AsteRx-U

Multi-constellation, dual-antenna GNSS receiver

septentrio

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, IRNSS, 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 SECORX 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, 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 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.

AsteRx-U

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)
- IRNSS: L5[1]
- QZSS: L1, L2, L5, L6[1]

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 (SECORX)[1,2]
Moving base[1,3]
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:
EU4G[4]:
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)
NA4G[5]:
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)[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
SECORX-D (PPP)[2,8]	6 cm	9 cm
SECORX-C (PPP)[2,8]	4 cm	6 cm
SECORX-60 (PPP)[2,8]	4 cm	6 cm

RTK performance [6,7,9,10]

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

GNSS attitude accuracy [6,7]

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

Velocity accuracy [6,7]

0.03 m/s

Maximum update rate

Position	50 Hz
Position and attitude	20 Hz
Measurements	100 Hz

Latency [11]

<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	7 W typical
Operating temperature	-30° C to +65° C
	-22° F to 149° 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] After convergence
[9] RTK fixed ambiguities
[10] Baseline < 40 Km
[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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EMEA (HQ)
Greenhill Campus
Interleuvenlaan 15i
3001 Leuven, Belgium
+32 16 30 08 00
septentrio.com

Americas
Suite 200
23848 Hawthorne Blvd
Torrance, CA 90505, USA
+1 310 541 8139
sales@septentrio.com

Asia-Pacific
Shanghai, China
Yokohama, Japan

septentrio