



xsens

MTi 100-series

The most complete MEMS based
IMU, VRU, AHRS and GNSS/INS

Innovative Xsens sensor fusion algorithm

- Superior heading tracking using Active Heading Stabilization (AHS)
- In-run Compass Calibration (ICC)
- State-of-the-art sensor fusion algorithm
- Selectable filter profiles for range of applications
- Tuned for performance under vibrations and magnetic distortions

Easy software integration

- Extensive suite of configurable output formats, calculated onboard the MTi
- MT Software Suite with intuitive GUI
- Complete SDK for all operating systems (Linux/Windows)
- Support for Robotic Operating System (ROS)
- Xsens Xbus protocol or ASCII (NMEA)
- Access to BASE (by Xsens), an extensive knowledge base and community forum

Best-in-class hardware design

- Highest quality industrial grade components
- Vibration-rejecting gyroscopes and accelerometers
- Low latency for real-time applications
- 10 kHz simultaneous sampling, 2 kHz SDI algorithm with coning/sculling compensation
- Wide array of synchronization options

Specification highlights

- Available as IP67 encased MTi or OEM board
- Choice of several interfaces and onboard USB
- All Xsens products are fully interchangeable
- Cost-effective system integrator solution
- Internal low-noise barometer
- True North without requiring a magnetic field
- Position, velocity and orientation outputs

Product overview

	MTi-100 IMU	MTi-200 VRU	MTi-300 AHR5	MTi-G-710 GNSS/INS
Calibrated Sensor Data	yes	yes	yes	yes
Roll/pitch (Static)	-	0.2°	0.2°	0.2°
Roll/pitch (Dynamic)	-	0.3°	0.3°	0.3°
Yaw	-	Active Heading Stabilization (AHS)	1.0°	0.8°

Position and velocity				
Horizontal position	1 σ STD			1.0 m
Vertical position	1 σ STD			2.0 m
Velocity accuracy	1 σ RMS			0.05 m/s

All above specifications based on typical application scenarios



MTi 100-series
Development Kit:
MTi, software and cabling



MTi encased:
57x42x23.5 mm, 52g,
9-pins push-pull connector



MTi OEM:
37x33x12 mm, 11g,
16-pins header

System specifications

Input voltage
4.5 to 34V or 3V3

Typical power consumption
600 mW @ 5V

IP-rating
IP67 (encased)

Temperature (in use)
-40 to 85 °C

Vibration
MIL-STD-202-
201A/204C/214A

Casing material
Anodized aluminum
6082

Sampling frequency
10 kHz/channel
(60 kS/s)

Clock drift
10 hours



Output frequency
Up to 2 kHz

Interfaces
RS232/RS422/RS485/USB
UART

Latency
<2 ms

Sync options
SyncIn, SyncOut, Clock sync

Interface protocol
Xbus or ASCII (NMEA)

Mounting orientation
No restriction, full 360°
in all axes

Built-in self test (BIT)
Gyroscopes, accelerometers,
magnetometer

MTBF
300,000 hours

Sensor specification

	Gyroscopes	Accelerometers
Standard full range *	+/- 450 °/s	+/- 20 g
Initial bias error	0.2 °/s	5 mg
In-run bias stability	10 °/h	15 µg
Bandwidth (-3 dB)	415 Hz	375 Hz
Noise density	0.01 °/s/√Hz	60 µg/√Hz
g-sensitivity (calibrated)	0.003 °/s/g	N/A
Non-orthogonality	0.05 deg	0.05 deg
Non-linearity	0.01%	0.1%

	Magnetometer	Barometer
Standard full range	+/- 8 G	300-1100 hPa
Total RMS noise	0.5 mG	3.6 Pa
Non-linearity	0.2%	N/A
Resolution	0.25 mG	8 cm (sea level, 15 °C)

