

# DPS i6



KONGSBERG



DREDGING  
AND PORT  
CONSTRUCTION  
AWARDS  
2018  
WINNER



## SENSOR FUSED GNSS SOLUTION FOR DYNAMIC POSITIONING

By the introduction of the DPS i-series, KONGSBERG fuses decades of experience within GNSS and inertial technology in order to create a fully scalable and future-proof reference solution with emphasis on operational efficiency for DP applications. DPS i6 provides a superior solution to the most challenging installations. In addition to precise positioning, DPS i6 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.

### Sensors teaming up

An unmatched integration of the latest within multi GNSS technology and KONGSBERG's unique motion gyro compass (MGC™) facilitate the possibility to operate with no additional augmentation services without compromising on DP performance. The DPS i-series is still fully prepared to utilize differential corrections, SBAS and Galileo HAS services when required.

### Designed for robust performance

The integration between GNSS and INS 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. GNSS and INS are perfectly matched as they overcome each others limitations. Using both systems is superior to using either system alone. RAIM (Receiver Autonomous Integrity Monitoring) extended by data from the INS provides ultimate reliability of the position and velocity data under difficult GNSS conditions.

### Two antennas - two eyes to the sky

The DPS i6 utilizes data from two separate GNSS antennas and from all available GNSS constellations, including GPS, GLONASS, Galileo and BeiDou. A dual GNSS antenna solution where the antennas are placed at different locations on the vessel, minimizes the risk of interference and improves the availability in periods with extensive signal blocking/shading. Multiple positions are calculated 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 multi frequency and allow for real-time compensation of errors introduced by high ionospheric activity. In addition, a GNSS based heading solution is available. It can be presented on a display or output to external equipment.

### Multi-use of sensor

By using the MGC as the inertial sensor, a high-quality WheelMark gyro compass becomes a part of the solution. In addition, MGC can serve other on-board systems such as navigation equipment and other systems that require attitude data.

### Increased operational efficiency

Inertial technology combined with the latest multi-constellation GNSS technology enables a cost efficient and reliable position reference solution. No regular maintenance, calibration or additional operational costs are required.

### Scalable solution

The flexible design of the DPS i-series ensures a scalable and expandable reference solution that can adapt to the specific requirements of any vessel. For the more demanding applications, a combination of multiple DPS systems and MGC/MRU sensors will enable precise heading determination world wide and provide spoofing detection capabilities. The DPS i-series may utilize existing or dedicated MGC or MRU sensors for the integration.

### Active decision support

The DPS i-series has an intuitive and easy-to-use graphical user interface developed in close co-operation with experienced DP operators. The HMI (Human-Machine Interface) enables the operators to assess the quality of their positioning quickly and effectively during operation.

### Remote service

The DPS i-series is ready for K-IMS remote services for operational support and troubleshooting. Cases that previously required a visit from a service engineer, may now be resolved remotely.

## FEATURES

- Multi-frequency GPS, GLONASS, Galileo, BeiDou, and SBAS receiver
- Highly optimized integration of INS and GNSS without the use of 3rd party DGNSS services
- Dual frequency ionospheric compensation
- INS aided RAIM capability for enhanced integrity and reliability
- Fully capable to utilize differential correction services if required
- High-precision lever arm compensation of position and velocity
- Intuitive and easy-to-use HMI tailored to safety critical DP operations
- GNSS based heading
- Spoofing detection capabilities
- Automatic data recording with replay functionality
- Remote service and diagnostics by utilizing K-IMS
- Galileo High Accuracy Service (HAS) ready
- GPS L5 ready

## TECHNICAL SPECIFICATIONS

### DPS i6

#### PERFORMANCE

Non-differential position accuracy <sup>1</sup>	0.65 m 95% CEP
RTK	1 cm + 1.6 ppm RMS
High precision accuracy <sup>2</sup>	< 10 cm, 95% CEP
HAS precision accuracy	< 20 cm, 95% CEP
DGNSS position accuracy	< 1 m, 95% CEP
SBAS position accuracy	< 1 m, 95% CEP
Velocity accuracy	< 0.01 m/s, 95% CEP
Roll, pitch accuracy	MRU 5+: 0.007° RMS, MGC R2: 0.01° RMS, MGC R3: 0.007° RMS
Update frequency rate <sup>1</sup>	200 Hz
Latency	< 1 ms
Heading accuracy <sup>3</sup>	MRU 5+: 0.02° RMS, MGC R2: 0.02° RMS, MGC R3: 0.01° RMS

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.

