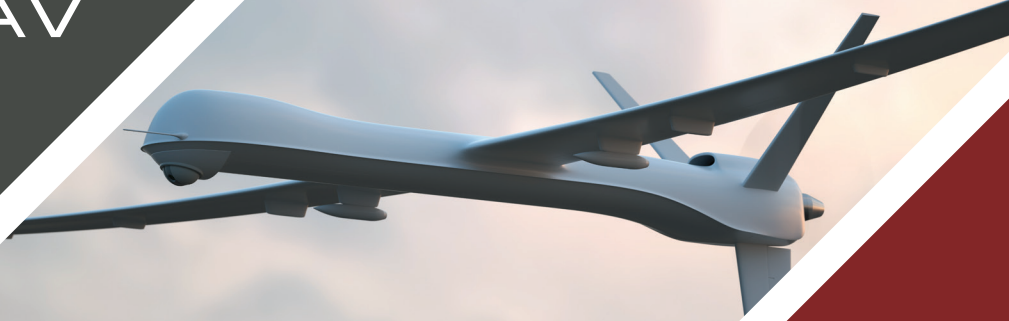


# VECTORNAV TACTICAL SERIES



VN-110 IMU/AHRS  
VN-210 GNSS/INS  
VN-310 DUAL GNSS/INS



VectorNav introduces the Tactical Series, a next-generation, MEMS inertial navigation platform that features high-performance IMU, AHRS, GPS/INS and GPS-Compass solutions.

Featuring a tactical-grade IMU core housed in a robust and compact aluminum enclosure, the Tactical Series leverages VectorNav's industry leading navigation algorithms to offer a new class of inertial navigation solutions.

#### Key Benefits

- $< 1^\circ/\text{hr}$  in-run gyro bias stability
- $< 2$  mrad attitude performance
- IP 68 rated enclosure designed to meet DO-160G
- Software compatible with existing VectorNav products
- Expansion port for connectivity to external sensors
- 4 GB onboard memory for data logging
- Made in the USA



# THE TACTICAL SERIES

The VectorNav Tactical Series sets a new standard for high-performance inertial navigation systems. Built on a tactical grade MEMS IMU core that is housed in a compact and ruggedized aluminum enclosure, the Tactical Series leverages VectorNav's industry leading navigation algorithms and extensive applications experience to deliver a new standard in inertial navigation.



VN-110 IMU/AHRS



VN-210 GNSS/INS



VN-310 Dual GNSS/INS

## CAPABILITIES

	VN-110 IMU/AHRS	VN-210 GNSS/INS	VN-310 Dual GNSS/INS
IMU Measurements	●	●	●
Magnetic Heading	●	●	●
Attitude Filter (VPE <sup>1</sup> )	●	●	●
INS Filter	-	●	●
GPS-Compass Heading	-	-	●

<sup>1</sup> Vector Processing Engine, VectorNav's proprietary suite of attitude estimation algorithms and toolboxes.

## KEY SPECIFICATIONS (PRELIMINARY)

NAVIGATION	VN-110	VN-210	VN-310
Heading (INS)	-	< 0.1 ° RMS	< 0.1 ° RMS
Heading (GPS-Compass) <sup>1</sup>	-	-	0.3 ° RMS
Pitch/Roll (Static)	< 0.05 ° RMS	< 0.05 ° RMS	< 0.05 ° RMS
Pitch/Roll (Dynamic)	-	< 0.03 ° RMS	< 0.03 ° RMS
Horizontal Position (w/ SBAS)	-	2.0 m RMS	2.0 m RMS
Vertical Position	-	5 m RMS	5 m RMS
Velocity	-	< 0.05 m/s	< 0.05 m/s

## PHYSICAL

Dimensions	56 x 56 x 23 mm	56 x 56 x 31 mm	56 x 56 x 31 mm
Weight	160 g	190 g	200 g

