

N300 Pro / N300WP Pro

High-Dynamic 9-Axis MEMS IMU & Attitude Sensor

High-rate inertial measurement platform for robotics, UAVs, marine systems and industrial motion sensing



Parameter	Specification
Sensor architecture	MEMS IMU with accelerometer, gyroscope and magnetometer; N300 Pro also supports barometer
IMU output rate	Up to 1000 Hz
Navigation/attitude output rate	Up to 1000 Hz
Gyroscope bias instability	As low as 1.6°/h
Input voltage	3.3-5 V DC
Power consumption	<350 mW
Operating temperature	-40°C to +85°C
Interfaces	N300 Pro: Type-C; N300WP Pro: TTL, CAN, RS485

1. Product Overview

The N300 Pro / N300WP Pro family is designed for high-dynamic, full-environment attitude and inertial measurement. The supplied product information describes an integrated MEMS-IMU platform combining inertial sensors with magnetic sensing and, on the N300 Pro, pressure sensing. Onboard algorithms include adaptive extended Kalman filtering, IMU noise/dynamic analysis, calibration, data fusion and motion-state processing. The family targets the industry challenges of accuracy, robustness and drift while supporting high-rate, low-latency data output.

2. Key Selling Points

- High-rate inertial and navigation data output up to 1000 Hz.
- Gyroscope bias instability specified as low as 1.6°/h.
- Integrated multi-sensor architecture: 3-axis accelerometer, 3-axis gyroscope and 3-axis magnetometer; N300 Pro also supports barometric pressure sensing.
- Adaptive extended Kalman filtering and onboard multi-sensor data fusion.
- Dynamic IMU noise analysis and carrier-motion-state recognition algorithms.
- Low-latency data output for high-dynamic control and measurement.
- Multiple development paths: ROS/ROS2, C and Qt examples are referenced in the supplied material.
- Direct Python data acquisition and real-time plotting support is shown.
- MATLAB data analysis and Allan variance analysis workflows are supported.
- Industrial N300WP Pro version provides TTL, CAN and RS485 interfaces and an industrial waterproof enclosure.
- Wide -40°C to +85°C operating-temperature range.
- Compact, lightweight construction with <350 mW power consumption.

3. General Specifications

Parameter	Specification
Model	N300 Pro / N300WP Pro
Dimensions - N300 Pro	26.5 × 24.5 × 14.5 mm
Dimensions - N300WP Pro	63 × 55 × 24.5 mm
Housing - N300 Pro	Mini metal housing
Housing - N300WP Pro	Standard metal housing / industrial waterproof version
Sensor axes - N300 Pro	10-axis
Sensor axes - N300WP Pro	9-axis
Barometer	N300 Pro: supported; N300WP Pro: not included
Power consumption	<350 mW
Input voltage	3.3-5 V DC
Default baud rate	115200
Output interfaces	N300 Pro: Type-C; N300WP Pro: TTL, CAN, RS485
Operating temperature	-40°C to +85°C

4. Data Outputs

Parameter	Specification
IMU data	Temperature, acceleration, angular velocity, magnetic-field strength, system timestamp
IMU output frequency	Up to 1000 Hz
Navigation / attitude data	Euler angles (Yaw, Pitch, Roll), quaternion, system timestamp, temperature; pressure where supported
Navigation / attitude output frequency	Up to 1000 Hz
Additional derived outputs shown	3-axis acceleration, 3-axis gyroscope, 3-axis magnetic field, Euler angles, quaternion, system time
Configuration functions	Serial-command calibration, configuration, mode switching and related setup functions

For 1000 Hz output, the supplied material states that the baud rate must first be configured to 921600.

5. Attitude Accuracy

Parameter	Specification
Pitch / Roll - static	Typical 0.15°; maximum 0.2°
Pitch / Roll - dynamic	Typical 0.15°; maximum 0.2°
Heading static drift - 6DOF	Typical 0.15°; maximum 0.2°
Heading dynamic drift - 6DOF	Typical 5°
Heading magnetic-aided - AHRS	Typical 2°; maximum 3°
Heading rotation error - 6DOF	Typical <0.8°; maximum 1.5°

6. Processing Architecture

The source block diagram shows 3-axis accelerometer, 3-axis gyroscope, 3-axis magnetometer and an additional 1-axis gyroscope feeding an MCU processing chain. The MCU performs filtering, calibration, data fusion and user configuration before sending data to the host interface. Dashed blocks in the source diagram indicate configuration-dependent sensing elements.

7. Mechanical Information

Parameter	Specification
N300 Pro overall size	26.5 × 24.5 × 14.5 mm
N300 Pro body references shown	24.5 mm width; 16.5 mm mounting/body reference; M2 × 3.5 mounting callout shown
N300WP Pro overall size	63 × 55 × 24.5 mm
N300WP Pro mounting/body width shown	49.5 mm
N300WP Pro body-height reference shown	40 mm
N300WP Pro connector-side reference shown	27.4 mm
N300WP Pro weight	99 g
N300 Pro weight	12.9 g

The original mechanical drawings contain Chinese annotations and are intentionally not reproduced in this datasheet. Dimensional values above were extracted from those drawings.

8. Software & Development Support

- ROS and ROS2 compatibility referenced for robotic-system integration.
- C and Qt development examples referenced in the supplied product material.
- Python workflow shown for direct serial data collection and real-time visualization.
- MATLAB analysis support shown, including Allan variance analysis.
- Host-computer GUI shown for calibration, configuration and real-time data monitoring.
- INS educational/reference documentation is included in the source package.

9. Typical Applications

- N300 Pro: UAVs, mobile robots and high-dynamic experimental platforms.
- N300WP Pro: unmanned boats, submersible systems and industrial environments.
- ROS/ROS2 robotic localization and motion-state sensing.
- Attitude estimation and orientation feedback.
- Navigation algorithm development and inertial-data research.
- Industrial motion monitoring and high-dynamic test systems.

10. Integration Notes

- Provide a regulated 3.3-5 V DC supply.
- Use 921600 baud when configuring the system for the stated 1000 Hz output mode.
- Select the N300WP Pro where CAN/RS485/TTL connectivity and ruggedized installation are required.
- Select the N300 Pro where minimum size, Type-C connectivity and barometric sensing are priorities.
- Perform application-specific calibration after final mechanical installation.
- Validate magnetic performance in the final enclosure and installation environment, particularly near motors, high-current conductors or ferromagnetic structures.

11. Source Notes

This datasheet was created exclusively from the supplied image package. Chinese-language product, parameter, software and mechanical-drawing images were used only to extract technical information and are not reproduced in the final PDF. Parameters not explicitly provided in the source package have not been invented.