AsteRx-U

Multi-constellation, dual antenna GNSS receiver

septentrio

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

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.

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 TerraStar corrections**

▶ **Septentrio GNSS+ algorithms for solid performance**

▶ **Integrated cellular modem, Bluetooth, WiFi and optional UHF radio**

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

Integrated dual-channel L-band receiver

AIM+ interference mitigation unit against narrow and wide band 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]

PPP (TerraStar services)[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)

CMR2.0 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)

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)[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
TerraStar-D[6]	6 cm	9 cm
TerraStar-C[6]	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[4,5,7,8]

Antenna separation	Heading	Vertical
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

Latency[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. 1.2 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 db-Hz

PHYSICAL AND ENVIRONMENTAL

Size	164 x 157 x 54 mm
	6.46 x 6.18 x 2.13 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 V DC
Maximum current	200 mA

Certification

	IP67, RoHS, CE
	FCC Class B Part 15
	IEC 60945

1 Optional feature

2 Service subscription required

3 Maximum output rate 20 Hz

4 Open sky conditions

5 RMS levels

6 After convergence, requires service subscription

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

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