Saab R4
Navigation Systems

IMO require SOLAS class ships to carry a type-approved GPS and further that any new GPS installation shall be compliant with the new performance standard for GPS. This was defined by MSC 112(73) and resulted in the associated test standard IEC 61108-1 Ed. 2. Saab TransponderTech can now offer a number of IMO-, Wheelmark- and US Coast Guard-compliant GPS and DGPS solutions, either as stand-alone Navigation Systems or as additions to existing Saab AIS systems.

The new navigation products from Saab are self-monitoring and extremely user friendly. They perform continuous RAIM (Receiver Autonomous Integrity Monitoring) calculations. This allows the Officer Of the Watch (OOW) to set the required navigation accuracy for any stage of the journey. The R4 Navigation System will then give continuous feedback on whether the accuracy requirement is being met.

R4 GPS Navigation Sensor

The new R4 GPS Navigation Sensor is a high-precision GPS receiver, capable of receiving WAAS, EGNOS and MSAS differential corrections. The unit performs continuous RAIM calculations, which enhance the integrity of the position data.

R4 DGPS Navigation Sensor

The new R4 DGPS Navigation Sensor is the ultimate sensor for any Commercial Marine application. This product has all the features of the GPS Sensor and a dual channel beacon receiver for reception of IALA beacon DGPS corrections.

R4 Control and Display unit

The R4 Control and Display Unit is a variant of the well-known R4 AIS MKD, performing navigation functions. The traffic-light LEDs are used to continuously indicate the status of the RAIM calculations. Green light tells the OOW that the position accuracy is within the required value and red light that the accuracy is not within the defined limit.

In combined DGPS / AIS configurations, the R4 Control and Display Unit will display and control Navigation data, in addition to the AIS information.

The new Saab R4 GPS / DGPS products will of course be ideal to connect to existing or future AIS systems, ensuring that the ship operates in full compliance with all relevant regulations. It is a well-known fact that many existing GPS systems don't provide correct information, in the required formats, as defined in the AIS standard. GPS information is becoming extremely vital for many systems onboard and hence critical to overall safety.

System Configurations

Stand-alone GPS or DGPS System

Combined AIS and DGPS System

General

Waypoints:	2000 waypoint memory.
Routes:	100 routes, using a total of 2000 waypoints.
Functions:	Navigation, Position, Route, Waypoint, Event Mark, Plot, Sail To, MOB, GPS/DGPS, Alarms, Speed Graph, Configuration.
Integrity:	The product performs RAIM calculations in accordance with IEC 61108-1 Ed. 2.
Supply:	10.5 - 30 V DC, 12.5 W.
Display:	High Resolution 6 inch, ¼ VGA monochrome, Sunlight Readable
LEDs:	1 Power and 3 RAIM status (R/Y/G)

Yoke or flush mounting of Display Unit

GPS receiver

12 channel L1, C/A-code with carrier phase smoothing. (10 channels, when tracking WAAS, EGNOS and MSAS)

Update rate:	1 Hz default, 5 Hz max
Position accuracy:	GPS*: 5m, DGPS**: 1m (2D RMS).
Cold start:	1 min typical

DGPS Beacon receiver

Dual receiver. Manual or Automatic tuning.

Frequency:	283.5 to 325.0 kHz
MSK Bit Rates:	50, 100, and 200 bps
Cold Start Time:	< 1 minute typical
Reacquisition:	< 2 seconds typical
Sensitivity:	2.5 µV/m for 6 dB SNR @ 200 bps

Interface

2 bi-directional user ports RS422
1 output port RS422
Ports are configurable 4,800 – 38,400 bps
1 Alarm output for relay activation
1 input
1 Log pulse output

Dimensions (W*H*D):

Control and Display Unit:	102 * 205 * 270 mm (4.0”*8.1”*10.6”)
Navigation Sensor:	114 * 38 * 130 mm (2.5”*1.5”*5.1”)

Weight:

Control and Display Unit:	1.1 kg (2.4 lb)
Navigation Sensor:	0.5 kg (1 lb)

Cables

Power/Data Cable to Navigation Sensor:
2m (7ft). 18 pin MaxiCon – pigtail.
Data cable to Control and Display Unit:
2m (7ft). 18 pin MaxiCon – pigtail.
Power cable to Control and Display Unit:
2m (7ft). 3 pin MaxiCon – pigtail.
GPS Antenna Cable (recommended):
RG214 and RG213: Max length 45 m
TNC connector

NMEA Messages

APB, BOD, BWC, BWR, DBT, DPT, DTM, GBS, GGA, GLL, GNS, GSV, HDG, HDT, HSC, RMB, RMC, Rnn, RTE, VHW, VTG, WPL, XTE, ZDA

Proprietary Messages

For RAIM control and display

Environmental

Protected environment (IEC 60945)
Operating temperature: -15ºC to +55ºC

Compliance with the following Standards

IMO Performance Standard for GPS
IEC 61108-1 Ed2, GPS
IEC 61162-1/2 Ed 2, NMEA 0183, versions 2.0 through 3.0.

* Dependent upon ionospheric activity and multipath

** SVs > 5, HDOP < 2, RTCM SC-104 correction data from a dual frequency reference station, short baseline, and low multipath environment.

Membership Organizations

Specifications subject to change without notice

Dokument id: 7000 109-008A

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