Advanced Navigation Unveils Compact Boreas 50 Series For High-Integrity Maritime and Naval Navigation

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Global, November 2025 - Advanced Navigation, a global leader in assured positioning, navigation and timing (APNT) and autonomous system, has announced the expansion of its Boreas range with the new 50 series – the company's most compact fiber-optic gyroscope (FOG) inertial navigation system (INS), delivering rapid North-seeking in challenging GNSS-denied maritime environments.

The 50 Series includes two high-performing variants:

- The A50 – an attitude and heading reference system (AHRS)
- The D50 – a strategic-grade INS

Each is equipped with a North-seeking gyrocompass capable of rapidly determining true North. Powered by Advanced Navigation's advanced sensor fusion, the series delivers intelligent, reliable navigation within a SWaP-optimized form factor.

Featuring all-band GNSS receivers, the D50 offers enhancements in signal availability, heading accuracy, and greater resilience in challenging environments. For defense missions operating in particularly high-threat scenarios, it also

offers an extra layer of protection through optional Electronic Protection (EP) capabilities.

Maximilian Doemling, Head of Product at Advanced Navigation, said,

“Accurately determining position and heading remains a persistent challenge in maritime and naval operations. That’s where the Boreas 50 Series comes in. It plugs straight into new and existing platforms and starts delivering fast, reliable positioning and North-seeking where traditional systems aren’t able to.

For high-threat operational environments, the D50’s advanced EP capabilities deliver uncompromising protection against nefarious attempts of GNSS jamming and spoofing. It is a powerful counter-Electronic Warfare solution built to operate under direct electronic attack, giving operators the resilience and reliability they need to stay on course against any adversary.”

Compact North-Seeking in Tough Environments

Real-time North-seeking: The Boreas 50 series contains precise North-seeking gyrocompassing, capable of detecting Earth’s rotation to determine true North in real time, completely independent of GNSS signals or magnetic interference. This is housed in a compact form factor weighing 910 grams, enabling easy integration into space- and weight-constrained platforms.

Advanced sensor fusion: Advanced Navigation’s proprietary sensor fusion draws on sophisticated algorithms to interpret and filter sensor data. The software is designed to dynamically weigh the input from each sensor, adjusting in real time based on reliability scores, environmental conditions, and operational context. This ensures continuous, high-confidence state estimation even when GNSS signals are lost or degraded.

All-band GNSS capabilities: The D50 incorporates dual-antenna, all-band GNSS receivers, supporting access to the newer L6 band. This broad-spectrum support enables significantly faster convergence times to centimetre-level positioning accuracy.

Optional EP: The D50 is available with optional EP functionality. While adversaries create GNSS signal attacks, the D50 proactively detects and neutralises these attacks to maintain a reliable, uninterrupted positioning.

Confidence from Surface to Underwater

The Boreas 50 Series integrates effortlessly into both new and legacy defense and commercial platforms to streamline upgrades, reduce installation time, and lower overall costs.This flexibility enables rapid deployment across a wide range of applications.

Maritime vehicles: The denial of GNSS signals blinds a vessel’s precision capabilities, risking its ability to navigate effectively or accurately identify and track incoming threats. The 50 Series is engineered to endure GNSS denial, navigate precisely, and deliver assets on target to maintain tactical advantage on the seas.

AUVs and ROVs: Accurate positioning is critical for AUVs and ROVs. The 50 series can find true North without magnetic sensors, eliminating magnetic interference. Advanced algorithms and integration with DVL and other sensors ensure long-endurance, high-accuracy underwater navigation.

Autonomous Surface Vessel: The 50 series combines North-seeking capability, precision sensors, and survey-grade fusion algorithms to deliver consistent performance for ASVs. With dual-antenna GNSS, DVL, and environmental sensor integration in a compact housing, it provides a robust navigation core that withstands GNSS outages, harsh weather, and violent vessel motion.

Boreas 50 Series Specifications

- Heading accuracy: Gyro compassing 0.5 degrees secant latitude
- Roll and pitch accuracy: 0.03 degrees
- Positional accuracy: 0.01 m CEP50
- Electronic Protection capabilities are available on the Boreas D50

Defense Veterans Continue to Drive Rapid Innovation

Beyond unmatched speed, Advanced Navigation’s defense team consists entirely of military veterans, a global force the company plans to more than double within the year to ensure its technologies are shaped by those who understand and have experienced the battlespace.

The veterans partner closely with system integrators, program offices, and military end-users to deliver tailored APNT solutions that meet rigorous performance, compliance, and security standards. Their military experience enables seamless communication between technical teams and military operators, accelerating timelines and reducing the risk of misalignment.

The Ultimate Capability is Availability

Advanced Navigation’s products are developed and delivered on stringent timelines, supported by the company’s vertically integrated manufacturing. This sets a new standard by guaranteeing the shortest production lead times in the industry – ready in weeks, not years, and is backed by a three-year warranty.

With a deep understanding of the applications its products operate in, Advanced Navigation’s global field experts are dedicated to meeting the needs of maritime and naval customers with responsiveness, exceptional quality and genuine care. The team partners closely with system integrators, OEMs, and end-users to deliver tailored solutions that overcome commonplace industry concerns such as integration challenges, cost uncertainty and risk aversion. By leveraging engineering excellence, unmatched speed and quality customer support, Advanced Navigation is accelerating the path towards maritime autonomy.