



# Gladiator Technologies, Inc.



## LandMark™ 10 IMU

**Rugged & Low Cost IMU**



Инерциальное Измерительное Устройство LandMark 10 IMU  
Устройство в усиленном корпусе эконом стоимости

- \* Опционально: функция вертикального гироскопа
- \* Шумы акселерометра  $<0.07mg/\sqrt{Hz}$  (2g)
- \* Погрешность гироскопа  $25^\circ/hour$
- \* Усиленный корпус к влияниям окружающей среды с коннектором MILSPEC
- \* Полная компенсация температурной погрешности
- \* Компенсация расцентровки  $1mrad$  и  $G <0.03^\circ/sec/g$   $1\sigma$
- \* Внешняя синхронизация (1kHz or 1pps)
- \* Мощность потребления  $<300 mW$  Typical
- \* Низкое напряжение питания +3.1V to +5.5V (single sided power)
- \* Вес  $<102 grams$
- \* Размеры  $<72cm^3/4.4in^3$
- \* Ширина частотной полосы датчика 140 Hz
- \* Фильтрация частотной полосы датчика
- \* RS485 с частой данных 500 Hz (устанавливается пользователем)
- \* Внутренняя изоляция вибрации
- \* Точная настройка по направлению
- \* 3 встроенных датчика температуры



Ниже технические данные

## LandMark™ 10 IMU

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**Rugged & Low Cost IMU**



- **Low Cost & Rugged IMU**
- **Vertical Gyro Option Available**  
*Pitch & Roll Angles  $\pm 0.25^\circ$*
- **Low Gyro Noise**  $< 0.014^\circ/\text{sec}/\sqrt{\text{Hz}}$   $1\sigma$
- **Low Accel Noise**  $< 0.07\text{mg}/\sqrt{\text{Hz}}$   $1\sigma$
- **Fully Temperature Compensated Bias and Scale Factor**
- **Compensated Misalignment**  $1\text{mrad}$  and **g-Sensitivity**  $< 0.03^\circ/\text{sec}/\text{g}$   $1\sigma$
- **In Run Gyro Bias**  $25^\circ/\text{hour}$   $1\sigma$
- **Low Power**  $< 1/3$  watt typical
- **Light Weight**  $< 102$  grams
- **Small Size**  $< 72\text{cm}^3/4.4\text{in}^3$
- **Low Voltage**  $+3.1$  to  $+5.5\text{V}$  (single sided)
- **RS485 Output** to 500 Hz (user selectable)
- **Bandwidth Filtering Capability**
- **External Sync Input** (1 kHz or 1pps)
- **Internal Vibration Isolation**
- **Precision Alignment**
- **3 Internal Temperature Sensors**
- **Self Test**
- **Shock Resistant**

**Low Noise & Excellent Bias  
Rugged Economy Class IMU**

Export Classification: Commerce ECCN7A994

The economy class LandMark™ 10 IMU is a substantially improved upgrade employing our latest low noise gyro technology for improved bias and with improved environmental sealing and MIL-SPEC connector. It provides internally temperature compensated RS485 output of delta velocity and delta theta. As an option the IMU is available as a 'Vertical Gyro' with pitch and roll angle outputs. The LandMark™ 10 IMU is ideal for applications requiring **low cost**, ultra low power consumption, rugged packaging, small size, light weight and no inherent wear out modes for long life. The signature feature of the



IMU is the performance, which is optimized with **fully temperature compensated bias and scale factor, compensated misalignment and g-sensitivity**. The unit is highly durable and employs an FEA designed internal vibration isolator that can withstand environmental vibration and shock typically associated with commercial aircraft requirements. LandMark™ IMU's include built-in firmware to accept external velocity as well as an external sync input 1 kHz (or 1pps indication). This IMU is well suited for low cost navigation, platform and antenna stabilization, general aviation as well as laboratory use. The unit is ideal where low gyro noise, excellent modeled performance coupled with small size, low power, light weight and low cost are desired for MEMS IMU applications.

