



**AsteRx-i V processes high-quality data, from the dual antenna multi-frequency AsteRx GNSS receiver with IMU measurements to generate an accurate and reliable position and orientation.**

## Key Features

- ▶ **Reliable and accurate IMU-enhanced GNSS positioning down to the cm level**
- ▶ **Full attitude - heading pitch and roll**
- ▶ **Lightweight, low power and compact**
- ▶ **AIM+ interference monitoring and mitigation system**
- ▶ **High-update rate, low-latency positioning and attitude**

## Reliability, availability and accuracy at their best

Septentrio's quad-constellation, multi-frequency, accurate and reliable RTK is further enhanced by a powerful GNSS/INS integration. Benefiting from a GNSS heading initialization, AsteRx-i V provides 3D attitude of the POI (point of interest).

The AsteRx-i V includes Septentrio's GNSS+ suite of positioning algorithms to convert difficult environments into good positioning. It also features AIM+ interference mitigation and monitoring system which can suppress the widest variety of interferers, from simple continuous narrowband signals to the most complex wideband and pulsed jammers.

## SWaP matters

Designed around demanding requirements for size, weight and power consumption, the AsteRx-i V is ideal for optical inspection and photogrammetry. Consuming typically 1.5 W and with a weight of less than 50 g, is ideal for UAVs where space and payload are at a premium. The versatility of design and range of connection interfaces extend the AsteRx-i V applicability to automation and robotics and as well as logistics.

## Ease of integration

Accompanied by a UAS-tailored carrier board, the AsteRx-i V integrates seamlessly into light UAV and robotics platforms. The IMU offers a simple, bolt-on, plug-n-play solution, designed for easy testing and integration. Septentrio's open interfaces and software tools (webUI, RxTools) make the integration, configuration and control of the AsteRx-i V seem effortless.

## FEATURES

### GNSS technology

The AsteRx-i V supports tracking of the following signals:

- ▶ GPS: L1, L2
- ▶ GLONASS: L1, L2
- ▶ Galileo<sup>1</sup>: E1 E5b
- ▶ BeiDou<sup>1</sup>: B1, B2
- ▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1)
- ▶ QZSS<sup>1</sup>: L1, L2

Septentrio's patented GNSS+ technologies:

- ▶ AIM+ unique anti-jamming and monitoring system against narrow and wideband interference
- ▶ APME+ a posteriori multipath estimator for code and phase multipath mitigation
- ▶ LOCK+ superior tracking robustness under heavy mechanical shocks or vibrations
- ▶ IONO+ advanced scintillation mitigation

RAIM (Receiver Autonomous Integrity Monitoring)

RTK (rover)<sup>1</sup>

### Formats

Septentrio Binary Format (SBF), fully documented with sample parsing tools

RTCM v2.x and v3.x (MSM included)

CMR and CMR+ (CMR+ input only)

NMEA 0183 v2.3, v3.01, v4.0 (output only)

### Connectivity AsteRx-i V OEM

4 Hi-speed serial ports (LVTTTL)

1 USB device port

xPPS output (max 100 Hz)

2 Event markers

SDIO interface for logging (covers µSD, SD, eMMC)

Outputs to drive external LEDs

General Purpose Output

### Connectivity AsteRx-i V UAS

Wide range power supply input (6-30 V)

On-board logging on Micro-SD card (max 32 GB)

Plug compatible with Pixhawk and ArduPilot

xPPS output (max 100 Hz)

2 Event markers for camera shutter synchronization Push-button start/stop logging on the SD-card

LEDs for power, logging and PVT status

3 Hi-speed serial ports (LVTTTL)

1 Full-speed USB device port (micro USB)

## PERFORMANCE

### Integrated position accuracy<sup>2,3</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>2,3,4</sup>

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

### RTK accuracy after outage

Outage duration (s)	Position error (m, RMS)
1	0.1
10	0.5
20	2
30	5

### Attitude accuracy in RTK mode<sup>2,3,4</sup>

Heading	0.2 deg
Pitch/Roll	0.05 deg

### Velocity accuracy<sup>2,3,4</sup>

0.02 m/s

### IMU performance

#### Gyroscope Performance

Input range	± 2000 °/s
In-run bias stability	< 10 °/hr
Random walk / noise density	0.21 °/√hr

#### Accelerometer Performance

Input range	± 16 g
In-run bias stability	0.04 mg
Random walk / noise density	0.14 mg/√Hz

### Maximum update rate

Integrated position	200 Hz (beta 50 Hz)
GNSS Measurements only (for post-processing)	2 Hz
IMU Raw data (for post-processing)	200 Hz
Latency	< 20 ms

### Time precision

xPPS output	5 ns
Event accuracy	< 20 ns

### Time to first fix

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

## PHYSICAL AND ENVIRONMENTAL

### AsteRx-i V OEM

Size 47.5 × 70 × 7.6 mm  
(1.87 × 2.75 × 0.29 in)

Weight 28 g (0.987 oz)

Input voltage 3.3 VDC ± 5%

### Connectors

30 pins Hirose DF40 socket

60 pins Hirose DF40 socket for expanded connectivity

### AsteRx-i V UAS

Size 47.5 × 70 × 14.9 mm  
(1.87 × 2.75 × 0.58 in)

UAS Interface alone (no GNSS) 10 g (0.352 oz)

Input voltage 5 V or 6-30 VDC

### Connectors

COM1 6 pins DF13-6P-1.25DSA  
(plug compatible with Pixhawk and ArduPilot)

COM2 6 pins DF13-6P-1.25DSA

COM3 4 pins DF13-4P-1.25DSA

Event-markers 2 pins header

PPS-Out 3 pins header

### IMU

Size 36 × 33 × 9 mm  
(1.42 × 1.30 × 0.35 in)

Weight 15 g (0.53 oz)

Input voltage 6-30 VDC

### Antenna

Antenna connectors 2 × U.FL

Antenna supply voltage 3 - 5.5 VDC

Maximum antenna current 200 mA

Antenna gain range 15-45 dB

### System power consumption

	AsteRx-i V OEM	AsteRx-i V UAS
GPS/GLO (L1/L2)	1.1 W	1.1 W
All signals	1.4 W	1.4 W
Onboard logging	NA	0.3 W

### Environment

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

Storage temperature -55 °C to +85 °C  
(-67 °F to 185 °F)

Humidity 5% to 95% (non-condensing)

Vibration MIL-STD-810G

<sup>1</sup> Optional feature

<sup>2</sup> Open-sky conditions

<sup>3</sup> RMS levels

<sup>4</sup> Baseline < 40 Km

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