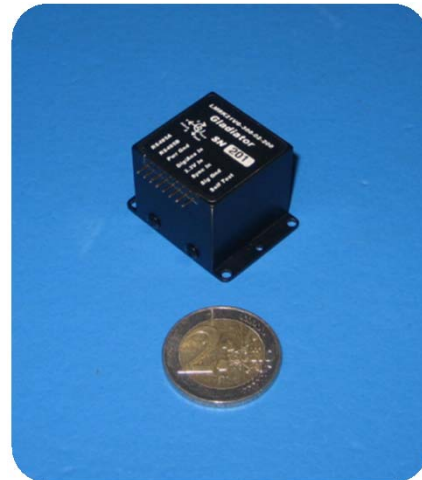


## LandMark™ 21 AHRS



- **NON-ITAR Miniature Low Noise AHRS**
- **Rugged Packaging**
- **Low Noise Silicon MEMS AHRS**
- **Low Gyro Noise**  $0.004^\circ/\text{sec}/\sqrt{\text{Hz}}$  ( $100^\circ/\text{sec}$ )
- **Low Accel Noise**  $0.25\text{mg}/\sqrt{\text{Hz}}$  ( $6g$ )
- **In-Run Gyro Bias**  $10^\circ/\text{hour}$   $1\sigma$
- **Heading (Yaw) Angles**  $0.5^\circ$  typical
- **Pitch & Roll Angles**  $0.25^\circ$  typical
- **Fully Temperature Compensated Bias and Scale Factor**
- **Compensated Misalignment**  $1\text{mrad}$  and **g-Sensitivity**  $<0.02^\circ/\text{sec}/g$  typical
- **External Sync Input** ( $1\text{kHz}$  or  $1\text{pps}$ )
- **Low Power**  $<550\text{ mWatt}$  typical
- **Low Voltage**  $+3.3\text{V}$  (single sided power)
- **Light Weight**  $38\text{ grams}$
- **Small Size**  $< 1.23\text{in}^3$
- **Wide Sensor Bandwidth**  $200\text{ Hz}$
- **Bandwidth Filtering Capability**
- **RS485 Data Rate**  $100\text{ Hz}$  (user selectable)
- **Internal Vibration Isolation**
- **Internal Temperature Sensors**

Export Classification: Commerce ECCN7A994



### Applications

Airborne Platform Stabilization  
Antenna Stabilization & Pointing  
EO/IR Stabilization  
LIDAR Stabilization  
Navigation  
Flight Testing  
Racing Yacht Marine Compass

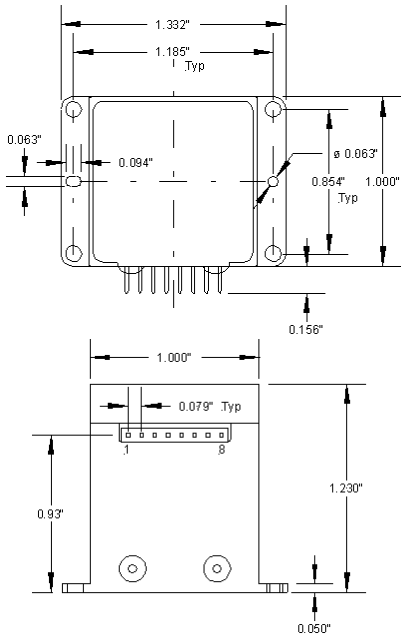
**Very Small, Rugged, Low Power, Low Noise And Accurate MEMS AHRS**



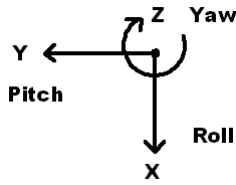
**Gladiator Technologies**  
Division of LKD Aerospace  
High Performance Inertial MEMS



# LandMark™ 21 AHRS



Axes (Top View)  
Right Hand Rule



LandMark™ 21 AHRS
LMRK21AHRS-100-06-100 or -10
LMRK21AHRS-300-06-100 or -10

## Preliminary Specification

Note: Front two No.2 button head screws provide cable clamp and case/shield ground

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 +4.2V Input Power
6	External Sync Input (1kHz or 1pps)
7	Signal Ground
8	Self Test In

Note: Any unused inputs (Pins 4, 6, 8) must be connected to signal ground (Pin 7).

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 - N/A
12, 13, 14	Angles: Roll, Pitch, Yaw
15, 16, 17	AC Velocities: (X), (Y) & Vertical Velocity: (Z)
18, 19, 20	Altitude - N/A, Temp, Forward Velocity

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

PARAMETER	RATE AXES		ACCEL AXES	
Range	±100°/sec	±300°/sec	±6 g's	±10 g's
Bias (Over Temp.)	<0.05°/sec 1 σ		< 2mg 1 σ	
Bias (In Run Stability)	10°/hour 1 σ		0.1mg 1 σ	
Scale Factor Error %	≤0.1% (over temperature) 1 σ			
Resolution	0.01°/sec		0.12mg	
Angle Random Walk (Typical)	0.004° /sec/√Hz 1σ	0.006° /sec/√Hz 1σ	0.25mg/ √Hz 1σ	
Alignment	1mrad typical			
G-Sensitivity	<0.02°/sec/g typical			
Self Test On	NA		Δ 0.6g ± 0.3g	
Temp Range	Logic 1 = 3V to 5V at Pin 8			
Operating:	-40°C to +85°C			
Non-Operating:	-55°C to +85°C			
Heading	± 0.5° typical			
Pitch & Roll	± 0.25° typical			
Update Rate	100 Hz or 10 Hz (user selectable)			
Temp Sensors	Internal Temperature Sensors			
Start-up Time	< 0.65 sec AHRS 200 Hz			
Input Power	<b>+3.1V to 5.5V Max. Input (single sided)</b>			
Power Consumption	550 mW at 3.3V typical 700 mW at 3.3V maximum			
Size U.S.:	1.00 x 1.00 x 1.23 = 1.23 in <sup>3</sup> 2.54 x 2.54 x 2.54 = 16.4 cm <sup>3</sup>			
Metric:				
Weight	38 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)			

Specification subject to change without notice



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High Performance Inertial MEMS



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