

Compliant
with new
IMO 2008 regulations

CHARTRADAR 1100

Brilliant Colour Radars with Chart Facilities



**SAM
Electronics**

an  communications company

Introduction

The CHARTRADAR 1100 combines the outstanding features of the RADARPILOT with the CHARTPILOT state-of-the-art ENC presentation.

Combining the full radar capabilities with the electronic chart in one unit offers significant benefits for a safe navigation.

This CHARTRADAR is a new milestone of radar development driven by innovation.

- Easy to operate by means of trackball
- Designed to meet the latest IMO/IEC requirements for radar with chart facilities
- Display of vector charts

- High resolution colour graphics
- Choice of simplified or paper chart symbol presentation
- Selectable visibility options
- Display of own chart user objects
- Display of pre-planned routes
- Six colour tables for day and night presentation including grey shaded mode
- Integrated CONNING mode
- Integrated automatic steering and track control for TRACKPILOT 1100 (in case of NACOS xx-5 only)
- Full operation as minimum keyboard display for AIS 3400/10
- Wide choice of X- and S-band transceivers (bulkhead or aloft)

- Display of NAVTEX messages
- Tracking of 80 ARPA/AIS targets
- Display of 400 AIS sleeping targets
- ARPA/AIS target association function
- Two antenna speeds for high speed operations (HSC)*
- Integrated 2-way radar interswitch
- Optional remote access e.g. for wing operation to master each display from any of up to 4 slave stations
- Full operation of Voyage Data Recorder DEEGEG 4300 including radar recording

* The high antenna rotation is available with three phase power supply only



Innovative Solutions

The CHARTRADAR 1100

- Combines navigation and collision avoidance functions in one workstation. The correlation of radar- and AIS-based data assisting effectively in collision avoidance and participation in traffic management systems
- Provides a correlated picture of the planned and the real situation and thereby enhances the officer's capability to fully access the nautical situation and development
- Supports high resolution graphics for clear and distinct chart and radar presentation
- High resolution graphic performance for clear radar presentation and easy target recognition
- The integrated 2-way interswitch allows switching of two transceivers and two displays
- Suppress radar interference from rain or sea clutter simply with the CLEAN SWEEP function: AVE (Automatic Video Enhancement) is now a standard feature
- Experience the advantage of modern graphic processors: Target trails are automatically adopted to signal strength and are not lost even if they are changed in presentation or length
- Switch to high speed antenna rotation¹⁾, this is advantageous for high speed ship operations and improves the display refresh rate for better target recognition
- If part of an NACOS system the CHARTRADAR also provides integrated Steering and Track Control by means of a joystick. A "Curved Headline" for any planned or commanded course change is shown on each CHARTRADAR display
- Up to four CHARTRADAR slave stations can be added to support docking manoeuvres of large ships. Each slave station is simultaneously controlled from one of the active station
- In combination with the AIS 3400/10 the CHARTRADAR supports full AIS operation which saves the costs for an extra minimum keyboard display
- If connected to the VDR DEBEG 4300 the internal network of the CHARTRADAR allows direct recording of the radar image
- In combination with DEBEG 2902 NAVTEX messages will be directly reported to the CHARTRADAR and displayed on user demand



The mechanical housing concept of the CHARTRADAR 1100 is very flexible:

- Choice between desktop and console versions
- The monitor and control panel components can also be supplied as individual units for integration into a customer specific console

CHARTRADAR 1100

Interswitching of antennas

- for dual installations (via built-in interswitch)
- for multiple installations with up to 5 transceivers/displays (via optional PCI interswitch)

CLEAN SWEEP

Anti-Clutter optimisation with AVE (Automatic Video Enhancement)

Interference Rejection

CHART Information

is derived from the CHARTPILOT and may be displayed by a wide range of individual user settings

4 Parallel Index Lines (PI)

for manoeuvre planning

2 Independent EBL and VRM

adjustable individually or combined directly within the PPI or via rotary knobs of the optional keyboard

