

MV5-AR

Compact, Ruggedized Attitude Reference and IMU



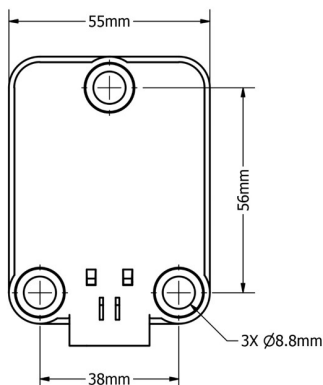
MV5-AR - High performance 6-DOF Attitude Reference and IMU in a compact, ruggedized reinforced PBT housing

The LORD Sensing MV5-AR brings a new level of precision to measurements of dynamic inclination, acceleration, and angular rate in challenging environments such as those encountered by heavy-duty construction, off-highway, agriculture, and trucking industries.

The MV5-AR utilizes the power of a sophisticated Auto-Adaptive Extended Kalman Filter (EKF) to remove errors associated with vibration, sudden linear motions, and quake, resulting in a true reading of inclination under all conditions.

LORD Sensing's state-of-the-art temperature compensation and calibration assures error-free performance over the full operational temperature range.

The compact size, wide 9 to 36 V power range, IP68/IP69K rating, and CAN J1939 communications interface make the MV5-AR a single part solution for a full range of vehicle sizes and applications.



FEATURES AND BENEFITS

HIGH PERFORMANCE

- Low-cost, compact size, and full 360° measurement range about all axes permits single part number inventory for a variety of vehicle sizes and applications
- Full accuracy over the entire operational temperature range of -40°C to 85°C
- High performance 6-DOF MEMs sensor suite provides best possible accuracy regardless of mounting angle
- Auto-Adaptive EKF provides best dynamic accuracy
- Compact and rugged reinforced PBT housing is fully sealed for immersion, pressure wash (IP68, IP69K)
- Low-cost, rugged, reliable AMPSEAL 16 connector
- CAN J1939 communication
- LORD Sensing mechanical isolation technology used internally for high shock resistance and reliability
- Based on LORD Sensing's proven 5th generation industrial/aerospace solid-state MEMs accelerometer and gyro inertial sensor technology
- Optional metal guard plate protects sensor and connector permits connector insertion/removal
- Standard or custom configurations

APPLICATIONS

- Dynamic incline detection (roll, pitch, rotation)
- Platform control, alignment and stabilization
- Auto-steer and terrain compensation
- Vehicle stability and leveling
- Bucket/Stick/Boom angle
- Precision navigation
- Operator feedback
- Impact detection



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Specifications

General		
Integrated Sensors	Triaxial accelerometer, triaxial gyroscope, temperature sensors	
Data Outputs	TBD (J1939 PGN codes)	
Inertial Measurement Unit (IMU) Sensor Outputs		
	Accelerometer	Gyroscope
Measurement range	±20 g	±1000° /sec
Output Range	±200 m/s ²	±250 °/sec
Non-linearity	±0.04% fs	±0.06% fs
Resolution	0.05 mg	<0.003° /sec
Bias instability	±0.08 mg	8° /hr
Initial bias error	±0.004 g	±0.1° /sec
Scale factor stability	±0.05%	±0.05%
Noise density	85 µg/√ Hz	0.0075° /sec/√Hz
Alignment error	±0.05%	±0.05%
Bandwidth	40 Hz	40 Hz
Offset error over temperature	0.2% (typ)	0.1% (typ)
Gain error over temperature	0.05% (typ)	0.1% (typ) 0.4% (max)
Scale factor non-linearity (@ 25°C)	0.04% (typ) 0.2% (max)	0.04% (typ) 0.15% (max)
IMU data output rate	100 Hz default (1 Hz to 500 Hz selectable)	
Operating Parameters		
Communication	CAN 250 kb/s, J1939	
Power source	+4.5 V Min, 12/24 V Nominal, +36 V Max	
Power consumption	625 mW Nominal	
Operating temperature	-40°C to +85°C	
Mechanical shock limit	TBD	

Inclinometer Outputs	
Attitude accuracy	±0.2° RMS roll and pitch
Attitude heading range	360° about all axes
Calculation update rate	500 Hz
Slope Output range	-85° (min) +85° (max)
Measurement range (3 axis)	-180° (min) +180° (max)
Attitude resolution	0.05°
Static Inclination Error (-40°C to 85°C)	±0.2°
Translational acceleration error	±0.44°
Settling time	5 mSec (typ) 200 mSec (max)
Attitude repeatability	0.2°
Data output rate	100 Hz default (1 Hz to 500 Hz selectable)
Physical Specifications	
Dimensions	L 80 mm x W 55 mm x H 24 mm
Weight	120 grams
Enclosure material	PBT Thermoplastic, Reinforced
Ingress protection	IP68, IP69K
Mounting	3 x M8, installation torque 20 Nm ±2 Nm
Regulatory compliance	ROHS, REACH, CE
Integration	
Connectors	AMPSEAL 16 gold plated 4 pin, 4 Position, gold plated pins
Software	MIP® Monitor, Windows 7, 8, & 10 compatible



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