LPMS-IG1W

9-AxisIMU(Inertial Measurement Unit)/AHRS(Pose Measurement)、

Wi-Fi communication support

The 9-axis IMU sensor LPMS-IG1W detects orientations and acceleration and measures them with high precision. It is possible to communicate with host systems such as PCs and smartphones via Wi-Fi connection. The compact size, high accuracy, waterproof case (IP67), and powerful CPU inside the sensor process data from the gyroscope, accelerometer, and magnetometer, and provide low-drift, high-precision results in real time. It is suitable for industrial environments where highly accurate, low-latency measurements are required.
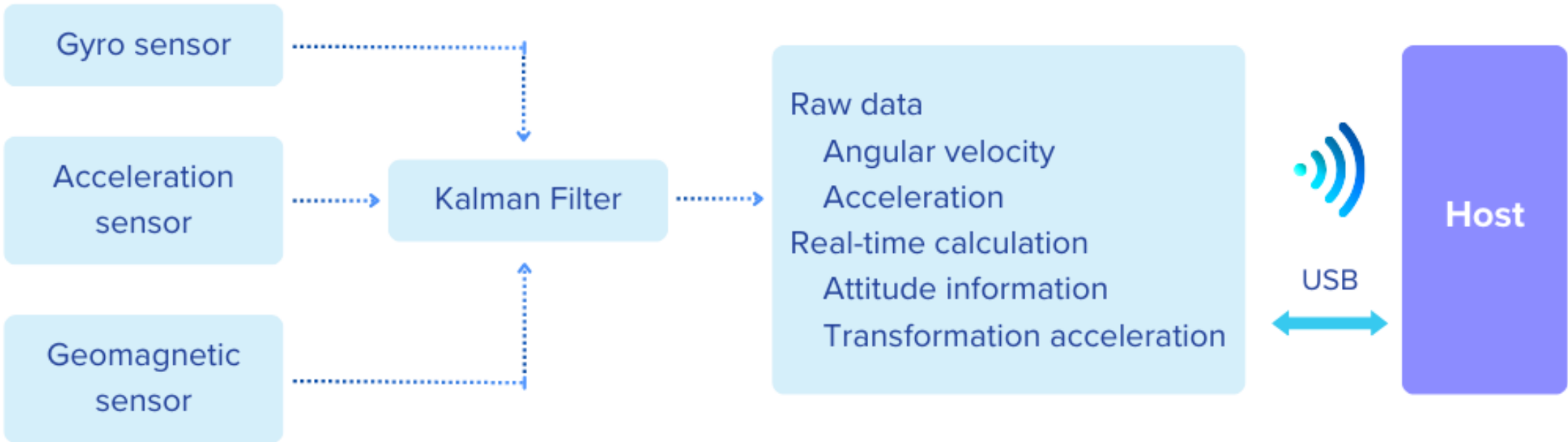
Key Features

- MEMS 9-axis IMU with sensor fusion function・Equipped with low-noise/low-drift (4°C/1h) accelerometer

- Equipped with two types of gyro, enabling measurement over a wide range (400 to 2000°/s)

- Pose/linear acceleration calculated in real time inside sensor

- Wi-Fi connection supported・Waterproof (IP67) and shock-resistant up to 10,000G. Suitable for industrial environments.
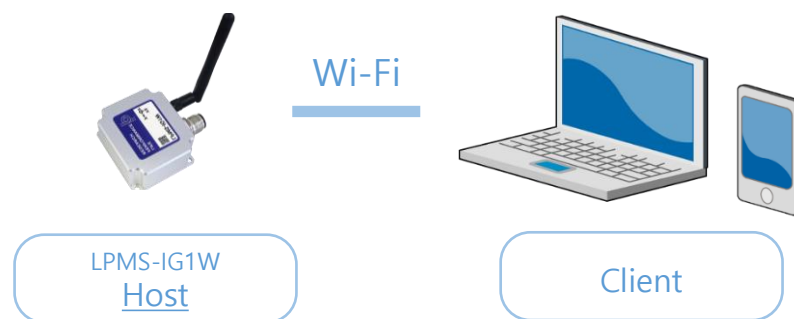
Application

・Remote-controlled robots, robot arms, etc.

