

LandMark™ 40 VG

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Next Generation Low Noise VG

0.002°/sec/√Hz ~ 0.085°/Hour



- **Ultra Low Noise MEMS VG**
- **Form, Fit and Function with LandMark™ 10 and 20 VG's**
- **Low Gyro Noise** $0.002^\circ/\text{sec}/\sqrt{\text{Hz}}$ ($100^\circ/\text{s}$)
- **Low Accel Noise** $0.04\text{mg}/\sqrt{\text{Hz}}$ ($2g$)
- **In-Run Gyro Bias** $10^\circ/\text{hour}$ 1σ
- **Pitch & Roll Angles** $\pm 0.25^\circ$ stationary 1σ
- **Rugged Environmentally Sealed Packaging & MILSPEC Connector**
- **Fully Temperature Compensated Bias and Scale Factor**
- **Compensated Misalignment** 1mrad and **g-Sensitivity** $< 0.02^\circ/\text{sec}/g$ typical
- **External Sync Input** (1kHz or 1pps)
- **Low Power** $< 430\text{ mW}$ Typical
- **Low Voltage** $+3.3\text{V}$ (single sided power)
- **Light Weight** 103 grams
- **Small Size** $< 72\text{cm}^3/4.4\text{in}^3$
- **Wide Sensor Bandwidth** 200 Hz
- **Bandwidth Filtering Capability**
- **RS485 Data Rate** 100 Hz (user selectable)
- **Internal Vibration Isolation**
- **Precision Alignment**
- **User Supplied Velocity Input**

Next Generation Low Noise MEMS VG with Small Size & Low Power

Export Classification: Commerce ECCN7A994

The LandMark™ 40 VG is the next generation of our 4.4in³ family of VG's and is form, fit and function interchangeable with our popular LandMark™ 10 and 20 VG'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. Proven performance in a multitude of applications by it's predecessor LandMark™ 10 and 20 VG's, this next generation VG 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 VG is the **very low noise gyros**, enabling precision measurement for demanding stabilization applications. The VG's performance is optimized with **fully temperature compensated bias and scale factor and compensated misalignment and g-sensitivity**. The unit is highly durable and employs an FEA designed internal vibration isolator. LandMark™ VG's also include built-in firmware to accept external velocity as well as an internal sync input 1 kHz (or 1pps indication). The unit is well suited for the harsh environments of aircraft, land and sea stabilization applications. Other standard ranges available (consult factory).



QMS

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



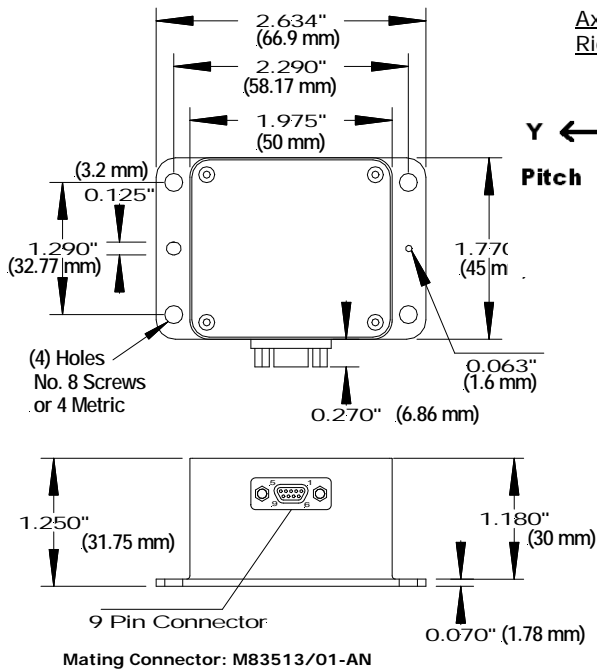
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LMRK40VG-075-02-100 or -10 LMRK40VG-100-02-100 or -10 LMRK40VG-300-02-100 or -10

Specification

PARAMETER	RATE AXES		ACCEL AXES	
Range	±100°/sec	±300°/sec	±2 g's	±10 g's
Bias (Over Temp.)	<0.03°/sec 1 σ		< 1.0mg 1 σ	< 1.5mg 1 σ
Bias (In Run Stability)	10°/hour 1 σ		0.03mg 1 σ	0.1mg 1 σ
Scale Factor Error %	≤0.05% (over temperature)			
Sensor Resolution	0.001°/sec		0.02mg	0.08mg
Angle Random Walk	0.002° /sec/√Hz 1 σ	0.003° /sec/√Hz 1 σ	0.04mg /√Hz 1 σ 0.16mg /√Hz 1 σ	
Alignment	1mrad 1 σ			
G-Sensitivity	<0.01°/sec/g 1 σ			
Self Test On	N/A		Δ 0.2g ± 0.1g	Δ 1.25g ± 0.75g
	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			
Pitch & Roll	± 0.25° stationary 1 σ			
Update Rate	100 Hz (full VG mode)			
Temp Sensors	Internal Temperature Sensors			
Start-up Time	< 0.65 sec			
Input Power	+3.1V to 5.5V Max. Input (single sided)			
Power Consumption	430 mW at 3.3V typical 450 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	103 grams			
Mounting	4ea No.8 or M4 Screws			
Shock	500g's ½ sine 30 msec powered			
Vibration	6gRMS (20Hz to 2KHz ~ 10g accelerometers)			
MTBF	53,869 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 Velocity Input (0V to 5V)
5	+3.1V to +4.2V Input Power
6	External Sync Input (1kHz or 1pps)
7	+5V Regulator Out
8	Signal Ground
9	Self Test

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) & (Z)
18, 19, 20	No Altitude, Temp, Forward Velocity (As Input)

Specification subject to change without notice



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Gladiator Technologies, Inc.
 8022 Bracken Place SE
 Snoqualmie, WA 98065 USA
 Tel: 425.396.0829 Fax: 425.396.1129
 Email: sales@gladiatortechnologies.com
 Web: www.gladiatortechnologies.com

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