AsteRx-U MARINE

Multi-constellation, dual antenna receiver for marine applications

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 robust heading calculation**
- **cm-level (RTK) and sub dm-level (PPP) position accuracy**
- **L-band reception, robust against Inmarsat uplink interference**
- **Support for TerraStar and VERIPOS corrections**
- **Septentrio GNSS+ algorithms for solid industrial performance**
- **Integrated cellular modem, Bluetooth, Wi-Fi and UHF radio**
- **Additional connector for dedicated L-band antenna**

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.

Centimeter 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 Wi-Fi network or USB connection.

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, E6), BEIDOU (B1, B2, B3), IRNSS (L5), QZSS (L1,L2,L5) (Galileo, Beidou and IRNSS, are optional features)

All-in-view SBAS (EGNOS, WAAS, GAGAN, MSAS, SDCM) (incl. L5 tracking)

Integrated dual channel L-band receiver

100 Hz Raw data output (code, carrier, navigation data) (optional feature)

20 Hz SBAS, DGNSS, PPP and RTK (50Hz available in future firmware versions)

A Posteriori Multipath Estimator Technique (APME+), including code and phase multipath mitigation

AIM+/WIMU interference mitigation unit, including chirp jammers

ION+ Advanced scintillation mitigation

L-Band reception robust against INMARSAT uplink interference

RAIM

DGNSS (base station and rover)

RTK (base and rover) (base is an optional feature)

Use of TerraStar and VERIPOS services (optional feature)

Moving base RTK positioning (optional feature)

8 GB Internal Memory

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)

Connector for dedicated L-Band antenna

Formats

Highly Compact and fully documented Septentrio Binary Format (SBF) output

NMEA v2.30 output format, up to 20 Hz ; NMEA 4.0; NMEA 3.01

RTCM v2.2, 2.3, 3.0 or 3.1

CMR2.0 and CMR+ (CMR+ input only)

UHF: Pacific Crest (GMSK, 4FSK, FST), SATEL, Trimtalk (450S_P, 450S_T)

PERFORMANCE

Position accuracy[1,2,3]

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.8 m
DGNSS	0.4 m	0.9 m
TerraStar-D[4]	6 cm	<10 cm
VERIPOS APEX2[5]	6 cm	<10 cm
VERIPOS ULTRA2[5]	6 cm	<10 cm

RTK performance[1,2,3,6,7]

Horizontal accuracy	0.6 cm + 0.5 ppm
Vertical accuracy	1 cm + 1 ppm
Average time to fix	7 s

Velocity Accuracy[1,2,3]

Horizontal	Vertical
0.01 m/s	0.015 m/s

Heading Accuracy[1,2,3]

	Heading	Pitch/Roll
1m antenna separation	0.1°	0.2°
10m antenna separation	0.01°	0.02°

Maximum Update rate

Position	20 Hz (50 Hz in future firmware versions)
Measurements	100 Hz

Latency

< 20 ms

Time accuracy

xPPS Out	10 ns
Event accuracy	< 20 ns

Time to first fix

Cold start[8]	< 45 s
Warm start[9]	< 20 s
Re-acquisition	avg. 1.2 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

Dynamics

Acceleration	10 g
Jerk	4 g/s

PHYSICAL AND ENVIRONMENTAL

Size	164 x 157 x 54 mm
Weight	1.5 kg
Input voltage	9–36 V DC
Power Consumption	7 W Typical
Operating temperature	-30 °C to +65 °C
Storage temperature	-40 °C to +75 °C
Humidity	MIL-STD810G, Method 507.5, Procedure I
Dust	MIL-STD-810G, Method 510.5, Procedure I
Shock	MIL-STD-810G, Method 516.6, Procedure I/II
Vibration	MIL-STD-810G, 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 and 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
IEC60945

[1] 1-20 Hz measurement rate

[2] Performance in open sky conditions

[3] RMS level

[4] Requires service activation from TerraStar

[5] Requires service activation from VERIPOS

[6] RTK fixed ambiguities

[7] Baseline: < 40 km

[8] No information available (no almanacs, no approximate position)

[9] Ephemeris and approximate position known

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