

# AntaRx-Si3

GNSS/INS smart antenna in an ultra-rugged housing



**Triple-band, multi-constellation smart antenna delivering reliable centimeter-level positioning together with 3D orientation in challenging environments. Thanks to the built-in inertial sensor, it provides orientation (heading, pitch and roll) as well as dead reckoning making it ideal for systems that require positioning under any condition.**

## KEY FEATURES

- ▶ **All-in-one GNSS receiver, inertial sensor and an antenna combined in a single ultra-robust IP69k-rated housing**
- ▶ **Heading with single or dual GNSS antenna**
- ▶ **Pitch and roll**
- ▶ **Centimetre-level (RTK) enhanced by an IMU**
- ▶ **Septentrio GNSS+ algorithms for reliable performance**
- ▶ **Integrated cellular modem**

## BENEFITS

### Consistently accurate position and orientation

AntaRx-Si3 is a state-of-the-art GNSS receiver designed to provide robust and reliable positioning and 3D attitude in the most challenging environments. Multi-constellation, multi-frequency RTK is further enhanced by a powerful GNSS/INS integration for best positioning performance and heading, pitch and roll angles. While a single antenna allows a lean configuration, adding an auxiliary GNSS antenna enables heading measurement without the need for movement.

### Centimetre accuracy

Septentrio's knowledge and experience in the GNSS industry ensures that AntaRx-Si3 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 AntaRx-Si3 offers the very latest in special interference mitigation technology which filters out ambient intentional and unintentional RF interference.

### Any device, any platform

Keep the hardware installation as simple as possible with this all-in-one solution which combines a receiver, an IMU sensor and a GNSS antenna in a single enclosure. Use any device with a web browser to operate the AntaRx-Si3 without any special configuration software via the Web UI accessible over Ethernet or USB connections.

## FEATURES

### GNSS technology

544 Hardware channels for simultaneous tracking of most visible signals:

- ▶ GPS: L1 C/A, L1C<sup>1</sup>, 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, L1 C/B<sup>1</sup>, L1C<sup>1</sup>, 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
- ▶ **FUSE+** fusion of RTK positioning with an inertial sensor
- ▶ **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-channel 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

NMEA 2000

### Connectivity

2 Hi-speed serial ports (RS232/RS422)

Ethernet port (TCP/IP and UDP)

CAN port

High-speed USB

2 Event markers

xPPS output (max. 100 Hz)

Integrated Cellular Modem (EDGE, 2G, 3G, 3.5G, 4G) - optional

## PERFORMANCE

### Integrated position accuracy <sup>2,3</sup>

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.8 m
DGPS	0.4 m	0.7 m

### RTK-INS <sup>2,3,6</sup>

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

### Integrated attitude accuracy <sup>2,3,6</sup>

	Non RTK mode	RTK mode
Heading, dual antenna	0.3°	0.15°
Heading, single antenna	0.3°	0.2°
Pitch/roll, dual antenna	0.04°	0.02°

### INS velocity <sup>2,3,6</sup>

	Non RTK mode	RTK mode
Velocity	0.05 m/s	0.02 m/s

### IMU performance

#### Gyroscope performance

Input range	± 500°/s	
Bias in-run instability	2.7°/hr	
Random walk / noise density	0.15 - 0.2°/√hr	

#### Accelerometer performance

Input range	± 8 g	
Bias in-run instability <sup>11</sup>	2.7 - 4.4 µg	
Random walk / noise density <sup>11</sup>	17.0 - 24.8 µg/√Hz	

### Maximum update rate

Integrated position	100 Hz
Latency <sup>7</sup>	< 20 ms
GNSS measurements	2 Hz
IMU raw data	200 Hz

### Time precision

xPPS out	5 ns
Event accuracy	< 20 ns

### Time to first fix

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

### Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

## PHYSICAL AND ENVIRONMENTAL

**Size** 158 x 166 x 83mm

**Weight** 1.1 kg

**Input voltage** 9-48 VDC

**Power consumption** 8 W typical

**Operating temperature** -30° C to +70° C

**Solar radiation** cycle A1 (MIL-STD-810H)

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

**Humidity** up to 100% RH (IEC 60068-2-38)

**Ingress Protection** IP69K (ISO 20655)

**Shock** 50g (ISO 16750-3)

**Vibration** 6g RMS (ISO 16750-3)

### Connectors

Auxiliary antenna TNC female

Power & I/O 23 pin Souriau UTS type

### Certification

RoHS, WEEE, CE, ISO 9001-2015



<sup>1</sup> Hardware ready

<sup>2</sup> Optional feature

<sup>3</sup> Open sky conditions

<sup>4</sup> RMS levels

<sup>5</sup> RTK fixed ambiguities

<sup>6</sup> Baseline < 40 Km

<sup>7</sup> 99.9%

<sup>8</sup> Including software compensation of sawtooth effect

<sup>9</sup> No information available (no almanac, no approximate position)

<sup>10</sup> Ephemeris and approximate position known

<sup>11</sup> Z-axis (lower value is for X & Y)

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