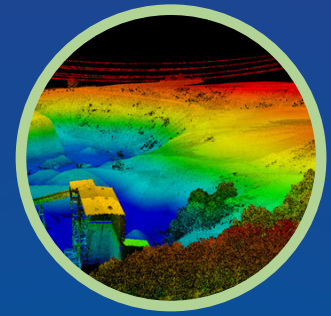


## Your ONE Source for GNSS Equipment and Solutions



Delivering expert GNSS + INS system design,  
COTS equipment solutions and more

- ◆ Custom hardware/software integration
- ◆ GPS/GNSS integration into LiDAR systems
- ◆ GNSS simulation and testing
- ◆ Jammer locating, detection, and interference mitigation
- ◆ GNSS RF network components, design and installation
- ◆ Unmanned air/ground/maritime vehicles
- ◆ Precise attitude/heading system applications
- ◆ Precise recovery/docking systems
- ◆ INS systems for remote sensing
- ◆ Mobile surveillance vehicles
- ◆ Precise PNT (position, navigation and timing) applications
- ◆ Indoor GNSS denied navigation
- ◆ Components from more than 20 manufacturers

### We sell products from ...



... and more!

### Products and Services

**In-house expertise on a wide range of components and systems from nearly 20 manufacturers.**

- ◆ Customized systems using off-the-shelf components (COTS)
- ◆ GPS/GNSS Integration into LiDAR systems
- ◆ [Hand-held GNSS jamming, interference detection and mitigation](#)
- ◆ Space weather monitor receivers for tracking through scintillation
- ◆ [RF networking system design and installation \(DAS\)](#)
- ◆ OEM on-chip GPS-aided INS
- ◆ Indoor locating and positioning in GPS-denied areas
- ◆ Differential subscription services
- ◆ GNSS heading and attitude
- ◆ [OEM receiver boards](#)
- ◆ [GNSS simulation and testing](#)
- ◆ GNSS development software
- ◆ Signal distribution products
- ◆ [GNSS inertial navigation](#)
- ◆ GNSS signal interference mitigation
- ◆ [Post-processing software](#)
- ◆ INS systems
- ◆ RTK/PPP systems
- ◆ GNSS antennas
- ◆ Smart antennas
- ◆ Customized cables
- ◆ GIS equipment
- ◆ SBAS

### GNSS Training and Seminars

**NavtechGPS is a world leader in GPS/GNSS education and training with more than 35 years of experience.**

- ◆ We offer private remote group courses or on-site courses\*, when possible, saving you overhead, travel expenses and time.
- ◆ We can tailor any course from our list of courses to meet your group's needs.
- ◆ For individuals or smaller groups, our public live remote courses offer an excellent learning environment, networking opportunities and time for in-depth instruction.

\*For the foreseeable future all courses will be presented remotely.

### References and Books

**We stock hard to find, specialized GPS/GNSS titles.**

- ◆ In stock titles usually ship same day. ◆ Order online or call.

### Contact Us

**For the choices you want and the expertise you need.**

**Monday – Friday: 0900 – 1730, EST**

**+1-703-256-8900 or 1-800-NAV-0885**

**[www.NavtechGPS.com](http://www.NavtechGPS.com) ◆ [Info@NavtechGPS.com](mailto:Info@NavtechGPS.com)**

**Woman-Owned Small Business 8(m)**

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## Chronos Technology

Chronos Technology has developed low-cost, battery-operated handheld GPS interference and jamming detectors and locators that detect the presence of too much power at the center frequency of L1 GPS, and interference broadcasting on the GPS satellite navigation L1 channel — the most common jamming source. These detectors could be used by the FCC, the FAA, law enforcement, trucking companies, vehicle fleets, in test labs, for field use, in airports, in toll booths, by local and federal governments, and in many other business uses.

*NavtechGPS has partnered with Chronos Technology to market these products in the United States. Contact us about how these products can help alert you to GPS jamming and unintended GPS signal interference.*

### CTL3510-LOG GPS Interference and Jammer Detector and Logger

The CTL-3510 got even better. It builds on the basic features of the CTL-3500 but with a more sensitive handheld device *that now has an internal event logging option*. Like the original CTL-3510, the CTL-3510 with event logging is also battery operated and designed to detect the presence of GPS jamming or too much power or interference in the GPS (L1) band.



### CTL3520 Handheld Directional GPS Interference and Jammer Detector and Locator

The Chronos CTL-3520 directional GPS jammer detector and locator is a handheld, battery operated device designed to detect and quickly locate the presence of jamming signals from commercially available GPS jammers or too much power or interference broadcast in the GPS (L1) band.

The CTL-3520 uses innovative direction finding technology developed by the University of Bath to accurately determine which vehicle or individual is hosting the jammer, and then point the user in the direction of the jammer.

Aimed specifically at detecting GPS jammers hidden in vehicles, the unit can pinpoint even the weakest jammer and identify the vehicle in which the jammer is hidden, even in a busy multi-level parking garage. Other applications include detecting vehicles with jammers at airports, fleet depots, airport parking garages and in taxi fleets.



### CTL3510-M1 GNSS Interference Detector and Logger

The Chronos CTL3510-M1 is a ruggedised waterproofed, handheld, battery operated device designed to detect the presence of GNSS jamming or too much power or interference in the GPS L1 and Galileo E1 bands in harsh environments. It is ideal for detecting commercially available GNSS jammers hidden in vehicles and for detecting GNSS jamming in harsh environments. The time stamped event logging feature enables covert deployment in vehicles where the driver is suspected of using GPS Jammers.





# FORSBERG

## GNSS Solutions for Extended Cable Runs

NavtechGPS is pleased to partner with Forsberg to handle the North America sales and distribution of the Forsberg StarLink RF line of GNSS / GPS down-up converters, signal splitters and in-line amplifiers, as well as the Forsberg Raven Link System of transmitters and receivers.

The Forsberg StarLink (formerly Raven StarLink DPGS) GPS signal splitters and fiber-optic solutions resolve the difficulties associated with signal losses due to extended antenna cable lines of practically any length.

Forsberg Services, Ltd., acquired Raven's StarLink GNSS product line from Raven Industries in April 2015. *NavtechGPS is the exclusive North American distributor for the Forsberg StarLink product line.*



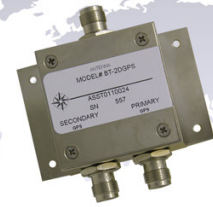
**Inline Amplifiers**  
GNSS Signal Amplifier



**DUC**  
Coaxial Down Up Converter



**RVL-1**  
Fibre Optic GNSS solution



**Splitters**  
GNSS Signal Splitter

### Inline Amplifiers

Forsberg StarLink in-line amplifiers are a convenient way to boost GPS signals before they reach the receiver. *These are designed to go in-line with RF cables and will also fit into pipe mounts.*

### Down/Up Converters

The patented GPS Down/Up converter makes it possible for long cable runs of 450 meters (1,476 feet). The DUC converters are the perfect add-on for L1 GPS installations where long antenna cables are needed and a simple in-line amplifier will not suffice. A DUC consists of a down converter at the GPS antenna and an up converter at the RF input of the GPS receiver.

### Fibre Optic Link System

The RVL-1 Fiber Optic Link System is an affordable GPS fiber optic antenna link system for GPS and GNSS systems, which offers complete lightning protection between the transmitter and receiver. Also used for secured connections where RF cable is not allowed.

### Splitters

The Forsberg StarLink splitters are designed to provide two GNSS receivers with a signal from a single antenna by dividing the outgoing signal into two separate GPS receivers with minimal signal loss.



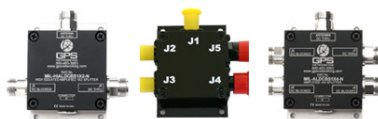
**GPS**  
NETWORKING

## Quality RF Components for GPS/GNSS signal distribution

GPS Networking, Inc., manufactures GPS signal distribution products to create distributed antenna systems (DAS) to distribute the GPS signal throughout a facility. GPS Networking was the first manufacturer to develop these building block GPS products and to commercially supply GPS re-radiating kits to transmit GPS signals indoors.

**Attention Military Users:** GPS Networking's ruggedized splitters have been tested and certified to military specifications. These products are specifically designed for military applications and are hermetically sealed, EMI shielded (MIL-SPEC). Contact us for product details, certification and testing information and pricing.

Over the years, NavtechGPS has designed and installed hundreds of DAS and RF networking systems. We have everything you need for your RF network: advice, expertise, years of experience, installation know-how, and quality components from GPS Networking, the company that originated the technology.



### Mil-Spec Splitters

GPS Networking's ruggedized splitters have been tested and certified to military specifications. These products are specifically designed for military applications and are hermetically sealed and EMI shielded for the most challenging environments. Please see the product detail pages on our website for certification and testing information.



