AsteRx-m2 UAS
Centimetre accuracy and easy integration into UAS

septentrio

UAV

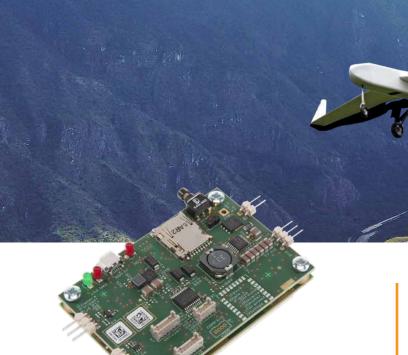Survey & GIS

Logistics

Automation

Mapping

The AsteRx-m2 UAS is a GNSS receiver specifically designed for straightforward integration into UAS applications providing centimetre-level RTK positioning at less than 1 W (GPS and GLONASS L1/L2). It features standard connections to Pixhawk and ArduPilot and a wide range 6-30 V power input as well as an event marker input to accurately time stamp camera shutter events.

Key Features

▶ **Multi-constellation, multi-frequency all-in-view satellite tracking**

▶ **Centimetre-level (RTK) position accuracy with or without a real-time datalink**

▶ **AIM+ anti-jamming and monitoring system**

▶ **Camera shutter synchronisation**

▶ **Plug compatible with ArduPilot/Pixhawk**

▶ **Easy-to-integrate**

Designed for UAS
The AsteRx-m2 UAS is designed for easy integration into any system. Standard connectors connect directly to your autopilot (e.g. Pixhawk) and the wide 6-30 V input power range allows you to use the power directly from the vehicle power bus. Event markers can accurately synchronise a camera shutter with GNSS time. The command interface is fully open and an SDK is provided to help create professional custom applications.

Interference robustness
The AsteRx-m2 UAS features AIM+, the most advanced on-board anti-jamming technology on the market. It can suppress the widest variety of interferers, from simple continuous narrowband signals to the most complex wideband and pulsed jammers. The RF spectrum can be viewed in real-time in both time and frequency domains.

No need for ground control points
The AsteRx-m2 UAS works seamlessly with GeoTagZ software and its SDK library for PPK (Post-processed kinematic) offline processing. This gives RTK accuracy without the need for ground control points or a real-time datalink.

Ultra-low power design
The AsteRx-m2 UAS provides RTK positioning at the lowest power consumption of any comparable device on the market. This means longer operation on a single battery charge, smaller batteries and greater usability.

FEATURES

GNSS Technology

448 Hardware channels for simultaneous tracking of all visible satellite supported signals:

- GPS: L1, L2, L5
- GLONASS: L1, L2, L3
- Galileo[1]: E1, E5a, E5b, AltBoc
- BeiDou[1]: B1, B2
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- IRNSS[1]: L5
- QZSS: L1, L2, L5
- Integrated dual-channel L-band receiver

Septentrio's patented GNSS+ technologies:

- **AIM+** unique anti-jamming 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

RAIM (Receiver Autonomous Integrity Monitoring)
RTK (base and rover)[1]
PPP (Precise Point Positioning with SECORX)[1,2]
Moving base[1,3]

Formats

Septentrio Binary Format (SBF), fully documented with sample parsing tools
NMEA 0183, v2.3, v3.01, v4.0
RINEX[1] (obs, nav) v2.x, v3.x
RTCM v2.x, v3.x (MSM messages included)
CMR v2.0 and CMR+ (CMR+ input only)

UAS Interface Board

Wide range power supply input (6-30 VDC)
On-board logging on Micro-SD card
(max 32 GB)
Plug compatible with Pixhawk and Ardupilot
xPPS output (max 100 Hz)
Event marker for camera shutter synchronisation[1]
Push-button to start/stop logging on
the SD-card.
LEDs for power, logging and PVT status.

Connectivity

3 Hi-speed serial ports (LVTTL)
1 Full speed USB device port (micro USB with access to internal disk, TCP/IP communication and with 2 extra serial ports)
General Purpose Output
Time and Frequency synchronisation inputs
NTRIP (server, client, caster)
FTP server, FTP push[1], SFTP

PERFORMANCE

Position Accuracy [4,5]

	Horizontal	Vertical
Standalone	1.2 m	1.9 m
SBAS	0.6 m	0.8 m
DGNSS	0.4 m	0.7 m
SECORX-C (PPP)[2,6]	4 cm	6 cm
SECORX-D (PPP)[2,6]	6 cm	9 cm

RTK Performance [4,5,7]

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

Velocity accuracy [4,5]   0.03 m/s

Maximum update rate

Position	100 Hz
Measurements	100 Hz

Latency [8]   <10 ms

Time precision

xPPS Out[9]	5 ns
Event accuracy	< 20 ns

Time to first fix

Cold Start[10]	< 45 s
Warm Start[11]	< 20 s
Re-acquisition	avg. 1 s

Tracking performance (C/N0 threshold)

Tracking	20 dB-Hz
Acquisition	33 dB-Hz

SUPPORTING COMPONENTS

- Web UI for easy configuration and monitoring via Ethernet or USB connectivity.
- RxTools, a complete and intuitive GUI tool set for receiver control, monitoring, data analysis and conversion.
- GNSS receiver communication SDK. Available for both Windows and Linux OS.

Optional accessories

- Antennas
- GeoTagZ re-processing software and SDK library for aerial mapping

PHYSICAL AND ENVIRONMENTAL

Size

	47.5 x 70 x 14.9 mm
	1.87 x 2.75 x 0.58 in

Weight

GNSS OEM board	28 g / 0.987 oz
UAS Interface board	10 g / 0.352 oz

Input voltage   5 V or 6–30 VDC

Power Consumption

GPS/GLO L1/L2	930 mW
All Signals all GNSS constellations	1.1 W
All Signals all constellations + L-Band	1.2 W

Antenna

Connectors[12]	2 x U.FL
Antenna supply voltage	3-5.5 VDC
Maximum antenna current	200 mA
Antenna gain range	passive 0 -50 dB active

I/O 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-maker	2 pins header
PPS-Out	3 pins header

Environment

Operating temperature	-40° C to +85° C
	-40° F to +185° F
Storage temperature	-55° C to +85° C
	-67° F to +185° F
Humidity	5% to 95% (non-condensing)
Vibration	MIL-STD-810G

Certification

RoHS, WEEE

[1] Optional feature
[2] Service subscription required
[3] Output rate 20 Hz
[4] Open sky conditions
[5] RMS level
[6] After convergence
[7] Baseline < 40 Km
[8] 99.9%
[9] Including software compensation of sawtooth effect
[10] No information available (no almanac, no approximate position)
[11] Ephemeris and approximate position known
[12] Second connector for alternative external antenna

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