



BOREAS A70






FOG IMU/AHRS

The Boreas A series offers accurate and reliable IMU/AHRS solutions with an industry-leading reduction in SWaP-C. Boreas combines ground-breaking Digital Fibre Optic Gyroscope (DFOG) and closed-loop accelerometer technologies with the latest AI-based fusion algorithms.

With ultra-fast north-seeking capability, the unit offers accurate heading without reliance on magnetometers or GNSS. This makes Boreas the ideal choice for demanding GNSS-denied scenarios where a cost-effective, high performance, solution is required.

The Boreas A Series can optionally be upgraded to full INS functionality and combined with an external GNSS input.

PERFORMANCE

-  0.01° Roll and Pitch
-  0.01°/hr FOG Gyroscope
-  0.1° Gyrocompass Heading
-  2 min Gyrocompassing
-  3 Year Warranty

KEY FEATURES

- Ultra-Fast North-Seeking
- AI-Based Fusion Algorithm
- Industry-Leading SWaP-C
- Multiple Protocols & Interfaces



APPLICATIONS



AIR

- High-Precision Surveying
- Gimbal Stabilisation
- Unmanned Aerial Vehicles



LAND

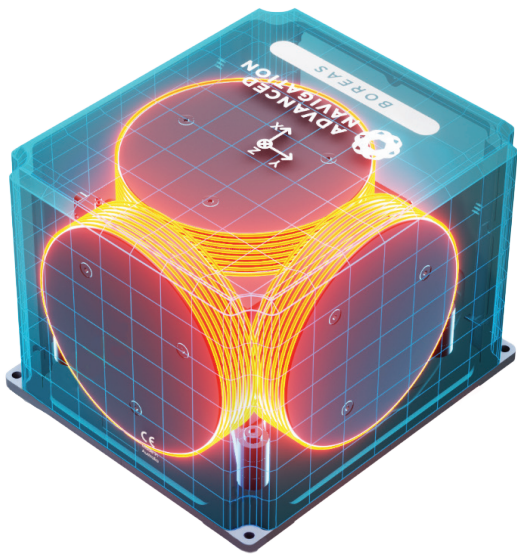
- Autonomous Vehicles
- Tunnelling and Mining
- Structural Monitoring



SEA

- Subsea Navigation
- Infrastructure monitoring
- Hydrography

FEATURES



REVOLUTIONARY DFOG TECHNOLOGY

Boreas takes Fibre Optic Gyroscope (FOG) technology into the next generation with new, patent pending Digital FOG (DFOG) technology, developed over 25 years with two research institutions.

This revolutionary DFOG technology combines a specially designed closed-loop optical coil with advanced spread spectrum digital modulation techniques that have never been used.

The resulting DFOG offers dramatically improved accuracy, stability and reliability with significantly reduced size, weight, power and cost.



ULTRA-FAST NORTH-SEEKING

The superior accuracy of the DFOG technology enables the Boreas A70 to rapidly determine its heading, without the need for GNSS or magnetometers.

By sensing the Earth's rotation, Advanced Navigation's revolutionary north-seeking algorithm allows Boreas to acquire an accurate heading within minutes of start up. This can be achieved in both static and dynamic conditions, as well as at high latitudes.

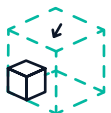


RELIABILITY

The Boreas A70 has been designed from the ground up for reliability. Both the hardware and software are designed and tested to demanding safety standards.

The precision aluminium enclosure is waterproof and dustproof to IP67. The system is resilient to shock and vibration, allowing it to be used in the most extreme conditions.

The hardware is designed and tested to MIL standards.



INDUSTRY-LEADING SWaP-C

Based on ground-breaking DFOG technology, the Boreas A70 offers significant reductions in size, weight, power and cost when compared to competing systems of similar performance.



EXTENSIVE PROTOCOLS AND INTERFACES

The Boreas A70 features multiple interfaces including Ethernet, CAN, RS232, RS422 and GPIO.

Boreas supports all the industry standard protocols including NMEA, CANopen, NTP, PTP as well as a wide variety of proprietary protocols.

A rich, responsive, embedded web interface provides full access to all of the device's internal functions and data. Internal storage allows for up to one year of data logging.



SPECIFICATIONS

NAVIGATION

| | |
|--|---|
| Roll and Pitch Accuracy | 0.01 ° |
| Heading Accuracy (Gyrocompass, no GNSS) | 0.1 ° secant latitude RMS |
| Gyrocompassing Alignment | 2 minutes coarse 10 minutes fine (typical) |
| Accuracy with Odometer (no GNSS) | 0.05 % distance travelled |
| Horizontal Position Accuracy (external RTK GNSS aided) | 0.01 m |
| Vertical Position Accuracy (external RTK GNSS aided) | 0.015 m |
| Velocity Accuracy (external GNSS aided) | 0.005 m/s |
| Heave Accuracy | 2 % or 0.02 m (whichever is greater) |
| Output Data Rate | 1000 Hz |

HARDWARE

| | |
|-----------------------------|-----------------------------|
| Operating Voltage | 9 to 36 V |
| Input Protection | -200 to 200 V |
| Power Consumption (Typical) | 12 W |
| Operating Temperature | -40 °C to 75 °C |
| Environmental Protection | IP67 |
| MTBF | > 70,000 hrs |
| Shock Limit | 50 g 11 ms MIL-STD-810H |
| Vibration | 8 g RMS (20-2000 Hz random) |
| Dimensions | 160x140x115.5 mm |
| Weight | 2.5 kg |

COMMUNICATION

| | |
|----------------------|--|
| Interface | Ethernet RS232/RS422 CAN 1PPS |
| Speed | 100Mbit 4800 to 4M baud serial |
| Protocol | AN Packet Protocol NMEA CANopen |
| Peripheral Interface | 2x GPIO 1x Auxiliary RS232 |
| GPIO Level | 5 V (RS232) 3.3 V |
| GPIO Functions | 1PPS input/output Odometer input DVL/USBL input Air Data input Zero Velocity input NMEA input/output Novatel GNSS input Trimble GNSS input AN Packet Protocol CAN/CANopen |

SENSORS

| SENSOR | ACCELEROMETERS | GYROSCOPES | PRESSURE |
|----------------------------|-----------------|----------------|---------------|
| Range | ± 15 g | ± 490 °/s | 10 to 130 kPa |
| Bias Instability | 7 µg | 0.01 °/hr | 8 Pa |
| Initial Bias | < 100 µg | < 0.05 °/hr | < 50 Pa |
| Initial Scaling Error | 340 ppm | 100 ppm | - |
| Scale Factor Stability | 150 ppm | 20 ppm | - |
| Non-linearity | 150 ppm | 10 ppm | - |
| Cross-axis Alignment Error | < 0.001 ° | < 0.001 ° | - |
| Noise Density | 40 µg/√Hz | 0.3 °/hr/√Hz | 0.4 Pa/√Hz |
| Random Walk | 23 mm/s/√hr VRW | 0.005 °/√h ARW | - |
| Bandwidth | 300 Hz | 400 Hz | 50 Hz |



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