#### INTERFACES

Serial ports	8 isolated ports, 6 configurable between RS-232 and RS-422
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, VER, VTG, ZDA

#### DATA INPUTS

DGNSS corrections	RTCM-SC104 v.2.2, 2.3, 3.0 and 3.1, Seastar XP/XP2/G2/G2+/G4/G4+
RTK corrections	RTCM-SC104 v. 2.3, 3.0, 3.1 and CMR
Gyro compass	NMEA 0183 HDT, HRC, THS and Robertson LR22 BCD format
Display control	DDC

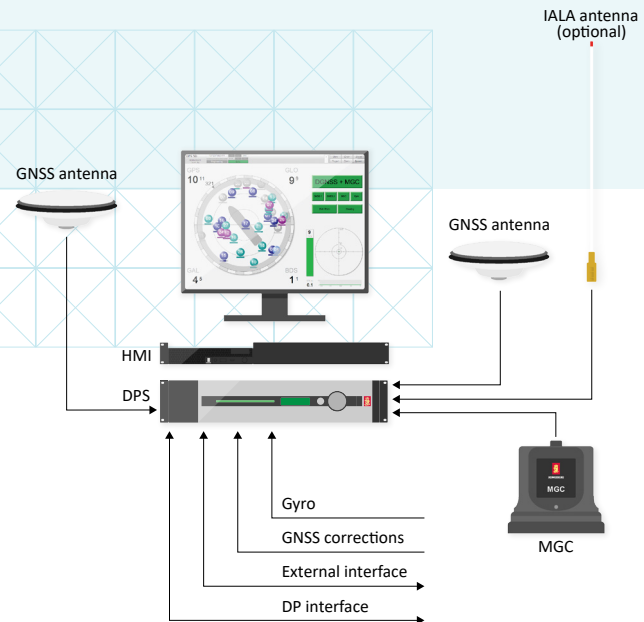
#### INS SENSOR

Supported INS	MRU 5+, MGC R2, MGC R3 (See dedicated datasheets for technical information)
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<sup>1</sup> Integrated system with non-differential filter enabled

<sup>2</sup> Dependent on subscription type

<sup>3</sup> With 4 m baseline. Heading accuracy depends on baseline and assumes accurate survey of antenna.



#### WEIGHTS AND DIMENSIONS

DPS Processing Unit	5.4 kg, 89 x 485 x 357 mm
DPS HMI Unit	3.6 kg, 44 x 481 x 267 mm
GNSS antenna	0.5 kg, 69 mm x 185 mm

#### POWER SPECIFICATIONS

DPS Processing Unit	100 - 240 V AC, 50/60 Hz, max 75 W
DPS HMI Unit	100 - 240 V AC, 50/60 Hz, max 170 W
GNSS antenna	5 V DC from Processing Unit

#### ENVIRONMENTAL SPECIFICATIONS

##### Operating temperature range

DPS Processing Unit	-15 to +55 °C (*)
DPS HMI Unit	+5 to +35 °C (**)
GNSS antenna	-40 to +85 °C
(*) Recommended	+5 to +40 °C
(**) Recommended	+20 °C

##### Humidity

DPS Processing Unit	Max 95 % non-condensing
DPS HMI Unit	Max 90 % non-condensing
GNSS antenna	IP69K

##### Mechanical

Vibration	IEC 60945/EN 60945, IACS E10
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##### Electromagnetic compatibility

Compliance to EMC, immunity/emission	IEC 60945/EN 60945, IACS E10
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##### Spectrum

Compliance to Article 3.2, standards used	ETSI EN 303 413 V1.2.1 (2021-04) ETSI EN 300 330 V2.1.1 (2017-02)
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##### PRODUCT SAFETY

Compliance to LVD, standard used	IEC 61010-1/EN 61010-1
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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)
UK00A compliant	

Specifications subject to change without any further notice.

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