VECTORNAV
Embedded Navigation Solutions

Attitude Heading Reference System

VectorNav VN-100

Next Generation Embedded Navigation

PRODUCT OVERVIEW

The VN-100 is a miniature, light weight, low power, high-performance Attitude and Heading Reference System (AHRS) available in a surface mount package or aluminum encased Rugged module. Incorporating the latest in solid-state MEMS technology, the VN-100 combines accelerometers, gyros, magnetometers and a 32-bit processor 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 attitude estimates and inertial measurements. The small size, high performance, and cost-effectiveness of the VN-100 provides unprecedented opportunities for embedded navigation.

HIGHLIGHTS

- Attitude & Inertial Data at 200 Hz
- Continuous Attitude Solution Over Complete 360° Range of Motion
- Static Accuracy better than 0.5° in Pitch/Roll, 2° in Heading
- Individually Calibrated for Bias, Scale Factor, Misalignment, & Gyro G-Sensitivity Errors
- Available with Full Temperature Compensation (-40°C to +85°C)
- Dimensions: 22 x 24 x 3 mm
- Weight: 3 grams
- Surface Mount Package (30-pin LGA)

FEATURES

- On-Board Gyro Drift Compensation
- Real-Time Magnetic & Acceleration Disturbance Rejection
- Adaptive Signal Filtering
- Dynamic Filter Tuning
- On-Board Hard & Soft Iron Compensation
- Multi-Sensor Synchronization
- Inputs for External Magnetometers or Velocity Measurements (Airspeed Measurements, GPS)

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TECHNICAL SPECIFICATIONS

Attitude & Heading

Range: Heading, Roll:	±180 °
Range: Pitch:	±90 °
Static Accuracy (heading):	< 2.0 °
Static Accuracy (pitch/roll):	< 0.5 °
Angular Resolution:	< 0.05 °
Maximum Output Rate:	200 Hz

IMU - Angular Rate

Range - Standard:	±500 °/s
Range - Extended*:	±2000 °/s
Linearity:	< 0.1 % FS
Noise Density:	0.005 °/s /√Hz
Bandwidth:	256 Hz
Alignment Error:	±0.05 °

IMU - Acceleration

Range - Standard:	±8 g
Range - Extended*:	±16 g
Linearity:	< 0.5 % FS
Noise Density:	400 mg/√Hz
Bandwidth:	260 Hz
Alignment Error:	±0.05 °

IMU - Magnetic

Range - Standard:	±2.5 Gauss
Range - Extended*:	±8 Gauss
Linearity:	< 0.1 %
Noise Density:	140 µGauss/√Hz
Bandwidth:	200 Hz
Alignment Error:	±0.05 °

IMU - Pressure

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

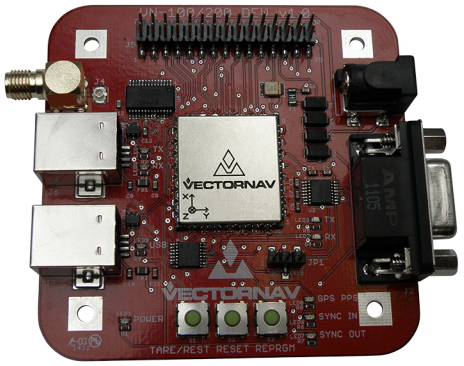
Input Voltage:	3.2 V to 5.5 V
Current Draw:	50 mA
Power Consumption:	165 mW @ 3.3V
Digital Interface:	Serial TTL, SPI

Physical (Surface Mount Part)

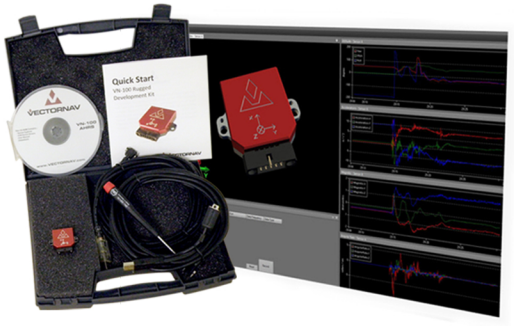
Size: (in)	0.87 x 0.95 x 0.12
(mm)	22 x 24 x 3
Weight:	3 g
Footprint:	30-pin LGA

* Contact VectorNav for pricing and availability of extended range versions.

VN-100 DEVELOPMENT KITS



- VN-100 Development Board
  - Pre-Soldered VN-100 Surface Mount Part with USB & RS-232 Interfaces
  - 30-Pin Header for Easy Prototyping



- VN-100 Rugged Development Kit
  - USB & Serial Adapter Cables
  - Connection Tool & Carrying Case
  - Powerful, User-Friendly Sensor Explorer 2.0 GUI
  - Software Development Kit: C/C++, .Net & MATLAB Libraries

VN-100 DEVELOPMENT TOOLS

- Sensor Explorer GUI
  - Powerful & user-friendly GUI allows you to display sensor output as a 3D object, graph inertial data, configure sensor settings, perform data-logging, & more
- Software Development Kit
  - Interface via C/C++, .NET, & MATLAB development environments
- Online Library
  - A large collection of inertial navigation knowledge & application notes is provided on our website to help maximize VN-100 performance for your application