

# DPS 5D



KONGSBERG



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## HYBRID GNSS BASED POSITION, ATTITUDE AND HEADING SYSTEM FOR DP

DPS 5D provides a superior solution to the most challenging installations. The unmatched all-in-one package addresses the extremes of accuracy and reliability. In addition to providing precise positioning, DPS 5D also offers precise GNSS based heading. The flexibility with regard to installation of the dual GNSS antennas ensures optimum tracking of multi-constellation satellite signals under all conditions.

### Designed to be trusted

DPS 5D is a position reference system especially developed for dynamically positioned (DP) vessels with a problematic infrastructure. When there is no single suitable GNSS antenna location without obstructions, the use of multi-sensor fusion techniques is required in order to obtain an accurate and reliable position solution.

### Sensors teaming up

When outages due to masking are frequently experienced and a conventional set-up would not provide the required stability and reliability, a multi-receiver solution with INS integration is the perfect solution. The dual GNSS receiver solution together with the INS (MRU 5+) integration ensures a continuous position solution by bridging gaps in the GNSS reception and increasing position stability in periods with limited GNSS availability due to masking, scintillation and interference. GPS and INS are perfectly matched as their error characteristics are different and they measure different quantities. They overcome each others limitations and using both systems is superior to using either system alone.

### Two antennas – two eyes to the sky

A dual GNSS antenna solution, where the antennas are located at different locations on the vessel, minimizes the risk of interference and improves the availability in periods with extensive signal blocking/shading. The NAV Engine® calculates multiple positions based on data from the two GNSS receivers and the IMU, ensuring a high level of robustness and integrity in the

position solution output to the DP system. Both GNSS receivers are dual frequency receivers and allow for real-time compensation of errors introduced by high ionospheric activity.

### Trust and precision

DPS 5D provides position and velocity data with the best possible accuracy by combining all available GNSS signals from two separate GNSS antennas and a multitude of differential correction data simultaneously. It supports RTK corrections, global high precision services, standard RTCM corrections and free-to-air services such as SBAS and IALA. In High Precision mode a worldwide accuracy of 10 - 20 cm is possible. RAIM (Receiver Autonomous Integrity Monitoring) extended by data from the IMU provides ultimate reliability of the position and velocity data under difficult GNSS conditions.

### Heading beyond gyros

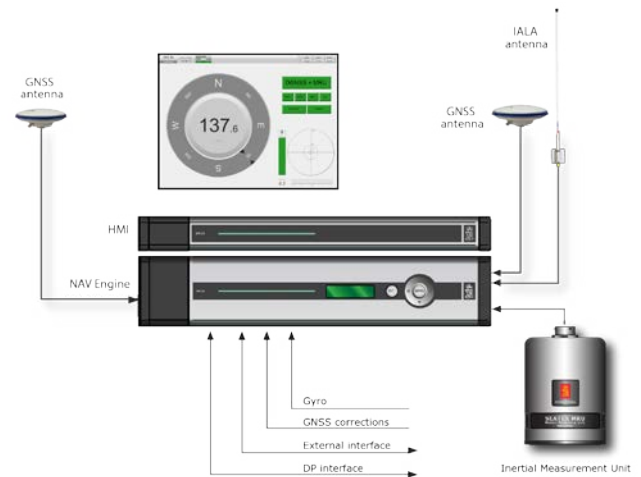
A GNSS based heading solution is available both as display and signal output. The IMU integration provides a high accuracy heading solution and precise lever arm compensation. No degradation at high latitudes, like traditional gyros or compasses.

### Active decision support

The DPS has an intuitive and easy-to-use graphical user interface developed in close co-operation with experienced DP operators. This HMI enables the operators to assess the quality of their positioning quickly and effectively during operation. Multiple layers of information give the DP operator unmatched opportunities for a customized visual presentation.

