

BOREAS D70

FOG GNSS/INS








Boreas D70 is an ultra high accuracy FOG GNSS/INS that provides position, velocity and orientation under the most demanding conditions.

It combines cutting edge Fibre Optic Gyroscopes (FOG) technology, with closed loop accelerometers and a dual antenna RTK GNSS receiver. These are coupled in a sophisticated fusion algorithm to deliver accurate and reliable navigation and orientation.

The system features ultra fast gyrocompassing heading that works under all conditions.

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 Algorithm
- Industry Leading SWAP-C
- Multiple Protocols & Interfaces



APPLICATIONS



AIR

- UAV Geopointing
- UAV Lidar
- Stabilisation & Pointing



LAND

- Antenna Targeting
- Land Surveying
- Underground Navigation

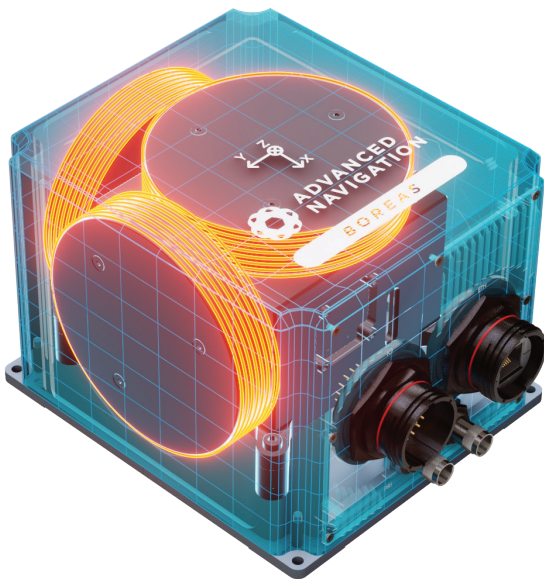


SEA

- AUV Navigation
- ROV Navigation
- Hydrography

PRELIMINARY

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 2 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 in a FOG before.

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 Boreas D70 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 D70 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.

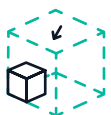


RELIABILITY

Boreas D70 has been designed from the ground up for reliability. Both the hardware and software are designed and tested to safety standards.

The precision aluminium enclosure is waterproof and dustproof to the IP67 standard. 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. The GNSS contains RAIM, which excludes malfunctioning or tampered satellite signals.



INDUSTRY LEADING SWaP-C

Based on ground-breaking DFOG technology, Boreas D70 offers a 40% reduction in size, weight, power and cost, when compared to competing systems of similar performance.



EXTENSIVE PROTOCOLS AND INTERFACES

Boreas D70 features multiple interfaces including Ethernet, CAN, RS232, RS422 and GPIOs.

Boreas D70 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 1 year of data logging.



SPECIFICATIONS

NAVIGATION

Roll and Pitch Accuracy	0.01 °
Heading Accuracy (Dual GNSS 1 m separation)	0.01 °
Heading Accuracy (without 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 (RTK or PPK)	0.01 m
Vertical Position Accuracy (RTK or PPK)	0.015 m
Horizontal Position Accuracy (SBAS)	0.5 m
Vertical Position Accuracy (SBAS)	0.8 m
Velocity Accuracy	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 with GNSS
Operating Temperature	-40 °C to 75 °C
Environmental Protection	IP67 MIL-STD-810H
MTBF	> 70,000 hrs
Shock Limit	50 g 11 ms
Vibration	8g rms (20-2000 Hz random)
Dimensions	160x140x115.5 mm
Weight	2.8 kg

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 ug	< 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 ug/√Hz	0.3 °/hr/√Hz	0.4 Pa/√Hz
Random Walk	23 mm/sec/√hr VRW	0.005 °/h ARW	-
Bandwidth	300 Hz	400 Hz	50 Hz

GNSS

Model	Advanced Navigation Aries
Supported Navigation Systems	GPS L1, L2 GLONASS L1, L2 GALILEO E1, E5b BeiDou B1, B2
Supported SBAS Systems	WAAS EGNOS MSAS GAGAN QZSS
Update Rate	Up to 20 Hz
Hot Start First Fix	2 s
Cold Start First Fix	30 s
Horizontal Position Accuracy	1.2 m
Horizontal Position Accuracy (SBAS)	0.5 m
Horizontal Position Accuracy (RTK)	0.01 m
Velocity Accuracy	0.05 m/s
Timing Accuracy	20 ns
Acceleration Limit	4 g

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



HEAD OFFICE

+61 2 9099 3800

sales@advancednavigation.com

Level 12, 255 George Street
Sydney NSW 2000
Australia

NORTH AMERICA

+1 863 777 0224

usasales@advancednavigation.com

1420 Kettner Blvd, Suite #100
San Diego CA 92101
United States

EUROPE

+44 20 3875 3118

emeasales@advancednavigation.com

One Kingdom Street, Paddington Central
London, W2 6BD
United Kingdom

SUBSEA RESEARCH CENTRE

+61 8 6146 5600

245 Balcatta Road,
Balcatta WA 6021
Australia