Attitude and Heading Reference System

AHRS-E304

Description:

The signals from three solid state angular rate sensors are coordinate transformed and then integrated to produce attitude and heading outputs that reflect normal aircraft attitude coordinates. These attitude and heading signals are compared against a triaxial accelerometer and a triaxial fluxgate magnetometer to derive gyro drift error. These errors are filtered over a long time constant and are used to adjust biases in the system so that the long-term convergence of the system is to the vertical references and the magnetic heading. A velocity input is used to calculate compensations for centrifugal forces and velocity changes on the vertical reference to improve overall stability and accuracy.

This is a microprocessor-based system using a 16 bit A/D converter, a 12 bit D/A converter and an RS-232 interface. The microprocessor has stored parameters for all the sensor inputs to correct bias, scale factor, axis alignment, and others. The analog attitude and heading outputs are updated 71.11 times per second. The serial interface is highly configurable and provides access to almost all operational parameters.

- Solid State, Strapdown System
- Low Cost, Low Power
- Rugged, High Reliability
- Vibration Resistant
- Analog and RS-232 Serial Outputs
- PC Heading Calibration
- Two Year Limited Warranty
- Engineering Support

Applications:

The AHRS-E304 is useful for land, sea and airborne applications. It can be used to drive an attitude indicator flight display, for control and stabilization of remote piloted subs or aerial vehicles, and for robotics research and road surface measurement.

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AHRS-E304 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:	0° - 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	< 0.1°/sec (Analog)	±0.02°/sec Binary Mode (14 bit)
	Non-Linearity	< 0.03%	Full scale range
	Bandwidth	20 Hz	
	Noise:	< 0.02°/sec rms	
Acceleration			
	Range: X, Y, Z	±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:	350mA @ 12VDC	200mA @ 24VDC
	Input Velocity: (Optional)	±10VDC	Full scale (±800kph)
	Digital Output	RS-232	
	Analog Output	±10VDC	
	Analog Output Impedance:	300 Ohm	Per line
Physical			
	Axis Alignment:	< 0.1°	
	Size: Including Mounting Flanges	3.24”W x 5.78”L x 4.68”H	8.2 x 14.7 x 11.9 (cm)
	Weight:	32oz (2lb)	910g (0.9kg)
	Connection: RS-232 / Analog Outputs	25 pin male “D” subminiature	
	Connection: Power	4 pin male MS-3110-P8-4P	

* 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.
- This product may be subject to export restrictions. Please consult the factory.

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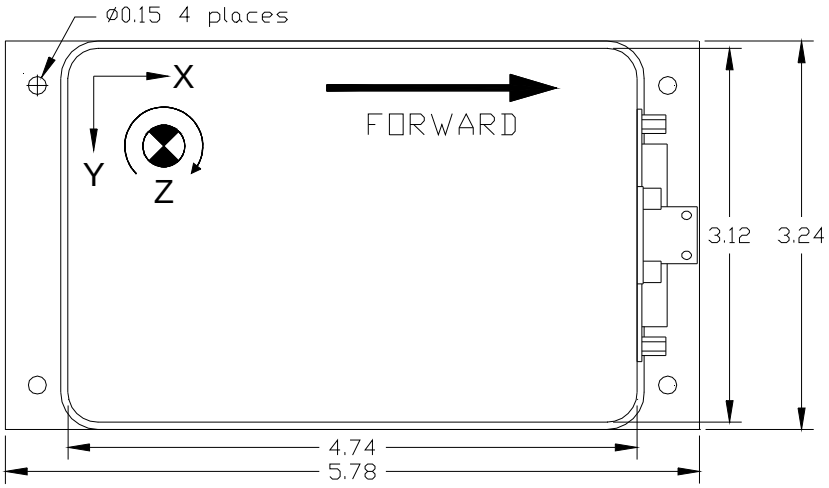
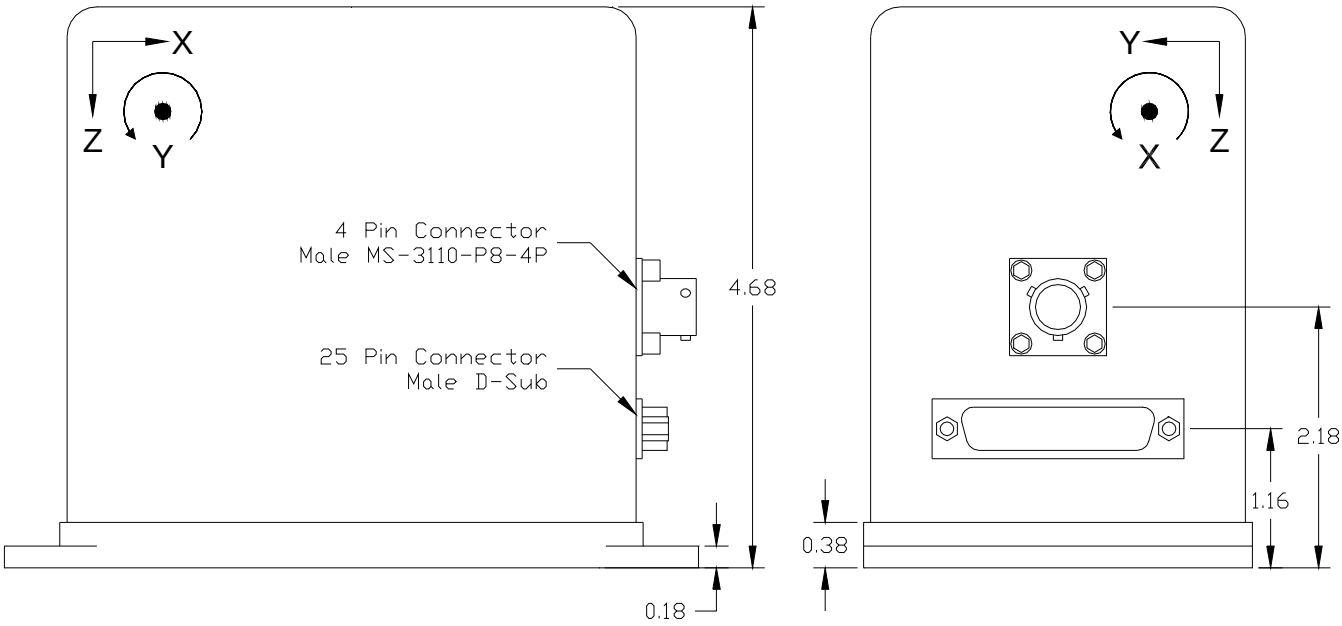
Dimensions:





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