DPS 232 R+ is a GNSS based absolute and relative position reference system using GPS and GLONASS. DPS 232 R+ features technology that is steps ahead for secure and robust positioning during various operational conditions.

**High precision absolute and relative position**
DPS 232 R+ is a GNSS-based system which uses simultaneously gathered GPS/GLONASS data from high performance sensors on remote and own vessel to compute distance to target (DT) and bearing to target (BT). Relative position will be available at short and long distances with a worldwide accuracy of 20 cm and is independent of differential correction data. For computation of absolute position, differential corrections are used. The absolute position is available with a worldwide accuracy of 10 cm in High Precision mode utilising commercial subscription services. In addition the DPS system also makes use of free-to-air SBAS correction signals such as WAAS, EGNOS and MSAS. These correction signals can be received and used free of charge.

**Trustworthiness of satellite navigation**
DPS NAV Engine® comprises an all-in-one signal processing core with advanced algorithms and true parallel processing of all available signals. The addition of GLONASS significantly increases satellite availability, improves integrity monitoring and enables better precision under different signal tracking conditions. DPS 232 R+ increases the reliability of system outputs and minimises the effects of outlier measurements. Alarms and warnings are activated if critical tolerances are exceeded and if position quality degrades. The system is tailormade for DP operations and will enhance DP performance and provide 24/7 reliable operation year after year.

**Multiple information layers**
Multiple layers of information give the DP operator unmatched opportunities for a customized visual presentation. Electronic chart, seabed maps, well head positions, static targets and AIS target information are some of the functions that are easily enabled by selecting or combining the different information layers.

**Radio communication**
Data between two DPS 232 R+ systems are transferred by UHF transceivers operating in the 450 MHz band, 455 MHz band or 860 MHz band. The data are transmitted using a TDMA protocol, which enables two-way communication between the two systems. UHF frequency configuration flexibility ensures reliable and safe operations in areas with high radio communication activity.

**Lever arm compensation**
Built-in lever arm compensation enables selection of several measurement points on the vessel. The selected monitoring points will be the basis for the distance calculations during relative position mode operation. Heading input is necessary to utilise the built-in lever arm compensation.
TECHNICAL SPECIFICATIONS

DPS 232 R+

PERFORMANCE
RTK horizontal accuracy 1 cm + 1.6 ppm RMS
RTK vertical accuracy 2 cm + 3.2 ppm RMS
XP2/G2 horizontal accuracy 10 cm, 95% CEP
XP2/G2 vertical accuracy 15 cm, 95% CEP
DGPS/DGLONASS position accuracy < 1 m, 95% CEP, 0.4 m, 1 σ
SBAS accuracy < 1 m, 95% CEP, 0.6 m, 1 σ
Velocity accuracy 0.05 m/s, 95% CEP, 0.2 m/s, 1 σ
Relative position accuracy 0.2 m, 95% CEP (*)
Output rate 1 Hz

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
Ethernet/LAN 4
USB 3

DATA OUTPUTS
Message formats NMEA 0183 v. 3.0, Proprietary
Message types ABIP, DPDDA, GTR, GBS, QGA, GLL, GNS, GRS, QSA, GST, GSV, PSKR, RMC, VBD, VFR, VTO, ZDA

DATA INPUTS
DGPS/DGLONASS corrections RTM-SC104 ver. 2.2, 2.3, 3.0, 3.1, Seastar XP/XP2/02/G2+ RTM-SC104 v 2.3, 3.0, 3.1 and CNR
RTK corrections NMEA 0183 HDT, HRC, HDM, THS, EM3000, PSXN10, PSXN 23, Robertson LR22 BCD format
Gyro compass
Display control

WEIGHTS AND DIMENSIONS
DPS 232 R+ unit 5.4 kg, 89 x 485 x 357 mm
HMI unit 3.8 kg, 43 x 485 x 330 mm
Radio unit (*) 3.0 kg, 43 x 485 x 330 mm
GNSS antenna 0.5 kg, 89 mm x 185 mm
IALA beacon antenna 0.9 kg, 1100 mm
UHF 450 antenna 1.3 kg, length 1400 mm, 6 cm max
UHF 860 antenna 1.4 kg, length 1510 mm

POWER
DPS 232 R+ unit 100 - 240 V AC, 50/60 Hz, max 60 W
HMI unit 100 - 240 V AC, 50/60 Hz, max 40 W
Radio unit (*) 100 - 240 V AC, 50/60 Hz, typical 7 W
GNSS antenna 5 V DC from processing unit
IALA beacon antenna 10.2 V DC from processing unit

ENVIRONMENTAL SPECIFICATIONS
Operating temperature range
DPS 232 R+ unit -15 to +55 °C (*)
HMI unit -15 to +55 °C
Radio unit (*) -15 to +55 °C
GNSS antenna -40 to +85 °C
IALA beacon antenna -55 to +55 °C
UHF antenna -30 to 70 °C

(*) Recommended +5 to +40 °C

Humidity
DPS 232 R+ unit Max. 95 % non-condensing
HMI unit Max. 95 % non-condensing
Radio unit (*) Max. 95 % non-condensing
GNSS antenna Hermetically sealed
IALA beacon antenna Hermetically sealed
UHF antenna Hermetically sealed

Mechanical
Vibration IEC 60945/EN 60945

Electromagnetic compatibility
Compliance to EMC, immunity/emission IEC 60945/EN 60945

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

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

Specifications subject to change without any further notice.