

## LandMark™ 50 Vertical Gyro (VG)



- High Performance NON-ITAR Commercial MEMS Vertical Gyro
- Pitch & Roll Angles  $\pm 0.1^\circ$  typical (No Magnetometers)
- *Built-in* Firmware for Turning Error Correction (External Velocity Input Req.)
- Ultra Low Gyro Noise  $0.0009^\circ/\text{sec}/\sqrt{\text{Hz}}$
- Low Accel Noise  $0.02\text{mg}/\sqrt{\text{Hz}}$  (2g)
- In-Run Gyro Bias  $1^\circ/\text{hour}$   $1\sigma$
- Fully Temperature Compensated Bias and Scale Factor  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$
- Compensated Misalignment  $\frac{1}{2}$  mrad
- G-Sensitivity  $< 0.002^\circ/\text{sec}/\text{g}$  typical
- Input Power  $+6\text{V}$  to  $+36\text{V}$  (single sided)
- Light Weight  $450$  grams
- Small Size  $< 321\text{cm}^3/19.6\text{in}^3$
- RS422/ RS485 Data Rate  $100$  Hz (4KHz internal sampling)
- Wide Sensor Bandwidth  $200$  Hz
- Bandwidth Filtering Capability
- External Sync ( $1$  kHz or  $1$  pps)
- Precision Alignment
- Shock Resistant  $500\text{g}'\text{s}$
- Internal Temperature Sensors
- Self Test
- MTBF 37,100 Hours

**Export Classification:**  
Commerce ECCN7A994 (NLR)



### Applications

- Platform Stabilization
- EO/IR Stabilization
- Antenna Stabilization & Pointing
- Railway Motion Monitoring
- Flight Control
- Navigation
- Automotive Testing
- Laboratory Use

**High Performance MEMS VG with  
Low Noise & Low Bias Performance**

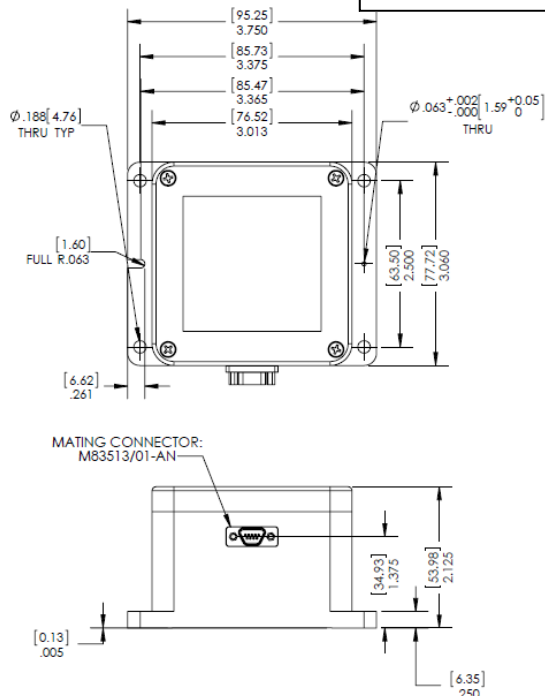


**Gladiator Technologies**  
Division of LKD Aerospace  
High Performance Inertial MEMS

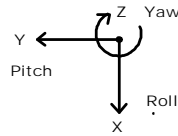
Gladiator Technologies Division  
LKD Aerospace, Inc  
8020 Bracken Place SE  
Snoqualmie, WA 98065 USA

Rev. 15July17  
SN: 600

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**Axes (Top View)**  
**Right Hand Rule**



## LandMark™ 50 VG

LMRK50VG-075-02-100 or -06 or -10  
LMRK50VG-100-02-100 or -06 or -10  
LMRK50VG-175-02-100 or -06 or -10  
LMRK50VG-300-02-100 or -06 or -10

## Specification

PARAMETER	LandMark™ 50 VG					
	RATE AXES			ACCEL AXES		
Range	±100°/sec	±175°/sec	±325°/sec	±2 g's	±6 g's	±10 g's
Bias (In Run Stability)	1°/hr	1.5°/hr 1σ	2°/hr	0.02mg	0.04mg 1σ	0.05mg
Angle Random Walk	0.0009°	0.0025° /sec/√Hz 1σ	0.003°	0.02	0.065 mg/√Hz 1σ	0.07
Bias (Over Temp.)	<0.01°/sec	<0.02°/sec 1σ	<0.02°/sec	<1.0mg	<1.3mg 1σ	<1.5mg
Scale Factor Error %	≤0.06% (over temperature)					
Non-Linearity % of FS	<0.1		<0.5	<2	<0.025	<0.05
Sensor Resolution	0.0005°/sec	0.0012°/sec	0.0015°/sec	0.02mg	0.05mg	0.06mg
Pitch & Roll	< ± 0.1° typical					
Alignment	0.5 mrad 1σ					
G-Sensitivity	<0.002°/sec/g 1σ					
Self Test On	N/A			Δ 1.0 ±0.5g	Δ 0.35 ±0.25g	Δ 0.35 ±0.25g
	Logic 1 = 3V to 5V at Pin 9					
Temp Range	Operating: -40°C to +85°C Non-Operating: -55°C to +100°C					
RS422/485 Update Rate	100 Hz or 10 Hz (user selectable)					
Temp Sensors	6 Internal Temperature Sensors					
Start-up Time	< 0.65 sec					
Input Power	<b>+6.0V to +36V Max. Input (single sided)</b> <b>(Input Transient Protection to 80V)</b>					
Power Consumption	640 mW at +12V typical 730 mW at +12V maximum					
SIZE U.S.:	3.0 x 3.06 x 2.13 = 19.6 in <sup>3</sup>					
	Metric: 7.62 x 7.8 x 5.4 = 321cm <sup>3</sup>					
Weight	<450 grams					
Mounting	4ea No.8 or M4 Screws					
Shock	500g's ½ sine 1 msec powered					
Vibration	6 gRMS (20Hz - 2KHz ~ 10g accelerometers)					
MTBF	37,100 hrs (per MIL-STD-217F, Notice 2 based on AIC environment with ambient temperature at 40°C)					

Pin No.	Assignment
1	RS-422/RS-485 A (+)
2	RS-422/RS-485 B (-)
3	Power Ground
4	Analog/Digital Input (0V to 5V)
5	<b>+6.0V to +36V Input Power</b>
6	External Sync Input (1kHz)
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	No Magnetometers: (X), (Y), (Z)
11	No Pressure
12, 13, 14	Angles: Roll, Pitch, No Yaw
15, 16, 17	AC Velocities: (X), (Y) & No (Z)
18, 19	No Altitude, No Temp
20	Forward Velocity (As Input)

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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