SEAPATH® 380 SERIES

KONGSBERG

THE ULTIMATE HEADING, ATTITUDE AND POSITIONING SENSOR

The Seapath 380 series uses a state-of-the-art dual frequency GNSS receiver, inertial technology and processing algorithms to provide surveyors with the best possible accuracy in position, attitude and timing. All available GPS, GLONASS, Galileo, Beidou and QZSS satellites are used in the position solution.

Function

The advanced Seapath navigation algorithms integrate RTK GNSS data with the inertial sensor data from the MRU. This gives the Seapath 380 unique advantages compared to stand- alone RTK products. The Seapath product's accurate roll, pitch and heading measurements allow the RTK antenna position to be referenced to any point on the vessel where accurate position and velocity are required. All data from Seapath have the same time stamp and the output is in real-time. Subdecimetre position accuracy can be achieved through download of satellite orbit and clock data from the internet and by post processing of satellite and IMU data.

Product range

The Seapath 380 series is delivered in the following product range:

	Roll/Pitch [RMS]	Heading [RMS]	
		2.5m baseline	4m baseline
Seapath 380-3	0.08°	0.07°	0.05°
Seapath 380-H	0.03°	0.07°	0.04°
Seapath 380-5	0.02°	0.04°	0.03°
Seapath 380-5+	0.008°	0.04°	0.02°

Note: The MRU 3 model part of Seapath 380-3 has to be mounted in a fixed direction relative to the vessel and with the connector pointing up or down. Otherwise the performance of the Seapath 380-3 will be degraded.

System configuration

This Seapath series is a two-module solution with a processing unit and a HMI unit connected via Ethernet. The processing unit run all critical computations independent from user interface on the HMI unit to ensure continuous and reliable operation. Multiple HMI units can be connected to the same processing unit in a networked architecture. The HMI units present the vessel motion in a clear and easy-to-understand format. The Seapath is operated through the operator software installed on one or several HMI units. This software is used for performance monitoring, configuration and troubleshooting of the system.

Interfaces

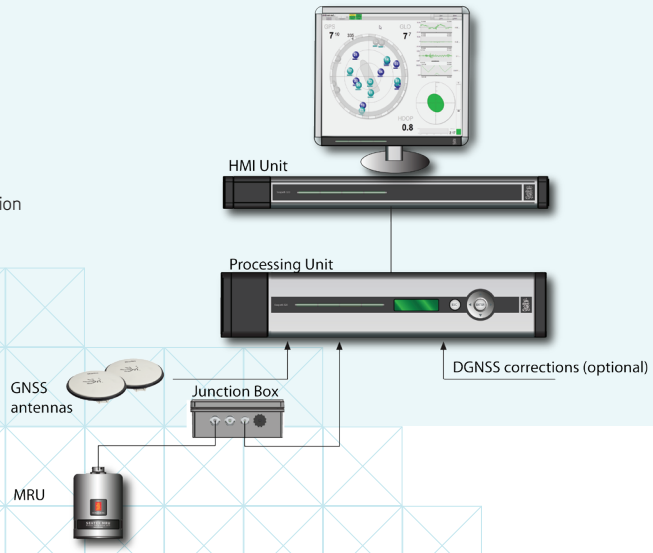
The processing unit has eight RS-232/422 serial lines, four Ethernet LANs and three analog output channels. This makes distribution of Seapath data to various users onboard almost endless. DGNSS corrections of various quality and sources are input on a configurable RS-232/422 serial line or Ethernet.

Applications

By using standard DGNSS, Fugro XP2/G2/G4/G4+ and RTK corrections, the Seapath 380 is a unique solution for hydrographic surveying and dredging work demanding the most comprehensive and accurate surveying data available.

FEATURES

- 0.008° to 0.08° roll and pitch accuracy depending on model
- 2 cm heave accuracy by use of the PFreeHeave® algorithms
- Meets IHO special order requirements
- Robust against GNSS dropouts due to the inertial sensor part of the product
- 555-channel dual frequency GPS/GLONASS/Galileo/Beidou receiver
- All available GPS/GLONASS/Galileo/Beidou/QZSS satellites are used in the positioning solution
- Includes ionospheric compensation methods to reduce Sunspot 24 cycle effects
- Fugro XP2/G2/G4/G4+ corrections and RTK supported
- RTK corrections format RTCM and CMR supported
- Includes SBAS corrections (WAAS, EGNOS, MSAS, GAGAN)
- All data have the same time stamp and to an accuracy of 0.001 s to the actual measurement time
- Logging of raw satellite and IMU data possible



TECHNICAL SPECIFICATIONS

SEAPATH 380 SERIES

PERFORMANCE

Heave accuracy (real-time)	5 cm or 5 % whichever is highest
Heave accuracy (delayed signal)	2 cm or 2 % whichever is highest
Heave periods (real-time), except Seapath 380-3	1 to 25 seconds
Heave periods (real-time), Seapath 380-3	0 to 18 seconds
Heave periods (delayed signal)	1 to 50 seconds
Position accuracy DGNSS	0.5 m RMS or 1 m 95% CEP
Position accuracy SBAS	0.5 m RMS or 1 m 95% CEP
Position accuracy Fugro XP2/G2/G4/G4+	0.1 m RMS or 0.2 m 95% CEP
Position accuracy RTK (X and Y)	1 cm + 1 ppm RMS
Position accuracy RTK (Z)	2 cm + 1 ppm RMS
Velocity accuracy	0.03 m/s (RMS)
Range to RTK reference station	10 km
UHF radio frequencies (radio not included in standard package)	430 to 470 MHz 390 to 430 MHz (optional)

DATA OUTPUTS

Communication ports	8 serial RS-232/RS-422 lines and 16 Ethernet UPD/IP ports
Data output interval	Programmable in 0.005-se steps and 1PPS pulse
Data update rate	Up to 200 Hz
Analog output	3 user configurable channels, +/- 10 Volt
1PPS signal accuracy	220 nsec

POWER SPECIFICATIONS

Processing Unit	100 to 240 V AC, 75 W (max)
HMI Unit	100 to 240 V AC, 40 W (max)
Monitor	100 to 240 V AC, 23 W (max)
IMU	24 V DC from Processing Unit
GNSS antenna	5 V DC from Processing Unit

WEIGHTS AND DIMENSIONS

Processing Unit	5.4 kg, 89 x 485 x 357 mm
HMI Unit	3.8 kg, 44 x 485 x 330 mm
Monitor	3.8 kg, 383 x 380 x 170 mm
IMU	2.2 kg, 140 x Ø105 mm
GNSS ante nna	0.5 kg, 69 x 185 mm

ENVIRONMENTAL SPECIFICATIONS

Operational temperature range

Processing and HMI Unit	-15 to +55 °C
Monitor	+5 to +40 °C
IMU	-5 to +55 °C
GNSS antenna	-40 to +85 °C

Storage temperature range

Processing and HMI Unit	-20 to +70 °C
Monitor	-20 to +60 °C
IMU	-25 to +70 °C
GNSS antenna	-55 to +85 °C

Enclosure protection

Processing and HMI Unit	IP 21 (rear)
Monitor	IP 21 (rear)
IMU	IP 66
GNSS antenna	IP 66
Cables	IP 67
Connectors	IP 67

Mechanical

Vibration	IEC 60945/EN 60945

Electromagnetic compatibility

Compliance to EMCD, immunity/emission	IEC 60945/EN 60945

PRODUCT SAFETY

Compliance to LVD, standard used	IEC 60950-1/EN 60950-1

Specifications are valid without multipath, without shadowing of antennas and with vessel in motion.

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Specifications subject to change without any further notice.

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