

MEMS LANDMARK10 Digital IMU



- **Low Cost Silicon MEMS 6 DOF Digital IMU**
- **Fully Temperature Compensated Bias, Scale Factor, Misalignment and g-Sensitivity**
- **In Run Gyro Bias** *10° to 100°/hour typical*
- **Low Power** *< 1/3 watt typical*
- **Light Weight** *108 grams*
- **Small Size** *< 67.5cm³/4.1in³*
- **Low Voltage** *+5V (single sided power)*
- **Bandwidth** *100 Hz (user selectable)*
- **RS485 Output** *200 Hz (user selectable)*
- **Bandwidth Filtering Capability**
- **Vibration Isolation**
- **Precision Alignment**
- **3 Internal Temp. Sensors**
- **Self Test**
- **Shock Resistant**
- **Long Life**

Thermally Compensated Delta Velocity and Delta Theta

Export Classification: Commerce ECCN7A994

The all new MEMS LandMark10 IMU is an all silicon 6 degree of freedom (6DoF) digital Inertial Measurement Unit (IMU) that provides internally temperature compensated RS485 output of delta velocity and delta theta.

The LandMark10 IMU is ideal for applications requiring ultra low power consumption (*< 1/3 watt typical*), small size (*< 67.5cm³/4.1in³*), light weight (*108 grams / .24lbs*) and no inherent wear out modes for long life. The signature



feature of the LandMark10 IMU is the performance, which is optimized with **fully temperature compensated bias, scale factor, misalignment and g-sensitivity**. In addition, 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 LandMark10 IMU offers standard rate ranges of $\pm 75^\circ/\text{sec}$, $\pm 150^\circ/\text{sec}$ or $\pm 300^\circ/\text{sec}$ and $\pm 1.7g$ or $\pm 12g$ of linear acceleration. Other rate ranges and g levels are available. This IMU is well suited for low cost navigation, antenna stabilization and pointing, general aviation as well as laboratory use. The LandMark10 IMU is ideal where excellent modeled performance coupled with small size, low power and light weight are desired for MEMS digital IMU applications.

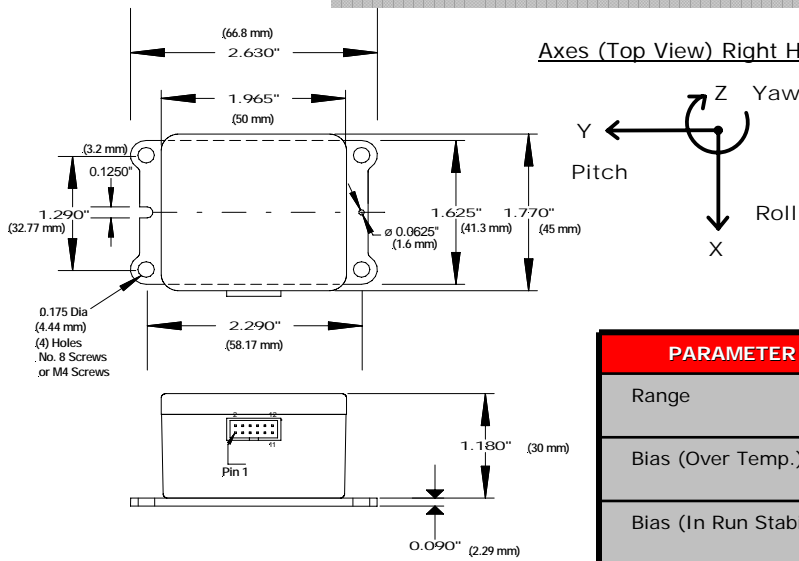


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Standard LandMark10 IMU
 LMRK10IMU-300-12-100
 LMRK10IMU-150-02-100
 LMRK10IMU-075-02-100

Pin No.	Assignment
1	RS-485 A
2	RS-485 B
3	Input Ground
4	Input Spare
5	+3.0V to 5.25V 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.)	$< 0.2^\circ/\text{sec}$ <i>typical</i>		$< 3\text{mg}$ <i>typical</i>	$< 10\text{mg}$ <i>typical</i>
Bias (In Run Stability)	10° to $100^\circ/\text{hour}$ <i>typical</i>		0.5mg <i>typical</i>	2mg <i>typical</i>
Scale Factor Error %	$\leq 1\%$ (<i>over temperature</i>)			
Resolution	$0.03^\circ/\text{sec}$	$0.075^\circ/\text{sec}$	0.3mg	2mg
Noise	$0.05^\circ/\text{sec}/\sqrt{\text{Hz}}$	$0.1^\circ/\text{sec}/\sqrt{\text{Hz}}$	$0.07\text{mg}/\sqrt{\text{Hz}}$	$0.5\text{mg}/\sqrt{\text{Hz}}$
Alignment	1mrad <i>typical</i>			
G-Sensitivity	$< 0.10^\circ/\text{sec/g}$ <i>typical</i>			
Self Test On	$\Delta +50$ $\pm 30^\circ/\text{sec}$	$\Delta +54$ $\pm 40^\circ/\text{sec}$	Δ $> +1.7\text{g}$	$\Delta +7$ $\pm 1.3\text{g}$
	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 100Hz (<i>user selectable</i>)			
Temp Sensors	3 Internal Temperature Sensors			
Start-up Time	$< 1 \text{ sec}$			
Input Power	$+3.0\text{V}$ to 5.25V Input <i>Single Sided</i>			
Power Consumption	280 mW at 3.3V <i>Typical</i> 330 mW at 3.3V <i>Maximum</i>			
Size	U.S. Metric	$1.965 \times 1.77 \times 1.18 = 4.1 \text{ in}^3$ $5 \times 4.5 \times 3 = 67.5 \text{ cm}^3$		
Weight	108 grams			
Mounting	4ea No. 8 or M4 Screws			
Shock	500g's $\frac{1}{2}$ sine 30 msec powered			
Vibration	6gRMS (<i>12g accelerometers</i>)			
MTBF	No inherent wear out modes for long life.			

Specification subject to change without notice



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