

## LandMark™ 40 AHRS



- **Ultra Low Noise MEMS AHRS**
- **Form, Fit and Function with LandMark™ 10 and 20 AHRS's**
- **Low Gyro Noise**  $0.002\%/sec/\sqrt{Hz}$   $1\sigma$
- **Low Accel Noise**  $0.04mg/\sqrt{Hz}$   $1\sigma$
- **In-Run Gyro Bias**  $6^\circ/hour$   $1\sigma$
- **Heading (Yaw) Angles**  $0.6^\circ$  stationary
- **Pitch & Roll Angles**  $0.25^\circ$  stationary
- **Altitude**  $\pm 3$  meter  $1\sigma$
- **Rugged Environmentally Sealed Packaging & MILSPEC Connector**
- **Fully Temperature Compensated Bias and Scale Factor**
- **Compensated Misalignment**  $1mrad$   $1\sigma$  and **g-Sensitivity**  $<0.01\%/sec/g$   $1\sigma$
- **External Sync Input** (1kHz or 1pps)
- **Low Power**  $<515$  mW Typical
- **Low Voltage**  $+3.3V$  (single sided power)
- **Light Weight** 113 grams
- **Small Size**  $< 72cm^3/4.4in^3$
- **Bandwidth Filtering Capability**
- **RS485 Data Rate** 100 Hz (user selectable)
- **Internal Vibration Isolation**

**Next Generation Ultra Low Noise MEMS AHRS**

Export Classification: Commerce ECCN7A994

The LandMark™ 40 AHRS is the next generation of our 4.4in<sup>3</sup> family of AHRS's and is form, fit and function interchangeable with our popular LandMark™ 10 and 20 AHRS's, enabling existing users an easy upgrade option to superior performance. The unit features ultra low noise gyros and accelerometers with exceptional bias in-run and bias over temperature performance in a small, light weight and ruggedized environmentally sealed enclosure with MILSPEC connector. The LandMark™ 40 is ideal for applications demanding very low noise and excellent performance coupled with requirements for both small size and challenging environments requiring lower cost MEMS. Proven performance in a

multitude of applications by it's predecessor LandMark™ 10 and 20 AHRS's, this next generation AHRS features low power consumption, small size, light weight, long life MTBF and a proven internal vibration isolator for rugged durability. The **signature feature** of this AHRS is the **very low noise gyros**, enabling precision measurement for demanding stabilization applications. The AHRS's performance is optimized with **fully temperature compensated bias and scale factor and compensated misalignment and g-sensitivity**. The unit is well suited for the harsh environments of aircraft, land and sea stabilization applications. Other standard ranges available (consult factory).

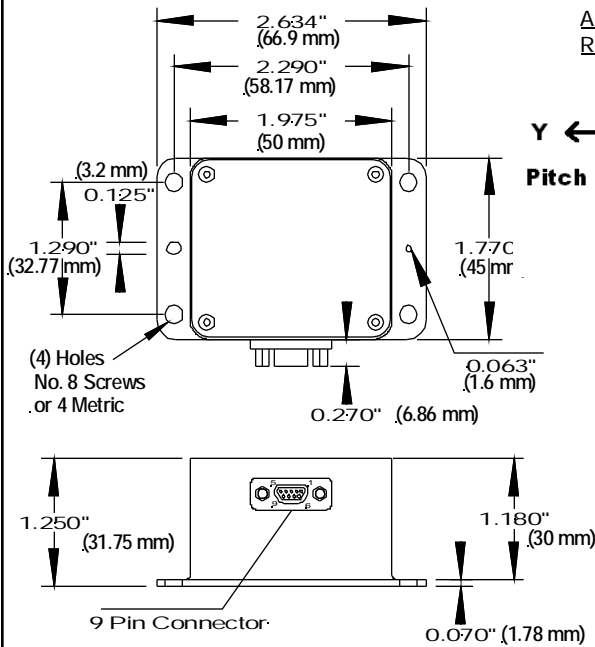


**Gladiator Technologies**  
  
**High Performance Inertial MEMS**

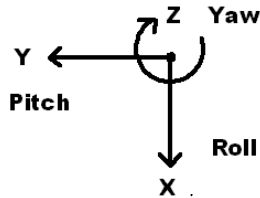
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# LandMark™ 40 AHRS



Axes (Top View)  
Right Hand Rule



## LandMark™ 40 AHRS

LMRK40AHRS-100-02-100 or -10  
LMRK40AHRS-300-02-100 or -10

## Specification

PARAMETER	RATE AXES		ACCEL AXES	
Range	±100°/sec	±300°/sec	±2 g's	±10 g's
Bias (Over Temp.)	<0.1°/sec 1σ	<0.15°/sec 1σ	< 0.5mg 1σ	< 1.0mg 1σ
Bias (In Run Stability)	6°/hour 1σ		0.02mg 1σ	0.08mg 1σ
Scale Factor Error %	≤0.1% (over temperature) 1σ			
Resolution	0.001°/sec		0.02mg	0.06mg
Angle Random Walk	0.002° /sec/√Hz 1σ	0.004° /sec/√Hz 1σ	0.04mg /√Hz 1σ	0.12mg /√Hz 1σ
Alignment	1mrad 1σ			
G-Sensitivity	<0.01°/sec/g 1σ			
Self Test On	N/A		Δ 1.5 ±0.5g	Δ 0.3g ± 0.2g
	Logic 1 = 3V to 5V at Pin 9 (open = off)			
Temp Range				
Operating:	-40°C to +85°C			
Non-Operating:	-55°C to +85°C			
Heading	± 0.5° stationary			
Pitch & Roll	± 0.25° stationary			
Altitude	± 3m 1σ			
Update Rate	100 Hz or 10 Hz (user selectable)			
Temp Sensors	Internal Temperature Sensors			
Start-up Time	< 0.65 sec AHRS 200 Hz Spec Mode			
Input Power	+3.1V to 5.5V Max. Input (single sided)			
Power Consumption	515 mW at 3.3V typical 675 mW at 3.3V maximum			
Size	U.S.: Metric:	1.97 x 1.77 x 1.25 = 4.4 in <sup>3</sup> 5 x 4.5 x 3.2 = 72 cm <sup>3</sup>		
Weight	113 grams			
Mounting	4ea No.8 or M4 Screws			
Shock	500g's ½ sine 30 msec powered			
Vibration	6gRMS (20Hz to 2KHz ~ 10g accelerometers)			
MTBF	31,428 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 100Hz
1, 2, 3	Gyros: Roll (X), Pitch (Y), Yaw (Z)
4, 5, 6	Accelerometers: (X), (Y), (Z)
7	IMU Temperature
8, 9, 10	Magnetometers: (X), (Y), (Z)
11	Pressure
12, 13, 14	Angles: Roll, Pitch, Yaw
15, 16, 17	AC Velocities: (X), (Y) & Vertical Velocity: (Z)
18, 19, 20	Altitude, Temp, Forward Velocity

User to provide either analog or external velocity for velocity functions to be enabled (pin 4).

Specification subject to change without notice



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