AsteRx-U3

Multi-constellation, dual-antenna GNSS receiver

septentrio

- Mining
- Construction
- Autonomous
- Logistics & Port Operations
- Automation
- Rail

Multi-frequency, multi-constellation GNSS positioning and heading, including wired and wireless communications in a rugged, IP68-rated 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 & 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.

Centimetre accuracy

Septentrio's knowledge and 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 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-U3 without any special configuration software via the Web UI accessible over Ethernet, Wi-Fi or USB connections.

AsteRx-U3

FEATURES

GNSS technology

544 Hardware channels for simultaneous tracking of most visible signals:

- GPS: L1 C/A, L1C[1], 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
- QZSS: L1 C/A, L1C[1], 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 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)
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)
Ethernet port (TCP/IP and UDP)
CAN port
High-speed USB
1 Event marker
xPPS output (max. 100 Hz)
Bluetooth[2] (2.1 + EDR/4.0)
WiFi[2] (802.11 b/g/n)
UHF[2] (410-475 MHz)
Cellular modem[2]: 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	0.6 m	0.8 m
DGNSS	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
Initialisation	7 s

GNSS attitude accuracy [3,4]

Antenna separation	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

Latency [7]

<20 ms

Time accuracy

xPPS out[8]	10 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 45mm
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

Connectors

Antennas	TNC female
COM1/3	M8 6 pins female
USB	M8 4 pins female
I/O	M8 6 pins male
Ethernet	M12 8 pins female
Power	M12 4 pins male
COM2/PPS	M12 8 pins female

Antenna LNA power output

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

Certification

IP68, RoHS, WEEE, CE, ISO 9001-2015

[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