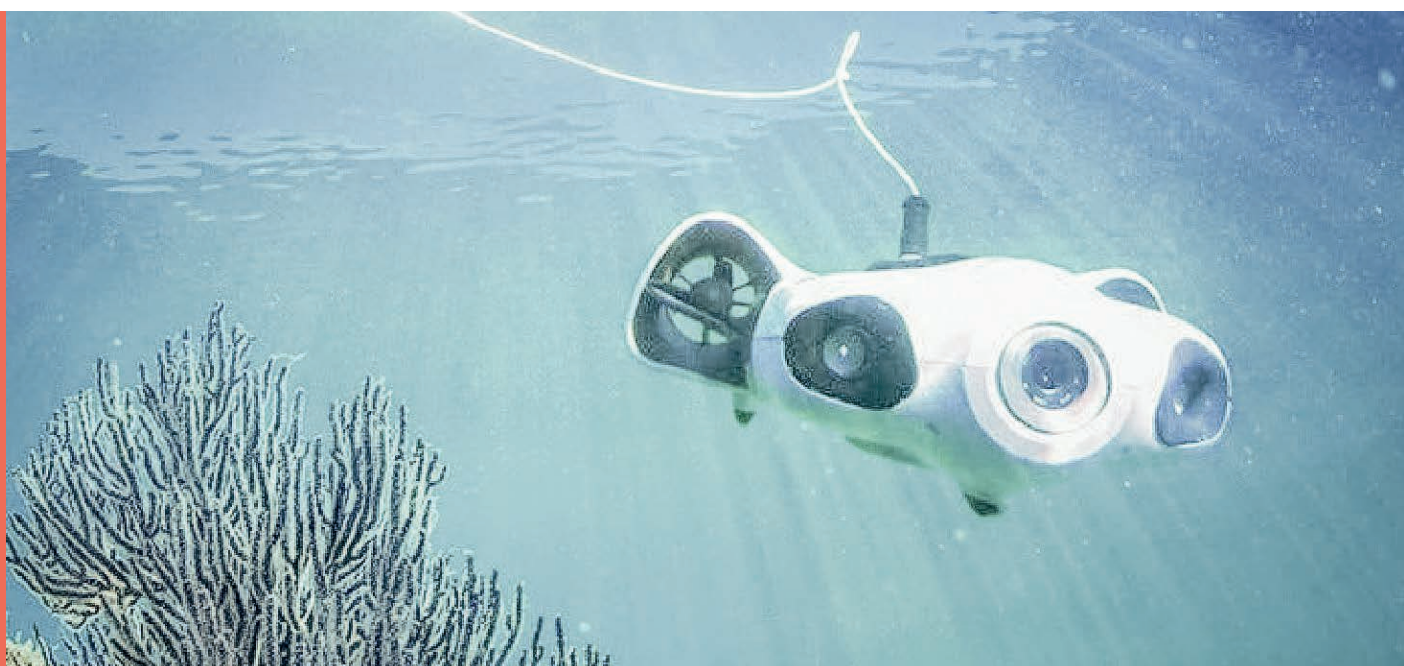
GNSS receiver			
Receiver type	72-channel, 4 Hz GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1, SBAS L1 C/A: WAAS, EGNOS, MSAS	Horizontal accuracy (CEP)	2.0 m (SBAS) 2.5 m (Autonomous)
Start-up time cold start	26 s	Velocity accuracy (@30 m/s)	0.05 m/s
Tracking sensitivity	-167 dBm		

* Optional +/- 1000 °/s available on request

ABOUT XSSENS

Xsens is the leading innovator in 3D motion tracking technology and products. Its sensor fusion technologies enable a seamless interaction between the physical and the digital world in applications such as industrial control and stabilization, health, sports and 3D character animation. Clients and partners include Electronic Arts, NBC Universal, Daimler, Autodesk, ABB, Siemens and various other leading institutes and companies throughout the world. Xsens is part of mCube, the provider of the world's smallest MEMS motion sensors, key enablers for the Internet of Moving Things. Xsens has offices in Enschede, Los Angeles, Shanghai and Hong Kong.

Visit xsens.com/distributors for an overview of Xsens' worldwide distributor network



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