

R4 Navigation System

GPS and DGPS Navigators

Versatile, Accurate and Reliable

For any application, from work boat manoeuvring to world wide navigation, from hydrographic surveying to marking of fishing grounds - one of the two models of our series of professional GPS and DGPS navigators has been designed to exactly suit your needs.

Depending on your precision requirements you can choose between the GPS and DGPS sensors with antennas for combining it with the main display and control units. Each combination offers IMO compliant accuracy and meets the latest requirements stated in IMO MSC.112(73).

So easy to operate, so versatile in its applications, so reliable due to its rugged and splashproof concept - it is amazing how much functionality fits into this compact marine navigator.

Two interface channels with an unmatched variety of optional settings establish the R4 Navigator as the center of navigation in a small boat or as a viable data supplier for other navigational aids or an Integrated Navigation System such as the NACOS.

If you want to navigate based on an electronic chart: CHARTPILOT is ready for a connection. Due to its flexible output which also includes previous data formats and speed log pulses, R4 Navigators can be easily retrofitted into existing systems.



And it also can easily be upgraded with additional features as new software becomes available.

Enjoy a headache-free installation: For the R4 Navigation System use just two multicore connector to a terminal block for display connection, Sensor connection, serial data according IEC 61162 (NMEA), speed log out, alarm out and alarm acknowledge. Separate power connector to the display and antenna connector (coax) to the sensor unit. The antenna does not require separate grounding and it is designed to reduce interferences and to reliably operate in the typical multitransmitter environment on-board of a ship.

SAM Electronics and its sales and service organisation will be glad to assist you in defining the perfect configuration for your requirement.

Features

- Bright sunlight-readable display
- BSH type approval, EC type approval (MED / Wheel mark) USCG type approval
- Straight forward, easy to operate control panel
- Advanced navigation features for commercial vessels
- Dual station capability
- Small receiver and antenna, easy to install
- Packaged in a ruggedized and weatherproof enclosure
- Full RAIM function
- Ready for WAAS, EGNOS, MSA

R4 GPS/DGPS Navigation Sensor

Beacon

Navigation authorities around the world have installed DGPS radiobeacon networks that broadcast free RTCM correction information. With the use of its built-in beacon demodulator, the DGPS Sensor uses these real-time corrections to deliver accurate, reliable positioning when in range of a beacon transmitter and can be controlled by the operator to accept RTCM data from external sources using the R4 Control and Display Unit (CDU).

RAIM

Receiver Autonomous Integrity Monitoring (RAIM) is a safety feature in the sensor unit which continuously

verifies the integrity of the GPS system to ascertain its accuracy and reliability. When position errors exceeds a pre-set limit, the CDU alerts the operator to take precautionary measures. RAIM is one of the latest requirements under IMO MSC 112 (73) regulation. This RAIM feature can be accessed by the operator using the CDU.

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.



