

AsteRx-U3

Multi-constellation, dual-antenna GNSS receiver



Mining



Construction



Autonomous



Logistics & Port operations



Automation



Rail

Multi-frequency, multi-constellation GNSS positioning and heading receiver, which includes wired and wireless communications in a rugged IP68 housing, for the broadest range of applications.

KEY FEATURES

- ▶ **Full-constellation, triple-frequency satellite tracking on both antennas**
- ▶ **Sub-degree GNSS heading & pitch or heading and roll**
- ▶ **Centimetre-level (RTK)**
- ▶ **Septentrio GNSS+ algorithms for reliable performance**
- ▶ **Integrated UHF radio, cellular modem, Bluetooth and Wi-Fi (depending on configuration)**

BENEFITS

Consistently accurate now and into the future

The AsteRx-U3 is the most advanced integrated multi-constellation dual-antenna receiver from Septentrio. Its multi-frequency engine can track signals from all 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.

Reliable centimetre accuracy

Septentrio's 25+ years of experience in the GNSS industry ensures that the AsteRx-U3 offers you the highest possible accuracy, down to a centimetre. LOCK+ technology maintains tracking during heavy vibration and IONO+ ensures position accuracy even under periods of elevated ionospheric activity. The AsteRx-U3 offers the very latest in advanced interference mitigation technology AIM+, which filters out ambient intentional and unintentional RF interference.

Any device, any platform

Use any device with a web browser to operate the AsteRx-U3 without any special configuration software via the Web interface accessible over Ethernet, Wi-Fi or a USB connections.

FEATURES

GNSS technology

544 hardware channels for simultaneous tracking of all visible supported satellite signals:

- GPS: L1 C/A, L1C¹, L2C, L2 P(Y), L5
- GLONASS: L1 C/A, L2 C/A, L3, L2P
- Beidou: B1I, B1C, B2a, B2I, B3I
- Galileo: E1, E5a, E5b, E5 AltBOC, E6
- QZSS: L1 C/A, L1C¹, L2C, L5
- NavIC: L5
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM

Septentrio's patented GNSS+ technologies

- **AIM+** unique mitigation and monitoring system against narrow and wideband interferences with spectrum analyser
- **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)

Integrated 4-channels L-band receiver

Moving base

GNSS heading & pitch or heading & roll

16 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, v3.01, v4.0

UHF: Satel, Trimtalk (450S) Pacific Crest (GMSK, 4FSK, FST)

Connectivity

3 Hi-speed serial ports (RS232 / RS422)

Ethernet port (TCP/IP and UDP)

High-speed USB

CAN port

1 Event marker

xPPS output (max. 100 Hz)

Bluetooth² (2.1 + EDR/4.0)

WiFi² (802.11 b/g/n)

UHF² (410-475 MHz)

Cellular modem³: LTE CAT4

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)

PERFORMANCE

Position accuracy^{3,4}

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS DGNSS	0.6 m	0.8 m
RTK performance	0.4 m	0.7 m

RTK performance^{3,4,5,6}

Horizontal accuracy	0.6 cm + 0.5 ppm
Vertical accuracy	1 cm + 1 ppm
Initialization time	7 s

GNSS attitude accuracy^{3,4}

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

Velocity accuracy^{3,4}

0.03 m/s

Maximum update rate

Position	100 Hz
Position and attitude	50 Hz
Measurements	100 Hz

Latency⁷

< 20 ms

Time precision

xPPS out ⁸	5 ns
Event accuracy	< 20 ns

Time to first fix

Cold start ⁹	< 45 s
Warm start ¹⁰	< 20 s
Re-acquisition	avg. 1 s

Tracking performance (C/N0 threshold)⁹

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

PHYSICAL AND ENVIRONMENTAL

Size 157 x 245 x 45 mm

Weight 1.5 kg

Input voltage 9-48 VDC

Power consumption 8 W typical

Operating temperature -30° C to +65° C

Storage temperature -40° C to +75° C

Humidity IEC60721-3-5, Class 5K2

Dust MIL-STD-810H, Method 510.7, Procedure I

Shock MIL-STD-810H, Method 516.8, Procedure I/II

Vibration MIL-STD-810H, Method 514.8, Procedure I

Corrosion IEC60068-2-52, Method 2

Connectors

Antennas	TNC female
Power	M8 4 pins female
USB/ETH	M8 4 pins female
PPS OUT	M8 6 pins male
Serial 2	M12 8 pins female
Serial 1 & 3	M12 4 pins male
Events/GPIO	M12 8 pins female

Antenna LNA power output

Output voltage	User selectable 3.3V/5V
Maximum current	150 mA

Certification

IP68, RoHS, WEEE, CE, FCC



- 1 Hardware ready
- 2 Optional feature
- 3 Open sky conditions
- 4 RMS levels
- 5 RTK fixed ambiguities
- 6 Baseline < 40 Km
- 7 99.9%
- 8 Including software compensation of sawtooth effect
- 9 No information available (no almanac, no approximate position)
- 10 Ephemeris and approximate position known

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