AsteRx-U
Multi-constellation, dual-antenna GNSS receiver

septentrio

Mining

Construction

Autonomous

Logistics

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 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.

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

Supported signals:

- ▶ GPS: L1, L2, L5
- ▶ GLONASS: L1, L2, L3
- ▶ Galileo: E1, E5ab, AltBoc, E6[1]
- ▶ BeiDou: B1, B2, B3[1]
- ▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- ▶ IRNSS: L5[1]
- ▶ QZSS: L1, L2, L5, L6

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.
- ▶ **RAIM** (Receiver Autonomous Integrity Monitoring)

RTK (base and rover)[1]

Integrated dual-channel L-band receiver

Support for PPP (SeCoRx-60)[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)

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 WiFi (802.11 b/g/n)

Integrated UHF (406-470 MHz)[1]

PERFORMANCE

Position Accuracy [4,5]

	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[6] (PPP)	4 cm	9 cm
SECORX-C[6] (PPP)	4 cm	6 cm
SECORX-60[2,6] (PPP)	4 cm	6 cm

RTK Performance[4,5,7,8]

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

GNSS attitude accuracy[4,5,]

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

Velocity accuracy[4,5]

0.03 m/s

Maximum Update Rate

Position	50 Hz
Position and attitude	20 Hz
Measurements	100 Hz

Latecy[9]

<20 ms

Time accuracy

xPPS Out[10]	10 ns
Event accuracy	< 20 ns

Time to first fix

Cold Start[11]	< 45 s
Warm Start[12]	< 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-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 & 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] Open sky conditions
[5] RMS levels
[6] After convergence
[7] RTK fixed ambiguities
[8] Baseline < 40 Km
[9] 99.9%
[10] Including software compensation of sawtooth effect
[11] No information available (no almanac, no approximate position)
[12] Ephemeris and approximate position known
[13] Max. speed 600 m/s

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