Orientation. Position. Xsens.

MTi 10-series

The reliable industry standard for MEMS Attitude and Heading Reference Systems

The 4th generation MTi sets the new industry standard for reliable MEMS based AHRS, VRU, and IMUs. The MTi 10-series gives the system integrator a choice of three different integration levels (IMU, VRU, AHRS). The MTi 10-series and the high performance MTi 100-series share a common range of mechanical, electrical and communication/API interfaces to enable easy integration across a wide range of 3D motion tracking requirements.

MTi 10-series

- Proven XKF3 sensor fusion algorithm
- Cost effective system integrator solution
- Low latency
- Excellent vibration rejection
- Coning and sculling algorithms @ 2 kHz
- Choice of integration levels
- Comprehensive SDK and straightforward system integration

	IMU	Δq Δv	Roll/Pitch	Yaw	Position & Velocity	Sensor fusion core
MTi 10-series						
MTi-10 IMU	18°/h	•				
MTi-20 VRU	18°/h	•	0.4 deg	Unreferenced		XKF
MTi-30 AHRS	18°/h	•	0.4 deg	1.0 deg		XKF
MTi 100-series						
MTi-100 IMU	10°/h	•				
MTi-200 VRU	10°/h	•	0.25 deg	Unreferenced		XEE
MTi-300 AHRS	10°/h	•	0.25 deg	1.0 deg		XEE
MTi-G-700 GPS/INS	10°/h	•	0.25 deg	1.0 deg	•	XEE

Market leader

- Industry standard from the undisputed leader in MEMS AHRS's
- Many high-profile companies fully rely on Xsens for control and stabilization, measurement correction and navigation.

Robust and accurate orientation data

- High-quality components, industrial-grade MEMS only
- Low latency (<2 ms), excellent for control and stabilization
- Proven and robust filter design
- Compensation against vibration and transient accelerations

Maximum flexibility and versatility in mechanical and software interfaces

- Available as OEM board and IP67 encased MTi
- 24-pins connector for OEM
- Extensive suite of output formats, available directly from the MTi
- Choice of several interfaces, onboard USB, 2+ GPIO's
- Xsens' industry standard open Xbus protocol or NMEA (e.g. TSS1)
- All products from the MTi 10-series and MTi 100-series are fully interchangeable

System specifications

Input voltage	4.5-36V or 3V3;	**Clock drift**	10 ppm or external reference
Typical power consumption	480-570 mW	**Output frequency**	Up to 2 kHz
Start-up time	1.3 sec.	**Latency**	<2 ms
IP-rating	IP 67 (encased)	**Interfaces**	RS232/422/UART/USB (no converters)
Temperature (in use)	-40 to 85 °C	**GPIO's and options**	SyncIn, SyncOut, 2x GPIO, Clock sync
Vibration	TBD	**Interface protocol**	XBus or NMEA
Shock	TBD	**Mounting**	Free; orientation alignment available
Sampling frequency	10 kHz/channel (60 kS/s)	**Built-in self test (BIT)**	gyroscopes, accelerometers, magnetometer

Orientation accuracy MTi 10-series

		20-VRU	30-AHRS
Orientation			
Roll/pitch	Static [max]	0.4 deg	0.4 deg
	dynamics [1σ RMS]	1.5 deg	1.5 deg
Yaw	In homogenous magnetic field	Unreferenced 18 deg/h	1.0 deg

*Details on orientation specification can be found in the MTi Technical Datasheet (MT0503P)

Mechanical specifications

Encased:

57x42x23 mm

52g

9-pins push-pull connector

OEM:

37x33x12 mm

11g

24-pins header

CAD-drawings (STEP/IGES) available on request via sales@xsens.com

Sensor specifications MTi 10-series

	Gyroscopes		Accelerometers	
	Typ	Max	Typ	Max
Standard full range	450°/s	-	50m/s²	-
Bias repeatability (1 yr)	0.2°/s	0.5°/s	0.03m/s²	0.05m/s²
In-run bias stability	18°/h		40 µg	
Bandwidth (-3 dB)	415 Hz	N/A	375Hz	N/A
Noise density	0.03°/s/√Hz	0.05°/s/√Hz	80 µg/√Hz	150 µg/√Hz
g-sensitivity (calibrated)	0.006°/s/g	0.02°/s/g	N/A	N/A
Non-orthogonality	0.05 deg	-	0.05 deg	-
Non-linearity	0.03% FS	0.1% FS	0.03% FS	0.5% FS

	Magnetometer	
	Typ	Max
Standard full range		+/- 2 Gauss
Noise density	200 µG/√Hz	
Non-linearity	0.1% FS	