### Splitters

GPS Networking signal splitters have a single antenna input and are available with 2, 4, or 8 outputs. Rack-mount configurations of 1x8, 1x16 and 1x32 are available, as well as auto-switching signal splitters. We also carry signal combiners from GPS Networking and the *MLDCBS1x2 Mini Splitter*, a one input, two output device based on the Wilkinson splitter design. The *MLDCBS1X2* was designed with drones in mind to minimize weight and size.

### Fiber Optic Antenna Link Systems

*Time to take advantage of these outstanding systems because the prices have dropped by nearly 50 percent!* Take advantage of various types of fibre optic antenna link systems for converting the GPS carrier for RF to travel up to 10 kilometers and then reconvert back to RF to be output to your GPS receiver.



### L1/L2 (plus all other GNSS signals\*) Hangar GPS Networking Re-radiating Kits

This re-radiating kit (L1/L2GHNRRKIT) is a complete re-radiating (GPS repeater) system that allows re-radiation of the GPS L1, L2, L5, Galileo, GLONASS and Omnistar signals indoors. The kit consists of an active roof antenna, a re-radiating amplifier with a wall mount plug-in transformer that powers the entire system, and a passive re-radiating antenna. We have a number of kits available with other configurations. *(Please see our website for required authorizations before purchases can be completed.)* \*Not including IRNSS L2



### Amplifiers

GPS Networking has a large line of low-noise amplifiers to meet any need, including in-line amplifiers.







## Innovative GNSS Products for Positioning, Guidance and Machine Control

Hemisphere GNSS has become a leader in the high-performance satellite positioning and heading marketplace with a robust technology foundation and a focus on innovation. Hemisphere sells globally with several leading product, service, and technology brands, including Athena™, Atlas®, Crescent®, Eclipse™, and Vector™ for high-precision positioning and heading applications. Hemisphere's innovative GNSS-based solutions are focused on drones, autonomous vehicles, precise positioning, agriculture, construction and mining, marine, and L-band correction service markets.

The all-new Phantom and Vega OEM boards offer considerable performance advantages in low-power, high-precision position and heading OEM modules. Multi-GNSS receivers process more than 1,100 channels. Hemisphere's platforms track all BeiDou Phase 2 and Phase 3 signals, new GLONASS signals, Galileo E6, and QZSS/L6, and have access to Hemisphere's Atlas® GNSS Global Corrections network. Ask us which of these fine products will work best for you.

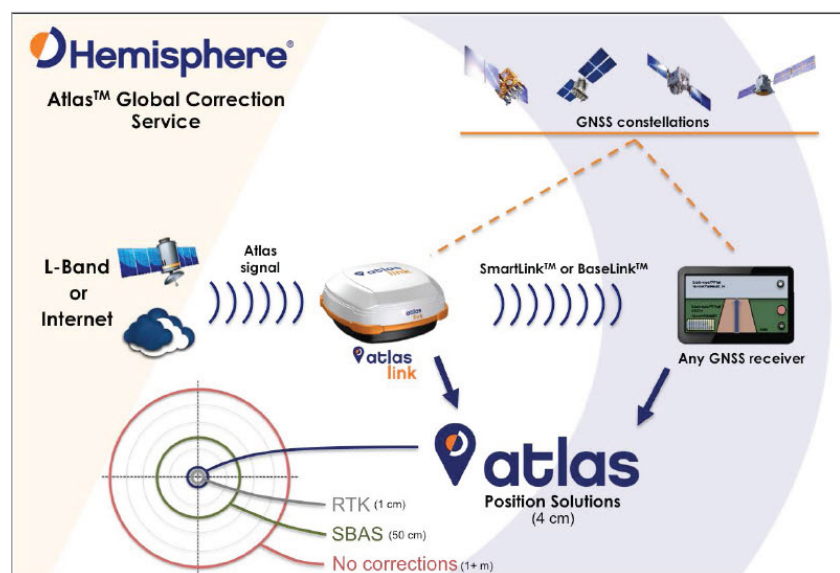
### Atlas™ Global Correction Service and AtlasLink™ Smart Antenna



Atlas™, Hemisphere's new space-based correction service, delivers correction signals via L-Band satellite broadcast or over the Internet at accuracies ranging from meter to sub-decimeter levels for GPS and GLONASS corrections.

Atlas™ support is being introduced across a wide range of multi-frequency, RTK-capable hardware, including Hemisphere's all-new AtlasLink™ GNSS smart antenna.

The Atlas L-Band correction service is available for the AtlasLink™, R330U, V200, V500 and VS1000. Or, you can export the corrections from the AtlasLink™ to your own existing RTK receiver using their corrections.



### AtlasLink™ Smart Antenna

AtlasLink™ is a versatile multi-frequency smart antenna from Hemisphere GNSS that is preconfigured to receive corrections from the new Atlas GNSS global correction service. AtlasLink offers Hemisphere GNSS Athena GNSS engine; L-Band 10 cm corrections; L1 L2, RTK; a powerful Web user interface accessible via WiFi; Built-in internal memory for data logging, download and upload, and an enclosure for the most aggressive user scenarios.



## Innovative GNSS Products for Positioning, Guidance and Machine Control

More great Hemisphere GNSS products to meet your needs. The experts at NavtechGPS® are ready to help you satisfy your firmware challenges. (Continued from prior page.)

### GNSS Crescent® Vector™ H220 Board

The H220 GNSS OEM board is a single-frequency, high-performance GNSS heading, positioning, and attitude module. It allows integrators to develop for sophisticated marine, navigation, and land applications in challenging, dynamic environments. It uses Hemisphere's advanced Vector technology, advanced multipath mitigation techniques, and Hemisphere's patented multifunction application. The H220 is capable of providing heading of 0.04° with a 5 meter antenna baseline and either RTK or SBAS positioning depending on your location requirements. With Atlas corrections, the H220 can obtain instant sub-meter accuracy worldwide, while being more robust than SBAS even in SBAS regions.



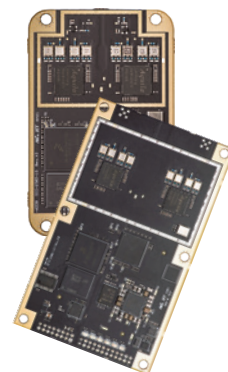
### The Phantom™ 20 & 34 & 40 GNSS OEM Boards

Track More Signals with these low-power, multi-frequency, multi-GNSS OEM solutions. With the Phantom™ 20 & 34 & 40, you can take advantage of simultaneous tracking of all satellite signals, including GPS, GLONASS, BeiDou, Galileo, QZSS, IRNSS and L-band, making these boards robust and reliable solutions for GIS, agriculture, and machine control. The power management system efficiently governs the processor, memory, and ASIC making it ideal for multiple integration applications. Hemisphere's aRTK technology, powered by Atlas, allows the these boards to operate with RTK accuracies when RTK corrections fail. Tracer uses specialized algorithms to sustain positioning in the absence of correction data. Scalable solutions with easy migration. Contact NavtechGPS to learn which board will best meet your needs.



### Vega™ 28 and Vega 40™ GNSS Compass Boards

GNSS heading and position boards developed specifically for sophisticated machine control and navigation solutions. Both the Vega 28™ and Vega 40™ use dual antenna ports to create a series of additional capabilities including fast, high-accuracy heading over short baselines, RTK positioning, onboard Atlas™ L-band, RTK-enabled heave, low-power consumption, and precise timing. positioning is scalable and field upgradeable with all Hemisphere software and service options. Utilize the same centimeter-level accuracy in either single frequency mode, or employ the full performance and fast RTK initialization times over long distances with multi-frequency, multi-constellation GNSS signals. High-accuracy L-band positioning from meter to sub-decimeter levels available via Atlas™ correction service.



More great Hemisphere GNSS products to meet your needs. The experts at NavtechGPS® are ready to help you satisfy your firmware challenges. (Continued from prior page.)

### R632™ GNSS Receiver with Optional Heading

The Hemisphere R632 GNSS receiver is ideal for almost any application requiring professional-level position and heading performance. The R632 is a compact and powerful package, offering the ability to easily upgrade to 0.01° accurate heading. The R632 offers interference rejection and multipath mitigation. The result is an effective combination of performance, communications, and connectivity.



### Vector™ VS1000 GNSS Receiver

The Hemisphere GNSS Vector™ VS1000 is a multi-GNSS, multi-frequency receiver designed specifically for the marine market. The VS1000 provides precise heading, Athena™ RTK positioning, and full Atlas® capability. Its rugged design is compliant to 60529:2013 IP67 and IEC 60945:2002 8.7 standards.

The VS1000 supports antenna separations up to 10 meters, offering heading accuracy to 0.01 degrees RMS in addition to RTK position accuracy and full support for Hemisphere GNSS' Atlas® world-wide L-band corrections.



