AsteRx-U MARINE

Multi-constellation, dual-antenna receiver for marine applications

septentrio

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[1]: E1, E5ab, AltBoc, E6
- BeiDou[1]: B1, B2, B3
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- NavIC: L5[1, 2]
- QZSS: L1, L2, L5, L6[2]

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 FUGRO Marinestar services[1,3]
Moving base[1,4]
Heading GNSS attitude[1]
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[1]: 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 4G[5]:
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[6]:
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 [7,8]

	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 [7,8,10,11]

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

GNSS attitude accuracy [7,8]

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

Velocity accuracy [7,8]

0.03 m/s

Maximum update rate [12]

Position	50 Hz
Position and attitude	20 Hz
Measurements	100 Hz

Latency [13,2]

<20 ms

Time accuracy

xPPS out[14]	10 ns
Event accuracy	< 20 ns

Time to first fix

Cold start[15]	< 45 s
Warm start[16]	< 20 s
Re-acquisition	avg. 1 s

Tracking performance (C/N0 threshold)[14]

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
Weight	1.5 kg / 3.30 lb
Input voltage	9-36 VDC
Power consumption	8 W typical
Operating temperature	-30° C to +60° C
	-22° F to 140° 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] Not applicable to (Fg) Model
[3] Service subscription required
[4] Maximum output rate is 20 Hz
[5] Applicable to the European version (4G compatibility in Europe and other regions)
[6] Applicable to the North American version (4G compatibility in North America and other regions)
[7] Open sky conditions
[8] RMS levels
[9] After convergence
[10] RTK fixed ambiguities
[11] Baseline < 40 Km
[12] (Fg) model 10 Hz maximum, configuration dependent
[13] 99.9%
[14] Including software compensation of sawtooth effect
[15] No information available (no almanac, no approximate position)
[16] Ephemeris and approximate position known

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