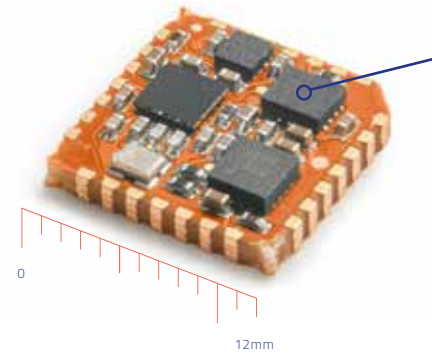
xsens

MTi 1-series

IMU | VRU | AHRS | GNSS/INS



MTi 1-series

- Always best-in-class inertial sensors incorporated
- Industry-leading signal processing pipeline and orientation algorithm
- Uniform software/hardware interface over product lifetime (no EOL)
- API-compatible with all Xsens Motion Trackers

MTi 1-series

The MTi 1-series is a self-contained Attitude Heading and Reference System (AHRS), Vertical Reference Unit (VRU) and Inertial Measurement Unit (IMU) as a 12.1 x 12.1 mm module. The Xsens-optimized strapdown algorithm (AttitudeEngine™) performs high-speed dead-reckoning calculations at 1 kHz allowing accurate capture of high frequency motions. Xsens' industry-leading sensor fusion algorithm (XKF3™) provides high accuracy and sensor auto-calibration in a cost-effective module for a wide range of (embedded) applications. It relieves users from the design, integration and maintenance of gyroscopes, accelerometers and other sensors. The roll and pitch accuracy of 0.5 deg under dynamic conditions allow for integration in demanding applications.

Development Kit

IIn order to get started with the MTi 1-series, an extensive development kit for characterization and prototyping is available:

- Arduino header compatible shield board
- Easy to use connection (micro USB), access to I2C/SPI/UART
- Arduino header compatible shield board
- Full functionality and pin configuration
- Intuitive MT Software Suite (Linux / Windows GUI)
- SDK with drivers and embedded software examples

Ordering information

Product	Description	Packing Method
MTi-1	IMU; inertial data	Tray (containing 20 or 100 modules)
MTi-2	VRU; inertial data, roll/pitch, unreferenced yaw	Tray (containing 20 modules)
MTi-3	AHRS; inertial data, roll/pitch/heading	Tray (containing 20 modules)
MTI-7	GNSS/INS; GNSS data, inertial data, roll/pitch/heading	Tray (containing 20 modules)
MTi-3-DK	Development kit for MTi 1-series	Development Kit box
MTi-7-DK	Development Kit for MTi-7 (GNSS/INS)	Development Kit box

Specifications MTi 1-series

Orientation accuracy	MTi 1-series	MTi 7
Roll/Pitch (static)	0.5° RMS	0.5° RMS
Roll/pitch (dynamic)	0.8° RMS	0.5° RMS
Yaw (dynamic)	2° RMS	1.5° RMS

Position and velocity (with MTi-7-DK)		
Horizontal position STD (SBAS)		1.0 m
Vertical position STD (SBAS, baro)		2.0 m
Velocity RMS		0.05 m/s
Clock drift		1 ppm or external reference

Inertial sensor performance		
Gyroscope full-scale range	±2000°/s	±2000°/s
Gyroscope bias stability	10 deg/hr	10 deg/hr
Gyroscope noise density	0.007°/s/√Hz	0.007°/s/√Hz
Gyroscope non-linearity	0.1% FS	0.1% FS
Accelerometer full-scale range	±16 g	±16 g
Accelerometer bias stability	0.03 mg	0.03 mg
Accelerometer noise density	120 µg/√Hz	120 µg/√Hz
Accelerometer non-linearity	0.5% FS	0.5% FS

System specifications		
Power consumption	44 mW @ 3V	<100 mW
Input voltage	2.19 to 3.6V	2.19 to 3.6 V
Package	SMD, footprint compatible with JEDEC PLCC-28	SMD, footprint compatible with JEDEC PLCC-28
Size	12.1 x 12.1 x 2.55 mm	12.1 x 12.1 x 2.55 mm
Weight	<1 g	<1 g
Packaging	Tray Reel (250 modules)	Same as 1-series

Interfacing		
Hardware interface	I²C, SPI, UART (selectable)	I²C, SPI, UART (selectable)
Software interface	Xsens Xbus Binary protocol Driver source Code supplied	Xsens Xbus Binary protocol Driver source Code supplied
Output data rate	0-800 Hz	0-800 Hz

Applications

Machinery

- Satcom on the Move (SotM)
- Construction machinery
- Ship monitoring

Miniature aerial vehicles

- Delivery drones
- Video drones
- Agricultural UAVs

Robotics

- Autonomous agriculture
- Warehouse automation
- Robotic arms

Other applications

- Handheld devices
- Pedestrian navigation
- VR/AR and HMDs
- Navigation aiding

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.

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

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