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 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 & 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 knowledge and 20 years of experience in the GNSS industry ensures that the AsteRx-U3 offers the highest possible accuracy, down to the centimetre level. LOCK+ technology maintains tracking during heavy vibrations and IONO+ ensures position accuracy even during 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 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
Corrosion	IEC60068-2-52, Method 2

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

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