

MRM 10 Analog IMU



- **Low Cost & Rugged Analog IMU**
- **±5 Volt Signal Output Swing**
- **Low Gyro Noise** $<0.014^\circ/\text{sec}/\sqrt{\text{Hz}}$ 1σ
- **Low Accel Noise** $<0.07\text{mg}/\sqrt{\text{Hz}}$ (2g) 1σ
- **In Run Gyro Bias** $25^\circ/\text{hour}$ 1σ
- **Fully Temperature Compensated Bias and Scale Factor**
- **Compensated Misalignment and g-Sensitivity** 1mrad and $<0.03^\circ/\text{sec}/\text{g}$ 1σ
- **Low Power** $< 2/3$ watt typical
- **Light Weight** <106 grams
- **Small Size** $< 72\text{cm}^3/4.4\text{in}^3$
- **Low Voltage** $+3.1$ or $+5.5\text{V}$ (single sided)
- **Wide Sensor Bandwidth** 140 Hz
- **External Sync Input** (1 kHz or 1pps)
- **Internal Vibration Isolation**
- **Precision Alignment**
- **3 Internal Temperature Sensors**
- **Self Test**

**Low Noise, Compensated
Rugged Analog IMU**

Export Classification: Commerce ECCN7A994

The new and improved MRM10 IMU is a substantial performance upgrade employing our latest low noise gyro technology for improved bias and with improved environmental sealing and MIL-SPEC connector. It provides internally temperature compensated analog output of gyros, accelerometers and temperature.

The MRM 10 IMU is ideal for applications requiring simple analog outputs, low cost, low power consumption, rugged packaging, small size, light weight and no inherent wear out modes for long life. The key feature of the MRM 10 IMU is the performance, which is optimized with **fully temperature compensated bias and scale factor, compensated misalignment and g-sensitivity**.

The unit is highly durable and can withstand environmental vibration and shock typically associated with motorsports racing and commercial aircraft requirements. The MRM 10 IMU offers standard rate ranges of $\pm 75^\circ/\text{sec}$, $\pm 150^\circ/\text{sec}$ or $\pm 300^\circ/\text{sec}$ and $\pm 2\text{g}$, $\pm 6\text{g}$ or $\pm 10\text{g}$ of linear acceleration. Other rate ranges and g levels are available. This IMU is well suited for low cost motorsports motion monitoring, automotive testing, antenna stabilization and pointing, general aviation as well as laboratory use. The unit is ideal where low gyro noise, excellent modeled performance coupled with small size, low power and light weight with a simple analog output are desired for MEMS IMU applications.



QMS

AS9100 Rev B &
ISO 9001:2000
Cert# FM 509639



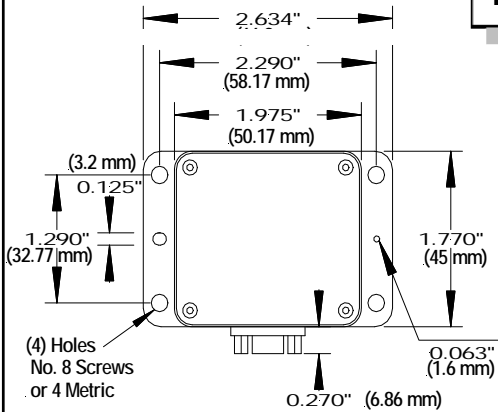
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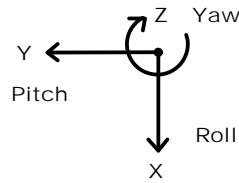
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MRM 10 Analog IMU



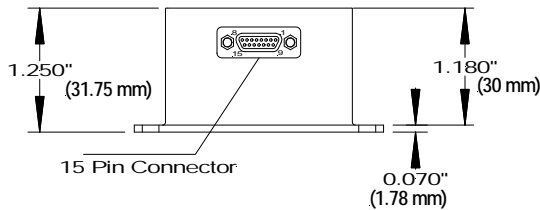
Axes (Top View) Right Hand Rule



MRM 10 Analog IMU

MRM10IMU-075-02-200 or -6 or -10
MRM10IMU-150-02-200 or -6 or -10
MRM10IMU-300-02-200 or -6 or -10

Specification



Mating Connector: M83513/01-BN

Pin No.	Assignment
1	RS-485 A (+)
2	RS-485 B (-)
3	Power Ground
4	Case
5	+3.1V to +5.5V Max Input Power
6	External Sync Input (1kHz) Option
7	Temperature = 50mV/°C typical
8	P/N -200: Signal Ground P/N -250: Signal Reference +2.5V
9	Self Test 3.3V Logic Level
10	Roll Gyro (X) Analog Out ± 5V
11	Pitch Gyro (Y) Analog Out ± 5V
12	Yaw Gyro (Z) Analog Out ± 5V
13	X Accelerometer Analog Out ± 5V
14	Y Accelerometer Analog Out ± 5V
15	Z Accelerometer Analog Out ± 5V

Standard -200 Model: The analog signals are ±5 volt scaled maximum measured with respect to signal ground pin 8. Load ≥ 5K Ohms & <100pf on each signal.

Special -250 Model: All analog signals are scaled ±2.5 volt maximum with respect to signal reference +2.5V on pin 8. Load ≥ 5K Ohms & <100pf on each signal.

PARAMETER	RATE AXES			ACCEL AXES		
Range = ±5V Output	±75°/sec	±150°/sec	±300°/sec	±2 g's	±6 g's	±10 g's
Bias (Over Temp.)	<0.1°/sec 1 σ			<3mg	<6mg	<8mg
Bias (In Run Stability)	25°/hour 1 σ			0.1mg	0.2mg	0.25mg
Scale Factor (± 5V Scaled)	15°/sec/V	30°/sec/V	60°/sec/V	0.4 g/V	1.2 g/V	2 g/V
Scale Factor Error %	≤0.2% (over temperature) 1 σ					
Resolution	0.007°/sec			0.003mg	0.6mg	0.12mg
Angle Random Walk	0.014° /sec/√Hz 1 σ			0.07mg	0.12mg	0.25mg
Alignment	<1 mrad 1 σ					
G-Sensitivity	<0.03°/sec/g 1 σ					
Self Test On	Δ 100 ± 25°/sec			Δ0.3g ±0.2g	Δ0.3g ±0.2g	Δ1.8g ±1.3g
Temp Range	Logic 1 = 3V to 5V at Pin 9					
Operating:	-40° C to +85° C					
Non-Operating:	-55° C to +85° C					
Bandwidth	140 Hz Sensor with 200Hz data update rate					
Temp Sensors	3 Internal Temperature Sensors					
Start-up Time	< 0.3 sec					
Input Power	+3.1V or +5.5V Max. Input Power (single sided)					
Power Consumption	600 mW at 3.3V <i>Typical</i> 750 mW at 3.3V <i>Maximum</i>					
Size	U.S.:	1.97 x 1.77 x 1.25 = 4.4 in ³				
	Metric:	5 x 4.5 x 3.2 = 72 cm ³				
Weight	106 grams					
Mounting	4ea No.8 or M4 Screws					
Shock	500g's ½ sine 30 msec powered					
Vibration	6gRMS (10g accelerometers)					
MTBF	58,976 hrs (per MIL-STD-217F, Notice 2 based on AIC environment with ambient temperature at 40°C)					

Specification subject to change without notice



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