Stand-alone GPS or DGPS System

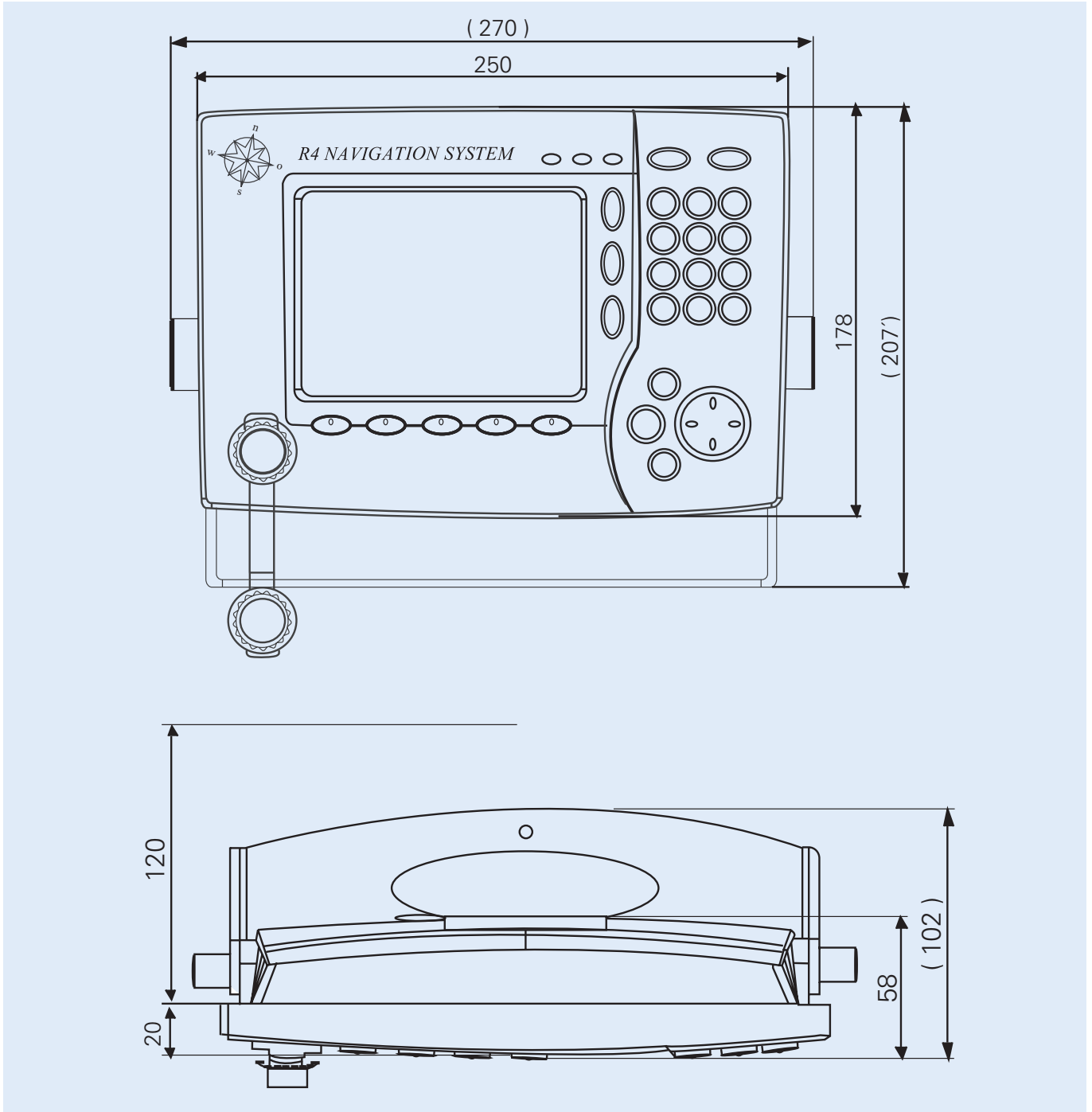
Technical data

General specifications	
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 and Configuration
Integrity	The product performs RAIM calculations in accordance with IEC 61108-1 ED.2
Power supply	24 V DC (-10% to +30%), 12.5 W
LC display	6 inch high resolution VGA monochrome, sunlight readable
LEDs	1 Power and 3 for RAIM status (R/Y/G)
Mounting	
- Control and Display Unit	Bracket or flush mounting
- Navigation Sensor	wallmounting
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* 5 m, DGPS** 1m (2D RMS)
Cold start	1 min typical
DGPS beacon receiver	
	Dual channel 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 @ 200bps
Interfaces	
- RS422 (configurable in steps between 4,800 and 38,400 bps)	2 bi-directional user ports 1 output port
- Alerting	1 alarm output for relay activation 1 alarm input for acknowledgement
- Log	pulse output
Dimensions (W x H x D)	
Control and Display Unit	270 x 207 x 102 mm
Navigation Sensor	128 x 39 x 137 mm
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: Max length 45 m, TNC connector
NMEA message	
	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 conditions	
- Control and Display Unit	IEC 60945 Ed4, protected -15°C to +55°C (operational) -55°C to +85°C (storage)
- Navigation Sensor	-30°C to +70°C (operational) -40°C to +80°C (storage)
Compliance with	
	IMO Performance Standard for GPS IEC 61108-1 Ed2 IEC 61162-1/2 Ed 2, NMEA 0183

*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.

Physical Size and Mechanical Drawing



Printed in Germany · Technical alterations reserved · © SAM Electronics GmbH · DS 3.064.06/2006

Determine where to install the R4 Control and Display Unit (CDU). It can be mounted horizontally or vertically.