

MTi-G

Miniature AHRS with integrated GPS

The MTi-G is an integrated GPS and Inertial Measurement Unit with an Attitude and Heading Reference System processor. The internal low-power signal processor runs a real-time Xsens Kalman Filter providing inertial enhanced position and velocity estimates (loosely coupled). It is also providing drift-free GPS enhanced 3D orientation estimates, as well as calibrated 3D acceleration, 3D rate of turn (rate gyro), 3D earth-magnetic field data and static pressure. The MTi-G is an excellent measurement unit for navigation and control of vehicles and other objects.

Features

- real-time computation of inertial enhanced position/velocity and GPS enhanced attitude/heading on embedded DSP
- built-in 16 channel Global Position System (GPS) receiver
- -158 dBm tracking sensitivity
- full SBAS support (WAAS, EGNOS, MSAS)
- accurate full 360 degrees 3D orientation output (Attitude and Heading)
- 3D acceleration, 3D rate of turn and 3D earth-magnetic field data
- static pressure sensor (barometer)
- high update rate (120 Hz TBD, 512 Hz inertial data only)
- UTC referenced output
- compact design
- low weight
- ultra-low power consumption
- various digital output modes
- all solid state miniature MEMS inertial sensors inside
- individually calibrated for temperature, 3D misalignment and sensor cross-sensitivity
- built-in test (BIT) feature
- antenna fault detection
- external active antenna supplied

Fields of use

- aerospace
- automotive
- robotics
- marine industry

With the MTi-G Development Kit, the MTi-G can easily be integrated in any system or (OEM) application.



GPS

Receiver Type:	16 channels L1 frequency, C/A code
GPS Update Rate:	4 Hz
Pos/Vel Update Rate:	120 Hz (TBD)
Accuracy Position SPS:	2.5 m CEP
DGPS/SBAS:	2.0 m CEP ¹
Start-up Time Cold start:	34 s
Tracking Sensitivity:	-158 dBm
Timing Accuracy:	50 ns RMS

Operational Limits:	
Altitude:	18 km
Velocity:	515 m/s (1854 km/h)

IMU sensor performance

	rate of turn	acceleration	magnetic field	static pressure
Dimensions	3 axes	3 axes	3 axes	-
Full Scale (standard)	± 300 deg/s	± 50 m/s ²	± 750 mGauss	30-120 kPa
Linearity	0.1% of FS	0.2% of FS	0.2% of FS	0.5% of FS
Bias stability ⁴ (1σ)	5 deg/s	0.02 m/s ²	0.5 mGauss	100 Pa/yr
Scale Factor stability ⁴ (1σ)	-	0.05%	0.5%	-
Noise density	0.1 deg/s/√Hz	0.002 m/s ² /√Hz	0.5 mGauss (1σ)	4 Pa/√Hz (0,3 m/√Hz)
Alignment error	0.1 deg	0.1 deg	0.1 deg	-
Bandwidth (standard)	40 Hz	30 Hz	10 Hz	-
Max update rate	512 Hz	512 Hz	512 Hz	9 Hz

Options

Full Scale	± 150 deg/s (noise density 0.05 deg/s/√Hz)
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Other options on request

Interfacing

Digital interface:	RS-232 (max 921k6 bps) and USB (ext. converter)
Operating voltage:	4.5 - 30 V
Power consumption:	540 mW (AHRS+GPS mode)
Interface option:	GPIO
GPS Antenna:	SMA connector, active

Housing

Dimensions:	58x58x33 mm (WxLxH)
Weight:	68 g
Ambient temperature operating range ⁵ :	-20...+55 °C

Attitude and Heading

Dynamic Range:	
Pitch:	± 90°
Roll:	± 180°
Heading:	± 180° (0...360°)
Angular Resolution ² :	0.05 deg
Static Accuracy (Roll/Pitch):	<0.5 deg
Static Accuracy (Heading):	<1 deg
Dynamic Accuracy ³ :	2 deg RMS
Max update rate:	120 Hz (TBD)



Product code (standard): MTi-G-28A53G35

1 depends on accuracy of SBAS service (WAAS, EGNOS, MSAS supported, inquire about RTCM support)

2 1σ standard deviation of zero-mean angular random walk

3 stabilized Xsens Kalman Filter

4 deviation over operating temperature range (1σ)

5 non-condensing environment

specifications subject to change without notice