



# Inertial Measurement Unit

IMU-E604


## **Description:**


The IMU-E604 is a complete inertial gyro system. It features three angular rate gyros, three accelerometers, and a fluxgate magnetometer all in a compact, durable package. With this sensor suite, the Watson Inertial Measurement Unit has the capabilities of an AHRS and a DMS combined. It has full attitude outputs - bank, elevation, and magnetic heading - along with triaxial leveled accelerometer data. This allows the IMU-E604 to be used in a wide range of applications, almost any in which an AHRS or DMS might be used. This makes the inertial measurement unit a superb general purpose instrumentation package for research and automotive testing facilities.




The IMU-E604 inertial sensor outputs data via an RS-232 serial link. This allows users to easily view data from the unit. It also allows users to easily change operational parameters for the inertial measurement unit, such as the output data channel selection. In addition to the standard attitude outputs, the IMU is capable of providing triaxial rate, acceleration, and magnetometer data to the user. Watson Industries provides free software for magnetic heading calibration that can be used once the IMU is installed.

- Solid State, Strap Down System
- Rugged, Vibration Resistant
- Convenient Set-up
- Analog and RS-232 Serial Outputs
- Two Year Limited Warranty
- PC Heading Calibration
- Engineering Support

 **Rate Gyros** – Our rate sensors are solid state, vibrating structure angular rate gyros. They combine excellent performance with ruggedness and small size, and may be used in high vibration environments.

 **Accelerometers** – The IMU features instrument grade accelerometers. Alternate ranges are available.

 **Magnetic Heading Sensor** – A triaxial magnetometer, combined with the bank and elevation data, provides accurate magnetic heading data. This results in accurate heading information without the use of gimbals. Calibration software is available.



## **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

## IMU-E604 Specifications

### Attitude

Range: Bank	±180°	
Range: Elevation	±90°	
Resolution:	0.02°	Binary mode (14 bit)
Analog Scale Factor:	18°/V	±10V Output
Accuracy: Static	±0.25°	
* Accuracy: Dynamic	±2%	

### Heading

Range: Bank	0° to 360°	
Resolution:	0.02°	Binary mode (14 bit)
Analog Scale Factor:	18°/V	±10V Output
† Accuracy: Static	±1°	
* Accuracy: Dynamic	±2%	

### Angular Rate

Range: Roll, Pitch, Yaw	±100°/sec	
Resolution:	0.01°/sec	Binary mode (14 bit)
Analog Scale Factor:	10°/sec/V	±10V Output
Scale Factor Accuracy:	1%	
Bias: Roll, Pitch, Yaw	< ±0.02°/sec	
Non-Linearity	< 0.03%	Full scale range
Bandwidth	20 Hz	

### Acceleration

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

### Magnetic

Range: X, Y, Z	±1000 mGauss	
Resolution:	0.1 mGauss	Binary mode (14 bit)
Scale Factor Accuracy:	1%	
Bias: X, Y, Z	< ±5 mGauss	
Non-Linearity:	< 0.01%	Full scale range
Bandwidth:	10 Hz	

### Environmental

Temperature: Operating	-30°C to +60°C	
Temperature: Storage	-55°C to +85°C	
Vibration: Operating	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: Fully operational	10 sec	
Input Power:	10 to 30VDC	4.8W
Input Current:	400mA @ 12VDC	200mA @ 24VDC
Input Velocity: (Optional)	±10VDC	Full scale (±400kph)
Digital Output	RS-232	
Analog Output	±10VDC	

### Physical

Axis Alignment:	< 0.1°	
Size: Including Mounting Flanges	6.5"W x 6.5"L x 3.00"H	16.5 x 16.5 x 7.6 (cm)
Weight:	53oz (3.3lb)	1500g (1.5kg)
Connection: RS-232	9 pin female "D" subminiature	
Connection: Power / Analog Outputs	25 pin male "D" subminiature	
* Assumes accurate velocity data (Actual accuracy can be calculated as the listed percentage multiplied by the change in value over the entire dynamic maneuver)		
† Static heading accuracy is dependent on the magnetic environment. This sensor will meet or exceed this spec within the 48 contiguous United States.		

