

# MRM 50 Analog IMU



- High Performance and Rugged Non-ITAR Commercial MEMS Analog Output IMU
- $\pm 5$  or  $\pm 2.5$  Volt Signal Output Swing
- Low Gyro Noise  $< 0.0009^\circ/\text{sec}/\sqrt{\text{Hz}}$  ( $100^\circ/\text{sec}$ )
- Low Accel Noise  $< 0.02\text{mg}/\sqrt{\text{Hz}}$  ( $2g$ )
- In Run Gyro Bias  $1^\circ/\text{hour } 1\sigma$
- Fully Temperature Compensated Bias and Scale Factor  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$
- Compensated Misalignment  $1/2 \text{ mrad}$  and g-Sensitivity  $< 0.002^\circ/\text{sec}/g$  typical
- Input Power  $+6V$  to  $+36V$  (single sided)
- Light Weight  $< 500 \text{ grams}$
- Wide Sensor Bandwidth  $200 \text{ Hz}$
- Bandwidth Filtering Capability
- External Sync ( $1 \text{ kHz}$  or  $1 \text{ pps}$ )
- Precision Alignment
- Vibration  $6 \text{ gRMS}$
- Shock Resistant  $500g$ 's
- 6 Internal Temperature Sensors
- Self Test
- High MTBF



## Applications

- Automotive Testing
- Railway Motion Monitoring
- Track Telemetry
- Flight Testing
- Platform & EO/IR Stabilization
- Antenna Stabilization & Pointing
- Laboratory Use

Export Classification:  
Commerce ECCN7A994 (NLR)

**Low Noise, Compensated  
Rugged Analog IMU**

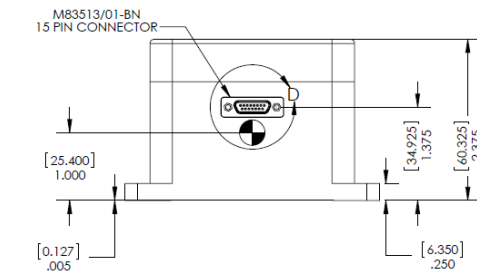
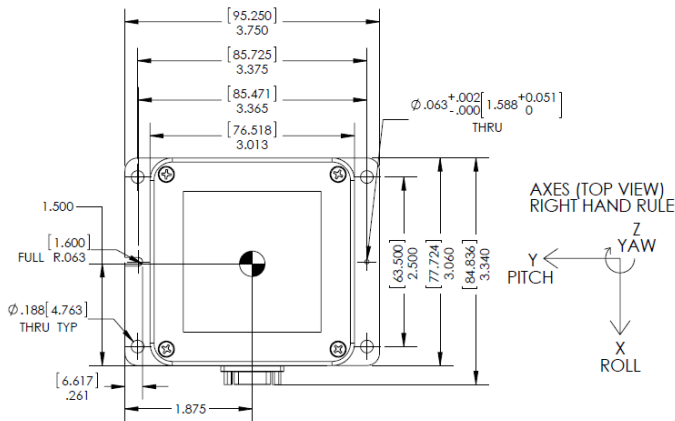


**Gladiator Technologies**  
Division of LKD Aerospace  
High Performance Inertial MEMS

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Rev. 15JMar25  
SN: 600

# MRM 50 Analog IMU



MRM 50 Analog IMU	
MRM50IMU-100-02-100 or -6 or -10	
MRM50IMU-175-02-100 or -6 or -10	
MRM50IMU-300-02-100 or -6 or -10	
MRM50IMU-100-02-250 or -6 or -10	
MRM50IMU-175-02-250 or -6 or -10	
MRM50IMU-300-02-250 or -6 or -10	

## Specification

Pin No.	Assignment
1	RS-485 A (+)
2	RS-485 B (-)
3	Power Ground
4	Case
5	<b>+6V to +36V Input Power</b>
6	External Sync Input (1kHz) Option Connect to ground if not using
7	Temp 50mV/°C (-100) 25mV/°C (-250)
8	Sig Gnd (-100) or 2.5V Ref (-250)
9	Self Test 3.3V Logic Level
10	Roll Gyro (X) Analog Out (see notes below)
11	Pitch Gyro (Y) Analog Out (see notes below)
12	Yaw Gyro (Z) Analog Out (see notes below)
13	X Accelerometer Analog Out (see notes below)
14	Y Accelerometer Analog Out (see notes below)
15	Z Accelerometer Analog Out (see notes below)

For -100 the analog signals are ±5 volts full scale measured with respect to signal ground pin 8.

For -250 the analog signals are ±2.5 volts full scale measured with respect to 2.5V reference pin 8.

Load > 5K Ohms & <100pf on each signal.

PARAMETER	MRM 50 Analog IMU					
	RATE AXES			ACCEL AXES		
Range	±100°/sec	±175°/sec	±300°/sec	±2 g's	±6 g's	±10 g's
Bias (In Run Stability)	1°/hour	1.5°/hour	2°/hour	0.02mg	0.04mg	0.05mg
Angle Random Walk	0.0009°	0.0025°/sec/√Hz	0.003°	0.02	0.065	0.07
Bias (Over Temp.)	<0.01°/sec	<0.02°/sec	<0.02°/sec	<1.0mg	<1.3mg	<1.5mg
Scale Factor	-200	50mV/°s	28.6mV/°s	16.7mV/°s	2.5V/g	0.83V/g
	-250	25mV/°s	14.3mV/°s	8.33mV/°s	1.25V/g	0.415V/g
Scale Factor Error %	≤0.06% (over temperature)					
Sensor Resolution	0.0005°/sec	0.0012°/sec	0.0015°/sec	0.02mg	0.05mg	0.06mg
Alignment	< 0.5 mrad 1σ					
G-Sensitivity	<0.002°/sec/g 1σ					
Self Test On	N/A			Δ 1	Δ 0.35	Δ 0.35
				±0.25g	±0.2g	±0.2g
Temp Range	Logic 1 = 3V to 5V at Pin 9					
Operating:	-40°C to +85°C					
Non-Operating:	-55°C to +100°C					
Bandwidth	200 Hz					
Temp Sensors	6 Internal Temperature Sensors					
Start-up Time	< 0.3 sec					
Input Power	<b>+6.0V to +36V Max. Input (single sided)</b> <b>(Input Transient Protection to 80V)</b>					
Power Consumption	950 mW at +12V typical 1100 mW at +12V maximum					
Size	U.S.:	3.0 X 3.06 X 2.38 = 21.8 in <sup>3</sup>				
	Metric:	7.62 X 7.8 X 6.05 = 360 cm <sup>3</sup>				
Weight	<500 grams					
Mounting	4ea No.8 or M4 Screws					
Shock	500g's ½ sine 2 msec powered					
Vibration	6 gRMS (20Hz - 2KHz ~ 10g accelerometers)					
MTBF	No inherent wear out modes for long life.					

Specification subject to change without notice



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