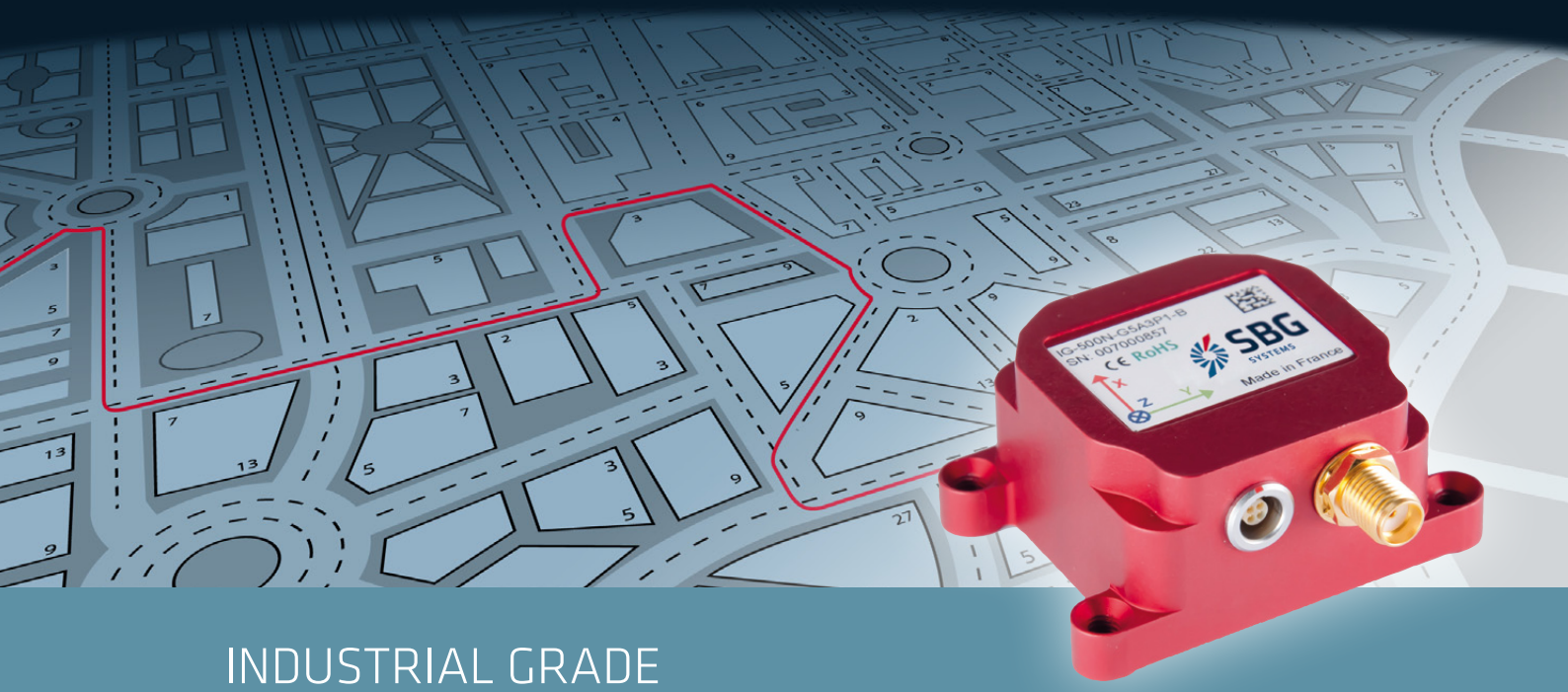
IG-500N

3D Orientation

0.35°
ACCURACY

Heave

Internal GPS



INDUSTRIAL GRADE

Inertial Navigation System with embedded GPS

IG-500 SERIES When size and performance matter, professionals trust the proven MEMS-based IG-500 series. After many years of success, the IG-500 Series is recognized for its high performance and reliability.

