



Dynamic Measurement System with Dual Antenna GPS

DMS-SGP02

Description:

The DMS-SGP02 is a miniaturized version of the DMS-EGP02. To allow for a smaller package, the DMS-SGP02 uses our S series MEMS rate gyro.

The DMS may be used in almost any application where triaxial angular rate and acceleration data is required. The sensor provides both angular rate and acceleration outputs in analog and digital formats. The DMS features six

accelerometer outputs. The X, Y, and Z axis outputs represent the accelerations in the plane of the vehicle body, while the second set of three outputs measure the acceleration aligned with an earth-level coordinate system. This allows forward and lateral acceleration measurements that are essentially free of gravity influences. The triaxial sensor set allows software alignment of sensors, greatly reducing any alignment errors. The serial interface is highly configurable and provides access to almost all operational parameters.

The DMS-SGP02 is designed for vehicle applications where accurate heading is required, but a magnetic compass is infeasible. This sensor is equipped with a dual GPS antenna system that provides heading data even when the vehicle is not in motion. The addition of the GPS antennas also gives vehicle velocity data to the DMS that enhances the unit's performance during highly dynamic maneuvers such as sharp turns. This makes the DMS-SGP02 inertial gyro sensor a more complete system since it does not require velocity information to be supplied from an external sensor. An antenna spacing of 0.500 meters ± 5 mm is required.



- Solid State, Strap Down System
- GPS Heading Reference
- Latitude, Longitude, Altitude Output
- Low Cost
- Rugged, High Reliability
- Vibration Resistant
- Analog and RS-232 Serial Outputs
- One Year Limited Warranty
- Engineering Support

Applications:

The DMS-SGP02 is useful in automotive testing, vehicle dynamics, marine, and aircraft applications. This sensor is most useful in applications where strong magnetic fields make heading data from a fluxgate magnetometer unreliable.



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DMS-SGP02 Specifications

Attitude

Range: Bank	±180°	
Range: Elevation	±90°	
Resolution:	0.02°	Binary mode (14 bit)
Analog Scale Factor:	18°/V	±10V Bank ±5V Elevation
Accuracy: Static	±0.5°	
* Accuracy: Dynamic	2%	

GPS Heading

Range:	0° - 360°	
Resolution:	0.02°	Binary mode (14 bit)
Analog Scale Factor:	18°/V	±10V Output
Accuracy: Static	0.5°	Based on antenna spacing. See figure 1
* Accuracy: Dynamic or Relative	2%	±0.1°/sec (without GPS)

Angular Rate

Range: Roll, Pitch, Yaw	±100°/sec	
Resolution:	0.025°/sec	Binary mode (14 bit)
Analog Scale Factor:	10°/sec/V	±10V Output
Scale Factor Accuracy:	2%	
Bias: Roll, Pitch, Yaw	< 0.3°/sec	
Non-Linearity:	< 0.05%	Full scale range
Bandwidth:	20 Hz	

Acceleration

Range: X, Y, Z	±10g	
Range: Forward, Lateral, Vertical	±10g	
Resolution:	4mg	
Analog Scale Factor:	1g/V	±10V Output
Scale Factor Accuracy:	1%	
Bias: X, Y, Z	< 10mg	
Non-Linearity:	0.1%	Full scale range
Bandwidth:	3 Hz	

GPS Positioning

Range: Latitude	±90°	
Range: Longitude	±180°	
Range: Altitude	0ft to 21500ft	
Resolution: Latitude, Longitude	0.0000013°	Binary mode (28 bit)
Resolution: Altitude	2 ft	Settable: Above mean sea level or GPS Geodetic Corrected
Accuracy: Latitude, Longitude	±0.6m (with DGPS)	±2.5m (without DGPS)

Environmental

Temperature: Operating	-40°C to +85°C	
Temperature: Storage	-55°C to +85°C	
Vibration: Operating	2.5g rms	20 Hz to 2 KHz
Vibration: Survival	10g rms	20 Hz to 2 KHz
Shock: Survival	500g	10mS ½ sine wave

Electrical

Frame Rate:	71.1 Hz	Maximum
Startup Time: Data	5 sec	
† Startup Time: Satellite Acquisition	5 min	Typical
Input Power:	10 to 35VDC	4.9W
Input Current:	410mA @ 12VDC	205mA @ 24VDC
Input Velocity: (Optional)	±10VDC	Full scale (±400kph)
Digital Output:	RS-232	
Analog Output:	±10VDC	
Analog Output Impedance:	300 Ohm	Per line

Physical

Axis Alignment:	< 0.25°	
Size: Including Mounting Flanges	3.24"W x 5.78"L x 3.50"H	8.2 x 14.7 x 8.9 (cm)
Weight:	31 oz (1.9lb)	879 grams (0.9Kg)
Connection: RS-232	9 pin female "D" subminiature	
Connection: Power / Analog Outputs	25 pin male "D" subminiature	
Connection: Antenna (Qty 2)	SMA	Antenna cable length: 3.0m

* Using velocity data with GPS mode on.

