

LandMark™ 40 AHRS



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

Next Generation Ultra Low
Noise MEMS AHRS

Export Classification: Commerce ECCN7A994

The LandMark™ 40 AHRS is the next generation of our 4.4in³ 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



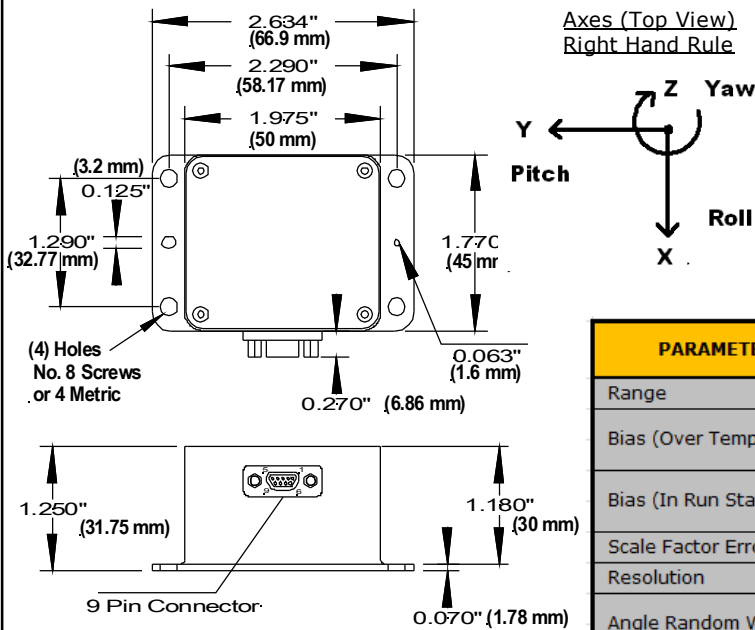
High Performance Inertial MEMS

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LandMark™ 40 AHRS



| 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 <0.15°/sec 1 σ | < 0.5mg < 1.0mg 1 σ |
| Bias (In Run Stability) | 6°/hour 1 σ | 0.02mg 0.08mg 1 σ |
| Scale Factor Error % | ≤0.1% (over temperature) 1 σ | |
| Resolution | 0.001°/sec | 0.02mg 0.06mg |
| Angle Random Walk | 0.002° 0.004° /sec/√Hz 1 σ | 0.04mg 0.12mg /√Hz 1 σ |
| Alignment | 1mrad 1σ | |
| G-Sensitivity | <0.01°/sec/g 1σ | |
| Self Test On | N/A | Δ 1.5 Δ 0.3g ±0.5g ± 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.: 1.97 x 1.77 x 1.25 = 4.4 in ³ Metric: 5 x 4.5 x 3.2 = 72 cm ³ | |
| 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) | |

Mating Connector: M83513/01-AN

| 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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