

LandMark™ 20 AHRS



- *Rugged* Environmentally Sealed Packaging & MILSPEC Connector
- *Low Noise* Silicon MEMS AHRS
- Low Gyro Noise $0.01^\circ/\text{sec}/\sqrt{\text{Hz}}$ 1σ
- Low Accel Noise $0.05\text{mg}/\sqrt{\text{Hz}}$ ($2g$)
- In-Run Gyro Bias $15^\circ/\text{hour}$ 1σ
- Heading (Yaw) Angles 0.5° *stationary*
- Pitch & Roll Angles 0.25° *stationary*
- Altitude ± 3 meter 1σ
- Fully Temperature Compensated Bias and Scale Factor
- Compensated Misalignment 1mrad 1σ and g-Sensitivity $<0.02^\circ/\text{sec}/g$ 1σ
- External Sync Input (1kHz or 1pps)
- Low Power <600 mWatt *typical*
- Low Voltage $+3.3\text{V}$ (*single sided power*)
- Light Weight 110 grams
- Small Size $< 72\text{cm}^3/4.4\text{in}^3$
- Bandwidth Filtering Capability
- RS485 Data Rate 100 Hz (*user selectable*)
- Internal Vibration Isolation
- Internal Temperature Sensors

Export Classification:
Commerce ECCN7A994 (NLR)



Applications

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

**Rugged, Low Power, Low Noise
and Accurate MEMS AHRS**

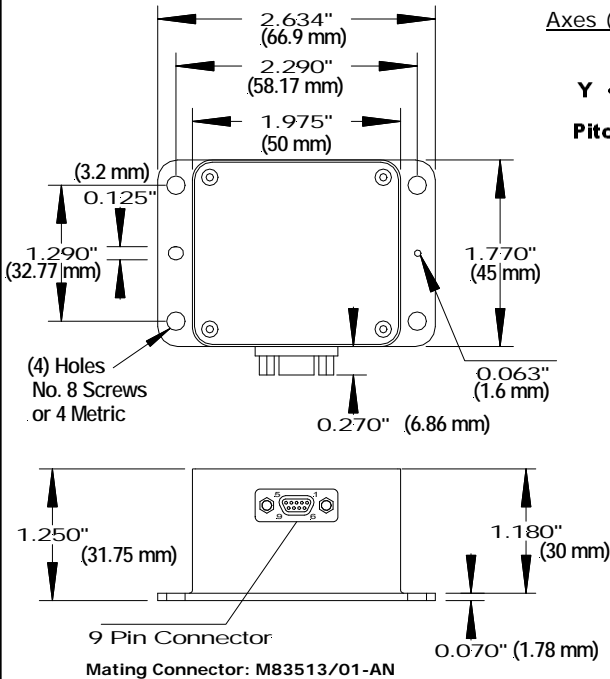


Gladiator Technologies
Division of LKD Aerospace
High Performance Inertial MEMS

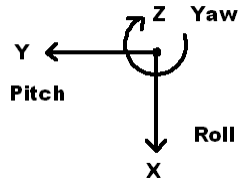
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SN: 150

LandMark™ 20 AHRS



Axes (Top View) Right Hand Rule



LandMark™ 20 AHRS

LMRK20AHRS-075-02-300 or -10
LMRK20AHRS-150-02-300 or -10
LMRK20AHRS-300-02-300 or -10

Specification

| PARAMETER | RATE AXES | | | ACCEL AXES | |
|-------------------------|---|--|-----------|--------------------|--------------------|
| | | | | | |
| Range | ±75°/sec | ±150°/sec | ±300°/sec | ±2 g's | ±10 g's |
| Bias (Over Temp.) | <0.05°/sec 1 σ | | | < 1.0mg 1 σ | < 1.5mg 1 σ |
| Bias (In Run Stability) | 15°/hour 1 σ | | | 0.02mg 1 σ | 0.1mg 1 σ |
| Scale Factor Error % | ≤0.1% (over temperature) 1 σ | | | | |
| Sensor Resolution | 0.005°/sec | | | 0.025mg | 0.08mg |
| Angle Random Walk | 0.01° /sec/√Hz 1 σ | | | 0.05mg /√Hz 1 σ | 0.16mg /√Hz 1 σ |
| Alignment | 1mrad 1 σ | | | | |
| G-Sensitivity | <0.02°/sec/g 1 σ | | | | |
| Self Test On | Δ 50 ± 25°/sec | | | Δ 1.5 ±0.5g | Δ 0.3 ±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 1 σ | | | | |
| 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 | 600 mW at 3.3V typical | | | | |
| | 750 mW at 3.3V maximum | | | | |
| Size | U.S.: | 1.97 x 1.77 x 1.25 = 4.4 in ³ | | | |
| | Metric: | 5 x 4.5 x 3.2 = 72 cm ³ | | | |
| Weight | 110 grams | | | | |
| Mounting | 4ea No.8 or M4 Screws | | | | |
| Shock | 500g's ½ sine 1 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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