SBG SYSTEMS

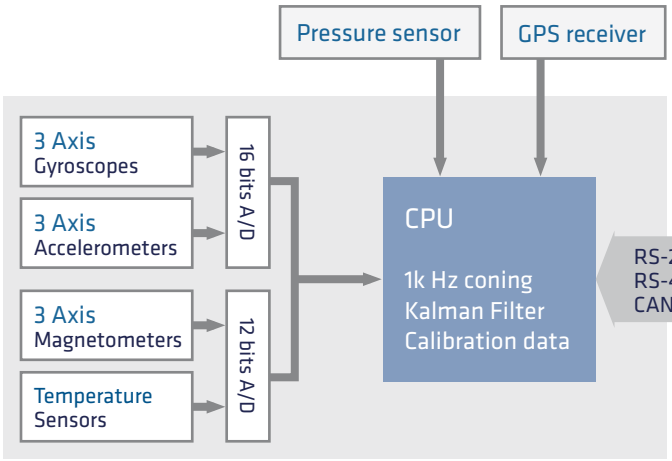
IG-500N - The Most Reliable Miniature INS/GPS

KEY FEATURES

- Accurate attitude even in high G maneuvers
- Automatic magnetic declination and local gravity
- Precise UTC referenced output and SyncOut signal
- NMEA / ASCII output for GPS drop in replacement

MINIATURE AND ROBUST

- Compact and lightweight 44 grams
- Low power design down to 800 mW
- Robust Aluminum enclosure



3D Orientation
- Euler
- Matrix
- Quaternion

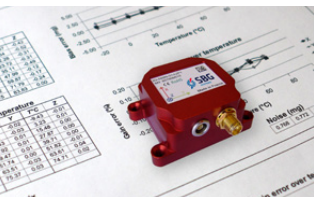
3D Navigation
- 3D velocity
- 3D Position

Sensors
- 3D Angular Rate
- 3D Acceleration
- 3D Magnetic field

Heave

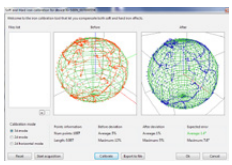
The IG-500N is a miniature inertial navigation system with an embedded GPS. It is composed of:
- a MEMS-based Inertial Measurement Unit (IMU) integrating 3 gyroscopes, 3 accelerometers, and 3 magnetometers,
- a 4 Hz, 50 channels GPS receiver,
- a barometric pressure sensor (altitude),
- and an on board Extended Kalman Filter (EKF).

THE MOST ADVANCED CALIBRATION TECHNIQUES



To ensure high data integrity, the IG-500N is calibrated from -40 to 85°C for bias, gain, linearity, misalignments, cross-axis and gyro-g. Every sensor is then intensively tested and shipped with its own calibration report.

COMPENSATION OF MAGNETIC DISTURBANCES



The magnetometer calibration tool compensates both soft and hard iron effects using a powerful algorithm. A calibration library is provided to be integrated in your system. You can easily calibrate your sensor in real conditions to obtain the most efficient compensation.

HIGH IMMUNITY TO VIBRATIONS

The IG-500N is especially reliable in vibrating environments. Each accelerometer is calibrated, and powerful algorithms have been designed to filter vibrations such as a 1 k Hz coning and a FIR filtering.

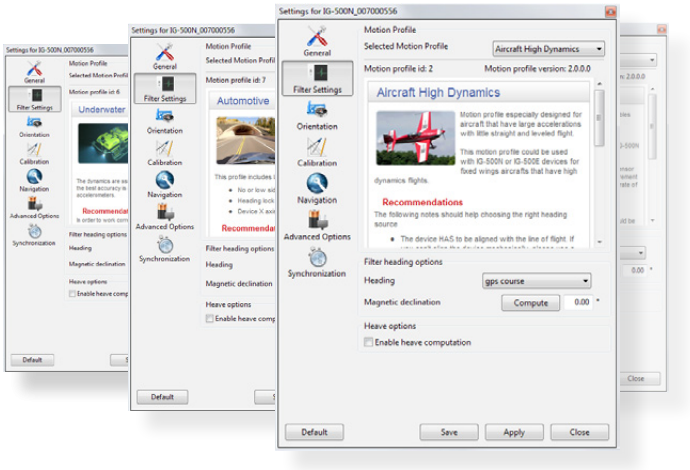
Performance adjusted to your application

MOTION PROFILES

Motion Profiles adjust automatically to:

- Kalman Filter parameters,
- Vibration level,
- Dynamic model,
- Magnetic disturbance immunity, etc.