**QMS**

AS9100 Rev B &  
ISO 9001:2000  
Cert# FM 509639



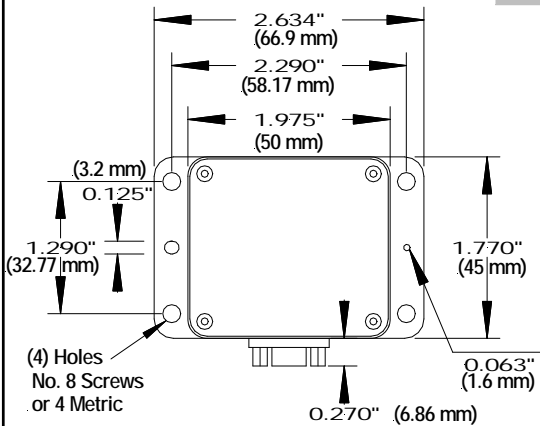
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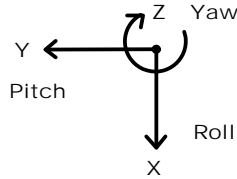
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Rev.Mar3111  
SN: 200

# LandMark™ 10 IMU



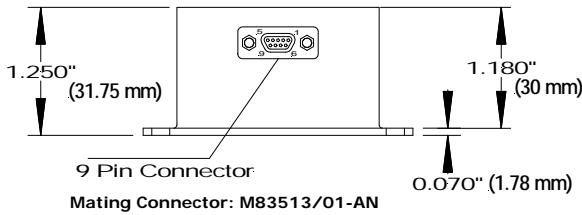
Axes (Top View)  
Right Hand Rule



## LandMark™ 10 IMU

LMRK10IMU-075-02-200 or -10  
LMRK10IMU-150-02-200 or -10  
LMRK10IMU-300-02-200 or -10

## Specification



| PARAMETER               | RATE AXES   |  |           | ACCEL AXES        |                  |
|-------------------------|---|--|-----------|-------------------|------------------|
|                         |   |  |           |                   |                  |
| Range                   | ±75°/sec  | ±150°/sec                                | ±300°/sec | ±2 g's            | ±10 g's          |
| Bias (Over Temp.)       | <0.1°/sec<br>1σ   |  |           | <3mg<br>1σ        | <5mg             |
| Bias (In Run Stability) | 25°/hour<br>1σ  |  |           | 0.1mg<br>1σ       | 0.25mg           |
| Scale Factor Error %    | ≤0.2% (over temperature) 1σ   |  |           |                   |                  |
| Sensor Resolution       | 0.007°/sec  |  |           | 0.025mg           | 0.25mg           |
| Angle Random Walk       | 0.014°<br>/sec/√Hz 1σ   |  |           | 0.07mg<br>/√Hz 1σ | 0.5mg<br>/√Hz 1σ |
| Alignment               | 1 mrad 1σ   |  |           |                   |                  |
| G-Sensitivity           | <0.03°/sec/g 1σ   |  |           |                   |                  |
| Self Test On            | Δ 100<br>± 50°/sec  |  |           | Δ0.3g<br>±0.2g    | Δ1.8g<br>±1.3g   |
|                         | Logic 1 = 3V to 5V at Pin 9   |  |           |                   |                  |
| Temp Range              | Operating: -40°C to +85°C<br>Non-Operating: -55°C to +85°C  |  |           |                   |                  |
| Update Rate             | 500 Hz, 200 Hz, 100 Hz, or 10 Hz (user selectable)  |  |           |                   |                  |
| Temp Sensors            | 3 Internal Temperature Sensors  |  |           |                   |                  |
| Start-up Time           | < 0.3 sec at 200 Hz   |  |           |                   |                  |
| Input Power             | <b>+3.1V to 5.5V Max. Input (single sided)</b>  |  |           |                   |                  |
| Power Consumption       | 300 mW at 3.3V Typical<br>400 mW at 3.3V Maximum  |  |           |                   |                  |
| Size                    | U.S.:   | 1.97 x 1.77 x 1.25 = 4.4 in <sup>3</sup> |           |                   |                  |
|                         | Metric:   | 5 x 4.5 x 3.2 = 72 cm <sup>3</sup>       |           |                   |                  |
| Weight                  | ≤ 102 grams   |  |           |                   |                  |
| Mounting                | 4ea No.8 or M4 Screws   |  |           |                   |                  |
| Shock                   | 500g's ½ sine 30 msec powered   |  |           |                   |                  |
| Vibration               | 6gRMS (20Hz to 2kHz ~ 10g accelerometers)   |  |           |                   |                  |
| MTBF                    | 75,712 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       | <b>+3.1V to +5.5V Input Power</b>  |
| 6       | External Sync Input (1kHz or 1pps) |
| 7       | +5V Regulator Out                  |
| 8       | Signal Ground                      |
| 9       | Self Test                          |

| Outputs | Serial Sequence at 200Hz     |
|---------|------------------------------|
| 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 |

\* Contact Factory to Order VG Option

Specification subject to change without notice



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