

Inertial Sensing Solutions for Off-Highway
Outstanding gyro-stabilized accuracy and durability

OFF-HIGHWAY VEHICLES

SENSORS FOR OFF-HIGHWAY APPLICATIONS

Today's off-highway machinery demands dynamic precision to continually improve operational performance and efficiency.

LORD Sensing offers inertial sensors in robust packaging to replace lower performing rotary position and inclinometer sensors on chassis, boom, and bucket locations.

Our inertial products out perform the competition under real-world dynamic conditions, including gyro bias (drift) and temperature fluctuation, acceleration and angular rate, and continue to set the standard for Industrial MEMS inertial performance.

Included with every sensor is our industry-leading technical and engineering support. Our experienced team is readily available to ease integration and fine-tune specific applications for increased productivity and connectivity.



The **MV5-AR** inertial sensor offers superior solutions for off-highway vehicles.



APPLICATIONS

- Enabling autonomy
- Dynamic inclination detection (roll, pitch, rotation)
- Real-time vehicle stability control and leveling
- Platform alignment and stabilization
- Bucket/Stick/Boom position, depth, and angle
- Auto-steer and terrain compensation

CRITICAL ATTRIBUTES

- Gyro-stabilized accuracy under shock, vibration and temperature extremes

DURABILITY

- Mechanical isolation (MV5-AR) provides superior performance under shock and vibration
- Rugged packaging (IP68/IP69K pressure wash) with waterproof connector
- 100% temperature compensated for outdoor operation (-40° to +85°C)

EASE OF INTEGRATION

- Small size allows greater mounting flexibility
- Regulated or unregulated power source operation
- Available CAN J1939 and CANopen protocols

PERFORMANCE

- Low-noise, low-drift MEMS gyros and accelerometers, dual on-board processors, and auto-adaptive Kalman Filter result in precise, low-latency position and inclination measurement



HIGH PERFORMANCE & RELIABILITY

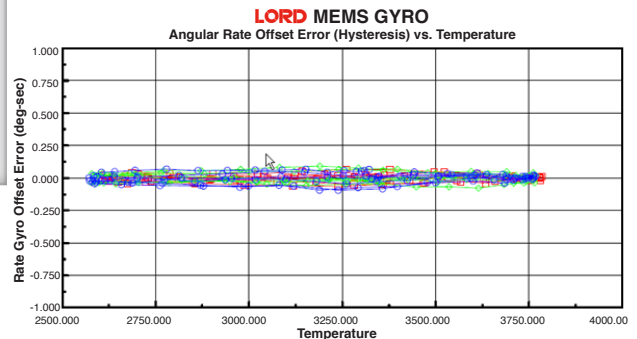
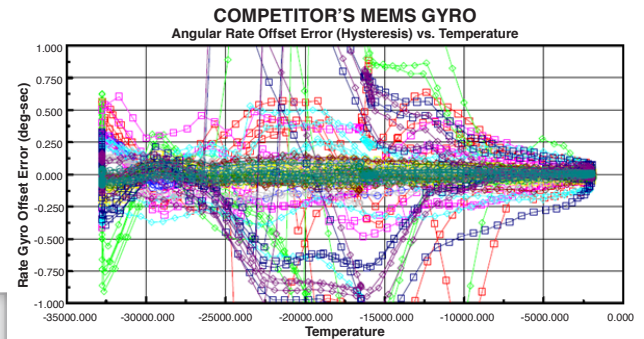
- Every unit calibrated with a proprietary process & full report
- Fully temperature compensated over -40° to +85°C
- Rigorous MEMS accelerometer & gyro sensor optimization
- Advanced Estimation Filter Technology (Kalman Filter)
- LORD pedigree on mission-critical aerospace components

Outperforming the Competition ▶

TOP – A Temperature Hysteresis sample from a non-LORD supplier. The spec sheet performance was not maintained over temperature with changes in offset (temp. range is -40 to +70°C). Temperature hysteresis cannot be reliably compensated for in firmware and these gyros are not acceptable for our products.

BOTTOM – A **LORD** production calibration record with Gyro temperature offset error hysteresis. We consider this result an acceptable performance for our product.

TEMPERATURE HYSTERESIS



EASY TO USE DEDICATED TECHNICAL SUPPORT



- Best real-world dynamic performance under temperature, vibration, and shock loads
- Full-featured product line with interchangeable footprints and performance levels
- Unrivaled field sales and product-specific technical support
- Scalable Tier-one volume manufacturing capability
- Flexible, forward compatible MIP protocol (API)
- Smallest footprint and lowest profile in class
- Extensive communication tools and options



INDUSTRY-LEADING EXPERIENCE & INNOVATION

- Over 95 years of industrial, automotive, and aerospace pedigree
- MicroStrain GX series introduced in 2002, currently on 5th generation
- An industry pioneer of solid-state MEMS-based inertial sensor systems
- Demonstrated ability to select and tune best-in-class MEMS sensors
- Fast product development cycles and new product introductions
- Expansive off-highway condition monitoring portfolio
- ISO 9001/AS9100D manufacturing



INTERCHANGEABLE PRODUCT LINE

An interchangeable product line provides customers the best price and performance value while reducing the overall part number count with highly flexible products that fit within the same footprint.

PACKAGING NEEDS

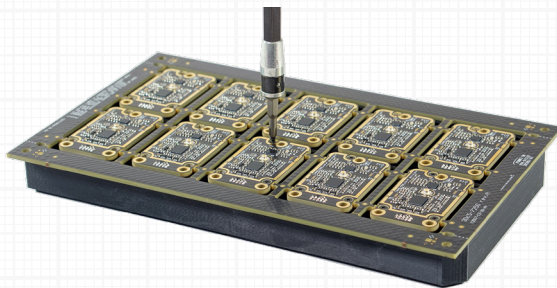
Embedded to Ruggedized

SENSOR OUTPUTS

IMU – AHRS – GNSS/INS

DATA TYPE

Raw or EKF



RAPID PRODUCTION

Our production team is equipped and tooled to scale to any volume needs required by our customers. Using state-of-the-art equipment, production times are in a continuing state of improvement with an acute focus on quality.

The MicroStrain production team thrives in a fast-paced and high-demand environment and takes great pride with each product assembled.

CERTIFIED CALIBRATION

Every product is calibrated and certified by a MicroStrain technician, ensuring the performance and reliability our customers have come to expect from our sensors.

LORD AS PARTNER

With over 95 years experience as a leading innovator in automotive, aerospace, and industrial pedigrees, choosing LORD Sensing as your partner connects you with a trusted tier one supplier with small-company spirit and innovation.



The LORD Sensing, MicroStrain line of advanced inertial sensors provide a range of measurement options including orientation (pitch, roll, yaw or azimuth), single axis or dual axis inclination, linear acceleration, and angular rate. We offer simple inclinometers (or tiltmeters), vertical gyros, VRUs (vertical reference units), IMUs (inertial measurement units), AHRS (attitude heading reference systems), and INS/GPS (GPS aided inertial navigation systems). Designed for applications from personnel tracking and drone navigation to downhole exploration.

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