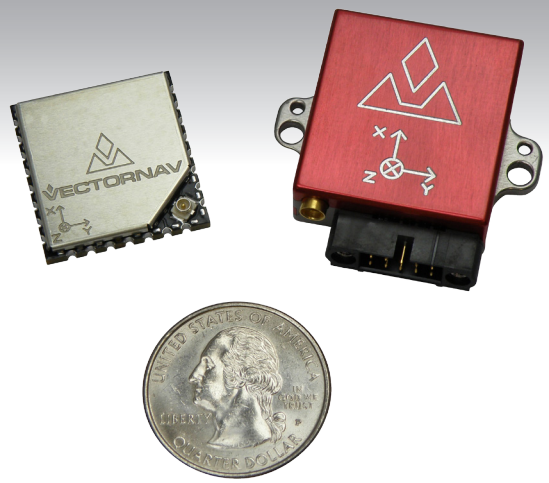
NavtechGPS®

VECTORNAV
Embedded Navigation Solutions

GPS-Aided Inertial Navigation System



VectorNav VN-200 GPS/INS

Next Generation Embedded Navigation

VectorNav Technologies introduces the VN-200, the world's smallest & lightest, high-performance GPS-Aided Inertial Navigation System (GPS/INS). Combining an advanced GPS module with the latest in MEMS inertial & pressure sensor technology, the patent pending VN-200 provides unprecedented opportunities for embedded navigation in a footprint no larger than a postage stamp.

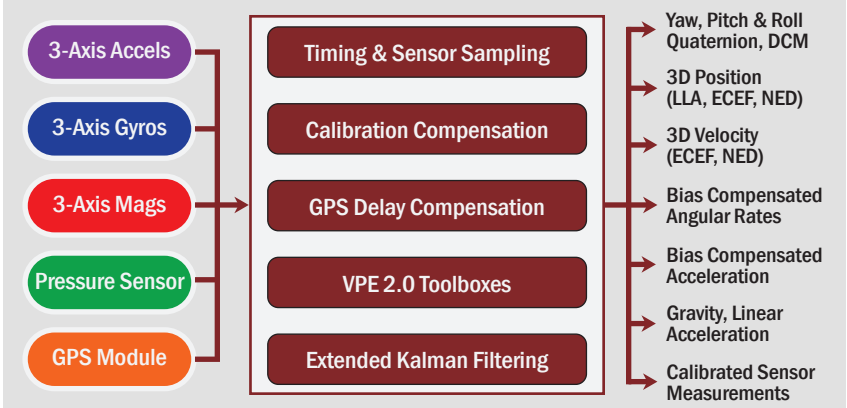
FEATURES

- On-Board Extended Kalman Filter Running at 200 Hz
- Coupled Position, Velocity & Attitude Estimates
- Dynamic Accuracy better than 0.25° in Pitch/Roll, 0.75°in Heading
- On-Board Pressure Sensor & U-Blox GPS Receiver
- Compatible with External GPS, Pressure or Magnetic Measurements
- Individually Calibrated for Bias, Scale Factor, Misalignment, & Gyro G-Sensitivity
- Available with Full Temperature Compensation (-40°C to +85°C)
- Miniature, Self-Locking U.FL & MMCX Connectors for GPS Antenna
- Serial TTL, SPI & USB Communication Interfaces
- Surface Mount Package (30-pin LGA)
  - Dimensions: 24 x 22 x 3 mm
  - Weight: 3 grams
- Rugged Package
  - Dimensions: 36 x 34 x 9.5 mm
  - Weight: 14 grams

VECTOR PROCESSING ENGINE (VPE) 2.0

- Automatic Filter Initialization & Dynamic Alignment
- GPS Delay Compensation
- All Inertial Data Synchronized to GPS Time
- Real-Time Sensor Bias Drift Compensation
- World Magnetic Model
- VPE Toolboxes
  - Advanced Disturbance Rejection
  - Adaptive Signal Filtering
  - Dynamic Filter Tuning
  - On-Board Hard & Soft Iron Compensation