Actual accuracy can be calculated as the listed percentage multiplied by the change in value over the entire dynamic maneuver.

† Acquisition time for GPS units is typical for the contiguous United States. Acquisition time may differ due to interference in your geographic area.

- Specifications are subject to change without notice.
- This product may be subject to export restrictions. Export Classification ECCN 7A994.



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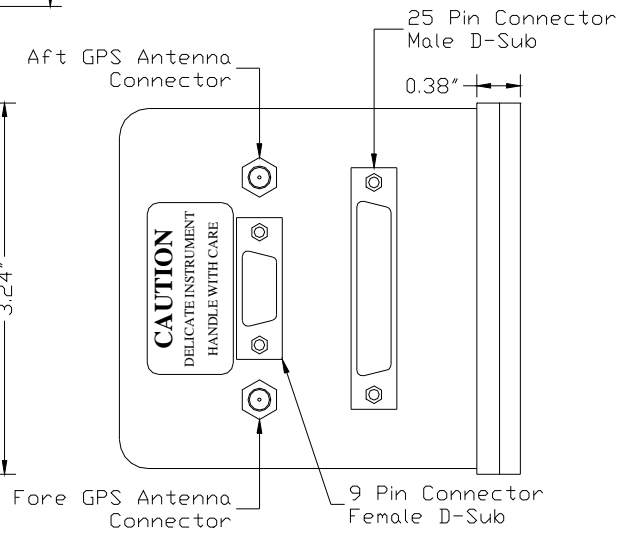
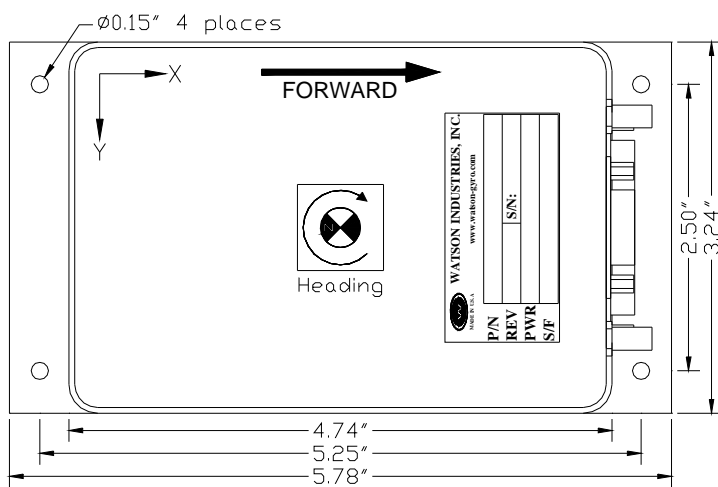
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**Dimensions:
DMS-SGP02**

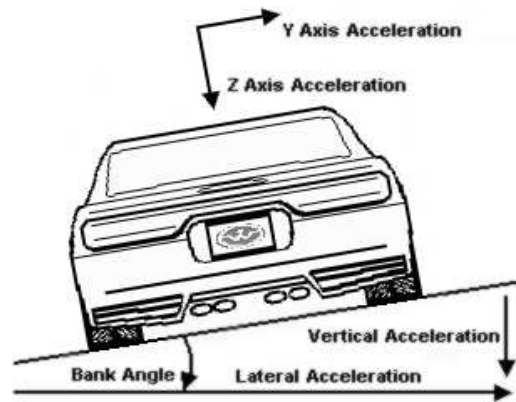
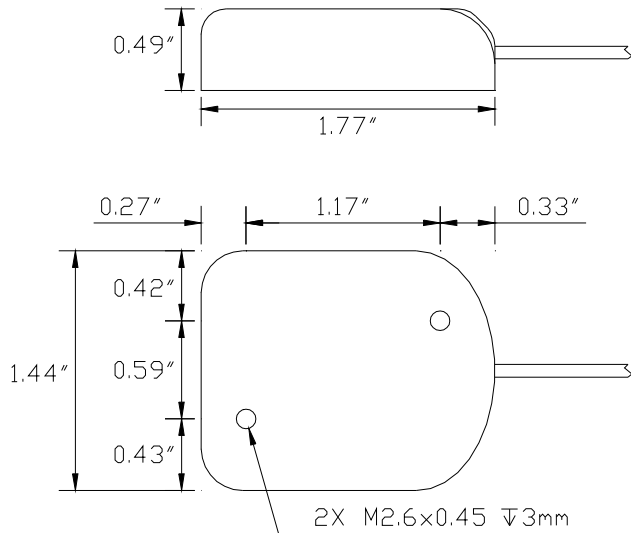


GPS Antenna Spacing(meters)	GPS Heading: Accuracy: Static
0.5m	0.5° rms
1.0m	0.25° rms
2.0m	0.13° rms
5.0m	0.07° rms

Figure 1



GPS Antenna



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