・IoT applications such as abnormal vibration
  detection

・VR/AR tracking systems

・AGV navigation systems

Gyro sensor → Kalman Filter

Acceleration sensor → Kalman Filter

Geomagnetic sensor → Kalman Filter

Kalman Filter →

Raw data
  Angular velocity
  Acceleration
Real-time calculation
  Attitude information
  Transformation acceleration

Host

USB

Two types of connection methods

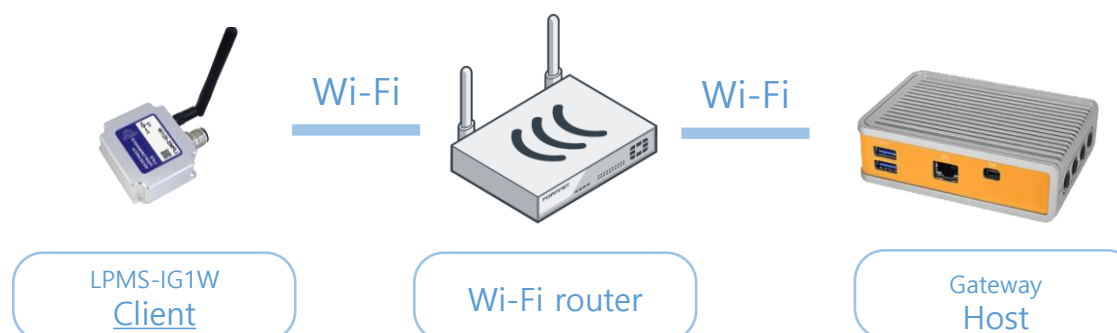### ① Without Wi-Fi router

Connection example

Wi-Fi

LPMS-IG1W
Host

Client

LPMS-IG1W becomes a Wi-Fi hotspot, and can be directly connected without a Wi-Fi router

② With Wi-Fi router

Connection example

Wi-Fi   Wi-Fi

LPMS-IG1W
Client

Wi-Fi router

Gateway
Host

If there is a Wi-Fi network, data can be sent via MQTT

Data Acquisition method   Data can be acquired via socket communication or MQTT
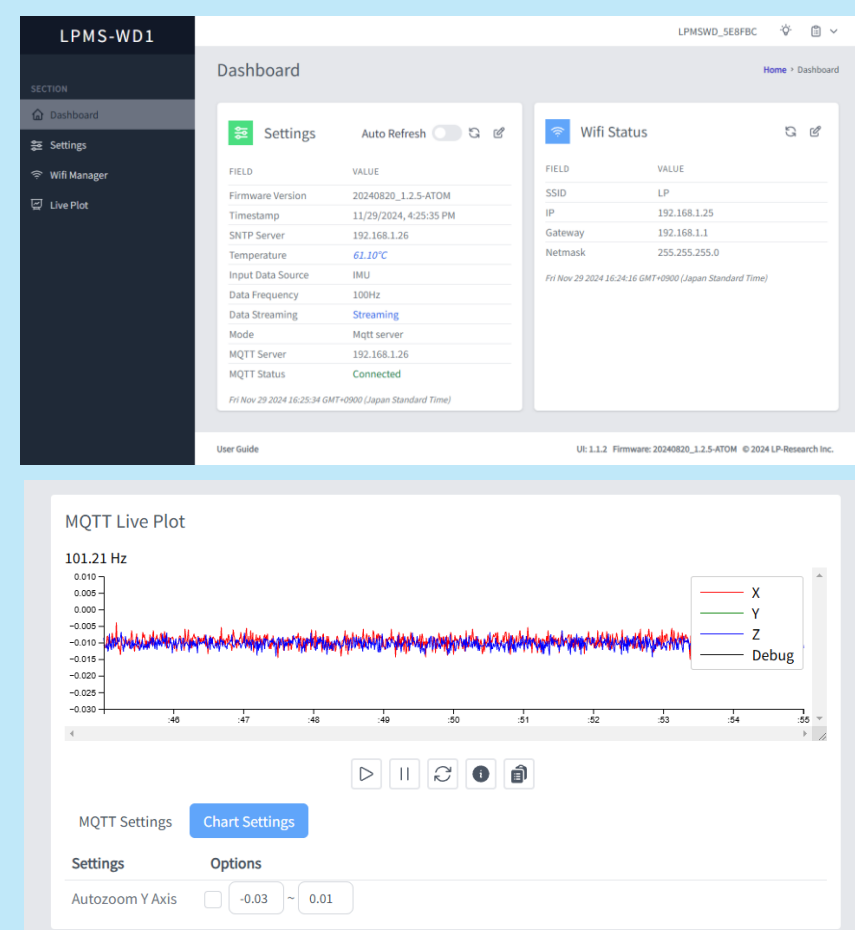
Check sensor data and change settings remotely.

