

Xsens

Sirius Dual Antenna

RTK GNSS/INS

Centimeter-level positioning, true heading and heave in challenging environments

Rugged dual-antenna RTK GNSS/INS delivering precise heading, even at standstill and low speed

Xsens Sirius Dual-Antenna RTK GNSS/INS combines a dual-antenna GNSS receiver with advanced sensor fusion to deliver centimeter-level positioning, precise orientation, true heading and heave. It provides reliable heading without depending on magnetic measurements or requiring the platform to move.



Engineered for precise position and absolute accurate heading

Xsens Sirius Dual-Antenna RTK GNSS/INS is designed for applications that require accurate heading from startup, including during standstill and low-speed operation. Its rugged housing, flexible interfaces and support for modern GNSS correction services enable straightforward integration into demanding marine, surveying and autonomous platforms.

- › Dual-antenna u-blox ZED-X20D GNSS receiver for true heading at standstill
- › RTK capability for centimeter-level positioning accuracy

- › Integrated heave output for marine and offshore applications
- › Support for RTK, PPP-RTK, Galileo HAS and PointPerfect services
- › Advanced sensor fusion for precise orientation and reduced drift
- › IP68-rated aluminum housing for exposed outdoor installations
- › MIL-STD-202 tested for shock, vibration and environmental robustness
- › Flexible interfaces: RS232, RS422, CAN and CAN-FD
- › ITAR-free for integration into international programs

Applications

- › Wheeled Unmanned Ground Vehicles and Autonomous Mobile Robots for agricultural, mining and off-road applications
- › USVs, UUVs, AUVs and buoys for marine navigation
- › UAVs, UAS and drones
- › Surveying and mapping devices or vehicles requiring reliable heading
- › Defense and security applications, including SATCOM and Communication-on-the-Move antenna systems





Sensor fusion performance

Accelerometer	Calibrated
Gyroscope	Calibrated
Roll, Pitch	0.2° RMS
Yaw/Heading (0.5 m baseline)	0.2° RMS
Yaw/Heading (1 m baseline)	0.1° RMS
Yaw/Heading (2 m baseline)	0.05° RMS
Position	0.6 cm + 1 ppm CEP ¹
Velocity	0.03 m/s RMS
Heave	< 5 cm for Heave periods up to 29s < 6 cm for Heave periods up to 40s
Wheel odometry aiding	Available ²
Strapdown Integration (SDI)	Yes

Gyroscope

Standard full range	±300°/s
In-run bias stability	7°/h
Bandwidth (-3dB)	400 Hz
Noise density	0.003°/s/√Hz
g-sensitivity (calibr.)	0.08°/s/g

Accelerometer

Standard full range	±8 g
In-run bias stability	15 µg
Bandwidth (-3dB)	470 Hz
Noise density	15 µg/√Hz

Magnetometer

Standard full range	±8 G
Total RMS noise	1 mG
Non-linearity	0.2%
Resolution	0.25 mG

RTK GNSS Receiver

Brand	u-blox
Model	ZED-X20D
Correction services	RTK, PPP-RTK (SPARTN), PPP (Galileo HAS), PointPerfect Flex/Live/Global
Correction input port	RS232 (38K4-921K6 bit/s)
Correction protocols	RTCM 3.x, SPARTN

Mechanical

IP-rating	IP68
Operating Temperature	-40 to 85 °C
Casing material	Aluminum
Mounting orientation	No restriction, full 360° in all axes
Dimensions	56.50 x 40.9 x 36.75 mm
Connector	Main: ODU (AMC HD 12 pins)
Weight	103 g
Certifications	CE, FCC, RoHS, MIL-STD-202, ITAR-free

Electrical

Input voltage	4.5 V to 24 V
Power consumption (typ)	<1 W

Interfaces / IO

Interfaces	CAN, CAN-FD, RS232, RS422
Additional input	Wheel odometry ²
Sync Options	SyncIn, SyncOut, ClockSync
Protocols	Xbus, ASCII (NMEA), CAN, CAN-FD
Clock drift	1 ppm with GNSS time reference; 10 ppm without GNSS time reference
Output frequency	Up to 2 kHz, 400 Hz SDI
Built-in self-test	Gyr, Acc, Mag, Baro, GNSS

Software Suite

GUI (Windows/Linux)	MT Manager, Firmware updater, Magnetic Field Mapper
SDK (Example code)	C++, C#, Python, Matlab, Public source code
Drivers	LabVIEW, ROS(2), GO
Support	Online manuals, community and knowledge base

¹ Achievable with RTK corrections under suitable GNSS conditions. ² Planned for a future firmware release; unavailable at initial product release. Preliminary specifications. Unless stated otherwise, values are typical and subject to change without notice.

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