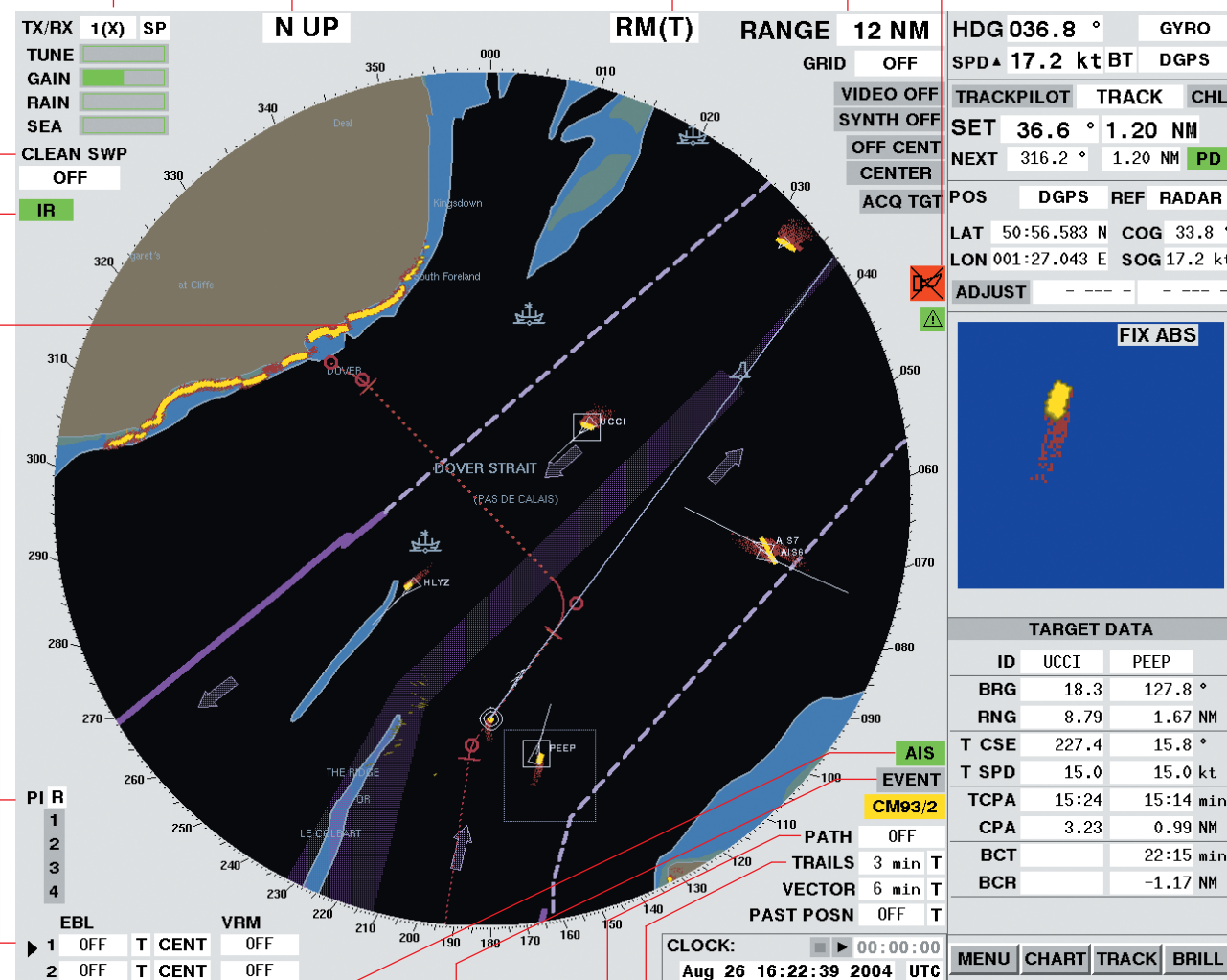
A **key-pad window** will be inserted for entry of characters or numbers

The **Trackball** is the main operational element. The active field is marked by a frame. A quick info box shows the available operational functions for the trackball buttons. Optional control panels can be integrated for operating the **Radar** or **TRACKPILOT**

Control of the display mode
Head Up and **North Up** or **RM** and **TM**

Control of the **Radar PPI** e.g. display ranges may be selected from 0.25 to 96 NM or for **DOCKING** as 250 or 500m