### V200™ GPS Compass

The all-in-one V200 GNSS Compass combines Hemisphere's Crescent Vector H220 OEM board, two superior multipath and noise-rejecting antennas (spaced 20 cm apart), a multi-axis gyro, and tilt sensors in a single easy-to-install and use enclosure. The V200 delivers 1.5 degree (or optional 0.75 degree) heading accuracy and Atlas L-band accuracies of 30 cm to 60 cm and offers instantaneous sub-meter accuracy and DGPS-level accuracy.



### Vector™ V500 GNSS Smart Antenna

The Hemisphere Vector V500 GNSS Smart Antenna is an all-in-one compass system that offers GNSS-based heading, pitch, roll, heave, and RTK positioning in a multi-frequency, multi-GNSS smart antenna, for RTK-level position and precise heading. It supports multi-frequency GPS, GLONASS, BeiDou, Galileo, QZSS, and IRNSS (with future firmware upgrade and activation) for simultaneous satellite tracking. The V500 is powered by Hemisphere's innovative and industry-leading Athena RTK engine and is Atlas L-band capable.



### A631GNSS SMART Antenna

The Hemisphere A631 The A631 Hemisphere GNSS Smart Antenna is an affordable, portable solution with professional-level accuracy for agricultural, marine, GIS, mapping, and other applications. The A631 has fast start-up and reacquisition times, scalable accuracy, and an easy-to-see LED status indicator for power, GNSS, and DGNSS. The durable enclosure houses both antenna and receiver. It can be powered through various sources, making the A631 smart antenna ideal for many applications. Dual-Serial, CAN, and pulse output options make this DGNSS receiver compatible with almost any interface.



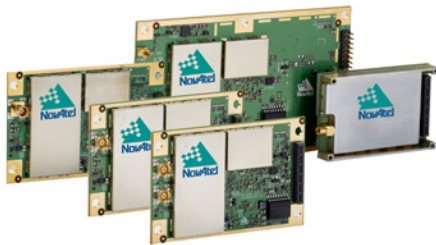




## Performance, Accuracy and Innovation

With innovations including GL1DE, ALIGN and AdVance RTK, SPAN® (NovAtel's synchronous position, attitude and navigation) technology, and correction services through NovAtel CORRECT®, NovAtel continues to evolve its GNSS hardware. And now, with the introduction of the OEM7 receivers, which includes advance interference mitigation features, NovAtel continues to ensure that the people get what they want. *(See next page for more great products from NovAtel.)*

### OEM7™ High Precision GNSS Receivers



The NovAtel OEM7™ GNSS series of receivers builds on the precise positions know-how of its previous six generations to incorporate innovative capabilities and features that enhance positioning reliability, accuracy and availability, including much needed advanced interference detection and mitigation capabilities, with L-Band and SPAN® GNSS+INS functionality on every card.

These Multi-frequency GNSS receivers use a 555 channel architecture and are capable of tracking all current and upcoming GNSS constellations. Multiple form factor, configurations and firmware options are available.

Five series 7 boards are available: OEM 7700™, OEM 7600™, OEM 7720™, OEM 719™, and the OEM 729™. NovAtel has a receiver for all your needs. The series 7 receivers include the following features:

1. **Compact Enclosure Option:** The Series also includes a new compact enclosure option, the PwrPak7™, to house OEM7 receiver technology, and offer 16 GB onboard data storage, built-in Wi-Fi and serial, USB, CAN and Ethernet for ease of integration.
2. **Interference Toolkit:** The Interference Toolkit is used to detect sources of interference and intentional and unintentional jamming, and then mitigates such occurrences using proprietary NovAtel filters.
3. **L-Band Functionality:** The L-Band functionality on every OEM7 receiver enables satellite delivery of Precise Point Positioning (PPP) correction data directly to the receiver. Utilizing TerraStar correction data from the TerraStar network, means centimeter level positioning is possible for a broad range of applications.
4. **SPAN® Technology:** NovAtel's SPAN® technology is supported on every OEM7 receiver. SPAN tightly-couples NovAtel's GNSS technology with a number of available Inertial Measurement Units (IMUs) to provide robust, continuous 3D positioning, velocity and attitude, even through periods of blocked or unavailable signal reception.

### OEMStar™

The OEMStar receiver has the same form factor as NovAtel's OEMV-1 series receivers and uses the OEMV® style command interface. This allows you to easily integrate the OEMStar into existing OEMV-1 series systems. The OEMStar uses SBAS corrections from services such as WAAS and EGNOS.





## Performance, Accuracy and Innovation

Multi-frequency and multi-constellation receivers with innovations including GLIDE, ALIGN and AdVance RTK, SPAN® (NovAtel's synchronous position, attitude and navigation) technology, and correction services through NovAtel CORRECT®, NovAtel continues to evolve its GNSS hardware. And now, with the introduction of the OEM7 receivers, which includes advanced interference mitigation features, NovAtel continues to ensure that the people get what they need. *(See next page for more great products from NovAtel.)*

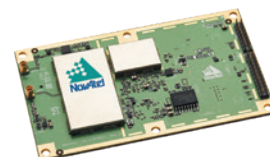
### NovAtel OEM719

The OEM719 multi-frequency GNSS receiver delivers precise positioning while retaining backwards compatibility with NovAtel's OEM615™ and OEM617™ form factors. The OEM719 is scalable to offer sub-meter to centimeter-level positioning, and is field upgradable to all OEM7® family firmware options.



### NovAtel OEM729

The OEM 729 from NovAtel is a multi-frequency GNSS receiver that delivers precise positioning while retaining backwards compatibility with NovAtel's OEM628™ form factor. It offers not only precise positioning, but also advanced interference mitigation. The OEM729 is scalable to offer sub-metre to centimetre level positioning, and is field upgradable to all OEM7™ firmware options.



### NovAtel OEM7700

This multi-frequency GNSS receiver offers precise positioning and advanced interference mitigation in a small package. With a 555 channel architecture, the OEM7700 can track upcoming GNSS constellations, including GPS, GLONASS, Galileo, BeiDou, QZSS and IRNSS. Firmware options include NovAtel CORRECT™ with RTK for centimetre level real-time positioning, ALIGN® for precise heading and relative positioning, GLIDE® for decimetre level pass-to-pass accuracy and SPAN® for continuous 3D position, velocity and attitude.



### NovAtel OEM7720™

This multi-frequency, dual-antenna receiver delivers robust heading and positioning along with advanced interference mitigation features. For maximum flexibility, the OEM7720 uses a 555 channel architecture and is capable of tracking all current and upcoming GNSS constellations. It is scalable to offer sub-metre to centimetre level positioning. This receiver is field upgradable to all OEM7® family software options, including NovAtel CORRECT™ with RTK, ALIGN®, GLIDE® and SPAN®.



### NovAtel PwrPak7®

The PwrPak7 is a compact enclosure that delivers scalable Global Navigation Satellite System (GNSS) with internal storage and INS options. The PwrPak7 is capable of tracking all present and upcoming GNSS constellations and satellite signals. It also offers optional integrated INS support for continuous position, velocity and attitude through short periods of GNSS outage.

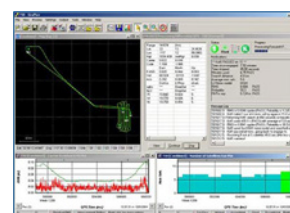


## GrafNav/GrafNet Post Processing Software

GrafNav/GrafNet post-processing software from NovAtel Waypoint® is a powerful and highly-configurable processing engine that allows for the best possible static or kinematic GNSS accuracy using all available GNSS data.

The software also has multiple quality control features built-in so the quality of the solution is never in question. The base station download utility allows access to thousands of publicly available, continuously operating reference stations and Precise Point Positioning (PPP) means that for many applications, no base station is required.

WAYPOINT  
PRODUCTS GROUP





## Performance, Accuracy and Innovation

Multi-frequency and multi-constellation receivers with innovations including GL1DE, ALIGN and AdVance RTK, SPAN® (NovAtel's synchronous position, attitude and navigation) technology, and correction services through NovAtel CORRECT®, NovAtel continues to evolve its GNSS hardware. And now, with the introduction of the OEM7 receivers, which includes advanced interference mitigation features, NovAtel continues to ensure that the people get what they need. *(See next page for more great products from NovAtel.)*

### SPAN® GNSS Inertial Navigation Systems

NovAtel's SPAN® technology tightly couples its OEM precision GNSS receivers with robust inertial measurement units (IMUs) to provide reliable, continuously available, position, velocity and attitude — *even through short periods of time when satellite signals are blocked or unavailable.*



#### SPAN® GNSS Receivers

NovAtel provides SPAN® capable GNSS/INS card-level receivers as well as enclosed GNSS/INS receiver products. Board level receivers that integrate with IMUs include the OEM 638. Enclosed receiver products include the ProPak6, the FlexPak6 and the PwrPak7e.



