

**Sperry Marine**

# NAVIGAT X MK 1



**Microprocessor Controlled  
Digital Gyrocompass System**

# Design and Standard Features

## OVERVIEW

With a watchful eye on the demands made on navigation and ship control technology emerging from the 21<sup>st</sup> Century, Sperry Marine has created the NAVIGAT X MK 1 Digital Gyrocompass System.

Ship's cables are connected directly to terminals within the gyrocompass housing, greatly facilitating installation. All electronic components are plug-in modules, thus providing fast and easy service. Digital heading information is derived as an absolute value from a 13-bit shaft encoder. The NAVIGAT X MK 1 has a control and display unit installed in the front access cover. When required, the control and display unit can be removed from the access cover and installed at a location (e.g. bridge console) remote from the gyrocompass.

## STANDARD FEATURES

- Comprises one single unit
- Control and display unit in front cover with 4-digit heading display and 6 operating keys
- Easy to install and easy to service
- High-speed follow-up system 100°/sec
- Type approved rate-of-turn output
- Automatic static north speed error correction
- Highly accurate digital heading data transmission by shaft encoder
- Self-synchronizing repeater compasses
- ±180° electronic alignment error correction in setup program
- Will drive a maximum of 12 analogue repeaters
- 180° heading offset function for shuttle vessels
- Automatic emergency power changeover and status alarm

- 7 independent serial outputs RS 422, IEC 61162-1 and IEC 61162-2
- 2 dependent 6 steps/° heading outputs (0.5 A)
- Complies with IMO regulations A.424(IX), A.694(17), A.821(19) - HSC (High Speed Craft) and ISO 8728.
- Outputs to Navigation Data Printer:
  - Heading
  - Heading source gyro/magnetic
  - Rudder angles of two independent rudders
- Twin rotors and liquid damping system eliminates latitude error
- High Mean Time Between Failures (MTBF) of 40.000 hours and low power consumption
- All repeater compasses with serial interface
- Gyro system remains north stabilized during power interruptions of up to 3 minutes
- Single point suspension of the gyrosphere container eliminates the well-known adverse effects associated with gimbals.
- Monitoring and alarm functions for all voltages, gyroscope current and follow-up system (gyrosphere current, temperature, elapsed operation time)

The unique method of supporting the well-proven Sperry Marine gyrosphere by means of mere buoyancy ensures north stabilization during short power failures.

A special version, NAVIGAT X MK 1 HSC, is available to meet the demands of high-speed craft (HSC). Here, the unique centering pin retaining arrangement for the gyrosphere is mounted in an additional gimbal system, which allows the NAVIGAT X MK 1 Mod 7 gyrocompass an almost unlimited freedom of roll and pitch (±90°).

## TYPE APPROVAL

NAVIGAT X MK 1 has been type approved by Germanischer Lloyd (GL) in accordance with the Marine Equipment Directive (MED) 96/98/EC (Wheelmark) and fulfills IMO Resolutions A.424(XI) and A.694(17) as well as IEC 61162.

The NAVIGAT X MK 1 HSC has been type approved to the High-Speed Craft Code by Germanischer Lloyd (GL) in accordance with the Marine Equipment Directive (MED) 96/98/EC (Wheelmark).

The rate-of-turn outputs of NAVIGAT X MK 1 and NAVIGAT X MK 1 HSC have been type approved by Germanischer Lloyd (GL) in accordance with the Marine Equipment Directive (MED) 96/98/EC (Wheelmark) and also fulfills IMO resolution A.526(13).

## PERFORMANCE

Linear mean settle point error (RMS): ≤0.1° secant latitude

Static error (RMS): ≤0.1° secant latitude

Dynamic error (RMS): ≤0.4° secant latitude

Performance in accordance with IMO A.694(17), IMO A.821(19), ISO 8728 and ISO 16328(2001).

## FREEDOM OF ROLL & PITCH

NAVIGAT X MK 1 Mod 7	±90°
NAVIGAT X MK 1 Mod 10	±40°

## POWER REQUIREMENTS

24 VDC (18 V to 36 V) and / or 115/230 VAC ± 10% 50 Hz / 60 Hz

The single-unit gyrocompass includes automatic switchover to 24 V emergency power supply in accordance with GMDSS Rules.