In a few clicks, Motion Profiles tune your sensor to your application constraints.



Example: If you want to install the IG-500 sensor in an airplane, select the "Aircraft High Dynamics" motion profile and all parameters will be automatically adjusted.

UAV & PAYLOADS

This INS/GPS comes with a barometric pressure sensor, making the IG-500N a perfect all-in-one solution for UAV navigation and stabilization, as well as payload orientation and positioning.

PERFORMANCE SAILING

The IG-500N provides robust heading, 360° attitude, and GPS position. It distinguishes itself by automatically computing the magnetic declination, and the local gravity.

GYRO-STABILIZED CAMERA

Payload orientation & stabilization is more efficient thanks to IG-500N high update rate, low latency, and the provided true heading based on GPS and accelerations.

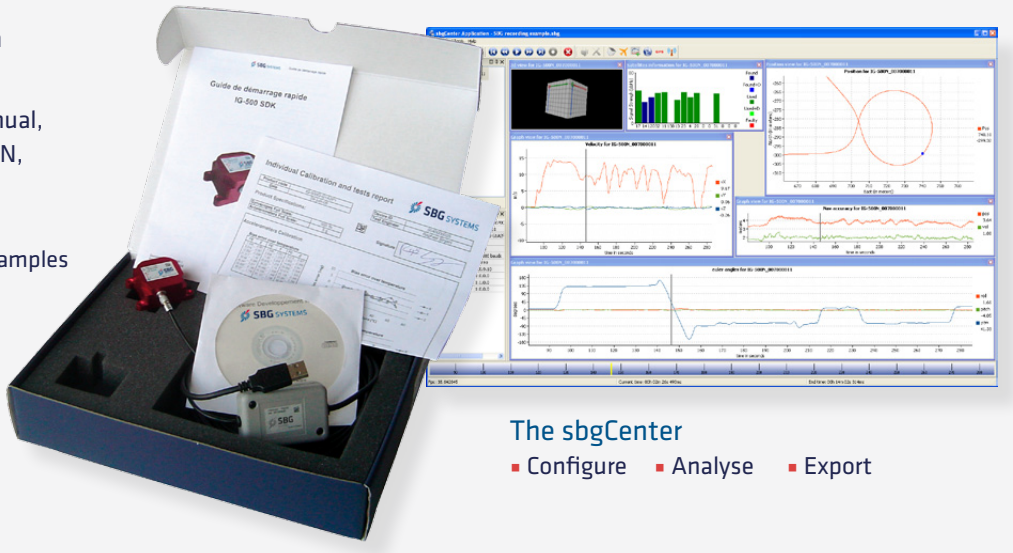
CAR MOTION ANALYSIS

The IG-500N is ready-to-use for chassis roll over detection, optimal trajectory determination, over and under steering characterization in high dynamics, and extreme temperature.

Development kit

The Development Kit which comes with your IG-500N sensors contains:

- A quick start guide and the user manual,
- The calibration report of your IG-500N,
- A USB converter cable,
- Useful software and tools:
  - A C library and some code sources examples
  - The Magnetometer Calibration Tool
  - LabView & Matlab plugins
  - The sbgCenter configuration & analysis software
  - The sbgUpdater that automatically alerts you and install the new software version.



