IG-500N

Redefine motion limits...

GPS aided Orientation Sensor



The IG-500N is a miniature and high performance GPS enhanced Attitude and Heading Reference System (AHRS). With its embedded Extended Kalman Filter, the IG-500N delivers unmatched precision for attitude and position measurements even during very high dynamic conditions.

All in one: the IG-500N

The IG-500N includes a MEMS based Inertial Measurement Unit (IMU), a GPS receiver and a pressure sensor. It provides precise drift-free attitude and position, even in long time turns.

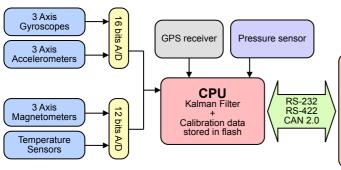
This miniature Inertial Navigation System (INS) runs a real time, on board, Extended Kalman Filter that computes orientation, position and velocity data at high update rates, up to 100 Hz.

The attitude accuracy is also improved, compared to traditional AHRS, by removing transient accelerations measured by the GPS receiver.

Easy and fast integration

SBG Systems has designed a powerful and easy to use Development Kit for this product. In just a few seconds, you can start evaluating and configuring your new device. Integrating the IG-500N in your application is even easier.

Simplified Block Diagram



Key Features

- GPS enhanced 3D velocity, position and orientation at high update rate (100 Hz)
- Accurate attitude even in high G maneuvers
- Precise UTC referenced output and SyncOut signal
- Embedded 4Hz GPS receiver & barometric sensor
- Wide inertial sensors range options
- Calibrated over full temperature range -40 to 85°C for bias, gain, misalignments, cross-axis and gyro-g
- Advanced and easy to use magnetometers compensation procedure for soft and hard iron
- Available protocols RS-232, RS-422, CAN and USB
- Very compact and lightweight design (44 grams)
- Very low power design down to 800 mW
- Robust and high precision aluminum enclosure

Fields of use

- Unmanned vehicles
- Vehicle motion analysis
- Aerospace
- Robotics
- Marine industry



3D Orientation
Euler, Matrix, Quaternion

3D Navigation
3D Velocity
3D Position

Sensors
3D Angular rate
3D Acceleration
3D Magnetic field



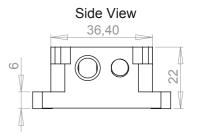
IG-500N

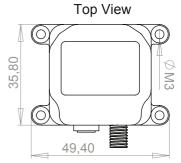
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Technical Specifications

Parameter	Specification		Remarks	
Attitude				
Sensing range	360° in all axes			
Static accuracy	± 0.5° (Pitch, Roll) ± 1° (Heading)			Stabilized Kalman Filter Homogenous magnetic field
Dynamic accuracy	± 1.0° RMS			Under good GPS availability
Repeatability	< 0.2°			
Resolution	< 0.05°			
Output frequency	0 to 500 Hz 0 to 100 Hz			Calibrated sensors only Sensors, attitude, velocity, position
Standard Sensors	Accelerometers	Gyroscopes	Magnetometers	
Measurement range	± 5 g	± 300 °/s	± 1.2 Gauss	Refer to sensors options table
Non-linearity	< 0.2% of FS	< 0.1% of FS	< 0.2% of FS	receive serisors options table
Non incarity	± 5 mg	± 0.5 °/s	± 0.5 mGauss	Over temperature range
Bias stability	± 5 mg	< 0.1 °/s	± 0.5 mGauss	Kalman filter stabilized
Soolo footor atability	- 0.10/		- 0.59/	
Scale factor stability	< 0.1%	< 0.05%	< 0.5%	Over temperature range
Noise density	0.25 mg/√Hz	0.05 °/s/√Hz	0.01 mG/√Hz	
Alignment error	< 0.1°	< 0.1°	< 0.1°	Address des 6
Bandwidth	50 Hz	40 Hz	500 Hz	Additional software filter available
Sampling rate	10 000 Hz	10 000 Hz	1 000 Hz	
GPS Receiver				
Receiver type	L1 frequency, C/	A Code, 50-Cha	nnels, 4 Hz	
Position accuracy	2.0 meters 5.0 meters			with SBAS support CEP (Horizontal accuracy) SEP (Vertical accuracy)
Acquisition time	< 1.0 s / 29 s			Hot start / Cold start
Tracking sensitivity	-160 dB			
Pressure Sensor				
Resolution	2.5 Pa			20 cm resolution
Pressure accuracy	± 50 Pa / ± 150 Pa			Relative / Absolute
Long term stability	100 Pa			Over 12 months
Update rate	100 Hz			
Communication	F 1	atauda a Madd		
Output modes	Euler angles, Quaternion, Matrix, 3D velocity, 3D position, Calibrated sensor data, Raw sensor and GPS data			Each output can be enabled or disabled by the user
Interface options	Serial (RS-232, RS-422 or TTL 3.3V) CAN 2.0A/B up to 1 Mbit/s Usb using provided UsbToUart			RS-422 and CAN 2.0A/B are only available for OEM and S packages
Serial data rate	9 600 to 921 600 bps			Configurable slew rate
Physical				
Dimensions OEM	27x30x14 mm			
Dimensions box	36x49x22 mm / 36x49x25 mm			B package / S package
Weight OEM	10 grams			
Weight box	44 grams / 49 grams			B package / S package
Specified temperature	-40 to 85°C			Non-condensing environment
Shock limit	1 000g (Powered), 2 000g (Unpowered)			Shocks can affect performance
Electrical				
Operating voltage	3.3 V to 30 V			
Power consumption	800 mW @ 5.0 V			High efficiency DC/DC converter
SyncOut, Trigger	Open drain pull-up voltage -0.3 to 25 V			Open drain, use a pull-up resistor
Start-up time	< 1 s			Valid data
t upo	110			

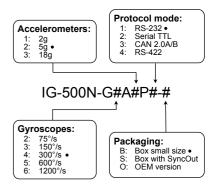
Mechanical drawing





All dimensions are in millimeters

Product code options



standard product options

