

AsteRx-U

Multi-constellation, dual-antenna GNSS receiver



Mining



Construction



Autonomous



Logistics & Port Operations



Automation



Rail



Multi-frequency, multi-constellation GNSS positioning together with GNSS Heading, L-Band positioning and wireless communications within a rugged IP67 housing for the broadest range of applications.

KEY FEATURES

- ▶ **544 channels for tracking all known and planned signals from GPS, GLONASS, Galileo, BeiDou, NavIC, QZSS and SBAS on both antennas**
- ▶ **Precise and solid heading**
- ▶ **Centimetre-level (RTK) and sub decimetre-level (PPP) position accuracy**
- ▶ **Dual L-band channel with support for corrections**
- ▶ **Septentrio GNSS+ algorithms for reliable performance**
- ▶ **Integrated cellular modem, Bluetooth and WiFi optional UHF radio**

BENEFITS

Consistently accurate now and into the future

The AsteRx-U 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 scalable accuracy

Septentrio's knowledge and experience in the GNSS industry ensures that the AsteRx-U 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 offers the very latest in special interference mitigation technology which filters out ambient intentional and unintentional RF interference.

Any device, any platform

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

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)
- ▶ NavIC: L5¹
- ▶ QZSS: L1, L2, L5, L6¹

Septentrio's patented GNSS+ technologies

- ▶ **AIM+** interference mitigation unit against narrow system against narrow and wideband interference with spectrum analyser
- ▶ **IONO+** advanced scintillation mitigation
- ▶ **APME+** a posteriori multipath estimator for code and phase multipath mitigation.
- ▶ **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations.

RAIM (Receiver Autonomous Integrity Monitoring) RTK (base and rover)¹

Integrated dual-channel L-band receiver

Support for PPP^{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:

EU4G⁴:

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)

NA4G⁵:

4G LTE CAT4 (B2, B4, B5, B7, B17)

3G UMTS/HSDPA/HSUPA (850/900/

AWS1 700/1900/2100)

2G GSM/GPRS/EDGE (850/900/1800/1900)

Integrated WiFi (802.11 b/g/n)

Integrated UHF (406-470 MHz)¹

PERFORMANCE

Position accuracy^{6,7}

	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^{6,7,8,9}

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

GNSS attitude accuracy^{6,7}

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

Velocity accuracy^{6,7}

0.03 m/s

Maximum update rate¹⁰

Position	50 Hz
Position and attitude	20 Hz
Measurements	100 Hz

Latency¹¹

<20 ms

Time accuracy

xPPS out ¹²	10 ns
Event accuracy	< 20 ns

Time to first fix

Cold start ¹³	< 45 s
Warm start ¹⁴	< 20 s
Re-acquisition	avg. 1 s

Tracking performance (C/N0 threshold)¹³

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 Service subscription required

³ Maximum output rate is 20 Hz

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

⁵ Applicable to the North American version (4G compatibility in North America and other regions)

⁶ Open sky conditions

⁷ RMS levels

⁸ RTK fixed ambiguities

⁹ Baseline < 40 Km

¹⁰ If combined with MARINESTAR max. 10 Hz

¹¹ 99.9%

¹² Including software compensation of sawtooth effect

¹³ No information available (no almanac, no approximate position)

¹⁴ Ephemeris and approximate position known

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