## IMU

	Accelerometer	Gyroscope	Magnetometer
Range	±10 g	±490 °/s	±2.5 Gauss
In-Run Bias Stability	< 10 µg	< 1 °/hr	-
Noise Density	0.04 mg/√Hz	3.24 °/hr /√Hz	140 µGauss/√Hz
Bandwidth	240 Hz	240 Hz	200 Hz

## GNSS (VN-210 and VN-310 Only)

Receiver Type	72 Channels, L1, GNSS	Time-to-First-Fix (Cold/Warm Start)	26 s
Update Rate	5 Hz	Time-to-First-Fix (Hot Start)	< 1 s
Altitude Limit	50,000 m	Velocity Limit	500 m/s

## ENVIRONMENT

Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
IP Rating	IP 68 per IEC 60529

## ELECTRICAL

Power Consumption	< 2.5 watts
Input Voltage	+9 to +36 VDC (MIL-STD-1275E)

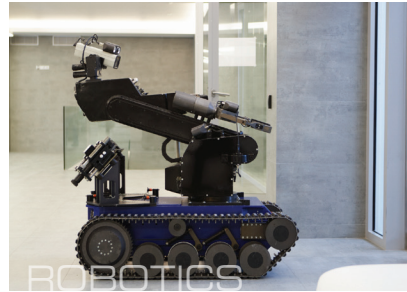
## INTERFACING

IMU	Up to 800 Hz
INS Solution	Up to 400 Hz
Primary Interface	RS-422 + 3 sync I/O pins
Expansion Interface	RS-232/422
Serial Protocols	VectorNav binary and ASCII protocols, NMEA
Power & I/O Connectors	Circular Push-Pull Fischer UltiMate (10-pin x 2; Size 7)
GNSS RF Connectors	SMA

<sup>1</sup> With one (1) meter baseline, clear view of GNSS satellites and good multipath environment.

# APPLICATIONS

The VectorNav Tactical Series has been designed from the ground up to offer robust inertial navigation solutions for a wide range of applications and operating environments. Whether it is an airborne, marine, or ground-based platform, the Tactical Series offers systems integrators versatile hardware and software configuration options to meet the most demanding navigation requirements. The Tactical Series is well suited for Size, Weight, Power and Cost (SWaP-C) constrained systems in the aerospace, military, marine, among other industries.



## VECTORNAV SUPPORT ECOSYSTEM

The Tactical Series is backed by the industry's most customer-focused, robust and responsive support ecosystem. With VectorNav as your inertial navigation partner, you receive full access to our support ecosystem throughout the entire development cycle and product lifetime of your system. Our mission is to ensure the successful evaluation, development, testing, and integration of VectorNav sensors into your application.

### SUPPORT

- < 24-hour sales and support response time
- Direct access to VectorNav's hardware, software and applications engineers
- Detailed and comprehensive documentation
- Online collection of inertial navigation knowledge, FAQ's and application notes
- Free and field upgradable firmware

### PRODUCTION

- 30,000 sq. ft. (2750 sq. meter) manufacturing facility with high-volume production capacity
- 1-2 day lead time on Development Kits
- Individual sensor calibration across full temperature range (-40 C to +85 C)
- Standard 1-year warranty
- Calibration reports

### DEVELOPMENT TOOLS

- **Development Kits:** Complete hardware Development Kits include VectorNav sensor, applicable cabling, GNSS antennas, documentation, hardware tools and rugged carrying case.
- **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:** Programming libraries with C/C++, .NET, MATLAB & LabVIEW support for both Windows and Linux.
- **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.



Your Partner in Embedded Navigation.

VectorNav Technologies is a leading developer and manufacturer of high performance inertial navigation systems using the latest in MEMS sensor and GPS/GNSS technology. Since its founding in 2008, VectorNav has provided systems integrators in the Military, Aerospace, Marine, and Robotics industries with embedded navigation solutions optimized for SWaP-C constraints. VectorNav has unique expertise in applying the digital filtering and sensor calibration techniques that have multiple decades of heritage in Aerospace applications to the state-of-the-art in MEMS inertial and GPS/GNSS technology.

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