Alarm symbol for calling-up of alarm messages



Heading
Speed

TRACKPILOT (Option NACOS) for Heading, Course- or Track Control

Selection of Consistent Common Reference Point (CCRP)

Data of on-screen **cursor position** or own **ship's position** and sensor in use

Radarscope window with display options:

- Radar-zoom fixed to a tracked target or to a certain position
- Graphic display of wind or depth profile
- Docking display
- AIS data display
- Radar map operation menu
- Alarm list

Data display for:

- Full tracked data for two marked targets
- Short readout of up to 8 targets
- Waypoint data
- Track data

Access to track and route planning functions

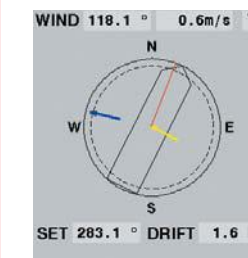
Individual brightness settings including choice of 6 colour tables

Access to chart functions

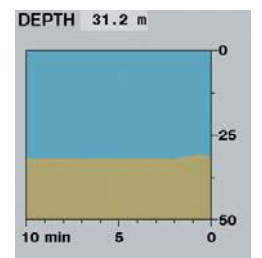
The Radarscope window may alternatively display **WIND** or **DEPTH** graphics, if the respective sensors are connected.

In the **DOCKING** mode the 2nd EBL may be used to establish the initial distances from the bow and stern to a berth.

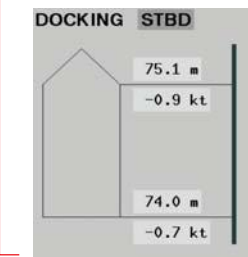
After defining the reference positions of the ship's contour, the CHARTRADAR continuously displays the actual distance and speed values based on the input of the (D)GPS receiver.



WIND display



DEPTH display



DOCKING display

Display of **AIS** data and symbology

Display and storing of **EVENT** data. **PRINT** screen function via CHARTPILOT 1100

PATH Prediction allows the operator to display a change of heading via constant radius turn

Trails are not lost despite of changing parameters

Quick info box for display of:
- ETA to cursor position
- operator instructions
- Date / Time
- Stop watch



TRACKBALL for left- or right-hand operation



TRACKPILOT control panel with joystick

The Trackball includes a large DO button for activating operator settings. Either one or the two smaller buttons may be used for additional functions.

The Combined Solution

The superior feature of the CHARTRADAR is the ability to superimpose radar and electronic vector chart information on operator's demand.

Direct comparison of the radar with the chart information on one display increases the safety of navigation and facilitates the collision avoidance.

Following the IMO Performance Standards for radar with selected parts of the **S**ystem **E**lectronic **N**avigation **C**hart (SENC), SAM Electronics has developed the CHARTRADAR which provides following modes of operation:

- RADAR
- CHART
- CONNING

Each of these individual modes has been implemented in accordance with the relevant international standards established by the IEC and IMO.

RADAR MODE

This mode features all radar functionality including ARPA and/or AIS presentation. If part of an NACOS system it also provides integrated Steering and Track Control by means of a joystick.

CHART MODE

The CHART MODE provides full radar control in combination with a vector chart presentation to the radar image. Chart information is derived from the CHARTPILOT and may be displayed either in S57 Ed.3 (official charts) or CM - 93/3 (C-MAP) format. To indicate

the required information the operator selects visibility groups and adds or removes specific chart contents.

CONNING MODE

In the CONNING MODE data from all relevant navigation sensors as well as engine and rudder data provide the navigator with the information essential for rapid decisions, safe navigation and economic ship operation, e.g.