## OPERATIONAL DATA

Ambient temperature range  
Operation: -10°C to +55°C  
Storage: -25°C to +70°C  
(without supporting fluid)

Settling Time: < 3 hours  
Gyrocompass follow-up rate: 100°/sec  
Heading Display: digital with 4 digits

# System Configurations

## Basic Single Gyrocompass System

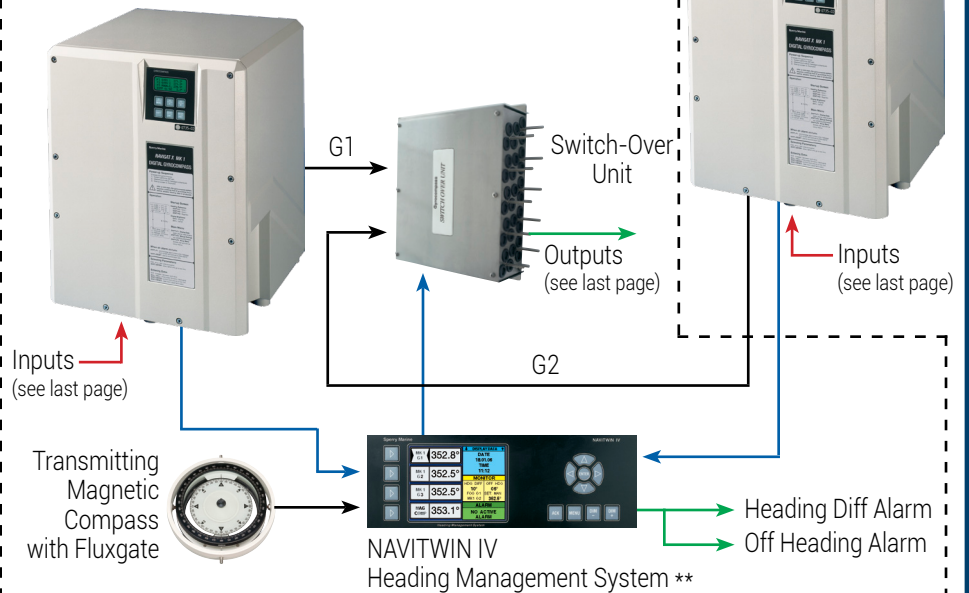


Inputs  
(see last page)

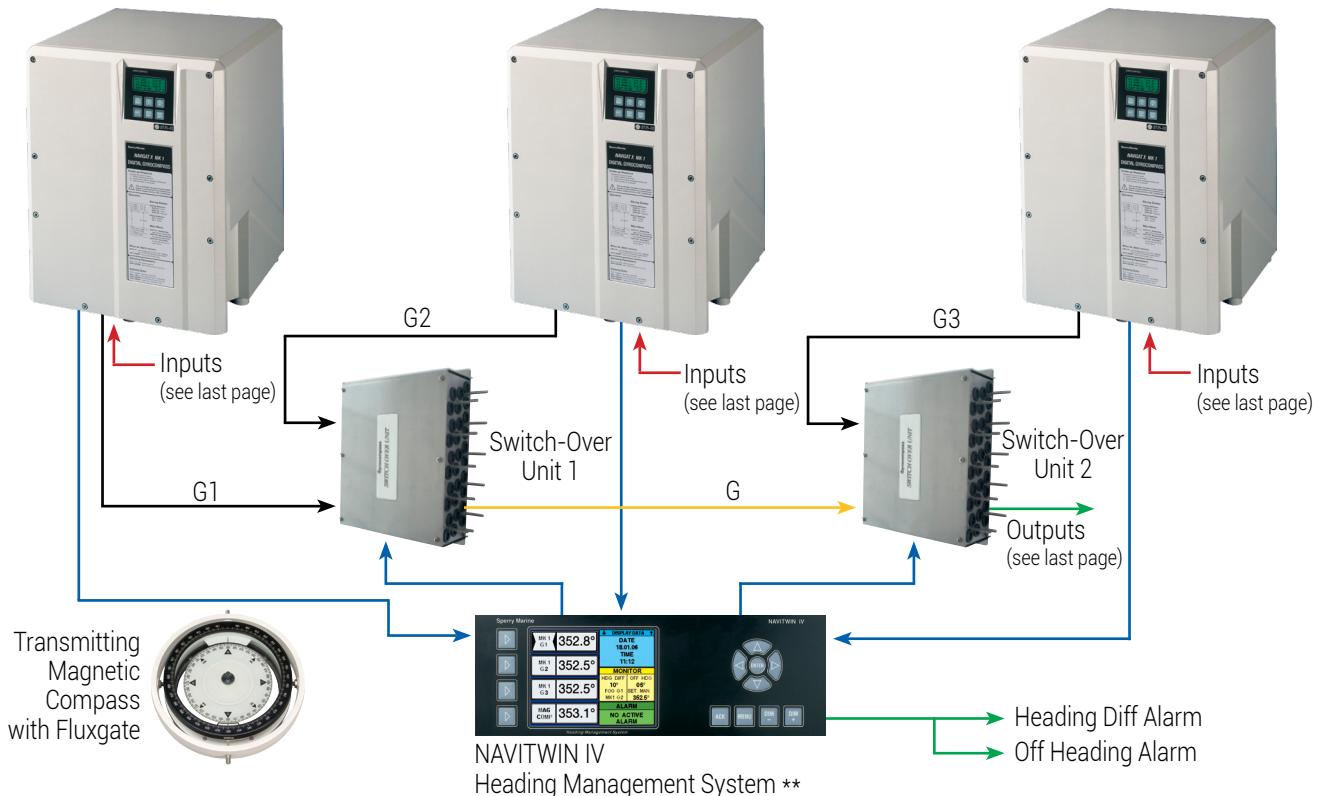
Outputs  
(see last page)

