



Dynamic Measurement System with Dual Antenna GPS

DMS-EGP02

Description:

Originally developed to meet the needs of automotive testing professionals, the Dynamic Measurement System (DMS) was designed for monitoring the drive and handling characteristics of vehicles. 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-EGP02 is designed to be used in 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-EGP02 inertial gyro sensor a more complete system since it does not require velocity information to be supplied from an external sensor.

- Solid State, Strap Down System
- Six Accelerometer Outputs
- GPS Heading Reference
- Low Cost
- Rugged, High Reliability
- Vibration Resistant
- Analog and RS-232 Serial Outputs
- Two Year Limited Warranty
- Engineering Support

Applications:

The DMS-EGP02 is useful in automotive testing, vehicle dynamics, and marine applications. This sensor can be used as a replacement for the Watson IMU-E604, and is most useful in applications where strong magnetic fields make heading data from a fluxgate magnetometer unreliable.



Watson Industries, Inc.

3041 Melby Road Eau Claire, Wisconsin 54703 U.S.A
Phone: +1 (715) 839-0628 Fax: +1 (715) 839-8248
e-mail: support@watson-gyro.com Website: www.watson-gyro.com

DMS-EGP02 Specifications

Attitude

Range: Bank	$\pm 180^\circ$	
Range: Elevation	$\pm 75^\circ$	
Resolution:	0.02°	
Analog Scale Factor:	$18^\circ/V$	Binary mode (14 bit)
Accuracy: Static	$\pm 0.25^\circ$	$\pm 10V$ Output
* Accuracy: Dynamic	$\pm 2\%$	

Heading

Range:	$0^\circ - 360^\circ$	
Resolution:	0.02°	Binary mode (14 bit)
Analog Scale Factor:	$18^\circ/V$	$\pm 10V$ Output
Accuracy: Static	$\pm 0.5^\circ$	Using GPS
* Accuracy: Dynamic	$\pm 2\%$	$\pm 0.05^\circ/\text{sec}$ (without GPS)

Angular Rate

Range: Roll, Pitch, Yaw	$\pm 100^\circ/\text{sec}$	
Resolution:	$0.01^\circ/\text{sec}$	Binary mode (14 bit)
Analog Scale Factor:	$10^\circ/\text{sec}/V$	$\pm 10V$ Output
Scale Factor Accuracy:	1%	
Bias: Roll, Pitch, Yaw	$< 0.1^\circ/\text{sec}$ (Analog)	$\pm 0.02^\circ/\text{sec}$ Binary mode (14 bit)
Non-Linearity	$< 0.03\%$	Full scale range
Bandwidth	20 Hz	
Noise:	$< 0.02^\circ/\text{sec}$ rms	

Acceleration

Range: X, Y, Z	$\pm 10g$	
Range: Forward, Lateral, Vertical	$\pm 10g$	
Resolution:	4mg	
Analog Scale Factor:	1g/V	$\pm 10V$ Output
Scale Factor Accuracy:	1%	
Bias: X, Y, Z	$< \pm 5mg$	
Non-Linearity:	$< 1\%$	Full scale range
Bandwidth:	20 Hz	

GPS Positioning

Range: Latitude	$\pm 90^\circ$	
Range: Longitude	$\pm 180^\circ$	
Range: Altitude	0ft to 21500ft	
Resolution: Latitude, Longitude	0.0000013°	Binary mode (28 bit)
Resolution: Altitude	2 ft	
Accuracy: Latitude, Longitude	$\pm 0.6m$ (with DGPS)	$\pm 2.5m$ (without DGPS)

Environmental

Temperature: Operating	-30°C to $+60^\circ\text{C}$	
Temperature: Storage	-55°C to $+85^\circ\text{C}$	
Vibration: Operating	5g rms	20 Hz to 2 kHz
Vibration: Survival	10g rms	20 Hz to 2 kHz
Shock: Survival	500g	10ms $\frac{1}{2}$ sine wave

Electrical

Frame Rate	71.1 Hz	Maximum
Startup Time: Data	5 sec	
Startup Time: Fully operational	< 60 sec	Typical
Input Power:	10 to 30VDC	5.9 W
Input Current:	490mA @ 12VDC	245mA @ 24VDC
Input Velocity: (Optional)	$\pm 10VDC$	Full scale ($\pm 400\text{kph}$)
Digital Output	RS-232	
Analog Output	$\pm 10VDC$	

Physical

Axis Alignment:	$< 0.1^\circ$	
Size: Including Mounting Flanges	6.5"W x 6.5"L x 3.75"H	16.5 x 16.5 x 9.5 (cm)
Weight:	54oz (3.4lb)	1531g (1.5kg)
Connection: RS-232	9 pin female "D" subminiature	
Connection: Power / Analog Outputs	25 pin male "D" subminiature	
Connection: GPS (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.

- Specifications are subject to change without notice.
- This product may be subject to export restrictions. Please consult the factory.

