

LANDMARK20 MEMS IMU



- **Low Noise Silicon MEMS Digital IMU**
- **Low Gyro Noise** $0.028^\circ/\text{sec}/\sqrt{\text{Hz}}$
- **Fully Temperature Compensated Bias and Scale Factor**
- **Compensated Misalignment and g-Sensitivity** $<0.03\%/ \text{sec}/\text{g}$ typical
- **In-Run Gyro Bias** $30\%/ \text{hour}$ 1σ
- **Low Power** $1/2$ watt typical
- **Light Weight** 113 grams
- **Small Size** $< 67.5\text{cm}^3/4.1\text{in}^3$
- **Low Voltage** $+3.0$ to 4.2V (single sided)
- **Wide Bandwidth** 100 Hz (user selectable)
- **Bandwidth Filtering Capability**
- **RS485 Output** 200 Hz (user selectable)
- **Vibration Isolation**
- **Precision Alignment**
- **3 Internal Temp. Sensors**
- **Self Test**
- **Shock Resistant**
- **Long Life**

Low Noise MEMS IMU With Improved Bias Performance

The all new LandMark20 MEMS IMU is a silicon low noise digital Inertial Measurement Unit (IMU) that provides internally temperature compensated RS485 output of delta velocity and delta theta.

The LandMark20 IMU is ideal for applications requiring improved performance MEMS gyros, but also needing ultra low power consumption, small size, light weight and no inherent wear out modes for long life. The signature feature of the LandMark20 IMU is the improved gyro performance. The **low noise gyros** enable precision measurement and improved in-run and bias over temperature. The IMU's performance is optimized with **fully temperature compensated bias and scale factor and compensated misalignment and g-sensitivity**. The rate outputs are free from bias steps and linear outputs are without acceleration hysteresis. The unit is highly durable and can withstand environmental vibration and shock typically associated with commercial aircraft requirements.



The LandMark20 IMU is well suited for low cost navigation, precision platform and antenna stabilization, general aviation as well as laboratory use. The LandMark20 IMU is ideal where low noise and excellent modeled performance coupled with small size, low power and light weight are desired for digital MEMS IMU applications.

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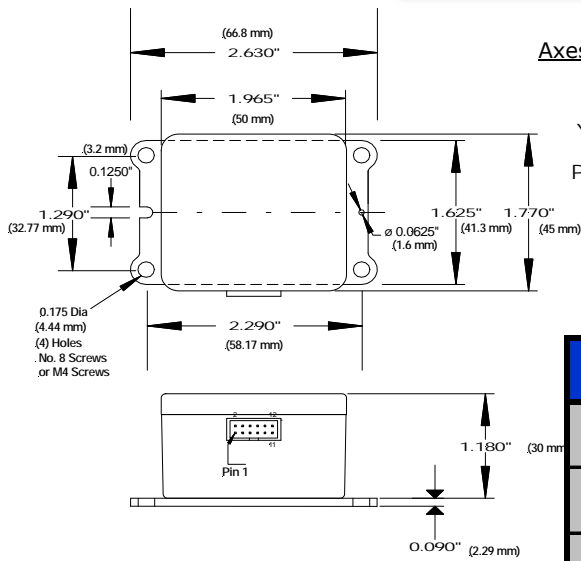


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Standard LandMark20 IMU

LMRK20IMU-075-02-100
 LMRK20IMU-075-10-100
 LMRK20IMU-150-02-100
 LMRK20IMU-150-10-100
 LMRK20IMU-300-02-100
 LMRK20IMU-300-10-100

Pin No.	Assignment
1	RS-485 A
2	RS-485 B
3	Input Ground
4	Input Spare
5	+3.0V to 4.2V Input
6	Input Spare
7	Input Spare
8	Signal Ground
9	Self Test Input
10	3.3V Regulator Out
11	5V Regulator Out
12	Case

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 $\pm 0.5^\circ$ C typical

PARAMETER	RATE AXES		ACCEL AXES	
	Range	$\pm 75^\circ/\text{sec}$ or $\pm 150^\circ/\text{sec}$	$\pm 300^\circ/\text{sec}$	$\pm 1.7 \text{ g's}$
Bias (Over Temp.)	$< 0.1^\circ/\text{sec}$ <i>typical</i>		$< 3\text{mg}$ <i>typical</i>	$< 10\text{mg}$ <i>typical</i>
Bias (In Run Stability)	$30^\circ/\text{hour}$ 1σ		0.5mg <i>typical</i>	2mg <i>typical</i>
Scale Factor Error %	$\leq 0.5\%$ (over temperature)			
Resolution	$0.01^\circ/\text{sec}$	$0.01^\circ/\text{sec}$	0.3mg	1mg
Analog Noise Density	$0.028^\circ/\text{sec}/\sqrt{\text{Hz}}$	$0.035^\circ/\text{sec}/\sqrt{\text{Hz}}$	$0.07\text{mg}/\sqrt{\text{Hz}}$	$0.5\text{mg}/\sqrt{\text{Hz}}$
Alignment	1mrad <i>typical</i>			
G-Sensitivity	$< 0.03^\circ/\text{sec}/\text{g}$ <i>typical</i>			
Self Test On	$\Delta +50$ $\pm 30^\circ/\text{sec}$	$\Delta +54$ $\pm 40^\circ/\text{sec}$	$\Delta > +1.7\text{g}$	$\Delta +7$ $\pm 1.3\text{g}$
	Logic 1 = 3V to 5V at Pin 9			
Temp Range	Operating: -40°C to $+85^\circ\text{C}$ Non-Operating: -55°C to $+85^\circ\text{C}$			
Update Rate	200 Hz or 100 Hz (<i>user selectable</i>)			
Temp Sensors	3 Internal Temperature Sensors			
Start-up Time	$< 1 \text{ sec}$			
Input Power	$+3.0\text{V}$ to 4.2V Input (<i>single sided</i>)			
Power Consumption	450 mW at 3.3V <i>Typical</i> 550 mW at 3.3V <i>Maximum</i>			
Size	U.S.:	$1.965 \times 1.77 \times 1.18 = 4.1 \text{ in}^3$		
	Metric:	$5 \times 4.5 \times 3 = 67.5 \text{ cm}^3$		
Weight	113 grams			
Mounting	4ea No.8 or M4 Screws			
Shock	500g's $\frac{1}{2}$ sine 30 msec powered			
Vibration	6gRMS (10g accelerometers)			
MTBF	No inherent wear out modes for long life.			

Specification subject to change without notice



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