

LandMark™ 20 IMU



- **Ultra Low Noise Small MEMS IMU**
- **Low Gyro Noise** $0.01^\circ/\text{sec}/\sqrt{\text{Hz}}$
- **Low Accel Noise** $0.05\text{mg}/\sqrt{\text{Hz}}$ (2g)
- **In-Run Gyro Bias** $15^\circ/\text{hour}$ 1σ
- **Rugged Environmentally Sealed Packaging & MILSPEC Connector**
- **Fully Temperature Compensated Bias and Scale Factor**
- **Compensated Misalignment** 1mrad and **g-Sensitivity** $<0.02^\circ/\text{sec}/\text{g}$ 1σ
- **External Sync Input** (1kHz or 1pps)
- **Low Power** $<400\text{ mW}$ Typical
- **Low Voltage** $+3.3\text{V}$ (single sided power)
- **Light Weight** $\leq 110\text{ grams}$
- **Small Size** $< 72\text{cm}^3/4.4\text{in}^3$
- **Sensor Bandwidth** 140 Hz
- **Bandwidth Filtering Capability**
- **RS485 Data Rate** 500 Hz (user selectable)
- **Internal Vibration Isolation**
- **Precision Alignment**
- **Internal Temperature Sensors**

**Rugged Low Noise MEMS IMU
with Small Size & Low Power**

Export Classification: Commerce ECCN7A994

The latest model of our LandMark™ 20 IMU is our mid-performance version of our small LandMark™ IMU family and is 10/20/40 form, fit and function interchangeable. The unit features low noise gyros and accelerometers with exceptional bias in-run and bias over temperature performance in a small light weight ruggedized environmentally sealed enclosure with MILSPEC connector. The unit also features low power consumption, small size, light weight and long life MTBF. The **signature feature** of the IMU is the **low noise gyros and accels**, which enable precision measurement. The IMU's performance is optimized with **fully temperature compensated bias and scale factor and compensated misalignment and g-sensitivity**. The unit is highly durable and employs an FEA designed internal vibration isolator that can withstand environmental vibration and shock typically associated with commercial aircraft requirements. LandMark™ IMU's also include built-in firmware to accept external velocity as well as an external sync input 1 kHz (or 1pps indication). The unit is well suited for the harsh environments of commercial automotive and motorcycle testing, motorsports racing, aircraft and sea applications that require both low cost and high performance as well as rugged durability.



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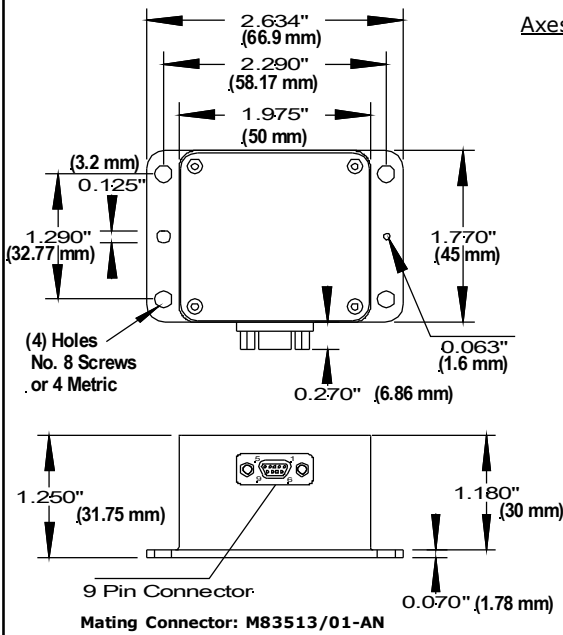
High Performance Inertial MEMS

Gladiator Technologies, Inc.

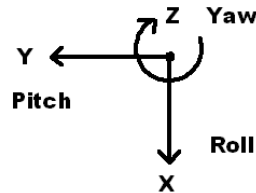
8022 Bracken Place SE
Snoqualmie, WA 98065 USA
Tel: 425.396.0829 Fax: 425.396.1129
Email: sales@gladiatortechnologies.com
Web: www.gladiatortechnologies.com

Rev. 13Feb21
SN: 200

LandMark™ 20 IMU



Axes (Top View) Right Hand Rule



LandMark™ 20 IMU

LMRK20IMU-075-02-300 or -10
LMRK20IMU-150-02-300 or -10
LMRK20IMU-300-02-300 or -10

Specification

PARAMETER	RATE AXES			ACCEL AXES	
Range	±75°/sec	±150°/sec	±300°/sec	±2 g's	±10 g's
Bias (Over Temp.)	<0.05°/sec 1 σ			< 1.0mg 1 σ	< 1.5mg
Bias (In Run Stability)	15°/hour 1 σ			0.02mg 1 σ	0.1mg
Scale Factor Error %	≤0.1% (over temperature) 1 σ				
Sensor Resolution	0.005°/sec			0.025mg	0.08mg
Angle Random Walk	0.01°/ /sec/√Hz 1 σ			0.05mg /√Hz 1 σ	0.16mg /√Hz 1 σ
Alignment	1mrad 1 σ				
G-Sensitivity	<0.02°/sec/g 1 σ				
Self Test On	Δ 50 ± 25°/sec			Δ 1.5 ±0.5g	Δ 0.3 ±0.2g
	Logic 1 = 3V to 5V at Pin 9				
Temp Range	Operating: -40°C to +85°C Non-Operating: -55°C to +85°C				
Update Rate	500 Hz, 200 Hz, 100 Hz, or 10 Hz (user selectable)				
Temp Sensors	Internal Temperature Sensors				
Start-up Time	< 0.3 sec at 200 Hz				
Input Power	+3.1V to 5.5V Max. Input (single sided)				
Power Consumption	400 mW at 3.3V Typical 450 mW at 3.3V Maximum				
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	≤ 110 grams				
Mounting	4ea No.8 or M4 Screws				
Shock	500g's ½ sine 30 msec powered				
Vibration	6gRMS (20Hz to 2KHz ~ 10g accelerometers)				
MTBF	55,279 hrs (per MIL-STD-217F, Notice 2 based on AIC environment with ambient temperature at 40°C)				

Pin No.	Assignment
1	RS-485 A (+)
2	RS-485 B (-)
3	Power Ground
4	Analog/Digital Input (0V to 5V)
5	+3.1V to +5.5V 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 ± 0.5° C typical

Specification subject to change without notice



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