MTi-G

Miniature AHRS with integrated GPS

The MTi-G is an excellent, small size and low weight, measurement unit for control and navigation of (un)manned systems and other objects.

The MTi-G is a MEMS based Inertial Measurement Unit (IMU) with integrated GPS and static pressure sensor. It delivers unprecedented performance for its size, weight, cost and low complexity in use. The design is flexible, providing a wide range of output modes and advanced settings for specific usage scenarios.

The MTi-G has an onboard Attitude and Heading Reference System (AHRS) and Navigation processor. This internal low-power digital signal processor runs a real-time Xsens Kalman Filter providing drift-free, GPS enhanced, 3D orientation data. Additionally the MTi-G provides inertial and barometric enhanced 3D position and velocity data.

Highlights

- real-time computed GPS-enhanced attitude/heading and inertial enhanced position/velocity data
- GPS integration overcomes typical IMU challenges
- embedded AHRS and Navigation DSP
- high update rate (100 Hz)
- individually calibrated for temperature, 3D misalignment and sensor cross-sensitivity

GPS

- built-in 16 channel Global Position System (GPS) receiver
- full SBAS support (WAAS, EGNOS, MSAS)
- UTC referenced output

Design

- compact and robust design
- easy integration in any system (OEM) application
- low weight, ultra-low power consumption

Output

- 3D Orientation (360°)
- Position and Velocity
- Raw sensor and GPS data
- 3D acceleration, 3D rate of turn
- 3D Earth magnetic field (normalized)

With the MTi-G Development Kit, the MTi-G can easily be configured and 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:	100 Hz
Accuracy Position SPS:	2.5 m CEP
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)

Attitude and Heading

Dynamic Range	
Pitch:	± 90 deg
Roll:	± 180 deg
Heading:	± 180 deg
Angular Resolution[2]:	0.05 deg
Static Accuracy (Roll/Pitch):	<0.5 deg
Static Accuracy (Heading)[3]:	<1 deg
Dynamic Accuracy[4]:	2 deg RMS
Max update rate:	100 Hz

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/s²	± 750 mGauss	30-120 kPa
Linearity:	0.1% of FS	0.2% of FS	0.2% of FS	0.5% of FS
Bias stability[5] (1σ):	5 deg/s	0.02 m/s²	0.5 mGauss	100 Pa/yr
Scale Factor stability[5] (1σ):	-	0.05%	0.5%	-
Noise:	0.1 deg/s/√Hz	0.002 m/s²/√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 (rate of turn):	± 150 deg/s (noise density 0.05 deg/s/√Hz)

Other options on request

Interfacing

Digital interface:	RS-232 (max 921k6 bps) and USB (ext. converter)
Operating voltage:	5 - 30 V
Power consumption:	750 mW (NAV/AHRS/3D orientation mode)
Interface option:	SyncOut, Analog In
GPS Antenna:	SMA connector, active

Housing

Dimensions:	58x58x33 mm (WxLxH)
Weight:	68 g
Ambient temperature operating range[6]:	-20…+55 °C

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

1 depends on accuracy of SBAS service (WAAS, EGNOS, MSAS supported)
2 1σ standard deviation of zero-mean angular random walk
3 depends on usage scenario. In case the Earth magnetic field is used, it must be homogeneous
4 under condition of a stabilized Xsens Kalman Filter and good GPS availability
5 deviation over operating temperature range (1σ)
6 non-condensing environment

specifications subject to change without notice

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