## Dual Gyrocompass System with TMC\* Function

### Single Gyrocompass System with TMC\* Function



## Triple Gyrocompass System with TMC\* Function



\*Transmitting Magnetic Compass. In TMC systems, the NAVITWIN IV Heading Management System provides an independent back-up magnetic heading source for distribution to autopilots, repeaters, radars and other peripheral appliances when required.

\*\* With selectable and programmable automatic heading takeover in accordance with Grounding Avoidance System (DNV NAUT OC and AW)

## OPERATIONAL DATA

Power Failure Alarm:	visible and audible and potential-free contact, max. 30 VDC / 1.0 A, max. 125 VAC / 0.5 A
Mean time between failure:	40,000 hours (MTBF)
North speed error correction:	automatic or manual
Built-in test equipment:	standard

## POWER CONSUMPTION

	DC	AC
Start-up:	80W	125VA
Operation:	45W	75VA
Each analogue repeater:	6W	6VA
Each universal digital repeater:	5W	5VA

## PROTECTION GRADE

Gyrocompass:	IP 23 in accordance with IEC/EN 60529
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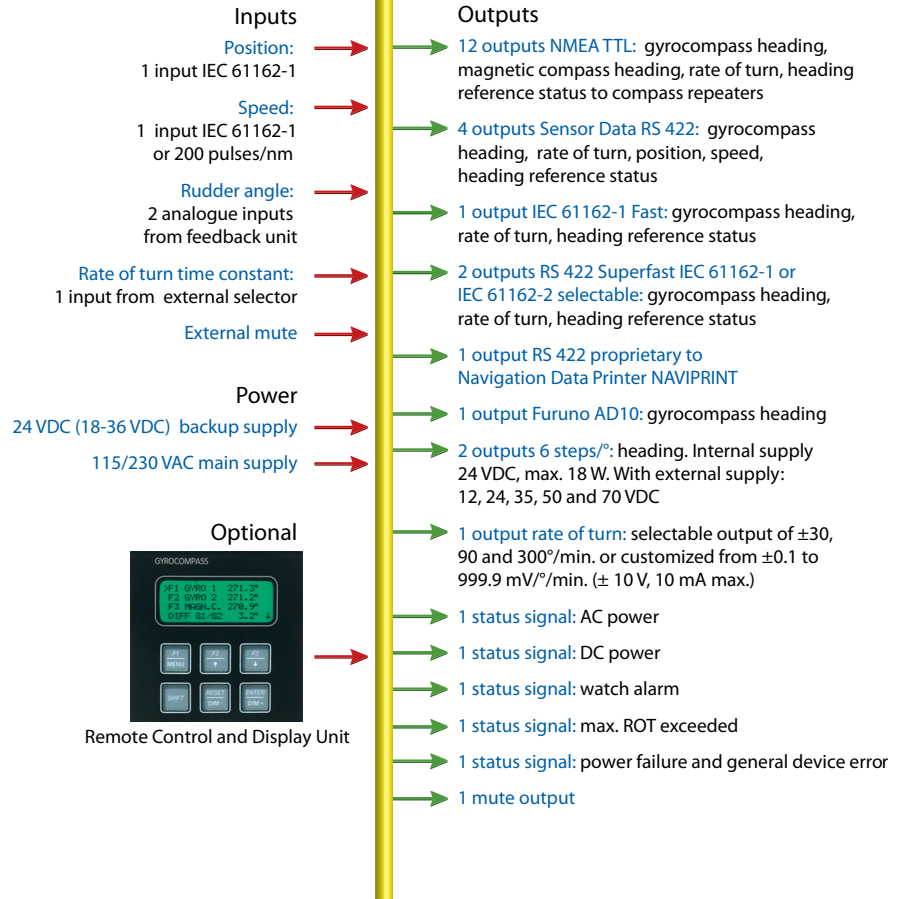
## ENVIRONMENTAL REQ. & EMC

In accordance with EN 60945 (IEC 945 + A1)

<b>Magnetic clearance to:</b>	
standard magnetic compass	0.6m
steering magnetic compass	0.4m
<b>Reduced magnetic clearance to:</b>	
standard magnetic compass	0.3m
steering magnetic compass	0.3m



## NAVIGAT X MK 1



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