#### SPAN Inertial Measurement Units (IMUs)

SPAN® technology tightly couples NovAtel's GNSS receiver technology with an Inertial Measurement Unit (IMU). NovAtel markets a variety of IMUs from leading IMU manufacturers to provide customers with the opportunity to select an IMU that delivers the accuracy or price point their application requires.



#### SPAN® GNSS/INS Combined Systems

Single enclosure GPS/INS systems are ideal for space constrained applications, integrating GPS receiver technology with Fiber Optic Gyros (FOG) and Micro Electrical Mechanical Systems (MEMS) accelerometer inertial components in a single compact unit. Tight coupling of the GPS and INS technologies in one enclosure optimizes the raw GPS and Inertial Measurement Unit (IMU) data, delivering a highly accurate position, velocity and attitude solution.

### NovAtel CORRECT™: Including TerraStar-X™ and TerraStar-C Pro™

NovAtel CORRECT™ is the positioning algorithm on NovAtel's GNSS receivers that handles corrections from a variety of sources, including RTK, PPP, SBAS and DGPS. With NovAtel CORRECT™, you can choose the correction method that best meets the requirements and performance objectives of your application.

CORRECT™ works with the data provided by the TerraStar® network. Subscriptions for TerraStar® corrections are available directly from NavtechGPS. NovAtel CORRECT™ provides a single source for NovAtel GNSS hardware, correction services and support through NovAtel. All these NovAtel CORRECT™ subscriptions are available from NavtechGPS. We can help you determine the appropriate correction service from those listed below to meet your needs.

NovAtel correction services include the following: CORRECT™ with RTK, CORRECT™ with PPP, CORRECT™ with TerraStar-X™, CORRECT™ with TerraStar-C PRO.

By providing a single source of GNSS hardware, correction service and support, NovAtel CORRECT™ simplifies the process for acquiring the best possible position. Lower accuracy, lower cost solutions are also available using SBAS/DGPS with CORRECT™.



## Performance, Accuracy and Innovation

With innovations including GL1DE, ALIGN and AdVance RTK, SPAN® (NovAtel's synchronous position, attitude and navigation) technology, NovAtel CORRECT® correction service, NovAtel continues to evolve its GNSS hardware. With the introduction of the OEM7 receivers, which includes advanced interference mitigation features, NovAtel continues to ensure that the people get what they need. And, of course, NovAtel provides a wide range of high precision GNSS antenna options.

### SMART2™ and SMART7™: GNSS Multi-Frequency Smart Antennas

Integrates NovAtel's powerful GNSS receiver and a precision antenna in a durable, waterproof enclosure to track multiple GNSS signals. The SMART7 also receives L-Band signals TerraStar corrections.



### VEXXIS GNSS-800 Series of Antennas

The VEXXIS GNSS-800 series features a patented multi-point feeding network and advanced radiation pattern optimization technology. This radiation pattern optimization technology enables low elevation satellite tracking without sacrificing gain for higher elevation satellites for excellent performance even in difficult environments. The VEXXIS 800 Series includes the following:

GNSS-802: GPS: L1, L2; GLONASS: L1, L2; Galileo: E1; Beidou: B1

GNSS-804: GPS: L1, L2; GLONASS: L1, L2; Galileo: E1, E5b; Beidou: B1, B2b/B2I

GNSS-850: GPS: L1, L2, L5; GLONASS: L1, L2, L3; Galileo: E1, E5a, E5b, E6; Beidou: B1, B2a, B2b/B2I, B3, L-Band



### VEXXIS™ GNSS-502

The VEXXIS GNSS-502 antenna provides outstanding circularly polarized, symmetric radiation patterns with superior multipath rejection performance. Multi-point feeding network and radiation pattern optimization technology provides a stable phase center and exceptional low-elevation satellite tracking, while achieving high peak zenith gain, to track the maximum number of satellites for an enhanced positioning solution. *Also capable of receiving correction services transmitted in the L-Band, such as TerraStar.*



### GPS-704-X Triple-Frequency Pinwheel® GNSS Antenna

The GPS-704-X GNSS passive antenna features improved performance to ensure excellent operation in all GPS, Galileo and GLONASS frequency bands. The antenna also includes NovAtel's patented Pinwheel technology for excellent multipath rejection and phase center stability.



### GNSS-750: Multi-Constellation Antenna

Capable of tracking signals from 5 satellite constellations, including GPS, GLONASS, Compass, Galileo and QZSS satellite systems, the innovative design of this 3-D choke ring antenna delivers exceptional low elevation tracking and enhanced multipath reduction.



### GPS-703-GGG-HV (High Vibration) Antenna

The GPS-703-GGG-HV receives L1, L2, L5 GPS; L1, L2, L3 GLONASS; B1, B2 BeiDou and E1, E5a/b Galileo frequencies. Customers can use the same antenna for GPS-only, dual or triple constellation applications, resulting in increased flexibility and reduced equipment costs. The GPS-703-GGG-HV is suited for use under high vibration conditions.







## OxTS Inertial + GPS

Oxford Technical Solutions designs and manufactures products combining the best of inertial navigation and GPS/GNSS. OxTS focuses on affordable INS using MEMS gyros and precision accelerometers. OxTS' Kalman filter extracts the maximum information from GPS, delivering high accuracy measurements and low drift rates.

The precision survey product line is aimed at mobile mapping companies; aerial surveying; UAV manufacturers; system integrators who require small, reliable tactical grade IMU/GPS, but without the added cost for unwanted features, and for anyone looking for high accuracy position, attitude and orientation for geo-referencing LiDAR, camera and sensor data. *OxTS products do not use magnetometers, so there are no effects from ferrous metals or electrical interference from outside sources! And, ALL OxTS systems include post-processing software at no additional charge!*

*NavtechGPS offers the xNAV family of products to customers looking for an inertial navigation and GNSS solution.*

### xNAV650 INS™

Combines cutting edge MEMS IMU sensors with survey-grade GNSS receivers for a tactical grade INS. The xNAV650 measures only 77 x 63 x 24 mm. Its small form factor is ideal for any application where size, weight and power (SWaP) matter, making it especially ideal for UAV-based mapping. Weighing just 130g, the xNAV650 is ideal when precision is crucial, but the payload needs to be light for longer UAV flight times. Standard quad constellation means users can benefit from 2 cm position accuracy even in the most challenging GNSS environments. *Post-processing software is included too!*



### Survey+ v3™

OxTS flagship INS for land-based mobile mapping and manned aircraft mapping. The advanced algorithms in the Survey+ blend the inertial and GNSS data to provide a smooth, real-time 3D navigation solution, even when satellite signals are blocked or disturbed. The Survey+ has for many years been recognised by companies worldwide as a powerful, high accuracy INS for measuring position and orientation in mobile mapping and other survey applications. Yet it remains affordable and cost-effective for accurate land-based and manned aircraft mapping.





Racelogic manufactures electronic systems to measure, record, display, analyze and simulate data. NavtechGPS has carried the complete

line of Racelogic's LabSat products starting with the original LabSat through the LabSat 3 generation, and now the LabSat Wideband. LabSat Wideband builds on the tri-band LabSat 3 by increasing the recording bandwidth on each of the 3 channels to capture ALL the bands of all the current GNSS constellations.

LabSat 3 is an affordable and versatile multi-constellation global navigation satellite simulator for recording and replaying real GPS RF data, allowing you to test almost any single-frequency GNSS device with real-world signals, *from your bench, and now, in real time* with the LabSat RT software.

If you are selling, testing or developing products using single GPS or multi-GNSS engines, incorporating GLONASS, Galileo, BeiDou, QZSS, IRNSS or SBAS, then you'll find LabSat invaluable. *Contact us for a demonstration. (LabSat continued next page.)*



## LabSat 3 Wideband GNSS Record and Replay

GPS: L1 / L2 / L5 ♦ GLONASS: L1 / L2 / L3 ♦ BeiDou: B1 / B2 / B3 ♦ QZSS: L1 / L2 / L5 ♦ Galileo: E1 / E1a / E5a / E5b / E6 ♦ IRNSS ♦ SBAS

The new LabSat 3 Wideband is the latest generation of the hugely successful LabSat 3 GNSS Simulator. Building on the original triband version, LabSat 3 Wideband is now capable of recording bandwidths of up to 56 MHz and 6 bit sampling (3 bit I & 3 bit Q) to capture the following signals:

- ♦ GPS: L1 / L2 / L5
- ♦ GLONASS: L1 / L2 / L3
- ♦ BeiDou: B1 / B2 / B3
- ♦ QZSS: L1 / L2 / L5
- ♦ Galileo: E1 / E1a / E5a / E5b / E6
- ♦ IRNSS: L5
- ♦ SBAS: WAAS, EGNOS, GAGAN, MSAS, SDCM

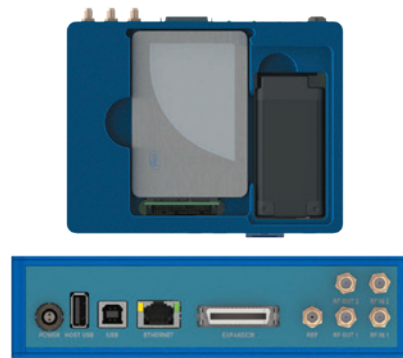


LabSat 3 Wideband is a completely portable, stand-alone unit — no need for a PC. It retains ALL of the existing features of LabSat 3, including one-touch record and replay. It has an internal rechargeable battery pack with over 2 hours record time, an SD card interface for replaying existing files from a LabSat 3. It has a compact, lightweight form factor, and dual-channel CAN Bus recording.