- Heading, ROT
- Course, drift angle
- Off course, off track
- Power*, pitch*, shaft*
- Rudder*, thruster*
- Trim*, heel*
- Depth, wind

* if connected to the NACOS



RADAR MODE: Radar Display with chart presentation (night, areas unfilled)

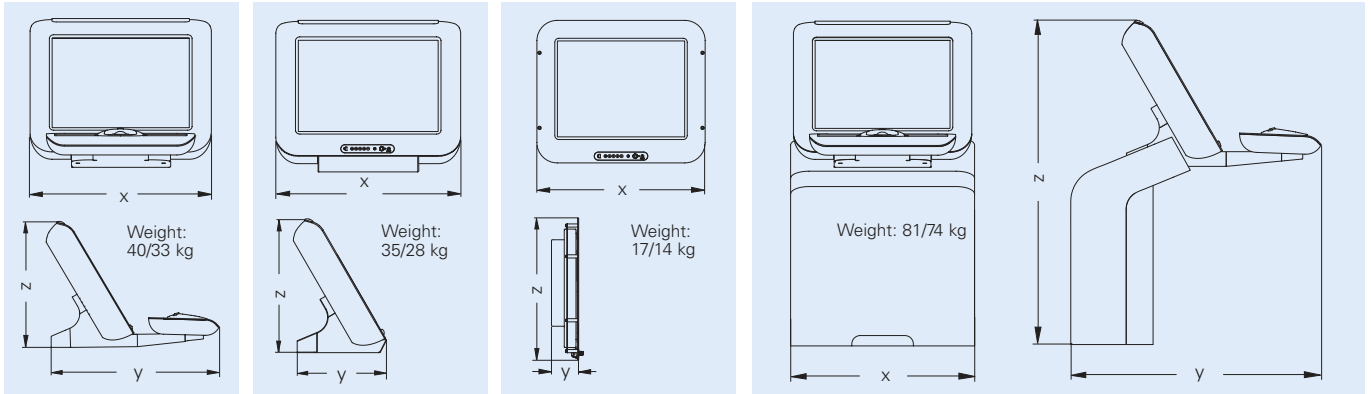


CHART MODE: Radar Display with chart presentation (night, areas filled)



CONNING MODE: (night presentation)

Technical and Installation Data



C5 Desktop unit with integrated control panel

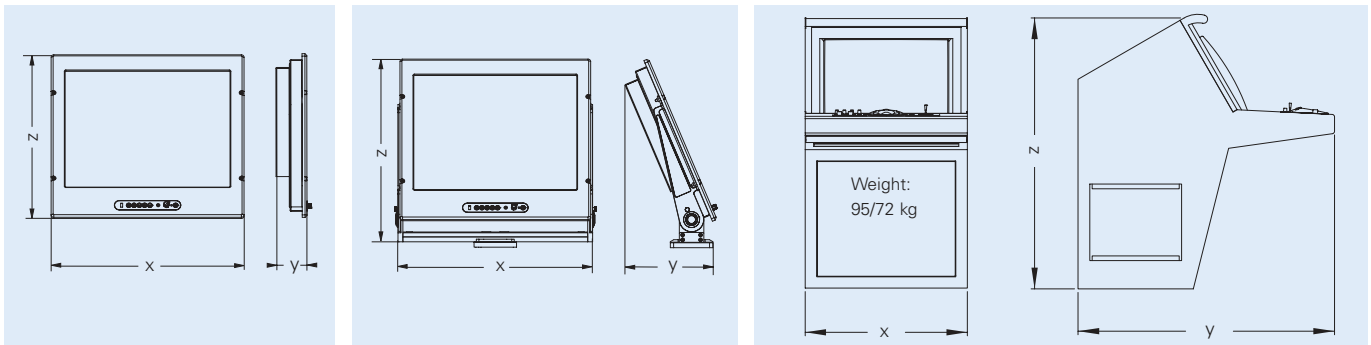
C5 Desktop monitor without control panel

C5 Console monitor

C5 Console unit with integrated control panel and display electronics

CHARTRADAR 1100 basic versions

Characteristics		Dimensions [mm]											
		C5 Console unit			C5 Desktop unit			C5 Desktop monitor			C5 Console monitor		
Category	Size	x	y	z	x	y	z	x	y	z	x	y	z
CAT 2	19" TFT	650	887	1085	516	690	432	516	344	436	515	88	441
CAT 1	23" TFT	650	887	1168	630	690	516	630	344	519	630	102	534



