

# LPMS-IG1P

9-Axis Inertial Measurement Unit (IMU) / AHRS and GPS Receiver with USB / CAN / RS232 Connectivity

The LPMS-IG1P is a 9-axis inertial measurement unit (IMU) and GPS receiver offering high precision orientation and linear acceleration measurements in an IP67-rated enclosure. It is equipped with a powerful central processing unit fusing raw data from gyroscope, accelerometer, magnetometer to calculate results on the fly with low drift and high accuracy. LPMS-IG1P perfectly fits application cases in an industrial environment where motion measurements with high precision and low latency are required.

LPMS-IG1P features an automotive-grade GNSS extension that supports global positioning based on BeiDou, Galileo, GLONASS, GPS / QZSS satellite systems. To enable the use of LPMS-IG1 in vehicle navigation systems we offer an optional sensor fusion library to combine IMU, GNSS and vehicle odometry data.

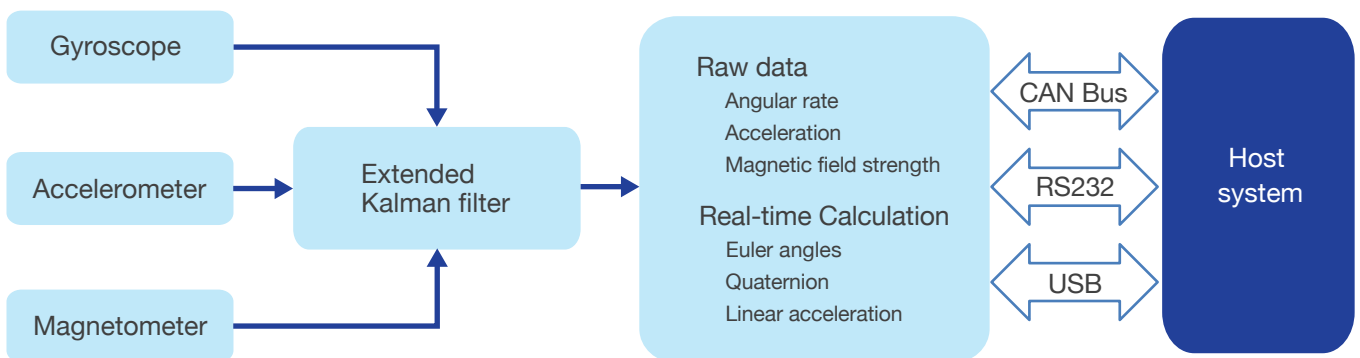


## Key Features

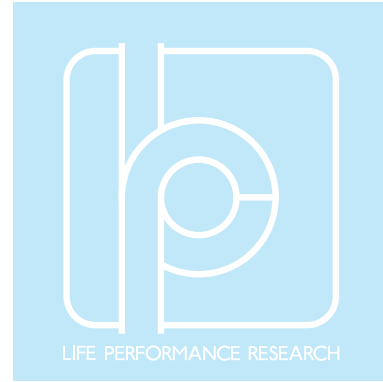
- MEMS-based 9-axis inertial measurement unit (IMU) with on-board sensor fusion
- Very low-noise gyroscope for low-drift measurements with a bias stability of 4°/hour
- Dual gyroscope mode with additional high-range gyroscope for measurements above 400°/s up to 2000°/s
- Multi-channel GNSS extension supporting BeiDou, Galileo, GLONASS, GPS / QZSS satellite systems
- Real-time, on-device calculation of sensor orientation and linear acceleration
- CAN bus (partial CANopen support) or RS232 communication interface options. All models include a USB connection.
- IP67 rated housing (dustproof and waterproof)

## Potential Applications

- Robotic manipulator forward kinematics control
- Automotive dead reckoning
- Object orientation tracking for VR/AR
- Automatic guided vehicle (AGV) navigation



