

# 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

## 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

## 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

## 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 AHRS	MTi-G-710 GNSS/INS
<b>Calibrated Sensor Data</b>	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°
<b>Position and velocity</b>				
Horizontal position	1σ STD			1.0 m
Vertical position	1σ STD			2.0 m
Velocity accuracy	1σ 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 ppm or 1 ppm (with GNSS)



**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**  
135.000h

## Sensor specification

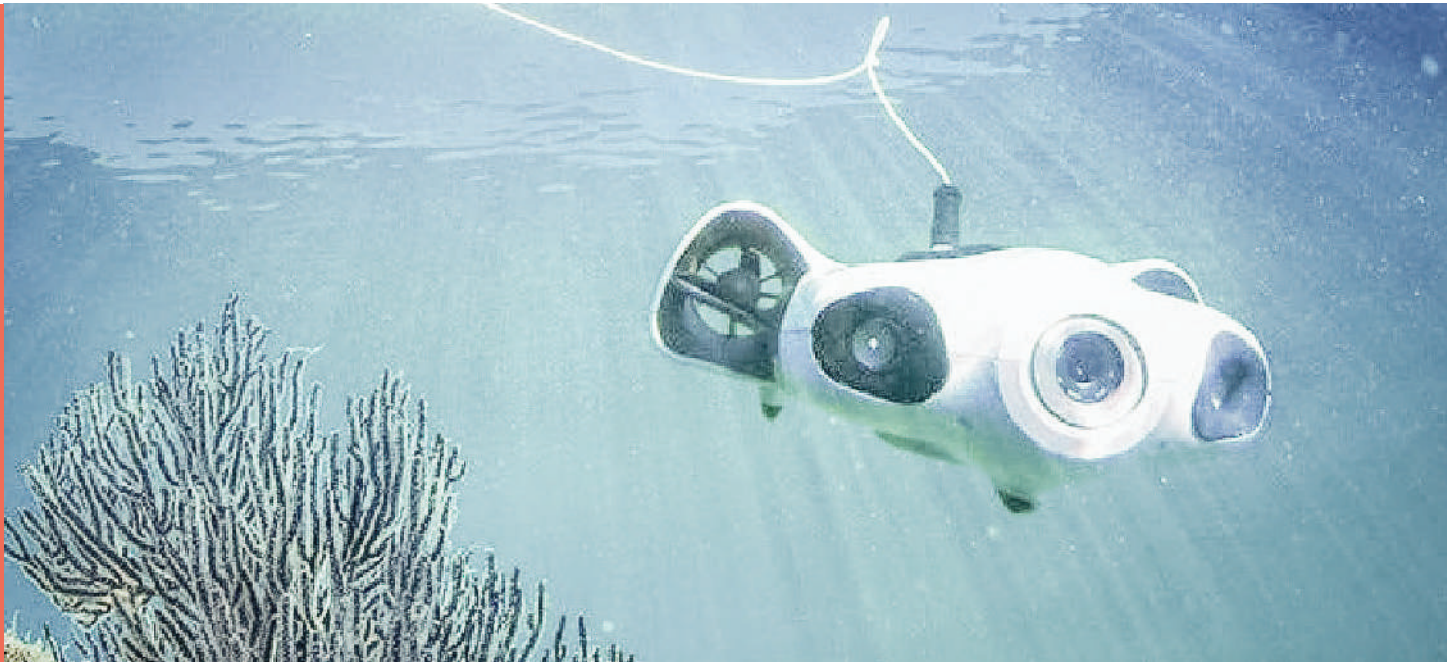
Gyroscopes		Accelerometers	
Standard full range *	+/- 450 °/s	+/- 20 g	
Initial bias erro	0.2 °/s	5 mg	
In-run bias stability	10 °/h	15 µg	
Bandwidth (-3 dB)	415 Hz	375 Hz	
Noise density	0.01 °/s/√Hz	60 µg/√Hz	
g-sensitivity (calibrated)	0.003 °/s/g	N/A	
Non-orthogonality	0.05 deg	0.05 deg	
Non-linearity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

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.

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