# Sperry Marine

# NAVIGAT 4000


The solution for cost effective INS

## Features

- High accuracy
- High shock resistance
- Invulnerable to GPS spoofing / jamming
- High-speed, low latency orientation output up to 512 Hz
- Standard outputs for navigation through CompassNet
- Full MIL spec and Wheelmark certified (WIP)

# NAVIGAT 4000

The NAVIGAT 4000 is a marine gyrocompass and attitude heading reference system (AHRS), using state-of-the-art fibre-optic gyros (FOG) and acceleration MEMS in a strap-down configuration. Augmented with an external Global Navigation Satellite System (GNSS) and/or Speed Log, the NAVIGAT 4000 provides high speed low senescent stabilisation data and can also compensate velocity for water currents, significantly improving the dead reckoning navigation accuracy. The system also provides inertial and hybrid position, heading, roll & pitch, angular rates, heave, acceleration and velocities. High dynamic angular rate and body acceleration with low noise enables highly sophisticated stabilisation and positioning control laws.

When installed with the optional mounting plate the NAVIGAT 4000 withstands shocks of up to 125 g. By verifying the plausibility of received GNSS signals, the NAVIGAT 4000 provides resistance against GNSS spoofing or jamming and is able to provide position and speed over a certain period even without GNSS augmentation.

The NAVIGAT 4000 is fully integrated into CompassNet including the master display, providing its data to the navigation equipment. It is easy to install without special tools and is free of scheduled maintenance. It provides automatic operation mode, reducing the operator's workload and need for awareness.

The NAVIGAT 4000 fulfils full MIL specifications. In addition, the NAVIGAT 4000 is also Wheelmark certified (WIP).

# Technical Data

### Accuracy

| | |
|---|---|
| Heading | ≤ 0.1° x sec (Lat) RMS |
| Attitude (Roll & Pitch) | ≤ 0.03° |
| Heave | ≤ 0.05 m or 5 % |
| Velocity | ≤ 0.2° m/s (GNSS augmented) |
| | ≤ Ref-Vel + 0.05 m/s (Log augmented) |
| Position | ≤ 1 nm / 8 h TRMS (Log augmented) |
| | GNSS accuracy (GNSS augmented) |
| | ≤ 2 nm / 1 h TRMS (free inertial) |

### Operational Characteristics

| | |
|---|---|
| Operational Range | ± 78° latitude |
| Velocity | ± 75 knot |
| Roll & Pitch | ± 45° |
| Angular Rates | ± 50° / sec. |
| Acceleration | ± 1 g |

### Alignment

| | |
|---|---|
| Static | 3.5 min. (lat ≤ ±45°) |
| Dynamic | 30 min. |

### Power Supply

| | |
|---|---|
| Power supply | 28 (18 – 32) V DC |
| Power consumption | 20 W 26 W nominal, 26 W 30 W max. |

### Environmental

| | |
|---|---|
| Protection Grade | IP X7 (IEC/EN 60529) |
| Operating Temperature | 0° C – +55° C (full performance) |
| | -15° C – +60° C (reduced performance) |
| Storage Temperature | -30° C – +70° C |
| Shock | 10 g / 125 g (with optional mounting plate) |
| EMC | MIL STD 461E / IEC 60945 sec. 10 |

### Interfaces

Synchronous RS422 serial interface with HDLC framing acc. ISO/IEC 13239 and asynchronous RS422, data update rate selectable up to 512 Hz

### Dimensions, Weight and MTBF

| | |
|---|---|
| Height | 147 mm (5.79 in) |
| Depth | 220 mm (8.66 in) |
| Width | 240 mm (9.45 in) (with mounting flanges) |
| Volume | 7.7 l (1.9 gal) |
| Colour | RAL 7001 (light grey) |
| Weight | 6 kg / 212 oz / 13.3 lb |
| MTBF | 40,000 hours |

### Compliance and Approvals

IMO A.424(XI), A.526(13), A.694(17), A.821(19), EN ISO 8728, IEC 60945, NMEA 0183 V4.00, MIL-STD-810G, MIL-STD-461E, MIL-STD-1275B, VG 95373, ANSI/TIA/EIA-422-B, ISO/IEC 3239, MIL-C-38999 J, NATO STANAG 422, US Navy Sign Convention

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