LabSat 3 is recognized as the most cost effective and intuitive GNSS simulator on the market. The ability to record live sky signals and replay them on the bench allows test engineers to develop products rapidly and with absolute consistency.

## Additional Features

- ♦ Wide bandwidth recording at up to 56MHz
- ♦ Three frequency sets / channels
- ♦ 4 or 6 bit capture
- ♦ Removeable 1 TB SSD hard drive
- ♦ SD card interface
- ♦ Wide tuning range to cover all GNSS bands for most applications
- ♦ Up to 3 bit I/Q record quantization dependent on channel / bandwidth selection
- ♦ Remote control and fast file transfer via Ethernet
- ♦ Event marking
- ♦ OCXO (Oven controlled oscillator)





Racelogic manufactures electronic systems to measure, record, display, analyze and simulate data. NavtechGPS has carried the complete

line of Racelogic's LabSat products starting with the original LabSat through the LabSat 3 generation, and now the LabSat Wideband. LabSat Wideband builds on the tri-band LabSat 3 by increasing the recording bandwidth on each of the 3 channels to capture ALL the bands of all the current GNSS constellations.

LabSat 3 is an affordable and versatile multi-constellation global navigation satellite simulator for recording and replaying real GPS RF data, allowing you to test almost any single-frequency GNSS device with real-world signals, *from your bench, and now, in REAL TIME* with the LabSat RT software.

If you are selling, testing or developing products using single GPS or multi-GNSS engines, incorporating GLONASS, Galileo, BeiDou, QZSS or SBAS, then you'll find LabSat invaluable. [Contact us for a demonstration.](#)



## LabSat 3 Multi-constellation Simulator With Robust Software Options

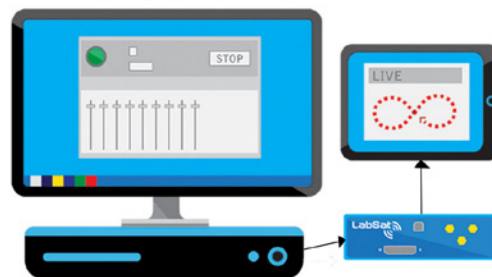
The LabSat 3 multi-constellation simulator by Racelogic is a portable, stand-alone, one touch record and replay device that allows developers looking for realistic signal output to easily record scenarios in the field and replay them in a controlled environment. In addition to the multi-constellation option, there are dual- and single-constellation options. *LabSat 3 has completely replaced the prior LabSats, with more features and options for testing.*

LabSat 3 is a completely self-contained device — no need for a laptop or PC! This system is capable of recording and replaying multiple raw (base band) satellite navigation RF signals, including GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS. By digitizing and storing the original signals at a high bandwidth when recording, LabSat 3 replays scenarios that include real-world signal artifacts like multipath and signal dropouts for authentic device testing. Choose from six model configurations. A *free* library of pre-recorded and simulated files is included with each system to get you up and running as quickly as possible.

## LabSat Real-Time

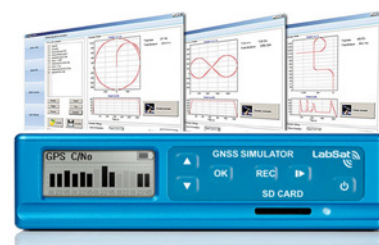
LabSat RT uses real-time GNSS RF signals to play multiple satellite signals from up to two constellations with a current time stamp. If you are developing, testing or selling products incorporating GPS, GLONASS or BeiDou engines, then you'll find LabSat RT makes your job quicker, easier and more effective. Use the SatGen v3 software to define the position, route, speed, date, and time, as well as the number of satellites included in the data stream. SatGen also gives you the ability to vary the individual carrier to noise levels for each satellite, allowing you to control the data being streamed directly into your device.

With a powerful PC, the system can generate GPS, GLONASS, and BeiDou L1 signals in single-constellation (1- or 2-bit) or dual-constellation signals at 1-bit each.



## SatGen v3 Software

SatGen v3 is a multi-constellation, 64-bit simulation software with single-, dual- or triple-constellation scenario creation capabilities. SatGen software allows you to create a GPS RF IQ data file that can be replayed on a LabSat, based on a user-generated trajectory file to simulate almost any kind of test scenario, at a set time and date, anywhere in the world. Take advantage of *significant price reductions when you buy the SatGen V3 and LabSat 3 together.*





## septentrio Septentrio OEM Receivers

Septentrio products cover professional, industrial and scientific applications in precise GNSS signal tracking, positioning and navigation. Advanced hardware and sophisticated algorithms provide world-class performance, while well-engineered and standardized interface formats, complemented by an extensive command language, make for wide applicability and easy integration. **NavtechGPS®** is a distributor of the entire Septentrio line. Most of Septentrio's products include *Septentrio's Advanced Interference Mitigation (AIM+) technology to help mitigate GNSS signal interference*. We also carry the full line of heading receivers utilizing IMU MEMS and GPS interferometry for a GNSS-only based heading.

### AsteRx SB ProDirect

Septentrio's AsteRx SB ProDirect combines the best RTK positioning and heading with GNSS positioning in a compact and ruggedized IP68 housing. Reliable positions are available together with heading & pitch or heading & roll angles directly from system initialization. Multi-constellation, triple-frequency dual antenna technology ensures highly accurate and reliable positioning and heading.



### AsteRx SB ProConnect

The Septentrio AsteRx SB ProConnect combines excellent RTK performance and flexibility in a compact and ruggedized IP68 housing. Multi-constellation, triple-frequency GNSS technology ensures highly accurate and reliable positioning. The low-power and compact design includes a wide selection of connection options for integration flexibility into your system. The AsteRx SB ProConnect is a high-performance GNSS receiver for demanding SWaP applications.



### AsteRx-U and AsteRx-U Marine

The AsteRx-U and the AsteRx-U Marine are multi-constellation dual antenna receivers that incorporate the latest GNSS tracking and positioning algorithms and interference mitigation. Built around Septentrio's latest ASIC, the GReCo4, the AsteRx-U features built-in jamming detection and countermeasures, multi-path rejection and fast acquisition. It has over 500 channels to track all available constellations and has many of Septentrio's special algorithms, including LOCK+ technology to maintain tracking during heavy vibration and IONO+ technology to assure position accuracy even in regions of elevated ionospheric activity.



### PolaRx5 and PolaRx5TR Multi-frequency GNSS Reference Receiver

The PolaRx5 is a versatile, robust multi-frequency GNSS reference receiver with built-in Advanced Interference Mitigation (AIM+) technology to filter out intentional and unintentional interference from narrowband signals over high powered pulsed signals to chirp jammers and Iridium interferers. This receiver is equipped with Septentrio's APME+ multipath mitigation technology to eliminating short delay multipath without the introduction of bias, guaranteeing superior measurement quality. If needed, the user has the ability to activate or deactivate APME+ to obtain completely unmodified measurements.



### PolaRx5S Scintillation Receiver

The PolaRx5S generates ultra-low noise scintillation indices and GNSS measurements while logging and streaming data at up to 100 Hz. Its compact and durable housing, low power consumption and open technology make it ideal for rapid and efficient integration into your existing network.



### AsteRx-m3 ProBase Receiver

Septentrio's AsteRx-m3 ProBase is a multi-frequency and multi-constellation GNSS receiver designed to operate as a base station for local RTK or to be used for network densification. On top of providing quality measurements it offers full configuration flexibility as well as easy monitoring capabilities.

### AsteRx-m3 Pro+ Receiver

This multi-frequency multi-constellation receiver features top positioning performance with flexibility to be used either as a base station or a rover receiver. The AsteRx-m3 Pro+ dual antenna mode provides heading & pitch or heading & roll information on top of reliable and accurate positioning.