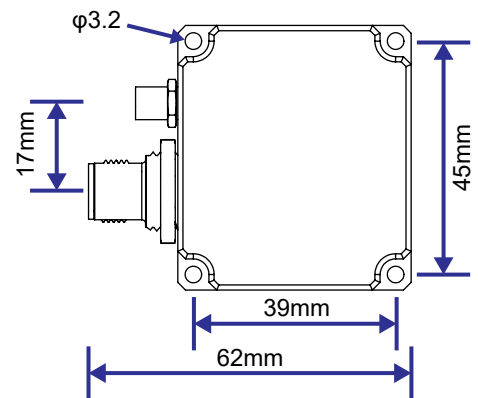
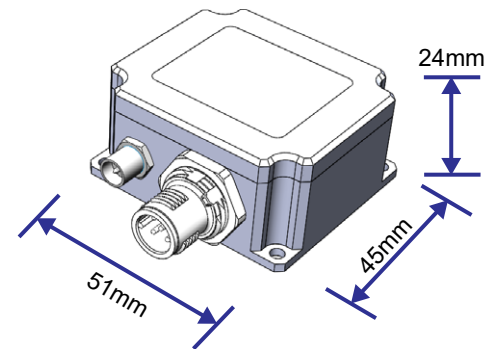
NOTE: Diagram is simplified. Please ask us, if you need more detailed information.



## Sensor Specifications

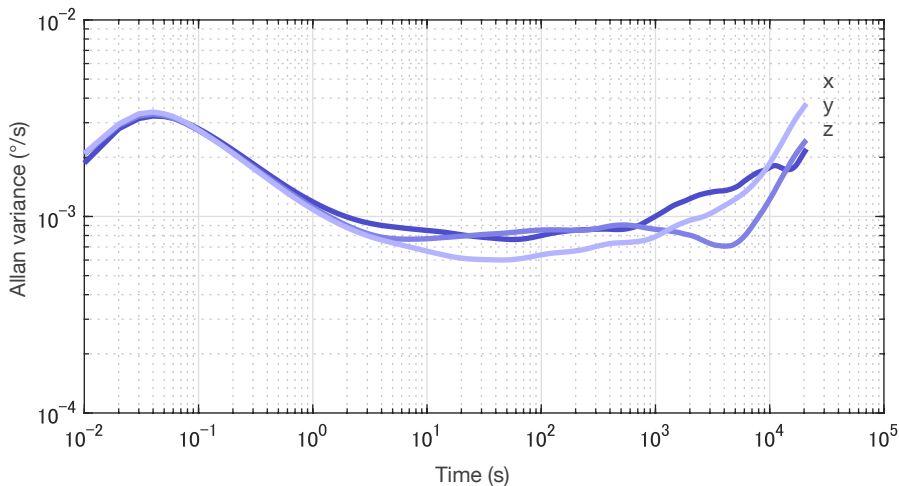
Product name	LPMS-IG1P CAN	LPMS-IG1P RS232
Wired interface	CAN Bus, USB	RS232, USB
Baudrate	1M bit/s	921600 bit/s
Communication protocol	LP-CAN / CANopen	LP-BUS
Size	51 x 45 x 24 mm	
Weight	76 g	
Orientation range	Roll: $\pm 180^\circ$ ; Pitch: $\pm 90^\circ$ ; Yaw: $\pm 180^\circ$	
Orientation resolution	0.01°	
Accelerometer	3-axis, $\pm 2 / \pm 4 / \pm 8 / \pm 16$ g, 16 bits	
Gyroscope	Dual gyroscope design: #1: 3-axis, $\pm 400$ , 24 bits #2: 3-axis, $\pm 1000 / \pm 2000$ dps, 16 bits	
Static orientation stability	#1: 4 °/hour, #2: 6 °/hour	
Gyroscope noise density	#1: 0.002 dps/ $\sqrt{\text{Hz}}$ , #2: 0.004 dps/ $\sqrt{\text{Hz}}$	
Magnetometer	3-axis, $\pm 2 / \pm 8$ gauss, 16 bits	
Data output format	Raw data / Euler angle / Quaternion	
Data output rate	5 ~ 500 Hz	
GNSS support	BeiDou, Galileo, GLONASS, GPS / QZSS	
GNSS max. update rate	30 Hz	
Power consumption	$\leq 400$ mW @12 V	
Power supply	5 V ~ 24 V DC	
Connector	Signal connector: M12	
Housing	Aluminum, IP67 rated	
Temperature range	-20 ~ +80°C	

## Mechanical Drawing



NOTE: For detailed specifications, please refer to our product manuals.

## LPMS-IG1 High Precision Gyroscope (#1) Allan Variance Plot



## Package Contents

- LPMS-IG1P sensor x 1
- User guide card x 1
- Cable (incl. USB connector) x 1
- Box x 1
- Warranty (1 year)