The VN-100 is a miniature, light weight, low power, high-performance Inertial Measurement Unit (IMU) and Attitude and Heading Reference System (AHRS) available in a surface mount package or aluminum encased Rugged module. Incorporating the latest in MEMS technology, the VN-100 combines 3-axis accelerometers, gyros, magnetometers, a barometric pressure sensor and a 32-bit microprocessor into an extremely compact design.

The VN-100 computes and outputs a real-time, drift-free attitude solution (i.e. 3D orientation) that is continuous over a complete range of 360° motion. All VN-100 sensors go through a rigorous calibration process at the VectorNav production facility to ensure the highest quality inertial measurements and attitude estimates. The small size, high performance, and cost-effectiveness of the VN-100 provides unprecedented opportunities for embedded navigation.
TECHNICAL SPECIFICATIONS

Attitude & Heading
Range (Heading/Roll): ±180 °
Range (Pitch): ±90 °
Static Accuracy (Heading, Magnetic)\(^1\): 2.0 ° RMS
Static Accuracy (Pitch/Roll): 0.5 ° RMS
Dynamic Accuracy (Heading, Magnetic)\(^2\): 2.0 ° RMS
Dynamic Accuracy (Pitch/Roll)\(^2\): 1.0 ° RMS
Angular Resolution: < 0.05 °
Repeatability: < 0.2 °
Output Rate (IMU Data)\(^3\): 1 kHz
Output Rate (Attitude Data): 400 Hz

Gyro
Range: ±2000 °/s
In-Run Bias Stability: < 10 °/hr
Linearity: < 0.1 % FS
Noise Density: 0.0035 °/s /√Hz
Bandwidth: 256 Hz
Alignment Error: ±0.05 °

Accelerometer
Range: ±16 g
In-Run Bias Stability: < 0.04 mg
Linearity: < 0.5 % FS
Noise Density: 0.14 mg/√Hz
Bandwidth: 260 Hz
Alignment Error: ±0.05 °

Magnetometer
Range: ±2.5 Gauss
Linearity: < 0.1 %
Noise Density: 140 µGauss/√Hz
Bandwidth: 200 Hz
Alignment Error: ±0.05 °

Pressure Sensor
Range: 10 to 1200 mbar
Resolution: 0.042 mbar
Accuracy: ±1.5 mbar
Error Band: ±2.5 mbar
Bandwidth: 200 Hz

Environment
Operating Temp: -40°C to +85°C
Storage Temp: -40°C to +85°C

Electrical:
- SMD
  - Input Voltage: 3.2 V to 5.5 V
  - Current Draw: 45 mA @ 3.3V
  - Max Power Consumption: 185 mW
  - Digital Interface: Serial TTL, SPI
- Rugged
  - Input Voltage: 4.5 V to 5.5 V
  - Current Draw: 40 mA @ 5 V
  - Max Power Consumption: 220 mW
  - Digital Interface: Serial TTL, RS-232

Physical:
- SMD
  - Size: 24 x 22 x 3 mm
  - Weight: 3.5 g
  - Interface: 30-pin LGA
- Rugged
  - Size: 36 x 33 x 9 mm
  - Weight: 15 g
  - Interface: 10-pin Harwin

\(^1\) With proper magnetic declination, suitable magnetic environment and valid hard/soft iron calibration.
\(^2\) Typical. Velocity Aiding required for applications with sustained linear accelerations.
\(^3\) Default 800 Hz.

APPLICATIONS

- UAVs, UAS, Manned Aircraft
- Heavy Machinery Monitoring
- Robotics
- ROVs
- Smart Weapons
- Body Motion Capture
- Head Mounted Displays

DEVELOPMENT TOOLS

Sensor Explorer GUI: Powerful and user-friendly GUI allows you to display sensor output as a 3D object, graph inertial data, configure sensor settings, perform data-logging, & more.


Online Library: A large collection of inertial navigation knowledge and application notes is available on our website to help maximize VN-100 performance for your application.

Engineering Support: Dedicated and responsive engineering support team with combined experience in sensing, guidance, navigation, and controls.

Custom Solutions Available: Application-specific modeling & algorithm development; controls & closed-loop navigation solutions; custom form-factors & packaging; integration with other external sensors; displays, GUIs & other software packages; tailored calibrations; custom communication protocols.

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