AsteRx-m2a UAS

Centimetre accuracy, heading output with easy integration in UAS

septentrio

UAV

Automation

Autonomous

Mapping

Logistics

The AsteRx-m2a UAS is specifically designed for straightforward integration into UAS applications providing centimetre-level RTK positioning and accurate heading for just over 1 W. It features standard connections to Pixhawk and ArduPilot as well as event marker inputs 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**

▶ **Heading output for orientation or INS integrations**

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

▶ **Camera shutter synchronisation**

▶ **Plug compatible with ArduPilot/Pixhawk**

Reliable Heading performance
With dual-antenna input, the AsteRx-m2a UAS provides precise and reliable heading combined with centimetre-level RTK positioning. GNSS heading removes the reliance on vehicle dynamics or magnetic sensors to provide unmatched performance in both static and dynamic conditions.

Designed for UAS
The AsteRx-m2a 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 powering the receiver directly from the UAS power bus. Event markers can accurately synchronise a camera shutter with GNSS time. The command interface is fully documented and an SDK is provided to help create professional custom applications.
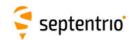
Interference robustness
The AsteRx-m2a UAS features AIM+: the most advanced on-board interference mitigation technology on the market today. It can suppress the widest variety of interferers, from simple continuous narrowband signals to the most complex wideband and pulsed jammers. The RF spectrum can be viewed in real-time in both time and frequency domains.

No need for Ground Control Points
The AsteRx-m2a 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 either Ground Control Points or a real-time datalink.

Ultra low power design
The AsteRx-m2a UAS provides RTK positioning at the lowest power consumption of any comparable device on the market. This means lower heat dissipation, simpler integrations and longer operation on a single battery charge.

AsteRx-m2a UAS

NavtechGPS

NavtechGPS is a U.S. distributor for Septentrio. Please contact NavtechGPS for U.S. inquiries

Septentrio

FEATURES

GNSS Technology

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

▶ GPS: L1, L2
▶ GLONASS: L1, L2
▶ Galileo[1]: E1, E5b
▶ BeiDou[1]: B1, B2
▶ SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1)
▶ QZSS: L1, L2

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)
▶ **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations

RTK[1]
Moving base[1,2]
GNSS Heading

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 100Hz)
Event marker for camera shutter synchronisation[1]
Push-button 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)

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]

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 only	100 Hz

Latency [6]

<10 ms

Time precision

xPPS Out[7]	5 ns
Event accuracy	< 20 ns

Time to first fix

Cold Start[8]	< 45 s
Warm Start[9]	< 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: complete and intuitive GUI tool set for receiver control, monitoring, data analysis and conversion. It is available for both Windows and Linux.
▶ GNSS Receiver Communication SDK. Available for both Windows and Linux OS.

Optional accessories

▶ Antennas
▶ GeoTagZ re-processing Software and SDK library for UAS applications

PHYSICAL AND ENVIRONMENTAL

Size

	47.5 × 70 × 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	1.1 W
All Signals all GNSS constellations	1.2 W
Standby power mode	10 mW

Antenna

Connectors	2 x U.FL
Antenna supply voltage	3-5.5 VDC
Maximum antenna current	200 mA
Antenna gain range	15-45 dB

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-markers	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] Maximum output rate 20 Hz
[3] Open sky conditions
[4] RMS level
[5] Baseline < 40 Km
[6] 99.9%
[7] Including software compensation of sawtooth effect
[8] No information available (no almanac, no approximate position)
[9] Ephemeris and approximate position known