



SEASTORM

The compact and highly accurate position, motion, environmental and meteorological data system “SeaStorm” was designed to match the increasing demand of modern technology for improved sensor performance, sensor fusion, data accuracy and data processing quality for various, naval applications in terms of determination of relative positions, true winds, tidal current effects, drift over “ground” and relative yaw, pitch and roll of vessels and their integrated subsystems.

The sensor system consists in the following components:

- Anemometer (relative wind speed and direction)
- THP combined sensor (outside temperature, relative humidity, air pressure)
- GNSS (differential GPS)
- IMU – Internal measurement unit (rotation, gravitational and linear acceleration)
- DIU – Data Interface Unit (sensor fusion and data processing)

The SeaStorm System is to sense, analyse, calculate and verify the effects of wind, current and waves, including fluctuations, absolute movements and relative motion, in order to provide highly accurate data for system relevant compensations, arithmetically predictions, system stabilization or plain navigational accuracy in general.

After an individual vessel set-up, the sensor suite is capable to detect and compensate for positional or measurement inaccuracies caused by the dynamic motions of sensors within the given environment. The SeaStorm system, with its high frequency data sampling and implemented data fusion algorithms, is able to provide the required system accuracy up to $\leq \pm 10\%$ tolerance, even in a high dynamic environment – thus being up to ten times more accurate than comparable standard systems without the integrated, adapted, sensor data fusion software for the relevant platform.

KEY CHARACTERISTICS

- High precision sensor data accuracy
- IMU, wind and GNSS internal data fusion
- NMEA protocol
- Internal data logging functionality
- High frequency data sampling rate
- Modular design
- 19" architecture of Data Interface Unit

STATUS

Available

DATA INTERFACE UNIT	
Height	266.7 mm
Length	410.0 mm
Width	350.0 mm
Voltage	115 V/60 Hz
Max. current consumption	10 A

ANEMOMETER	
Wind direction (relative to ships bow)	Range: 0 to 359.9°
Wind speed (relative to ship)	Range: 0 to 75 m/s
Measuring rate	10 Hz
Operating conditions	-40 to +70°C 0 to 100% r. h.
Current consumption	35 mA at 24 VDC without heating 60 W/120 W at 24 V with heating

COMBINED TEMPERATURE/HUMIDITY/PRESSURE	
Temperature measuring range	-40 to +70°C
Temperature resolution/accuracy	0.1°C / ±1°C
Rel. humidity measuring range	0 to 100% r. h.
Rel. humidity resolution/accuracy	0.1% r. h./±4% r. h.
Air pressure measuring range	500 to 1,100 hPa
Air pressure resolution/accuracy	0.1 hPa/±2 hPa
Current consumption	4 mA at 24 VDC

GNSS	
Dual antenna, dual frequency receiver	
Signal tracking	GPS: L1, L2, L2C Galileo: E1, E5b; BeiDou: B1, B2; GLONAS: L1, L2
Accuracy	
Single point L1	1.5 m
Single point L1/L2	1.2 m
SBAS (GPS only)	0.6 m
DGPS	0.4 m
RT-2®	1 cm + 1 ppm
Heading	up to 0.05° (RMS)
Velocity	0.03 m/s (RMS)
Velocity limit	515 m/s
Time	20 ns (RMS)
Temperature range	-40 to +75°C
Humidity	95% non-condensing
Vibration/schock	7.7 g/40 g

IMU	
Measurement	Rotation (Gyroscope); Gravity- & Linear acceleration
Acceleration resolution	1.0 mg
Gyroscope resolution	0.007°/s
Temperature range	-40 to +85°C

The example configuration shown can be individually adapted on request due to the system modularity.

The scope of supply, appearance, performances, dimensions and weights of the system correspond to the knowledge available at the time of printing. Deviations from the illustrations in color and form, errors and misprints as well as changes are reserved.