

# 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 XEE 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
- 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



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

Product overview

		MTi-100 IMU	MTi-200 VRU	MTi-300 AHRS	MTi-G-710 GNSS/INS
Calibrated Sensor Data		yes	yes	yes	yes
Roll/pitch	Static	-	0.2°	0.2°	0.2°
	Dynamic	-	0.3°	0.3°	0.3°
Yaw	In homogenous magnetic field	-	Active Heading Stabilization (AHS)	1.0°	0.8°
Position and velocity					
Horizontal position	1 STD (SBAS)				1.0 m
Vertical position	1 STD (SBAS, baro)				2.0 m
Velocity accuracy	1 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

Sensor specification

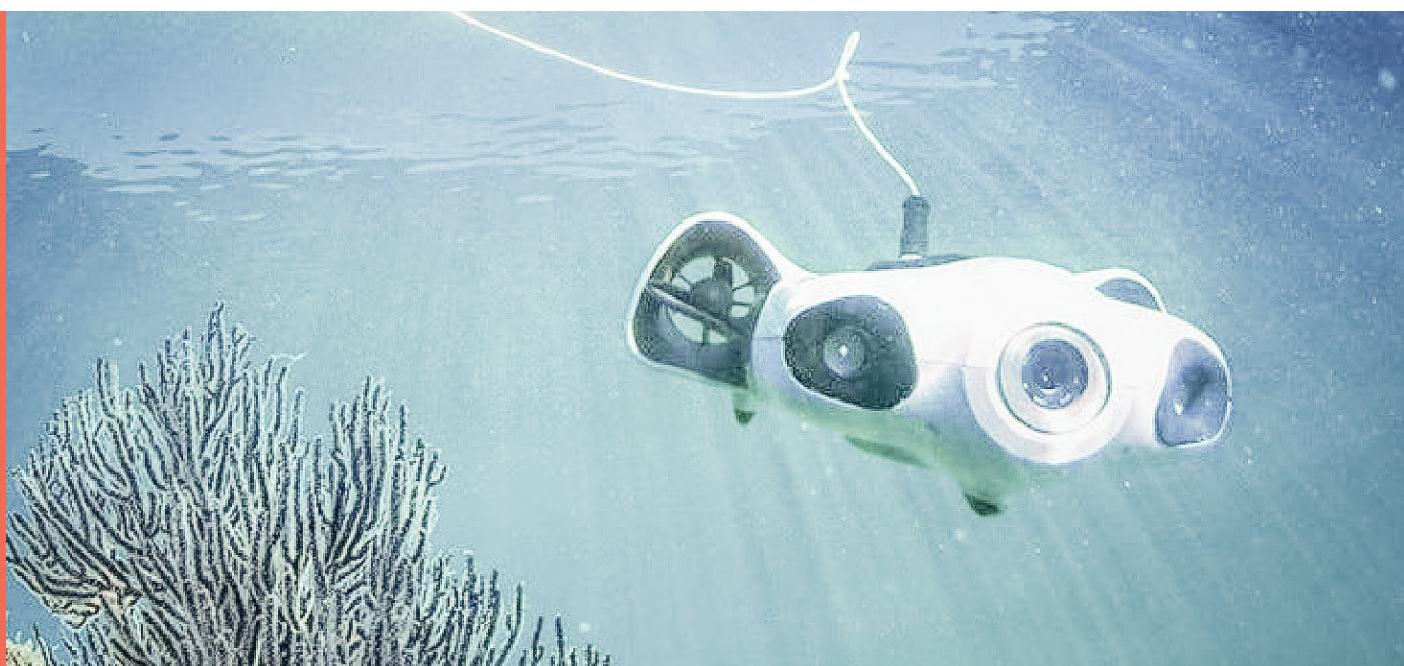
Gyroscopes		Accelerometers	
Standard full range *	+/- 450 °/s	+/- 20 g	
Initial bias erro	0.2 °/s	5 mg	
In-run bias stability	10 °/h	15 µg	
Bandwidth (-3 dB)	415 Hz	375 Hz	
Noise density	0.01 °/s/√Hz	60 µg/√Hz	
g-sensitivity (calibrated)	0.003 °/s/g	N/A	
Non-orthogonality	0.05 deg	0.05 deg	
Non-linearity	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 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](http://xsens.com/distributors) for an overview of Xsens' worldwide distributor network



### Xsens Netherlands

Xsens Technologies B.V.  
P.O. Box 559  
7500 AN Enschede  
The Netherlands

Phone: +31 88 97367 00  
Fax: +31 88 97367 01  
Email: [info@xsens.com](mailto:info@xsens.com)

### Xsens North America Inc.

101 N. Pacific Coast Hwy,  
Suite 306  
El Segundo, CA 90245  
North America

Phone: 310-481-1800  
Fax: 310-416-9044  
Email: [info@xsens.com](mailto:info@xsens.com)

### Xsens AsiaPac

Unit 208, Bldg 16W  
Hong Kong Science Park  
Shatin  
Hong Kong

Phone: +852 3618 9080  
Fax: +852 3705 8994  
Email: [info@xsens.com](mailto:info@xsens.com)

Building 1, 2nd Floor  
No.333 Huangqing Road  
PRC 201899  
Shanghai

Phone: +86 021 31760067  
Fax: +86 021 31760067  
Email: [china@xsens.com](mailto:china@xsens.com)

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