The sbgCenter

- Configure
- Analyse
- Export

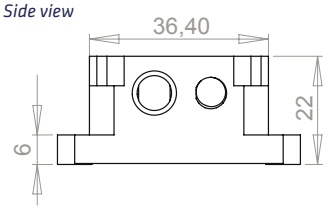
IG-500N - Specifications

PARAMETER	SPECIFICATIONS			REMARKS
Performance	**Aerospace**	**Ground**	**Marine / Subsea**	
Roll/Pitch (Dynamic)	1.0° RMS	0.8° RMS	0.35° RMS	Under good GPS availability
Heading (Dynamic)	1.0° RMS	0.5° RMS	1.0° RMS	Depends on heading aiding source
Resolution	< 0.05°	< 0.05°	< 0.05°	
Velocity (RMS)	< 0.1 m/s	< 0.1 m/s	< 0.1 m/s	Under good GPS availability
Position (SEP)	< 2 m	< 2 m	< 2 m	Under good GPS availability
Heave	-	-	10 cms or 10 %	Whichever is greater
Sensing range	360° in all axes, no mounting limitation			Solid state sensors
Inertial Sensors	**Accelerometers**	**Gyroscopes**	**Magnetometers**	
Measurement range	± 5 g	± 300 °/s	± 1.2 Gauss	Refer to sensors options table
Non-linearity	< 0.2 %	< 0.05 %	< 0.2 %	% of full scale
Initial bias error	± 5 *mg*	± 0.5 °/s	± 0.5 mGauss	Over temperature range
Bias in-run stability	± 0.06 *mg*	20 °/hr	-	Allan variance - constant temperature
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	< 0.05°	< 0.05°	< 0.1°	
Bandwidth	250 Hz	240 Hz	500 Hz	1 k Hz gyroscopes coning integrals
Sampling rate	10,000 Hz	10,000 Hz	1,000 Hz	Advanced anti-aliasing FIR filters
GPS Receiver				
Receiver type	L1 frequency, C/A Code, 50 Channels, SBAS, 4 Hz			
Acquisition time	< 1.0 s / 29 s			Hot start / Cold start
Tracking sensitivity	-160 dB			
Pressure Sensor				
Resolution	2.5 Pa / 20 cms / < 1 feet			
Pressure accuracy	± 50 Pa / ± 150 Pa			Relative / Absolute
Sampling rate	50 Hz			
Communication				
Available data	Euler angles, quaternion, rotation matrix, velocity, position, heave, calibrated sensor data, delta angles, barometric data, device status, raw GPS data, UTC time reference, etc.			Each output can be enabled or disabled by the user. Output rate is user selectable
Output rate	100 Hz for orientation, velocity and position			500 Hz in IMU mode only
Serial interface	RS-232, RS-422, TTL 3.3V or USB Binary proprietary protocol and NMEA/ASCII			RS-422 only for S and O packages USB using an external adapter
CAN interface	CAN 2.0A/B up to 1 Mbit/s			Only available for S and O packages
Physical				
Dimensions OEM	27 x 30 x 14 mm, 1.1 x 1.2 x 0.6"			
Dimensions box	36 x 49 x 22 mm, 1.4 x 1.9 x 0.9"			B package
	36 x 49 x 25 mm, 1.4 x 1.9 x 1"			S package
Weight OEM	10 grams, 0.02 pounds			
Weight box	44 grams, 0.1 pounds			B package
	48 grams, 0.1 pounds			S package
Specified temperature	-40 to 85°C, -40 to 185°F			Non-condensing environment
Shock limit	1,000 *g* (Powered); 2,000 *g* (Unpowered)			Shocks can affect performance
Operating vibration	3 g RMS (20 Hz to 2 k Hz per MIL-STD 810G)			Valid for 18g accelerometers
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

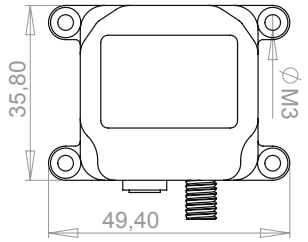
MECHANICAL DRAWING

All dimensions are in millimeters

Side view



Top view



PRODUCT CODE

▪: *standard product options*

IG-500N-G#A#P#-#

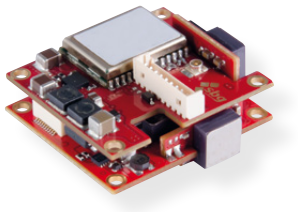
GYROSCOPES
- 2: 75 °/s
- 3: 150 °/s
- 4: 300 °/s ▪
- 5: 600 °/s
- 6: 1200 °/s

ACCELEROMETERS
1: 2 g 2: 5 g ▪ 3: 18 g

PROTOCOL MODE
- 1: RS-232 ▪
- 2: Serial TTL
- 3: CAN 2.0A/B
- 4: RS-422

PACKAGING
- B: Box small size ▪
- S: Box with SyncOut
- O: OEM version

OEM VERSION



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