Specifications are subject to change without notice

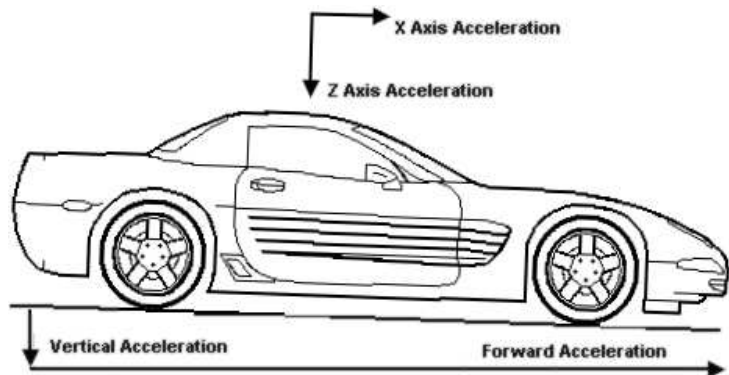
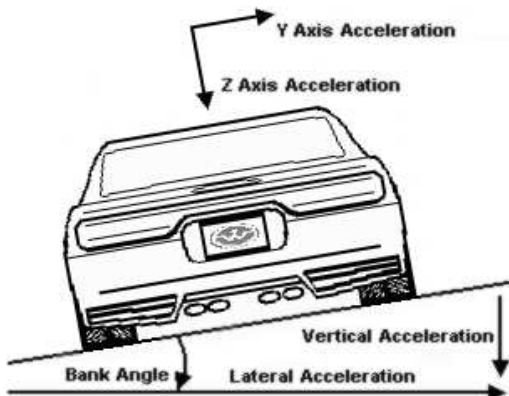
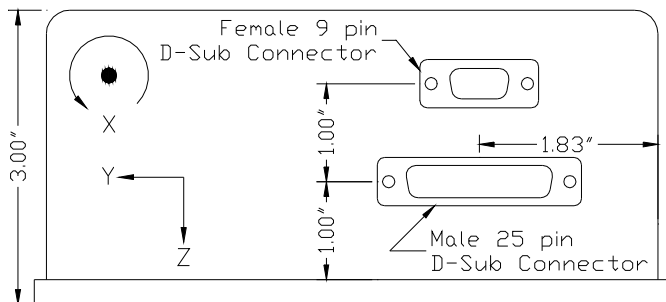
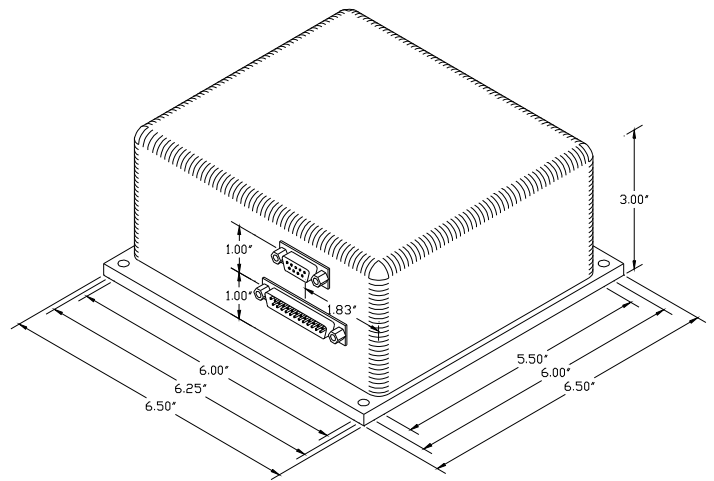
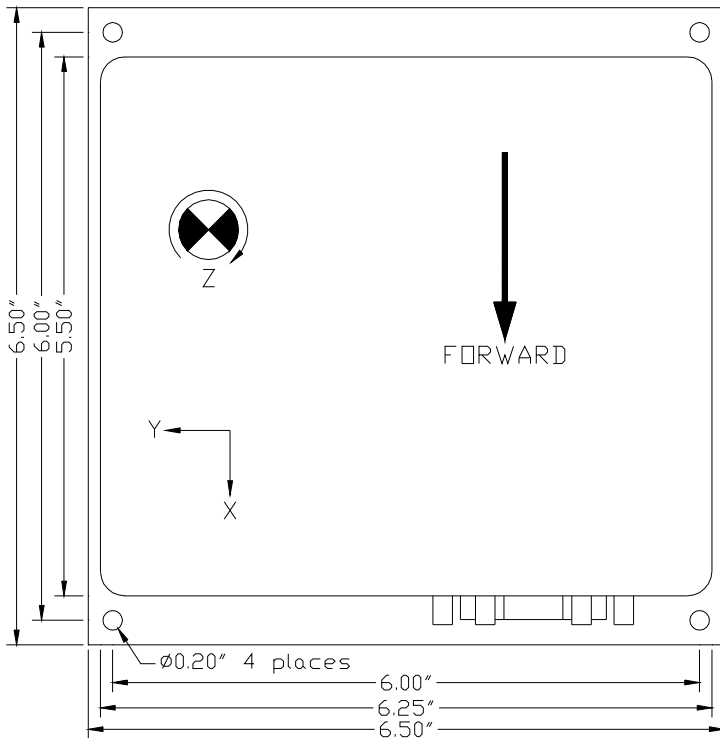


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## Dimensions:

### IMU-E604



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