

# AsteRx-U

Multi-constellation, dual-antenna GNSS receiver



Mining



Construction



Autonomous



Logistics & Port Operations



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, NavIC, 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 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 the most advanced integrated 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, NavIC 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.

## FEATURES

### GNSS technology

544 Hardware channels for simultaneous tracking of all visible satellite signals:

- ▶ GPS: L1, L2, L5
- ▶ GLONASS: L1, L2, L3
- ▶ Galileo<sup>1</sup>: E1, E5ab, AltBoc, E6
- ▶ BeiDou<sup>1</sup>: B1, B2, B3
- ▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- ▶ NavIC: L5<sup>1</sup>
- ▶ QZSS: L1, L2, L5, L6<sup>1</sup>

### 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.
- ▶ **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations.

RAIM (Receiver Autonomous Integrity Monitoring) RTK (base and rover)<sup>1</sup>

Integrated dual-channel L-band receiver

Support for PPP<sup>1,2</sup>

Moving base<sup>1,3</sup>

Heading GNSS attitude<sup>1</sup>

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<sup>1</sup>: Satel, Trimtalk (450S\_P, 450S\_T) Pacific

Crest (GMSK, 4FSK, FST)

CAN 1939

### 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)

4G LTE models:

#### EU4G<sup>4</sup>:

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)

#### NA4G<sup>5</sup>:

4G LTE CAT4 (B2, B4, B5, B7, B17)

3G UMTS/HSDPA/HSUPA (850/900/

AWS1 700/1900/2100)

2G GSM/GPRS/EDGE (850/900/1800/1900)

Integrated WiFi (802.11 b/g/n)

Integrated UHF (406-470 MHz)<sup>1</sup>

## PERFORMANCE

### Position accuracy<sup>6,7</sup>

	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<sup>6,7,8,9</sup>

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

### GNSS attitude accuracy<sup>6,7</sup>

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

### Velocity accuracy<sup>6,7</sup>

0.03 m/s

### Maximum update rate<sup>10</sup>

Position	50 Hz
Position and attitude	20 Hz
Measurements	100 Hz

### Latency<sup>11</sup>

<20 ms

### Time accuracy

xPPS out <sup>12</sup>	10 ns
Event accuracy	< 20 ns

### Time to first fix

Cold start <sup>13</sup>	< 45 s
Warm start <sup>14</sup>	< 20 s
Re-acquisition	avg. 1 s

### Tracking performance (C/N0 threshold)<sup>13</sup>

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** 8 W typical

**Operating temperature** -30° C to +60° C  
-22° F to 140° F

**Storage temperature** -40° C to +75° C  
-40° F to 167° F

**Humidity** MIL-STD810H, Method 507.5, Procedure I

**Dust** MIL-STD-810H, Method 510.5, Procedure I

**Shock** MIL-STD-810H, Method 516.6, Procedure I/II

**Vibration** MIL-STD-810H, 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



<sup>1</sup> Optional feature

<sup>2</sup> Service subscription required

<sup>3</sup> Maximum output rate is 20 Hz

<sup>4</sup> Applicable to the European version (4G compatibility in Europe and other regions)

<sup>5</sup> Applicable to the North American version (4G compatibility in North America and other regions)

<sup>6</sup> Open sky conditions

<sup>7</sup> RMS levels

<sup>8</sup> RTK fixed ambiguities

<sup>9</sup> Baseline < 40 Km

<sup>10</sup> If combined with MARINESTAR max. 10 Hz

<sup>11</sup> 99.9%

<sup>12</sup> Including software compensation of sawtooth effect

<sup>13</sup> No information available (no almanac, no approximate position)

<sup>14</sup> Ephemeris and approximate position known

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