The LPMS-IG1W can host web pages

・This product can host web pages on its own
・Devices on the same network as this product or via a web browser can access it

Remote data confirmation, modification, and operation

・Measurement data from this product can be confirmed in real-time graphs from the hosted web page
・ The connection status and temperature of this product can also be confirmed
・ Various settings such as the type of data to be acquired and measurement frequency can be changed remotely
・ Sensor commands such as the calibration initialization command can also be executed

Example of how it will look in the browser (the screen is still under development)

Sensor Specifications

| Part number	LPMS-IG1W
Interface	Wi-Fi + USB
Weight	115g
Size	51×45×24mm
Static orientation stability	#1: 4 °/hour, #2: 6 °/hour
Orientation range	360° about all axes
Resolution	< 0.01°
Accuracy	< 0. 3° (static), < 1° RMS (dynamic)
Accelerometer	3-axis, ±20 / ±40 / ±80 / ±160 m/s2, 16 bits
Gyroscope (2 types installed)	Gyro #1: 3-axis, ± 400 dps, 24 bit; Gyro #2: 3-axis, ± 1000 / ± 2000 dps, 16 bit
Magnetometer	3-axis, ± 4 / ± 8 / ± 12 / ± 16 gauss, 16 bits
Gyro-noise density	#1: 0.002 dps/√Hz, #2: 0.004 dps/√Hz
Data output format	Raw data / Euler angle /Quaternion
Data output rate	5 ~ 500 Hz
*Power consumption	0.85W (0.07A@12V)
Power supply	5 V ~ 36 V DC
Temperature range	-20 ~ +80°C
Connector	M12 connector
Case material	Aluminum, waterproof (IP67)
Wi-Fi information	Maximum transmission distance: 10 ~ 30m (※1), Wi-Fi frequency band: 2.4GHz, Communication protocol: TCP/IP I MQTT, Wi-Fi output frequency: MQTT 5 ~ 200Hz, Socket 5~500Hz
Software	Windows C++ library, Java library for Android, LPMS Control (Data analysis software), Open Motion Analysis Toolkit (OpenMAT) for Windows

※1: The communication range may change depending on the usage environment.

* Performance parameters are measured at **+25°C**. Other temperatures may result in varying reference values.
※Please refer to the product manual for more detailed specifications.

