DPS i3





SENSOR FUSIONED GNSS SOLUTION FOR DYNAMIC POSÍTIONING

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.

Sensors teaming up

An unmatched integration of the latest within multi GNSS technology and KONGSBERG's unique motion gyro compass (MGC^{TM}) 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. DPS i3 utilizes data from GPS and Galileo.

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.

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 multiconstellation 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.

• 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
- Scalable solution
- GNSS heading (requires two DPS systems)
- · 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 i3

PERFORMANCE

Non-differential position

1.3 m, 95% CEP accuracy RTK 1 cm + 1.6 ppm RMSHigh precision accuracy¹ < 10 cm, 95% CEP HAS precision accuracy < 20 cm, 95% CEP < 1 m, 95% CEP DGNSS position accuracy SBAS position accuracy < 1 m. 95% CEP

Velocity accuracy < 0.01 m/s, 95% CEPMRU 5+: 0.007° RMS, MGC R2: 0.01°RMS, Roll, pitch accuracy MGC R3: 0.007° RMS

Update frequency rate¹ 200 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.

INTERFACES

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

RS-422 Ethernet/LAN 3 USB

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+

RTCM-SC104 v. 2.3, 3.0, 3.1 and RTK corrections

CMR

NMEA 0183 HDT, HRC, THS and Gyro compass Robertson LR22 BCD format

Display control DDC

INS SENSOR

MRU 5+, MGC R2, MGC R3 Supported INS (See dedicated datasheets for

technical information)

WEIGHTS AND DIMENSIONS

IALA antenna (optional)

GNSS antenna

DPS Processing Unit 5.4 kg, 89 x 485 x 357 mm 3.6 kg, 44 \times 481 \times 267 mm DPS HMT Unit. GNSS antenna 0.5 kg, $69 \text{ mm} \times 185 \text{ mm}$

POWER SPECIFICATIONS

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

HMI Unit

Processing Unit

External interface

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 +5 to +40 °C (*) Recommended (**) Recommended +20 °C

Humidity

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

Mechanical

IEC 60945/EN 60945, IACS E10 Vibration

Electromagnetic compatibility

Compliance to EMC,

immunity/emission IEC 60945/EN 60945, IACS E10

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)

PRODUCT SAFETY

Compliance to LVD,

standard used IEC 61010-1/EN 61010-1

PRODUCT STANDARDS

IEC 61108-1 GNSS systems

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

Specifications subject to change without any further notice.

Dependent on subscription type

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Navigation (hdg)

DP (attitude & hdg)