

# 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, NavIC, 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**
- ▶ **Support for FUGRO Marinestar 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 the most advanced integrated 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, NavIC 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
- ▶ Galileo<sup>1</sup>: E1, E5ab, AltBoc, E6
- ▶ BeiDou<sup>1</sup>: B1, B2, B3
- ▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- ▶ NavIC: L5<sup>1,2</sup>
- ▶ QZSS: L1, L2, L5, L6<sup>2</sup>

### 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)<sup>1</sup>
- Integrated dual-channel L-band receiver  
Support for FUGRO Marinestar services<sup>1,3</sup>  
Moving base<sup>1,4</sup>  
Heading GNSS attitude<sup>1</sup>  
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)  
UHF<sup>1</sup>: Satel, Trintalk (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 4G<sup>5</sup>:**  
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 4G<sup>5</sup>:**  
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<sup>7,8</sup>

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.8 m
DGNSS	0.4 m	0.7 m

### RTK performance<sup>7,8,10,11</sup>

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

### GNSS attitude accuracy<sup>7,8</sup>

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

### Velocity accuracy<sup>7,8</sup>

	0.03 m/s
Maximum update rate <sup>12</sup>	
Position	50 Hz
Position and attitude	20 Hz
Measurements	100 Hz

### Latency<sup>13,2</sup>

	<20 ms
Time accuracy	
xPPS out <sup>14</sup>	10 ns
Event accuracy	< 20 ns

### Time to first fix

Cold start <sup>15</sup>	< 45 s
Warm start <sup>16</sup>	< 20 s
Re-acquisition	avg. 1 s

### Tracking performance (C/N0 threshold)<sup>14</sup>

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

## PHYSICAL AND ENVIRONMENTAL

Size	174 x 166 x 53 mm 6.85 x 6.54 x 2.09 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	8 W typical
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Operating temperature	-30° C to +60° C -22° F to 140° F
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Storage temperature	-40° C to +75° C -40° F to 167° F
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Humidity	MIL-STD810H, Method 507.5, Procedure I
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Dust	MIL-STD-810H, Method 510.5, Procedure I
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Shock	MIL-STD-810H, Method 516.6, Procedure I/II
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Vibration	MIL-STD-810H, 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 VDC  
Maximum current 200 mA

### Certification

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



<sup>1</sup> Optional feature

<sup>2</sup> Not applicable to (Fg) Model

<sup>3</sup> Service subscription required

<sup>4</sup> Maximum output rate is 20 Hz

<sup>5</sup> Applicable to the European version (4G compatibility in Europe and other regions)

<sup>6</sup> Applicable to the North American version (4G compatibility in North America and other regions)

<sup>7</sup> Open sky conditions

<sup>8</sup> RMS levels

<sup>9</sup> After convergence

<sup>10</sup> RTK fixed ambiguities

<sup>11</sup> Baseline < 40 Km

<sup>12</sup> (Fg) model 10 Hz maximum, configuration dependent

<sup>13</sup> 99.9%

<sup>14</sup> Including software compensation of sawtooth effect

<sup>15</sup> No information available (no almanac, no approximate position)

<sup>16</sup> Ephemeris and approximate position known

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