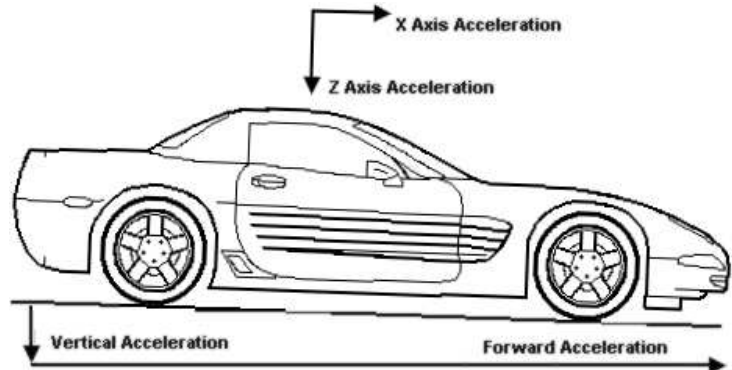
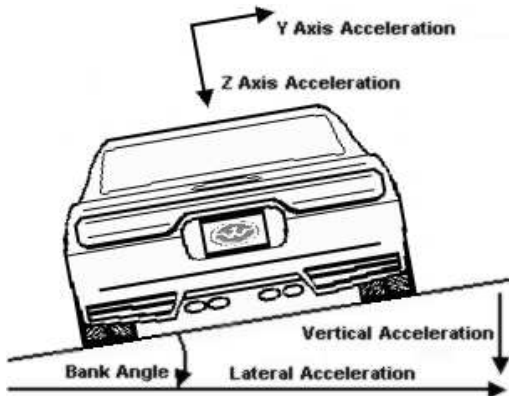
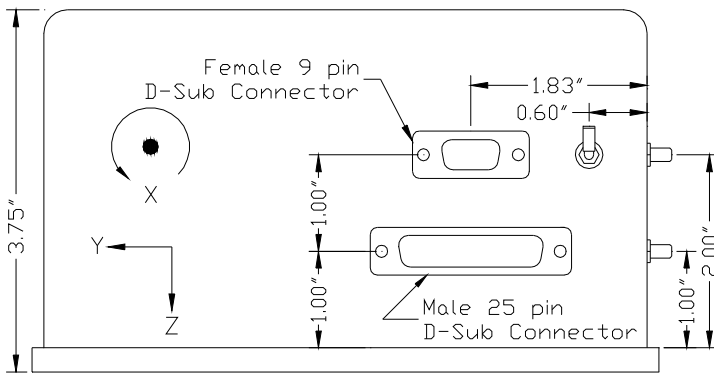
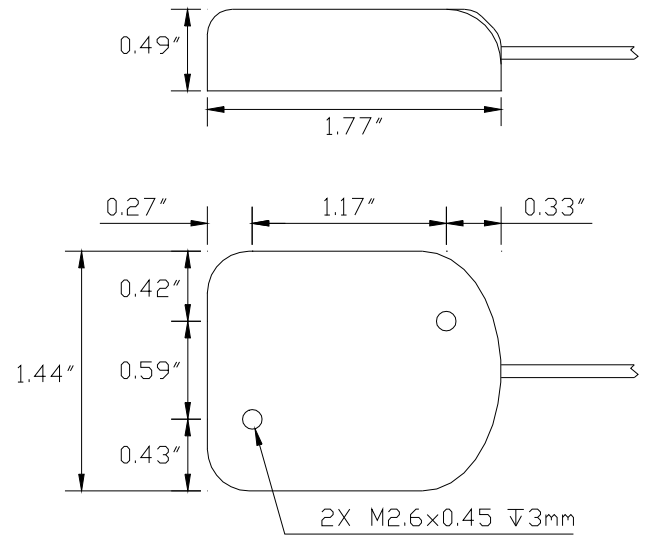
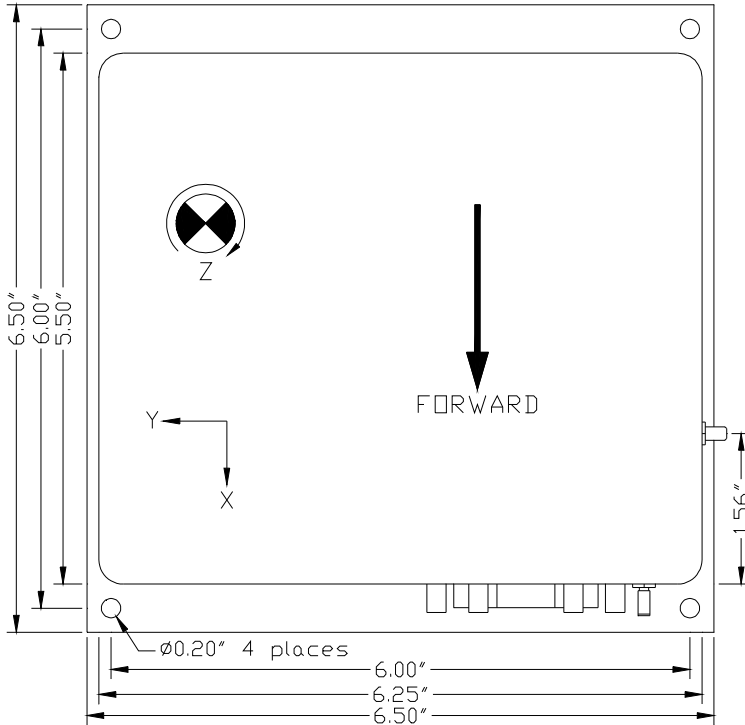


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**Dimensions:
DMS-EGP02**

GPS Antenna



10/10 DAO



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