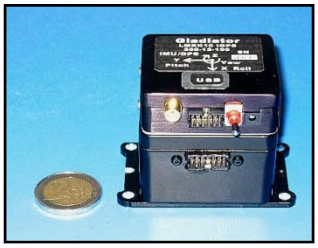
LANDMARK20 MEMS IMU/GPS

- **Low Noise Silicon MEMS IMU & GPS**
- **Fully Compensated Bias, Scale Factor, Misalignment & g-Sensitivity** *<0.03°/sec/g*
- **In-Run Gyro Bias** *30°/hour 1σ*
- **RS485 Output** *200Hz/Inertial 10Hz/GPS*
- **GPS Update Rate - 10Hz Raw Data / 4 Hz Position Data**
- **GPS Receiver - 16 Channel C/A Code**
- **Synchronized Timing Outputs for Inertial and GPS Data**
- **Supports DGPS, WAAS, EGNOS and MSAS**
- **Rechargeable Battery Power** *up to (4 hrs int. / 12 hrs ext.)*
- **Low Power** *< 550 milliwatts typical*
- **Light Weight** *< 153/(193 grams w/battery)*
- **Small Size** *< 115cm³/7in³*
- **Low Voltage** *+3.3V (single sided power)*
- **Sensor Bandwidth** *100 Hz*
- **Vibration Isolation, Precision Alignment, Shock Resistant**
- **Self Test & Internal Temp Sensors**

Synchronized Timing & Rechargeable Battery Power

The all new MEMS LandMark20 IMU/GPS is a low noise and ultra low power combined IMU that provides internally temperature compensated RS485 output of delta velocity and delta theta and a 16 channel C/A code GPS receiver with 10Hz raw data/4Hz position update rate.



The LandMark20 IMU/GPS is ideal for applications requiring low gyro noise, ultra low power consumption or autonomous power, small size, light weight, as well as no inherent wear out modes for long life.

The signature feature of the LandMark20 IMU/GPS is the performance, which is optimized with **misalignment and g-sensitivity compensation plus fully temperature compensated bias and scale factor, 4Hz position update rate GPS with synchronized timing and rechargeable battery power.** 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 LandMark20 IMU/GPS offers various standard ranges and other customer options are available. This IMU/GPS is well suited for low cost flight control, navigation, antenna stabilization and pointing, general aviation as well as laboratory use. The LandMark20 IMU/GPS is ideal where excellent modeled performance, coupled with small size, ultra low or autonomous power and light weight are desired for MEMS digital IMU/GPS applications.

Gladiator Technologies, Inc.

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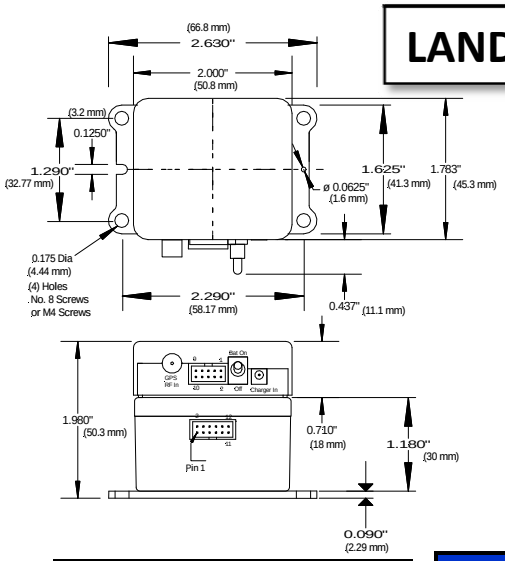
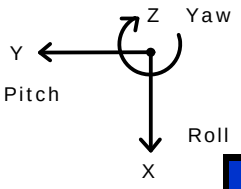
LANDMARK20 MEMS IMU/GPS



Axes (Top View) Right Hand Rule



Standard LandMark20 IMU/GPS
LMRK20IGPS-075-02-100 or -200
LMRK20IGPS-075-10-100 or -200
LMRK20IGPS-150-02-100 or -200
LMRK20IGPS-150-10-100 or -200
LMRK20IGPS-300-02-100 or -200
LMRK20IGPS-300-10-100 or -200

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 or 100Hz
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

GPS Output	Serial Data NMEA-1083
1	GGA-GPS Fix Data
2	GLL-Latitude & Longitude
3	GSA-DOP & Active Satellites
4	GSV-GPS Satellites in View
5	RMC-Recommended Min Data
6	VTG-Ground Speed
7	ZDA-Time & Date
8	DTM- Datum Reference
9	TXT- Text Transmission
10	(Other Data Selectable)

Pin No.	GPS Assignment
J1	GPS Antenna
1	+3.0V to +4.2VDC Ext. Input
2	Power Ground
3	GPS RS485 A
4	GPS RS485 B
5	Signal Ground
6	Battery Out (to IMU)
7	/RE (Not Read Enable)
8	DE (Drive Enable)
9	1kHz Sync Pulse (to IMU)
10	+3.3V Power

PARAMETER	RATE AXES		ACCEL AXES	
Power Requirements				
Input Voltage	+3.0V to 4.2VDC (or internal battery at 3.7V)			
Input Current *Typical (Max)*	550mW (600mW)			
Battery Life	4 hours *typical (internal battery)* / 12 hours *typical (external battery)*			
Performance				
Standard Full Scale Ranges	±75°/sec or ±150°/sec	±300°/sec	±1.7 g's	±10 g's
Scale Factor Error %	≤0.1% (over temperature) typical			
Bias In-Run Stability	30°/hour *1 σ*		0.5mg *typical*	2mg *typical*
Bias Over Temperature	<0.1°/sec *typical*		<3mg *typical*	<10mg *typical*
Resolution	0.01°/sec	0.01°/sec	0.3mg	2mg
Analog Noise Density	0.028°/sec/√Hz	0.035°/sec/√Hz	0.07mg/√Hz	0.5mg/√Hz
Alignment	1mrad *typical*			
G-Sensitivity	< 0.03°/sec/g *typical*			
Accuracy	2.5 m CEP			
Start-Up Time (Inertial)	< 1 sec			
GPS Acquistion (cold start)	< 30 sec			
GPS Reacquisition (warm start)	< 1 sec			
Update Rate (Inertial)	200 Hz or 100 Hz *(user selectable)*			
Data Rate (GPS)	Raw Data 10 Hz / Position Data 4 Hz *typical*			
Weight	< 187 grams or < 147 grams *(without battery)*			
Size *U.S.*	2.0 x 1.98 x 1.783 = 7.0 in^3			
Metric	5.1 x 5..0 x 4.5 = 116 cm^3			
Operating Life	10 Years *typical*			
Environments				
Operating Temperature	-40°C to +85°C *(without battery)* -30°C to +70°C *(with battery)*			
Storage Temperature	-55°C to +100°C *(without battery)* -30°C to +70°C *(with battery)*			
Vibration Operating	6gRMS *(10g accelerometers)*			
Shock	500g's ½ sine 30 msec powered, any axis			

Specification subject to change without notice

Gladiator Technologies, Inc.

Sold Through:
LKD Aerospace, Inc. Snoqualmie, WA 98065
Tel: (425) 396-0829 Fax: (425) 396-1129
Email: sales@gladiatortechnologies.com
Web: www.gladiatortechnologies.com

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