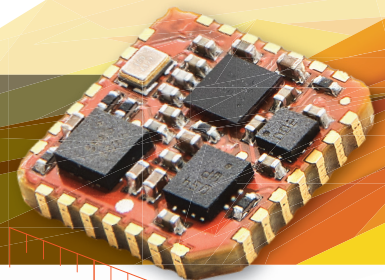# MTi-7
Miniature GNSS/INS Module

- ✔ Complete GNSS/INS module using existing GNSS infrastructure
- ✔ Best performing GNSS-aided AHRS
- ✔ Fully temperature calibrated module
- ✔ Miniature and lightweight SMD form factor with low power consumption

0   12mm

The MTi-7 GNSS/INS module is a new miniature motion tracking module with multiple GNSS receiver support, making it the smallest GNSS/INS module using advanced sensor fusion algorithms. With its miniature SMD form factor (12.1x12.1mm) and low power consumption it is ideal for upcoming technologies including drones, UAV's, smart farming, unmanned control, Internet of (Moving) Things and robotics.
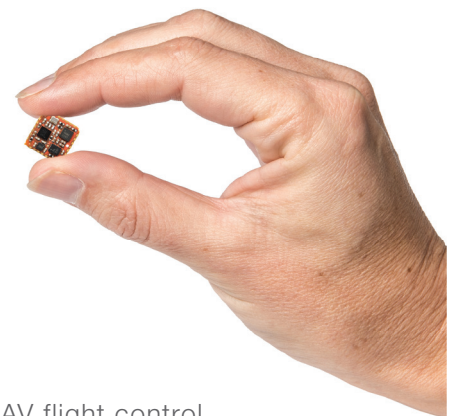
Features

- Providing industry standard Arduino header compatible development kit
- High performance orientation, velocity and positioning using advanced sensor fusion algorithms
- Best in class hardware and firmware using same form factor
- Uniform software/hardware interface over product lifetime (no end of life)

Applications

- Navigation input for UAV flight control
- Navigation input for Ground Vehicles
- Outdoor mapping stabilization
- Hyperspectral cameras

Ordering information

Part Number		Packing Method
MTi-7	GNSS/INS; GNSS data, inertial data, roll/pitch/yaw	Tray (containing 20 modules)
		Reel (containing 250 modules)
MTi-7-DK	MTi-7 Reference design	Development Kit

Supported GNSS Receivers

Manufacturer	GNSS Receiver	Protocol
uBlox	MAX-M8 series	UBX Binary protocol
Additional GNSS receivers support upon request		

Specifications MTi-7

Orientation accuracy

Roll/pitch (dynamic)	0.5° 1σ RMS
Roll/pitch (static)	0.5° 1σ RMS
Yaw (dynamic)	1.5° 1σ RMS

Position and velocity (with MTi-7-DK)

Horizontal position 1σ STD (SBAS)	1.0 m
Vertical position 1σ STD (SBAS, baro)	2.0 m
Velocity 1σ RMS	0.05 m/s
Clock drift	1 ppm or external reference

All above specifications based on typical application scenarios

Inertial sensor performance

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

Module specifications

Power consumption	<100 mW
Input voltage	2.19 to 3.6 V
Package	SMD, footprint compatible with JEDEC PLCC-28
Size	12.1 x 12.1 x 2.55 mm
Weight	<1 g

Interfacing

Hardware interface	I^{2}C, SPI, UART (selectable)
Software interface	Xsens Xbus binary protocol Driver source code supplied
Output data rate	0-800 Hz

PIN LAYOUT

DEVELOPMENT KIT

In order to get started with the MTi-7, an extensive development kit for characterization and prototyping is available:

• Arduino header compatible development kit
• Easy to use connection (micro USB), access to I^{2}C/SPI/UART
• Full functionality and pin configuration
• Intuitive MT Software Suite (Linux / Windows GUI)
• SDK with drivers and embedded software examples
• Shield board, GNSS daughter card, GNSS antenna and USB cable