## FEATURES DPS 5D

- Combined GPS L1/L2, GLONASS L1/L2 and SBAS receivers
- Multi-receiver solution with INS integration
- Dual frequency ionospheric compensation
- Supports multiple high precision correction sources
- Simultaneous integration of multiple correction signals (high precision services, standard RTCM corrections, SBAS and IALA)
- GNSS based heading
- High precision lever arm compensation
- Extended interfacing capabilities (DP, gyro, AIS, ROV)
- Easy-to-use HMI tailored to safety critical DP operations
- Automatic data recording with replay functionality
- Skyplot with satellite prediction and shadow sectors
- Target monitoring and Speed view
- Electronic chart/seabed maps with Electronic Bearing Line (EBL)



## TECHNICAL SPECIFICATIONS

### PERFORMANCE

RTK	1 cm + 1.6 ppm RMS
High precision accuracy	10 cm, 95 % CEP
DGPS/DGLONASS	< 1 m, 95 % CEP
SBAS accuracy	< 1 m, 95 % CEP
Velocity accuracy	< 0.01 m/s, 95 % CEP
Accuracy roll, pitch (for ±5° amplitude)	0.01° RMS
Update frequency rate	1 to 20 Hz
Latency	< 1 ms

All accuracy specifications are based on real-life tests conducted in the North Sea under various conditions. Operation in other locations under different conditions may produce different results.

### ENVIRONMENTAL SPECIFICATIONS

#### Operating temperature range

DPS 5D Processing Unit	-15 to +55 °C (*)
DPS 5D HMI Unit	-15 to +55 °C (*)
GNSS antenna 1/2	-40 to +85 °C/-30 to +70 °C
IALA beacon antenna	-55 to +55 °C
MRU 5+ (IMU)	-5 to +55 °C

(\*) Recommended +5 to +40 °C

#### Humidity

DPS 5D Processing Unit	Max 95 % non-condensing
DPS 5D HMI Unit	Max 95 % non-condensing
GNSS antennas	Hermetically sealed
IALA beacon antenna	Hermetically sealed
MRU 5+ (IMU)	Hermetically sealed

#### Mechanical

Vibration	IEC 60945/EN 60945
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#### Electromagnetic compatibility

Compliance to EMC, immunity/emission	IEC 60945/EN 60945
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#### POWER

DPS 5D Processing Unit	100 - 240 V AC, 50/60 Hz, max 75 W
DPS 5D HMI Unit	100 - 240 V AC, 50/60 Hz, max 40 W
GNSS antennas	5 V DC from processing unit
IALA beacon antenna	10.2 V DC from processing unit

Specifications subject to change without any further notice.

MRU 5+ (IMU)	24 V DC from processing unit, max 12 W
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### WEIGHT AND DIMENSIONS

DPS 5D Processing Unit	5.4 kg, 89 x 485 x 357 mm
DPS 5D HMI Unit	3.8 kg, 44 x 485 x 330 mm
GNSS antenna 1	0.5 kg, 69 mm x 185 mm
GNSS antenna 2	3.2 kg, 111 mm x 210 mm
IALA beacon antenna	0.9 kg, 1100 mm
MRU 5+ (IMU)	2.5 kg, 140 mm x Ø 105 mm

### INTERFACES

Serial ports	8 isolated ports, 6 configurable between RS-232 and RS-422
MRU 5+ (IMU)	RS-422
Ethernet/LAN	4
USB	3

### DATA OUTPUTS

Message formats	NMEA 0183 v. 3.0, Proprietary
Message types	ABBDP, ARABB, DPGGA, DTM, GBS, GGA, GLL, GNS, GRS, GSA, GST, GSV, RMC, VBW, VTG, ZDA

### DATA INPUTS

DGPS/DGLONASS corrections	RTCM-SC104 v.2.2, 2.3, 3.0 and 3.1, Seastar XP, Seastar G2
RTK corrections	RTCM-SC104 v. 2.3, 3.0, 3.1 and CMR
Gyro compass	NMEA 0183 HEHDT, EHRC and Robertson LR22 BCD format

### PRODUCT SAFETY

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

GNSS systems	IEC 61108-1
Maritime navigation and radio communication equipment and systems	IEC 61162-1, IEC 60945
IMO regulations	MSC.112(73), MSC.113(73), MSC.114(73), MSC.115(73)

UKOOA compliant