## **Trimble® High-Precision Positioning Solutions**

Trimble has unique systems and solutions that our customers are looking for. Trimble develops high quality, high accuracy OEM boards and antennas that provide easy integration into your projects, whatever the application.

**NavtechGPS®** is a reseller of the entire Trimble high-precision OEM line, including L1, L1/L2, L5, GLONASS, SBAS, Inertial, and more. Trimble products can leverage the strong network of existing community base stations around the globe and support many external sensors via a variety of interfaces available on board many of their OEM products. Product uses include unmanned systems, defense systems, mapping, machine control, asset tracking, mining and much more. [Here is a sampling of the Trimble products we offer.](#)

### **BX992 GNSS Receiver Enclosure (BD992 Receiver Inside)**

The Trimble® BX992 has been designed for applications requiring continuous centimeter accuracy in a compact package. By integrating inertial sensors on the same module, robust high accuracy positions and orientations are produced in all environments. The BX992 enclosure is a dual-antenna receiver with an integrated inertial navigation system powered by the BD992-INS. The Trimble BD992 supports triple frequency for the GPS, GLONASS, BeiDou and Galileo constellations. As the number of satellites in the constellations grows the BD992 is ready to take advantage of the additional signals. This delivers the quickest and most reliable RTK initializations for centimeter positioning.



### **The Trimble® BD990 Triple Frequency GNSS Receiver**

The Trimble BD990 supports triple frequency for the GPS, GLONASS, BeiDou and Galileo constellations. As the number of satellites in the constellations grows the BD990 is ready to take advantage of the additional signals. This delivers the quickest and most reliable RTK initializations for centimeter positioning.



### **BD970 GNSS System: Compact Low-Power GPS Receiver**

The BD970 GNSS system is a compact multi-constellation receiver designed to deliver centimeter accuracy to a variety of applications. With the BD970, OEMs and integrators can be assured their investment is sound today and into the future. The BD970 GNSS receiver supports a wide range of satellite signals, including GPS L2C and L5 and GLONASS L1/L2 signals.



### **BD992 Dual Antenna Receiver**

The BD992 is a dual-antenna receiver that delivers centimeter accurate positions and precise heading. Heading derived from dual-antenna GNSS measurements helps overcome issues such as difficulty determining where the antenna is positioned relative to the vehicle and object of interest. With the BD992, you are buying a robust navigation solution, not just a GNSS receiver.



### **BD940-INS GNSS Receiver**

The Trimble® BD940-INS module has been designed for applications requiring continuous centimeter accuracy in a compact package. By integrating inertial sensors on the same module, robust high accuracy positions are produced in all environments. The GNSS components are fully shielded to ensure signals are protected from the sources of EMI on the host platform. The BD940-INS was designed for easy integration and rugged dependability. With the BD940-INS you are buying a robust navigation solution, not just a GNSS receiver. It delivers varying levels of performance down to centimeter level without the use of a base station.





**Trimble®**

## High-Precision Positioning Solutions

Trimble develops high quality, high accuracy OEM boards and antennas that provide easy integration into your projects, whatever the application. Here are some more great Trimble products.



### Zephyr 3 Rover and Base Antennas

The Trimble Zephyr 3 external GNSS antennas contain advanced technology for multipath reduction, outstanding low elevation satellite tracking and sub-millimeter phase center stability. The Zephyr 3 antennas offer full support for current and near-future GNSS signals, including GPS, GLONASS, Galileo, BeiDou, QZSS, IRNSS, OmniSTAR, Trimble RTX and SBAS.



### Trimble AV59 Aviation GNSS Antenna

The AV59 is designed to support centimeter level accuracy for aerial, land and marine applications. The bulkhead mounting works in rugged environments and resists unwanted signal interference or multipath, which can cause inaccurate measurements. The aviation design and bulkhead mounting ensure that only the rugged radome is exposed to the elements, which is an ideal design for machine control systems.



### The Trimble LV59 Aviation GNSS Antenna

The LV59 aviation GNSS antenna has been designed to support centimeter level accuracy for land and marine applications. The rugged 5/8" x 11 female threaded mount and all aluminum base allows the antenna to be used in the most rugged of environments.



### The Trimble AV37 GNSS and L-Band Aviation Antenna

The Trimble AV37 Aviation Antenna has been designed to support centimeter level accuracy for airborne applications and track SBAS signals all in one compact design. It is fully certified by the FAA for aircraft installations. Mapping and surveying from the air using GNSS requires survey grade antenna technology in a compact and reliable form factor. The Trimble AV37 GNSS Aviation antenna achieves this without compromising performance.



### The Trimble® GA810 Antenna

The Trimble® GA810 Antenna is a general purpose GNSS rover antenna ideal for dynamic applications where position and heading are required. The GA810 offers OmniSTAR (L-Band), GPS and GLONASS signal reception, making it ideal for use with the OmniSTAR G2 service as well as GPS/GLONASS positioning and heading applications.



## VectorNav Technologies

**VectorNav Technologies** is a leading developer and manufacturer of high performance inertial navigation systems (INS) using the latest in MEMS sensor and GPS/GNSS technology, including miniature MEMs Inertial Measurement Units (IMUs), Attitude Heading Reference Systems (AHRS), inertial sensors, and GPS-aided INS. VectorNav brings high performance aerospace filtering and calibration techniques into the world of low-cost industrial grade MEMS sensors, expanding the possibilities of today's MEMS sensor technology. 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. *Ask us about available development kits! (VectorNav continued on next prior page.)*

## The VectorNav Tactical and Embedded Series

The VectorNav Tactical and Embedded Series is a next-generation, MEMS inertial navigation platform that features high-performance IMU, AHRS, GPS/INS and GPS-compass solutions. The tactical grade features an IMU core housed in a robust and compact aluminum enclosure. The tactical embedded series was designed to meet the demands of the most demanding military and aerospace applications, bringing unprecedented capability and performance to SWaP-C constrained applications.



VN-110

VN-110E

### VN-110 and VN-110E IMU and Attitude Heading Reference System

The VN-110 is a tactical grade IMU and AHRS. It incorporates the latest MEMS sensor technology, combining a 3-axis accelerometer, a 3-axis gyroscope and a 3-axis magnetometer into a compact and rugged package. Along with providing calibrated sensor measurements, the VN-110 also computes and outputs a real-time 3D orientation solution over 360 degrees of motion.

#### Product Features

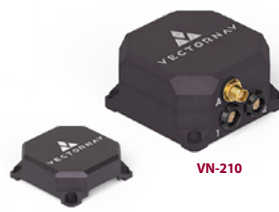
- ◆ Rugged Design: IP-68, DO-160G, MIL-STD-1275E, MIL-STD-461G, MIL-STD-810G
- ◆ Onboard Hard/Soft Iron compensation
- ◆ Vector Processing Engine (VPE) 2.0: Real-time magnetic & acceleration disturbance rejection, adaptive signal filtering and dynamic filter tuning.
- ◆ Data Outputs: 400 Hz Navigation Data and 1 kHz IMU Data
- ◆ Ultra Low SWaP: < 172.13 cm<sup>3</sup>; < 160 grams; < 2.5 W
- ◆ User Configurable ASCII & VectorNav Binary messages
- ◆ Made in the USA, ITAR-free, & ships within 1 week

#### Embedded

- ◆ Size: 31 x 31 x 11 mm
- ◆ Power: <2 W
- ◆ Weight: <12 g

#### Rugged

- ◆ Size: 56 x 56 x 23 mm
- ◆ Power: <1 W
- ◆ Weight: 125 g



VN-210

VN-210E

### VN-210 and VN-210E GNSS Aided Inertial Navigation System

The VN-210 is a tactical-grade, high-performance GNSS-Aided Inertial Navigation System (GNSS/INS) incorporating the latest inertial sensor and GNSS technology. The VN-210 combines a 3-axis accelerometer, a 3-axis gyro, a 3-axis magnetometer, and a multi-band GNSS receiver into a compact embedded module or ruggedized packaging option to deliver a high-accuracy position, velocity and attitude solution.

#### Product Features

- ◆ Multi-band GNSS: Integrated L1/L2/E1/E5b GNSS Receiver
- ◆ High Data Outputs: 400 Hz Navigation Data and 1 kHz IMU Data
- ◆ Ultra Low SWaP: 31 x 31 x 11 mm; 14 grams; < 1.5 W
- ◆ Made in the USA, ITAR-free, & ships within 1 week
- ◆ RTK/PPK Capable: External RTCM 3 Inputs; Exportable RINEX
- ◆ Rugged Design: IP-68, DO-160G, MIL-STD-1275E, MIL-STD-461G, MIL-STD-810G
- ◆ Support for external RTK/PPK & SAASM GPS (ICD-GPS-153)

#### Embedded

- ◆ Size: 31 x 31 x 11 mm
- ◆ Power: <1.5W
- ◆ Weight: <14 g

#### Rugged

- ◆ Size: 56 x 56 x 31 mm
- ◆ Power: <2.7 W
- ◆ Weight: 155 g



VN-310

VN-310E

### VN-310 and VN-310E Dual GNSS Aided Inertial Navigation System

The VN-310 was designed for applications that require highly accurate inertial navigation solution under both static and dynamic operating conditions, especially in environments with unreliable magnetic heading and good GNSS visibility. The VN-310 provides the ability to accurately estimate true heading (azimuth with respect to True North) in both static and dynamic conditions without relying on magnetic sensors.

