BOREAS D70
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 Gyrosopes (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
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.

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.

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.

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.

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 | 2.5 kg

### COMMUNICATION

Interface | Ethernet
RS232/RS422 CAN
1PPS
Speed | 100 Mbit
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

### 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

### SENSORS

**ACCELEROMETERS**

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**GYROSCOPES**

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**PRESSURE**

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