VN-200 SIMPLIFIED BLOCK DIAGRAM



12-0003-NT-R1

Tel +1.703.256.8900 / +1.800.628.0885 www.NavtechGPS.com Info@NavtechGPS.com

TECHNICAL SPECIFICATIONS

Navigation Specifications

Position Accuracy:	2.5 m RMS Horizontal 5 m RMS Vertical
Velocity Accuracy:	±0.1 m/s
Static Accuracy (heading):	2.0 °
Static Accuracy (pitch/roll):	0.5 °
Dynamic Accuracy (heading):	0.75 °
Dynamic Accuracy (pitch/roll):	0.25 °
Angular Resolution:	< 0.05 °
Repeatability:	< 0.2 °
Maximum Output Rate:	200 Hz*

Gyro Specifications

Range:	±2000 °/s
In-Run Bias Stability:	< 10 °/hr
Linearity:	< 0.1 % FS
Noise Density (or ARW):	0.005 °/s /√Hz
Bandwidth:	256 Hz
Alignment Error:	±0.05 °

Accelerometer Specifications

Range:	±16 g
Linearity:	< 0.5 % FS
Noise Density:	0.4 mg/√Hz
Bandwidth:	260 Hz
Alignment Error:	±0.05 °

Magnetometer Specifications

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

GPS Specifications

Receiver Type:	50 Channels, L1 Freq GPS C/A Code
Solution Update Rate:	5 Hz
Time-to-First-Fix:	Cold/Warm Start: 36 s Hot Start: < 1 s
Altitude Limit:	50,000 m
Velocity Limit:	500 m/s

Pressure Sensor Specifications

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 (Surface Mount):	3.2 V to 5.5 V
Input Voltage (Rugged):	3.2 V to 17 V
Current Draw:	120 mA @ 5 V
Power Consumption:	600 mW
Digital Interface (Surface Mount):	Serial TTL, SPI
Digital Interface (Rugged):	Serial TTL, RS-232

Physical (Surface Mount Part)

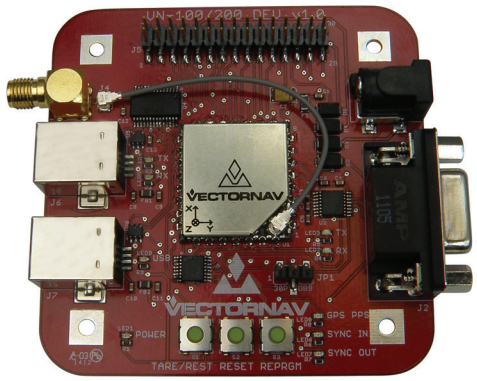
Size:	24 x 22 x 3 mm
Weight:	3 g
Footprint:	30-pin LGA
GPS Antenna Connector:	U.FL

Physical (Rugged)

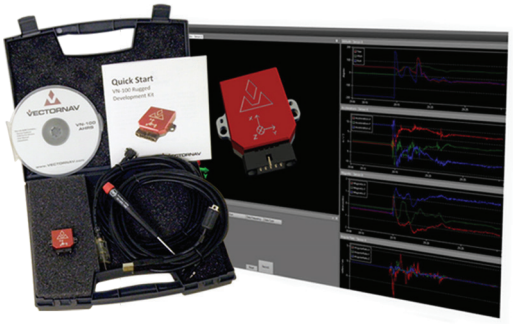
Size:	36 x 34 x 9.5 mm
Weight:	14 g
Connector:	Harwin M80-5001042
GPS Antenna Connector:	MMCX

* Rates of up to 1 kHz (for IMU data only) available upon request.

VN-200 DEVELOPMENT



- VN-200 Development Board
  - Pre-Soldered VN-200 Surface Mount Part with USB & RS-232 Interfaces
  - SMA Connector for GPS Antenna



- VN-200 Rugged Development Kit
  - USB & Serial Adapter Cables, GPS Antenna
  - Connection Tool & Carrying Case

VN-200 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
- **Software Development Kit**: Interface via C/C++, .NET & MATLAB development environments
- **Online Library**: A large collection of inertial navigation knowledge and application notes is available on our website to help maximize VN-200 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.

12-0003-NT-R1