

AsteRx-U MARINE

Multi-constellation, dual antenna receiver
for marine applications



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.

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 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 special interference mitigation technology which filters 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.

Key Features

- ▶ **544 channels for tracking all known and planned signals from GPS, GLONASS, Galileo, BeiDou, IRNSS, QZSS and SBAS on both antennas**
- ▶ **Precise and solid heading calculation**
- ▶ **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 TerraStar and VERIPOS corrections**
- ▶ **Septentrio GNSS+ algorithms for solid performance**
- ▶ **Integrated cellular modem, Bluetooth and WiFi optional UHF radio**
- ▶ **Additional connector for dedicated L-band antenna**

AsteRx-U MARINE

FEATURES

GNSS Technology

544 hardware channels for simultaneous tracking of all visible satellite signals

Supported signals:

- GPS: L1, L2, L5
- GLONASS: L1, L2, L3
- Galileo: E1, E5ab, AltBoc, E6¹
- BeiDou: B1, B2, B3¹
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- IRNSS: L5¹
- QZSS: L1, L2, L5, L6

Integrated dual-channel L-band receiver

AIM+ interference mitigation unit against narrow and wide band interference with spectrum analyser

IONO+ advanced scintillation mitigation

APME+ a posteriori multipath estimator for code and phase multipath mitigation

RAIM (Receiver Autonomous Integrity Monitoring)

RTK (base and rover)¹

PPP (TerraStar and VERPIOS services)^{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)

CMR2.0 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)

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)

Integrated Quadband Cellular Modem (EDGE, 2G, 3G, 3.5G)

Integrated Wi-Fi (802.11 b/g/n)

Integrated UHF (406-470 MHz)¹

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
TerraStar-D ⁶	6 cm	9 cm
TerraStar-C ⁶	4 cm	6 cm
VERIPOS APEX ⁶	6 cm	9 cm
VERIPOS ULTRA ⁶	6 cm	9 cm

RTK Performance^{4,5,7,8}

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

GNSS attitude accuracy^{4,5,7,8}

Antenna separation	Heading	Vertical
1 m	0.15 °	0.25 °
5 m	0.03 °	0.05 °

Velocity accuracy^{4,5}

0.03 m/s

Maximum Update Rate

Position	50 Hz
Position and attitude	20 Hz
Measurements	100 Hz

Latency⁹

< 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. 1.2 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

PHYSICAL AND ENVIRONMENTAL

Size	164 x 157 x 54 mm 6.46 x 6.18 x 2.13 in
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Weight	1.5 kg / 3.30 lb
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Input Voltage	9-36 VDC
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Power Consumption	7 W typical
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Operating temperature	-30 °C to +65 °C -22 °F to 149 °F
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Storage temperature	-40 °C to +75 °C -40 °F to 167 °F
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Humidity	MIL-STD810G, Method 507.5, Procedure I
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Dust	MIL-STD-810G, Method 510.5, Procedure I
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Shock	MIL-STD-810G, Method 516.6, Procedure I/II
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Vibration	MIL-STD-810G, Method 514.6, Procedure I
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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 V DC
Maximum current	200 mA

Certification

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

- 1 Optional feature
- 2 Service subscription required
- 3 Maximum output rate 20 Hz
- 4 Open sky conditions
- 5 RMS levels
- 6 After convergence, requires service subscription
- 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

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SSNDS 10/2017/43 • Specifications subject to change without notice. Certain features and specifications may not apply to all models. © 2017 Septentrio NV

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