Procedure I
-------------	---

Shock	MIL-STD-810H, Method 516.6, Procedure I/II
--------------	--

Vibration	MIL-STD-810H, Method 514.6, Procedure I
------------------	---

Connectors

Antennas	TNC female
Power	LEMO 4 pins female
USB/ETH	LEMO 16 pins female
PPS OUT	LEMO 5 pins female
Serial 2	LEMO 9 pins female
Serial 1 & 3 USB Host	LEMO 14 pins female
Events/GPIO	LEMO 7 pins female

Antenna LNA Power Output

Output voltage 5 VDC
Maximum current 200 mA

Certification

IP67, RoHS, WEEE, CE
FCC Class B Part 15
IEC 60945

¹ Optional feature

² Service subscription required

³ Maximum output rate is 20 Hz

⁴ Open sky conditions

⁵ RMS levels

⁶ After convergence

⁷ RTK fixed ambiguities

⁸ Baseline < 40 Km

⁹ 99.9%

¹⁰ Including software compensation of sawtooth effect

¹¹ No information available (no almanac, no approximate position)

¹² Ephemeris and approximate position known

¹³ (Fg) model 10 Hz

¹⁴ Max. 600 m/s

¹⁵ Not applicable to (Fg) Model

¹⁶ Applicable to the European version (4G compatibility in Europe and other regions)

¹⁷ Applicable to the North American version (4G compatibility in North America and other regions)



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

+32 16 30 08 00

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

+1 310 541 8139

Asia-Pacific
Shanghai, China
Yokohama, Japan