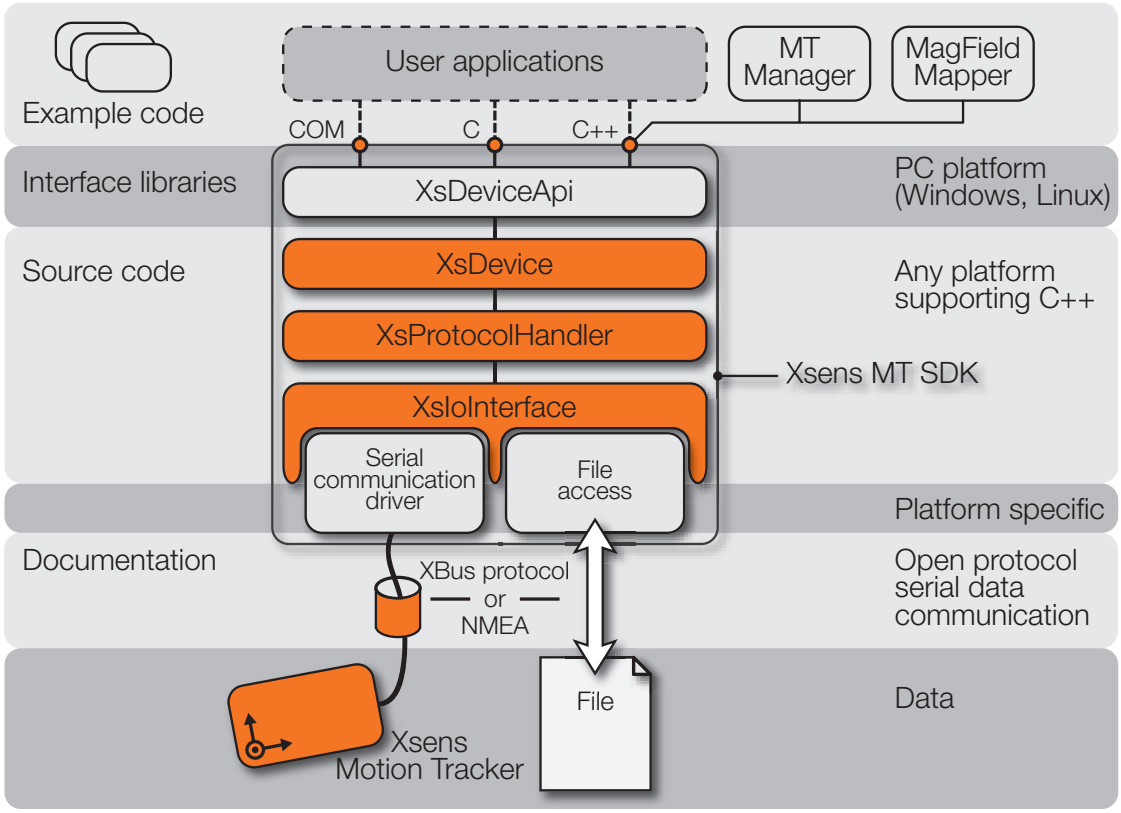
* Typical values @ 25 °C

System integration

Integration with the MTi is very straightforward with the Xsens MT SDK. The MT SDK is an easy-to-use API which can be interfaced with via a COM, C and C++ interface with support for Windows and Linux. In addition, there is complete access to the low level source code for full flexibility on any platform. The components of the MT SDK are:

Xsens Device API	API to communicate with the MTi. Interfaces for common programming languages as well as source code for lower communication levels.
Example code	To make starting with the MTi even easier, example code is provided for various platforms, amongst others Matlab and Linux.
MT Manager	An intuitive GUI for Windows and Linux, including configuration and recording tools, graphs and a serial port viewer to help understanding the Xbus protocol.
Magnetic Field Mapper	An algorithm and tool to calibrate the MTi for hard- and soft iron effects. The calibration can be done during normal operation; there are no restrictions on the trajectories or rotations.
Documentation	Full (HTML-)documentation on the MTi, API, SDK and application notes.

Xsens MT SDK



Development kit

The best way to start with the MTi is with the complete MTi Development Kit. This kit will make development very easy. The MTi Development Kit contains the following:

- MTi
- Cable set for USB and serial communication, as well as GPIO's.
- MT Software Development Kit (on USB flash drive)
- Robust suitcase
- Test and calibration certificates

ABOUT XSENS

Xsens is a leading developer and global supplier of 3D motion tracking products based upon miniature (MEMS) inertial sensor technology.

Since its foundation in 2000, thousands of motion sensors and motion capture solutions have successfully been deployed for 3D character animation, movement science, control of autonomous vehicles and stabilization. Clients of Xsens include Electronic Arts, NBC Universal, INAIL Prosthesis Centre, Daimler, Saab, Kongsberg Defence Systems and many other companies and institutes throughout the world. Xsens is working with several industry partners, including Autodesk, Sagem (Safran Group) and Siemens.

Xsens' research department has created unique intellectual property in the field of multi-sensor data fusion algorithms, combining inertial sensors with GPS and RF positioning and biomechanical modelling. Xsens and its products have received several awards and five consecutive entries in Deloitte's ranking of fastest growing technology companies in Europe.

Xsens is a privately held company with its headquarters in Enschede, the Netherlands and a US subsidiary in Los Angeles, California.

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Preliminary specifications: specifications are subject to change without notice

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