#### Product Features

- ◆ Multi-band GNSS: Integrated L1/L2/E1/E5b GNSS Receiver
- ◆ Integrated GNSS Compass
- ◆ Made in the USA, ITAR-free, and ships fast
- ◆ Ultra Low SWaP: 31 x 31 x 11 mm; 15 grams; < 1.6 W
- ◆ RTK/PPK Capable: External RTCM 3 Inputs; Exportable RINEX
- ◆ Rugged Design: IP-68, DO-160G, MIL-STD-1275E, MIL-STD-461G, MIL-STD-810G
- ◆ High Data Outputs: 400 Hz Navigation Data and 1 kHz IMU Data

#### Embedded

- ◆ Size: 31 x 31 x 11 mm
- ◆ Power: <1.6 W
- ◆ Weight: <15 g

#### Rugged

- ◆ Size: 56 x 56 x 31 mm
- ◆ Power: <3.3 W
- ◆ Weight: 160 g



## VectorNav Technologies

**VectorNav Technologies** is a leading developer and manufacturer of high performance inertial navigation systems using the latest in MEMS sensor and GPS/GNSS technology, including miniature MEMs inertial measurement units (IMUs), attitude heading reference systems (AHRS), inertial sensors, and GPS-aided INS. VectorNav brings high performance aerospace filtering and calibration techniques into the world of low-cost industrial grade MEMS sensors, expanding the possibilities of today's MEMS sensor technology. 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. [Ask us about available development kits!](#)

### VN-300 SMD

The VN-300 is a miniature, high-performance Dual Antenna GNSS-Aided Inertial Navigation System that combines MEMS inertial sensors, two high-sensitivity GNSS receivers, and advanced Kalman filtering algorithms to provide optimal estimates of position, velocity, and orientation. The VN-300 is the first and only Dual GNSS Antenna Inertial Navigation System in a single surface mount package. The size of a postage stamp, the VN-300 SMD requires only a single 3.2-5.5V power supply, and can be directly embedded into a user's electronics.

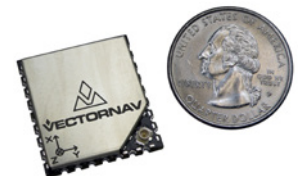


### The VN-300 Rugged

The VN-300 Rugged is the "plug and play" version of the VN-300 SMD. Enclosed in a clamshell precision anodized aluminum enclosure, it offers additional protection to the internal MEMs sensors, GNSS receivers and electronics. Interfacing with the module is made through a locking 10-pin connector, as well as two MMCX connectors for external active GPS antennas.

### VN-200 SMD

The VN-200 SMD is a miniature, high performance GNSS-Aided Inertial Navigation System (GNSS/INS) that combines 3-axis gyros, accelerometers and magnetometers, a high-sensitivity GNSS receiver, and advanced Kalman filtering algorithms for optimal estimates of position, velocity, and attitude. Introduced in 2012, the VN-200 was the world's first GPS-Aided INS in a single surface mount package. At the size of a postage stamp, it requires only a single 3.2-5.5V power supply, and can be directly embedded into a user's electronics.



### VN-200 Rugged™

The VN-200 Rugged is the "plug and play" version of the VN-200 SMD. Enclosed in a clamshell precision anodized aluminum enclosure, the VN-200 Rugged offers additional protection of the internal inertial sensors, GNSS receiver and electronics. Interfacing with the module is made through a locking 10-pin connector, as well as a MMCX connector for an external active GNSS antenna.



### VN-100 SMD

Introduced in 2009, the VN-100 was the first Attitude and Heading Reference System (AHRS) on the market to offer calibrated, high-performance, industrial grade MEMS sensors and quality sensor fusion algorithms in a single surface mount package. At the size of a postage stamp, the VN-100 SMD (surface mount device) is designed to be directly embedded into [your] electronics assembly.



### VN-100 Rugged™

To facilitate development and testing, the VN-100 is available in a rugged "plug and play" version. Enclosed in a clamshell precision anodized aluminum enclosure, the VN-100 Rugged offers additional protection of the internal inertial sensors and electronics.





## Interference Mitigation and Detection

Because signal jamming can render your GPS useless, these new products for jammer detection and location, and interference mitigation can be invaluable.

NavtechGPS® carries a line of easy to use handheld GPS jammer detectors from Chronos Technology, as well as a number of receivers with built-in interference mitigation and detection from quality companies like NovAtel and Septentrio.

NavtechGPS has considerable field experience with the Chronos CTL detectors and has found numerous jamming sources. Contact us so we can help you with your interference detection and mitigation needs.



## Heading and Attitude Systems

Do you need accurate heading or attitude measurements? We have a line of products for that. Do you need an OEM or boxed solution? We can recommend the right product for your needs. We carry single- and dual-frequency heading and attitude systems from leading manufacturers that include Hemisphere GNSS, NavCom, NovAtel, Septentrio and Trimble. These systems have a range of sizes, antenna types and prices.

Let us know what your application is, and we will recommend a solution.



## Small Antennas for Unmanned Aerial Vehicles (UAVs)

NavtechGPS® carries a variety of antennas that are ideal for use in UAVs. For example, Tallysman Wireless offers a range of precision housed and embedded GNSS antennas that are optimized for use in autonomous systems, (UAV & UAS, UGVs, USVs, and inertial navigation systems *where low weight, small size and low power are absolute requirements*). Tallysman® helical antennas are designed for applications that require high performance and versatility, with an absolute minimum of weight, such as UAVs.

Tallysman technology incorporates its dual feed Accutenna™ technology, which provides a circular response over the entire bandwidth, resulting in excellent cross polarization rejection and superior multi-path signal rejection. The net result is increased accuracy of position. Tallysman's OEM (embedded) antennas are available with different connectors and custom cable lengths. Contact NavtechGPS to find just what you need.





## Pacific Crest Radios and Modems

NavtechGPS® carries the complete line of Pacific Crest Advanced Data Link (ADL) modules and accessories, including the XDL Rover 2, for *wireless* precise positioning and remote sensing. These broad spectrum transceivers offer up to 35 Watts of power and over-the-air link rates as high as 19,200 bps. The rapidly growing line of ADL products include: the ADL Vantage Pro, a 35-Watt programmable UHF radio; the ADL Vantage, a 4-Watt programmable UHF radio for survey applications; the ADL Sentry, a 4-Watt radio for remote sensing and monitoring environments; the ADL Foundation, a transceiver OEM board; the ADL RXO, a receive-only OEM board; the ADL Uplink, a ruggedized handheld computer that streams Internet-based RTK corrections to a radio for rebroadcast into areas of poor cell coverage, and the XDL Rover 2, a lightweight, ruggedized UHF receiver for communications between 403 and 473 MHz in 25 kHz channels. Let us help you select the best option for your project.



## TERRASTAR TerraStar: Freedom from Base Stations!

NavtechGPS® is an authorized reseller of the TerraStar® satellite-based differential correction service. TerraStar® provides data services which enable accurate and efficient positioning solutions. These solutions are delivered in partnership with leading GNSS receiver manufacturers. The main service is based on precise point positioning, or PPP, which delivers an accuracy of a few centimeters globally using just a single receiver and without the need for a dedicated communications channel. TerraStar® is available worldwide and eliminates reliance on base stations for accurate positioning. Subscription options are available for different areas of the planet, levels of accuracy and different durations. NavtechGPS sells TerraStar-ready equipment from NovAtel and Septentrio. We can help you decide which subscription option you will need.



## Oceanix Correction Services for Marine Applications

NovAtel Oceanix Correction Services deliver sub-decimeter positioning for nearshore marine applications including dredging, hydrographic survey and mapping. For users desiring a complete solution, the MarinePak7 is a GNSS+INS receiver built ready to receive Oceanix nearshore correction services.

## Hemisphere® AtlasLink™ and Atlas

AtlasLink™ is a versatile multi-frequency smart antenna from Hemisphere GNSS that is preconfigured to receive corrections from the new Atlas GNSS global correction service. AtlasLink offers Hemisphere GNSS' Athena GNSS engine; L-Band 10 cm corrections; L1 L2, RTK; a powerful Web user interface accessible via WiFi; Built-in internal memory for data logging, download and upload, and an enclosure for the most aggressive user scenarios.



