XSENS

Orientation. Position. Xsens.

MTi 10-series

The reliable industry standard for MEMS Attitude and Heading Reference Systems

XSENS

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
- Coning and sculling algorithms @ 2 kHz
- Choice of integration levels
- Comprehensive SDK and straightforward system integration

	Roll/Pitch Typ	Max	Roll/Pitch Typ	Max	Yaw (Typ)	Sensor fusion core	Position & Velocity
MTi 10-series	Static		Dynamic				
MTi-10 IMU	-	-	-	-	-	-	-
MTi-20 VRU	0.2 °	0.4 °	0.5 °	2.0 °	Unreferenced	XKF	-
MTi-30 AHRS	0.2 °	0.4 °	0.5 °	2.0 °	1.0 °	XKF	-
MTi 100-series							
MTi-100 IMU	-	-	-	-	-	-	-
MTi-200 VRU	0.2 °	0.25 °	0.3 °	1.0 °	Unreferenced	XEE	-
MTi-300 AHRS	0.2 °	0.25 °	0.3 °	1.0 °	1.0 °	XEE	-
MTi-G-700 GPS/INS	0.2 °	0.25 °	0.3 °	1.0 °	1.0 °	XEE	1m (1σ STD)

Market leader

- Industry standard from the undisputed leader in MEMS AHRSs
- 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 MTi 10-series

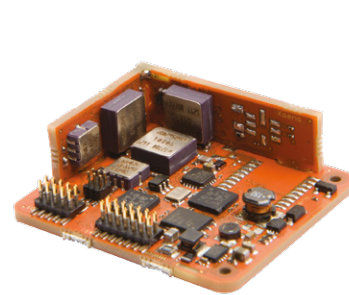|				
Input voltage	4.5-34V or 3V3;		**Clock drift**	10 ppm or external reference
Typical power consumption	480-570 mW		**Output frequency**	Up to 2 kHz
Start-up time	1.3 sec.		**Latency**	<2 ms
IP-rating	IP 67 (encased)		**Interfaces**	RS232/422/485/UART/USB (on board)
Temperature (in use)	-40 to 85 °C		**GPIO's and options**	SyncIn, SyncOut, 2x GPIO, Clock sync
Vibration and shock	MIL STD-202 / 2000g		**Interface protocol**	XBus or NMEA
Casing material	Anodized aluminum 6060		**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	
		Typ	Max	Typ	Max
Orientation					
Roll/pitch	Static	0.2 °	0.4 °	0.2 °	0.4 °
	Dynamic	0.5 °	2.0 °	0.5 °	2.0 °
Yaw	In homogenous magnetic field	Unreferenced		1.0 °	-

*Additional orientation test specifications can be found in the MTi Technical Datasheet (MT0503P)

Mechanical specifications MTi 10-series

Encased:

57x42x23.5 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/s^2	-
Bias repeatability (1 yr)	0.2°/s	0.5°/s	0.03m/s^2	0.05m/s^2
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

* Typical values @ 25 °C

	Magnetometer	
	Typ	Max
Standard full range	-	+/- 80 µT
Noise density	200 µG/√Hz	-
Non-linearity	0.1% FS	-

* Typical values @ 25 °C

‡ Other ranges available upon request, see also technical datasheet (MT0503P)

System integration

Integration with the MTi is very straightforward with the Xsens MT Software Suite. The MT Software Suite 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 Software Suite 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, including configuration and recording tools, graphs and a serial port viewer to help understand 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 Software Suite
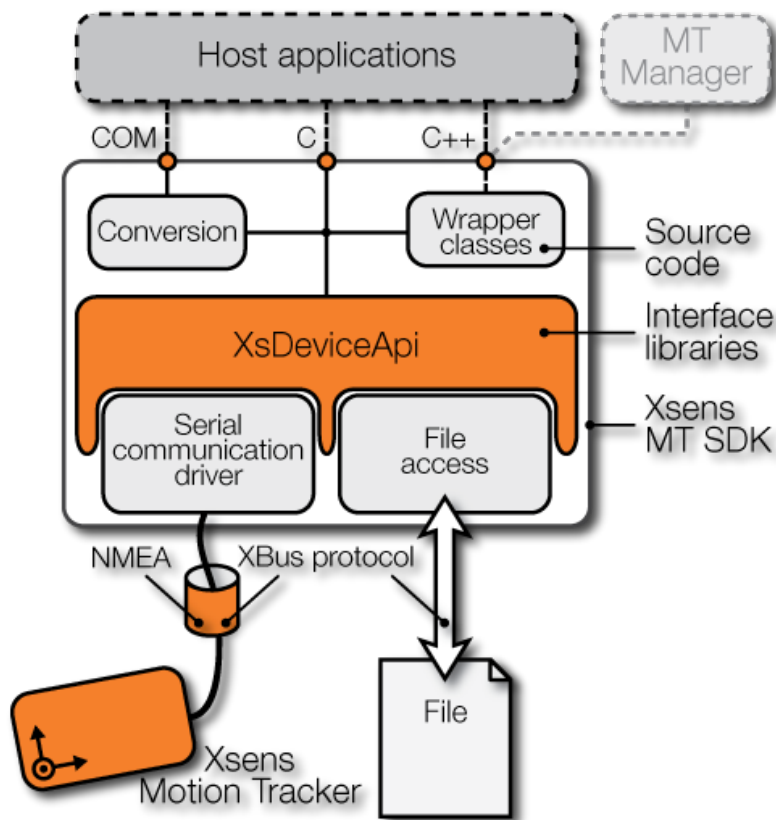
Development kit

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:

• The MTi of your choice
• Cable set for USB and serial communication, as well as GPIO's.
• MT Software Suite (on USB flash drive)
• Robust suitcase
• Test and calibration certificates

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 fully owned by Fairchild Semiconductor, an industry icon delivering power solutions for the mobile, industrial, cloud, automotive, lighting, and computing industries. Xsens has offices in Enschede, the Netherlands and Los Angeles, California.

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