

# 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  $1\%$  hour  $1\sigma$
- Fully Temperature Compensated Bias and Scale Factor  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$
- Compensated Misalignment  $1/2$  mrad and g-Sensitivity  $< 0.002^\circ/\text{sec}/g$  typical
- Input Power  $+6\text{V}$  to  $+36\text{V}$  (single sided)
- Light Weight  $< 500$  grams
- Wide Sensor Bandwidth  $200$  Hz
- Bandwidth Filtering Capability
- External Sync ( $1$  kHz or  $1$  pps)
- Precision Alignment
- Vibration  $6$  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



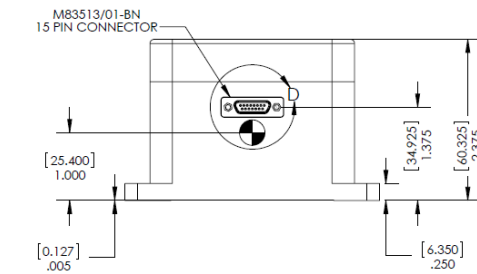
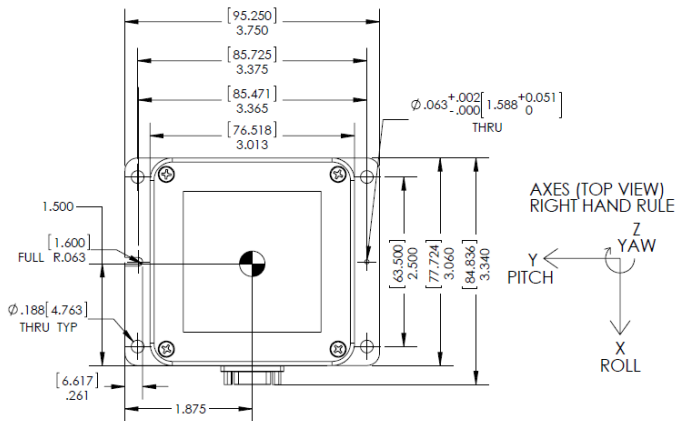
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Rev. 15JMar25  
SN: 600

# 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
Scale Factor Error %	-250	25mV/°s	14.3mV/°s	8.33mV/°s	1.25V/g	0.415V/g
Sensor Resolution	≤0.06% (over temperature)					
Alignment	0.0005°/sec					
G-Sensitivity	0.0012°/sec					
Self Test On	N/A			0.02mg	0.05mg	0.06mg
Temp Range	< 0.5 mrad 1σ					
Bandwidth	<0.002°/sec/g 1σ					
Temp Sensors	Operating: -40°C to +85°C			Δ 1	Δ 0.35	Δ 0.35
Start-up Time	Non-Operating: -55°C to +100°C			±0.25g	±0.2g	±0.2g
Input Power	Logic 1 = 3V to 5V at Pin 9					
Power Consumption	200 Hz					
Size	6 Internal Temperature Sensors					
Weight	< 0.3 sec					
Mounting	Input Power <b>+6.0V to +36V Max. Input (single sided)</b> <b>(Input Transient Protection to 80V)</b>					
Shock	950 mW at +12V typical 1100 mW at +12V maximum					
Vibration	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>		
MTBF	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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