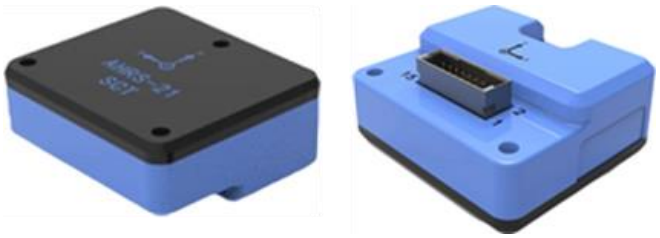
# AHRS-21



The AHRS-21 is a high-precision, compact, and low-power nine-degree-of-freedom attitude sensor, integrating a six-axis MEMS IMU with a three-axis magnetometer. It provides real-time 3D attitude angles—pitch, roll, and yaw—along with true north heading, using an embedded quaternion-based algorithm and extended Kalman filter for accurate and reliable measurements.

## Key Features

- 3D attitude angle update rate up to 500 Hz (configurable)
- Quaternion-based filtering algorithm
- Online sensor calibration and full-temperature error compensation model
- Preloaded high-precision global magnetic declination model
- ROS support
- Raw sensor data output

## Application Areas

- Robotics
- UAV

# Performance Specifications

## Hardware Specifications

| | | |
|---|---|---|
| Gyroscope | Maximum Range | ±2000deg/s |
| | Angular Random Walk | 0.2deg/$\sqrt{hr}$ |
| | Bias Stability | 3 deg/hr |
| | Bias Temperature Drift | ±0.005 deg/s/°C |
| | Bias Repeatability (at 25 °C) | ±1 deg/s |
| | Nonlinearity | ±0.1% |
| Accelerometer | Maximum Range | ±16g |
| | Velocity Random Walk | 0.3mg /$\sqrt{hz}$ |
| | Bias Stability | 2.5mg |
| | Bias Temperature Drift | ±0.1mg/°C |
| | Bias Repeatability (at 25 °C) | 50mg |
| | Nonlinearity | ±0.1% |

## Software Specifications

| | | |
|---|---|---|
| Attitude Accuracy (1σ) | Pitch | 0.3° |
| | Roll | 0.3° |
| | Yaw | 1.2° |
| Data Output Rate | configurable up to 500 Hz | |
| Online Sensor Calibration | < 10 s | |