External dimensions
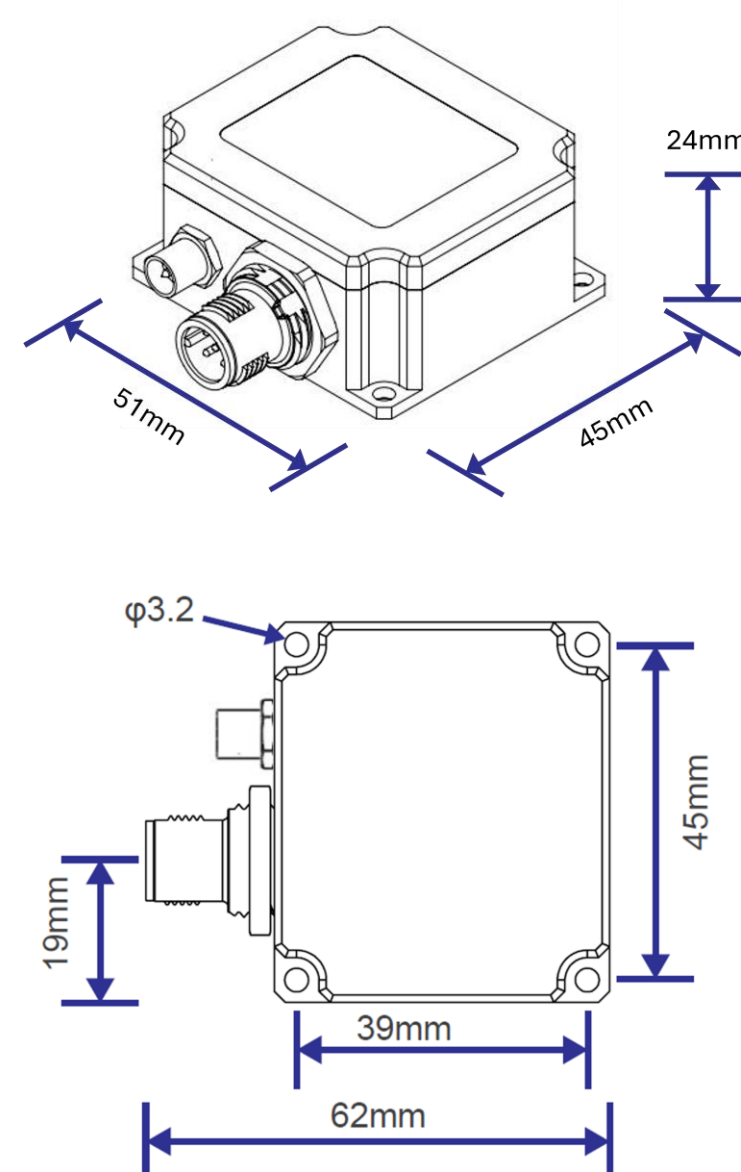
LPMS-IG1W High-precision gyroscope (#1) Allan variance graph
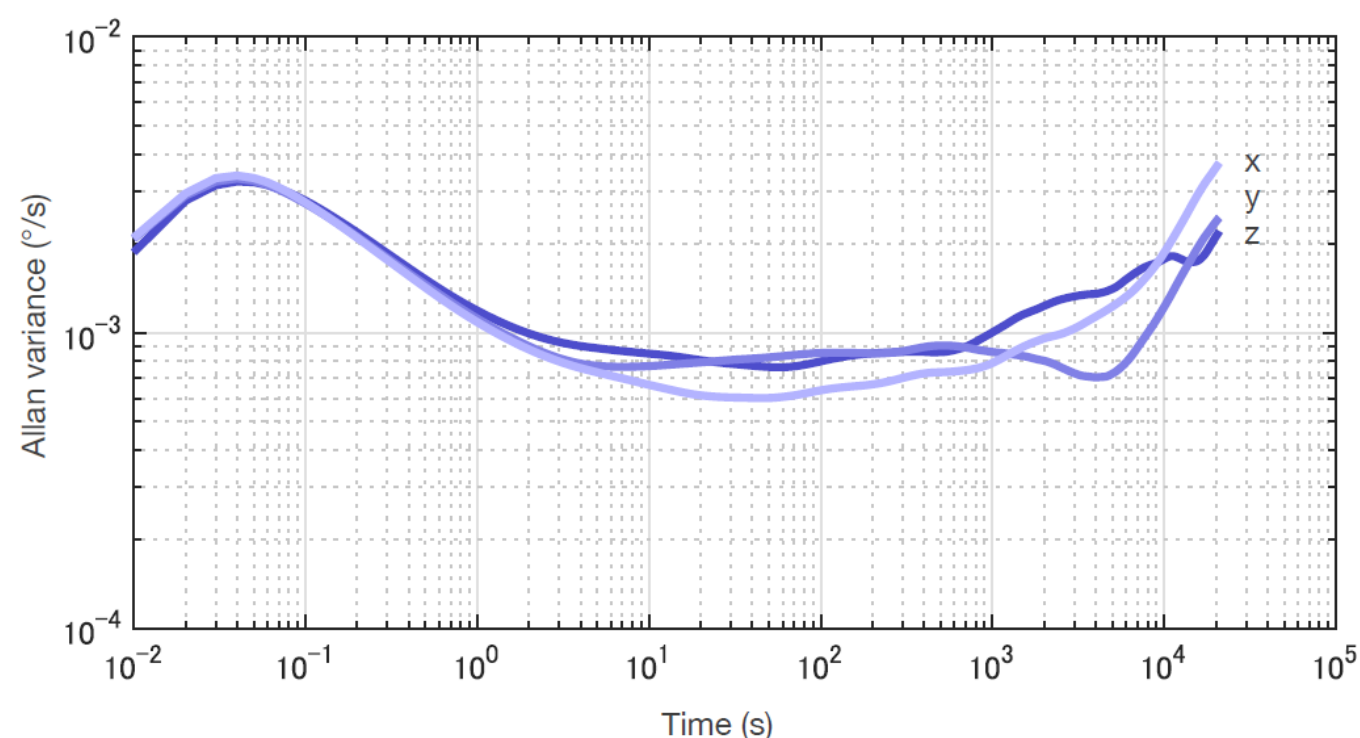
Package

- LPMS-IG1W sensor× 1
- Antenna× 1
- Instruction Manual× 1
- Cable (included USB connector) × 1
- Warranty (1 year)