

LandMark™ 50 IMU



- High Performance NON-ITAR Commercial MEMS IMU
- Ultra Low Gyro Noise $0.0009^\circ/\text{sec}/\sqrt{\text{Hz}}$ $\sim 0.038^\circ/\sqrt{\text{Hz}}$
- Low Accel Noise $0.02\text{mg}/\sqrt{\text{Hz}}$ (2g)
- In-Run Gyro Bias $1^\circ/\text{hour } 1\sigma$
- Fully Compensated Bias and Scale Factor Over Temperature -40°C to $+85^\circ\text{C}$
- Compensated Misalignment $< \frac{1}{2} \text{ mrad}$
- G-Sensitivity $< 0.002^\circ/\text{sec}/\text{g}$ typical
- Input Power $+6\text{V}$ to $+36\text{V}$ (single sided)
- Light Weight 450 grams
- Small Size $< 321\text{cm}^3/19.6\text{in}^3$
- RS422/ RS485 Serial Data Format
- Data Rate 1000 Hz (user selectable) Internally Sampled @ 4kHz
- Wide Sensor Bandwidth 200 Hz
- Bandwidth Filtering Capability
- External Sync (1 kHz or 1 pps)
- Precision Alignment
- Internal Vibration Isolation 6 gRMS
- Shock Resistant 500g's
- 6 Internal Temperature Sensors
- Self Test
- MTBF 37,100 Hours

Export Classification:
Commerce ECCN7A994



Applications

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

**High Performance MEMS IMU with
Ultra Low Noise & Bias Performance**

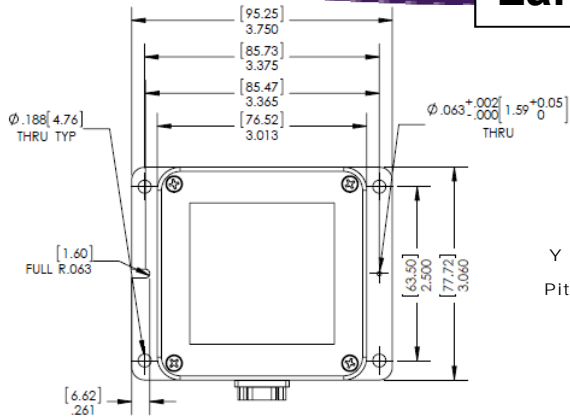


Gladiator Technologies
Division of LKD Aerospace
High Performance Inertial MEMS

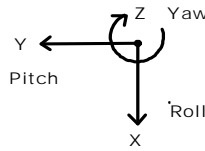
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Rev. 15JUL17
SN: 600

LandMark™ 50 IMU

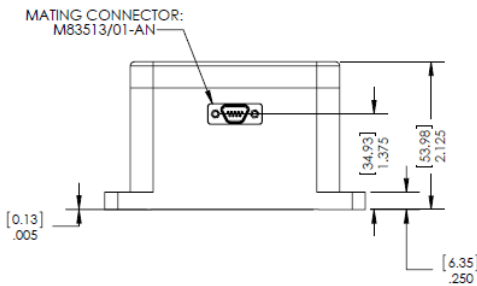


Axes (Top View)
Right Hand Rule



LandMark™ 50 IMU		
LMRK50IMU-100-02-100	or -06	or -10
LMRK50IMU-175-02-100	or -06	or -10
LMRK50IMU-300-02-100	or -06	or -10

Specification



Pin No.	Assignment
1	RS-422/RS-485 A (+)
2	RS-422/RS-485 B (-)
3	Power Ground
4	Analog/Digital Input (0V to 5V)
5	+6.0V to +36V Input Power
6	External Sync Input (1kHz or 1pps)
7	+5V Regulator Out
8	Signal Ground
9	Self Test

Note: Any unused inputs (Pins 4, 6, 9) must be connected to signal ground (Pin 8).

Outputs	Serial Sequence at 200Hz
1	Roll Gyro (X)
2	Pitch Gyro (Y)
3	Yaw Gyro (Z)
4	X Accelerometer
5	Y Accelerometer
6	Z Accelerometer
7	Temperature $\pm 0.5^\circ\text{C}$ Typical

PARAMETER	LandMark™ 50 IMU					
	RATE AXES			ACCEL AXES		
Range	$\pm 100^\circ/\text{sec}$	$\pm 175^\circ/\text{sec}$	$\pm 325^\circ/\text{sec}$	$\pm 2\text{ g's}$	$\pm 6\text{ g's}$	$\pm 10\text{ g's}$
Bias (In Run Stability)	$1^\circ/\text{hr}$	$1.5^\circ/\text{hr}$	$2^\circ/\text{hr}$	0.02mg	0.04mg	0.05mg
Angle Random Walk	0.0009°	0.0025°	0.003°	0.02	0.065	0.07
	$/\text{sec}/\sqrt{\text{Hz}} \quad 1\sigma$			$\text{mg}/\sqrt{\text{Hz}} \quad 1\sigma$		
Bias (Over Temp.)	$<0.01^\circ/\text{sec}$	$<0.02^\circ/\text{sec}$	$<0.02^\circ/\text{sec}$	$<1.0\text{mg}$	$<1.3\text{mg}$	$<1.5\text{mg}$
	1σ			1σ		
Scale Factor Error %	$\leq 0.06\%$ (over temperature)					
Non-Linearity % of FS	<0.1	<0.5	<2	<0.025	<0.05	
Sensor Resolution	$0.0005^\circ/\text{sec}$	$0.0012^\circ/\text{sec}$	$0.0015^\circ/\text{sec}$	0.02mg	0.05mg	0.06mg
Alignment	$< 0.5\text{ mrad } 1\sigma$					
G-Sensitivity	$<0.002^\circ/\text{sec}/\text{g } 1\sigma$					
Self Test On	N/A			$\Delta 1$	$\Delta 0.35$	$\Delta 0.35$
				$\pm 0.25\text{g}$	$\pm 0.2\text{g}$	$\pm 0.2\text{g}$
	Logic 1 = 3V to 5V at Pin 9					
Temp Range	Operating: Non-Operating:			-40°C to $+85^\circ\text{C}$ -55°C to $+100^\circ\text{C}$		
RS422/485 Update Rate	1000Hz, 500Hz, 200Hz, 100Hz, or 10Hz (user selectable) (internally sampled at 4kHz)					
Temp Sensors	6 Internal Temperature Sensors					
Start-up Time	$< 0.3\text{ sec}$ at 200 Hz					
Input Power	+6.0V to +36V Max. Input (single sided) (Input Transient Protection to 80V)					
Power Consumption	640 mW at +12V typical 730 mW at +12V maximum					
	U.S.:	$3.0 \times 3.06 \times 2.13 = 19.6\text{ in}^3$				
	Metric:	$7.62 \times 7.8 \times 5.4 = 321\text{cm}^3$				
Weight	$\leq 450\text{ grams}$					
Mounting	4ea No.8 or M4 Screws					
Shock	500g's 1/2 sine 1 msec powered					
Vibration	6 gRMS (20Hz - 2KHz ~ 10g accelerometers)					
MTBF	37,100 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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