## Antennas

Chances are, NavtechGPS® has an antenna for your application and can match an antenna to your receiver. We carry antennas by Antcom, PCTel, Panasonic, Hemisphere, navXperience, NovAtel, Tallysman and others. We stock a wide variety of single and dual frequency and multi-constellation antennas.



## Antcom Antennas for an Array of Applications

Antcom excels in the design, development, manufacture and testing of a wide range of antenna and microwave products. We deliver leading edge solutions to customers developing applications for the agricultural, aviation, military, ground, marine, and space industries. Our extensive antenna product line includes Global Navigation Satellite System (GNSS) antennas as well as those with frequencies ranging from 100 MHz to 12 GHz. Whatever your antenna requirement — UHF, Iridium, Globalstar, InMarSat, Thuraya, XM, ICO, Video/Data Link or L/S/C/X-Band — we have the ideal solution for your unique application.



**TALLYSMAN®**  
A CALIAN® COMPANY

## High Performance, High Quality GNSS Antennas

Tallysman Wireless is a developer of high performance, dual-feed, quality GNSS antennas. The line includes precision grade GPS, GLONASS, Galileo, Globalstar, Iridium, SBAS, L-band (OmniSTAR™, StarFire™, DGPS) and custom global positioning antennas, which meet or exceed industrial and military specifications.

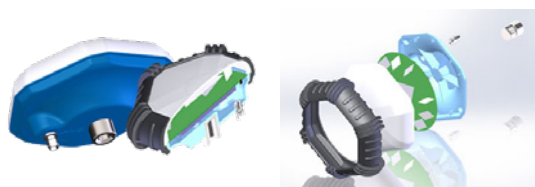
Tallysman patented VeraPhase technology introduces extremely high performance in a light weight package across the full bandwidth of the antenna. The VeraPhase™ is lighter, smaller and more economical than most traditional choke ring antennas.

The VeraChoke 6100 is a full GNSS spectrum antenna with consistent performance (gain, axial ratio, PCV, and PCO) across the full bandwidth of the antenna, low axial ratios and exceptional front to back ratios. The VC6100 is compatible with both large and small SCIGN radomes.



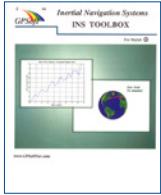
## navXperience Rugged, Light & Accurate GNSS Antenna

These next-generation GNSS antenna products have been developed by navXperience with a future-proof technology that meets or exceeds phase center eccentricity standards of up to 1 mm. The navXperience 3G+C antennas offer superior performance and durability for many applications, including reference (surveying), agriculture, navigation, marine and machine control.



### Engineering/Development Software

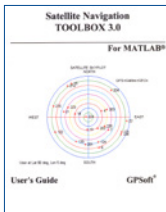
NavtechGPS® has the navigation simulation and analysis software you need — in stock and ready to ship. Give us a call.



#### INS Toolbox 3.0™ for MATLAB® from GPSoft®

An official MATLAB® partner product, GPSoft® expanded on the highly successful SatNav Toolbox™ with the INS Toolbox for MATLAB®. The INS Toolbox provides the

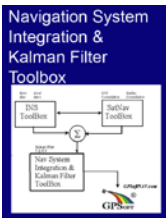
necessary functions to emulate a wide variety of inertial sensors from RLG's and FOG's down to MEMS sensors via user-defined sensor errors such as biases, scale factor error and noise. The INS Toolbox is fully compatible with the GPSoft SatNav Toolbox and both are utilized in GPSoft's Navigation System Integration & Kalman Filter Toolbox.



#### SatNav Toolbox 3.0™ for MATLAB® from GPSoft®

Now the power of the SatNav Toolbox is extended with real data processing! Import ephemeris and measurement data (pseudorange and carrier-phase) in RINEX2 format. Perform simulations in

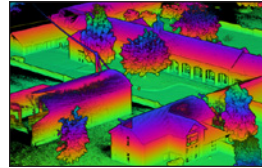
your lab or office right now! GPSoft® has applied the power of MATLAB® to GNSS (Global Navigation Satellite System). This toolbox allows the user to emulate the C/A-code on L1, L2, L5 and any other user defined frequency. In addition, the toolbox can be used to simulate P-code on L1 and L2. Also with support for Galileo!



#### Navigation System Integration & Kalman Filter Toolbox™ for MATLAB® from GPSoft®

This toolbox extends the capabilities of the GPSoft® SatNav and INS toolboxes by providing the Kalman filter algorithms used to achieve maximum performance.

Among these are GPS stand-alone 8-State and 11-State extended Kalman filters, inertial error modeling in state-space, loosely integrated INS/GPS Kalman filters.



#### OxTS® Boresite Software

Boresight calibration is an essential part of INS and LiDAR integration and OxTS' boresight software is critical for generating the most accurate point cloud

possible. OxTS' Georeferencer is a software tool developed by OxTS to combine INS navigation data with raw LiDAR data. It can be used alongside any OxTS INS to create a georeferenced 3D point cloud. OxTS Georeferencer takes a file collected with a LiDAR scanner (synchronized in real-time with an OxTS inertial navigation system), a processed navigation trajectory file from the OxTS INS, and some required configuration files, to create a LAS point cloud file that can be viewed in many third party LiDAR software packages.



#### OxTS® Georeferencer Software


This toolbox extends the capabilities of the GPSoft® SatNav and INS toolboxes by providing


the Kalman filter algorithms used to achieve maximum performance. Among these are GPS stand-alone 8-State and 11-State extended Kalman filters, inertial error modeling in state-space, loosely integrated INS/GPS Kalman filters.





NavtechGPS® represents industry leading manufacturers of GNSS products, components and auxiliary products.


Contact Us: 1-703-256-8900 or 800-628-0885 or [info@navtechgps.com](mailto:info@navtechgps.com)


 **AntCom.** Antenna division of NovAtel. Quality, well priced single- and multi-frequency antennas for geodetic, GIS, automotive, airborne and marine applications.


 **Chronos Technology.** Handheld GPS jamming detectors and locators.


 **Forsberg Services Ltd.** Forsberg StarLink DGPS products: In-line signal amplifiers, DUCs, fiber optic link system, splitters. (NavtechGPS is the sole distributor for Forsberg StarLink GPS products in the U.S. and Canada)


 **GPS Networking.** Signal splitters, amplifiers and signal distribution, re-radiation systems.


 **GPS Soft.** SatNav, INS, Kalman filtering MATLAB® toolboxes.


 **Hemisphere GNSS.** Single- and multi- frequency OEM and boxed receivers. GPS compass products with integrated gyroscope. Many form factors.

 **LabSat by Racelogic.** Multi-constellation GNSS simulator (GPS/ GLONASS/Galileo, BeiDou, QZSS or SBAS). Record - playback multiple base band satellite RF signals. LabSat 3 Wideband is capable of recording bandwidths of up to 56 MHz and 6 bit sampling (3 bit I & 3 bit Q).


 **NovAtel.** Single- and multi-frequency GPS receivers. GLONASS and Galileo capability. OEM receiver boards and boxed receivers with varying form factors. Multi-band antennas. Firmware options to support high data rates, carrier phase outputs and DGPS.


 **navXperience.** Robust, light, accurate, next generation, 4 constellation antennas. NGS calibrated.


 **Omnistar.** Subscription options include localized or worldwide, short- or long-term and varying accuracy levels.


 **OxTS.** Inertial navigation systems, combining GNSS technology with high-performance inertial sensors. Available with dual antenna and dual frequency configurations for GNSS heading/roll or heading/pitch. Also includes post-processing software!


 **Pacific Crest.** UHF radio transceivers and accessories.

 **PCTEL.** Diverse line of primarily single frequency antennas. Timing and reference, automotive and marine applications. Also smart antennas and receiver modules. Many form factors.

 **Septentrio.** High sensitivity single and multi-frequency receivers. GPS/Galileo/ GLONASS. Heading units. High output rates. OEM receiver boards and boxed receivers, plus Septentrio's Advanced Interference Mitigation (AIM+) technology. GPS/Galileo receivers for signal analysis.

 **Tallysman.** Small form factor GNSS antennas and amplifiers, and SMART antennas. Single frequency L-band and GNSS inline signal amplifiers, splitters, bias-tees and lightning arresters.

 **Trimble.** High quality, high accuracy OEMs providing seamless integration, whatever the application, for high-precision positioning solutions.

 **VectorNav.** OEM GPS-aided INS, Inertial Measurement Unit and Attitude Heading Reference System (IMU/AHRS) for commercial and tactical applications.

 **Waypoint,** a NovAtel company. Waypoint GrafNav/GrafNet post-processing software.