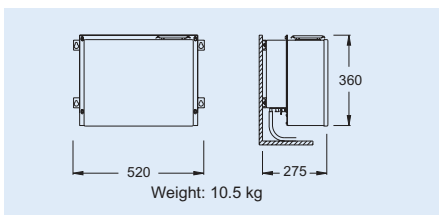
C4 Console monitor

C4 Desktop monitor with mounting bracket

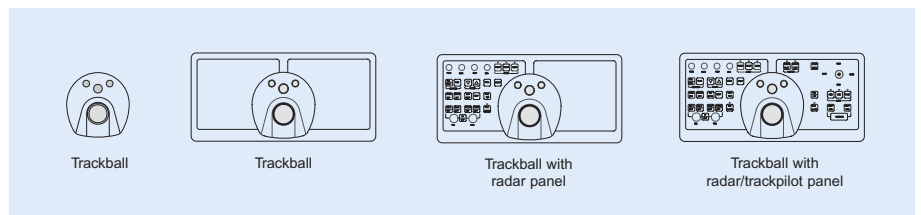
C4 Console unit with integrated control panel and display electronics

CHARTRADAR 1100 basic versions

Characteristics		Dimensions [mm]								
		C4 Console unit			C4 Console monitor			C4 Desktop monitor		
Category	Size	x	y	z	x	y	z	x	y	z
CAT 2	19" TFT	550	1090	1150	483	82	404	489	130	493
CAT 1	23" TFT	700	1090	1150	584	97	495	615	130	576

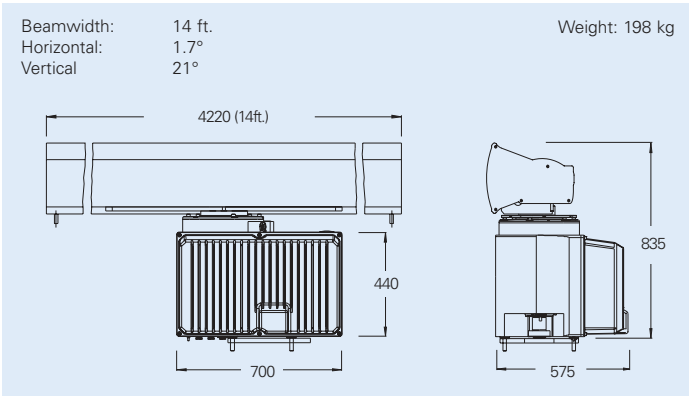


Display electronics

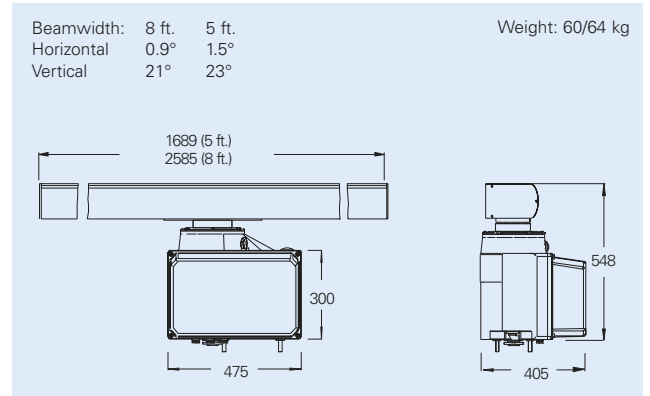


Control panels

Technical and Installation Data



S-Band antenna unit, type GR3041, with integrated performance monitor and 30 kW* S-Band transceiver, optional 30kW* bulkhead transceiver, type NG3041



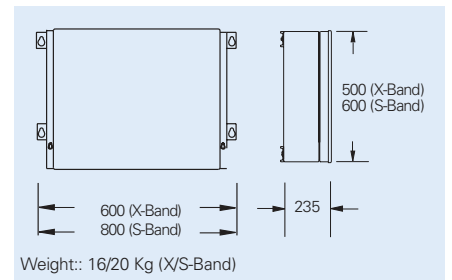
X-Band antenna unit, type GR3040, with integrated performance monitor and 12.5 or 25 kW* X-Band transceiver, optional 25 kW* bulkhead transceiver, type NG3040

AC Voltage**	1x 115 V	1x 230 V	3x 230 V	3x 400 V	3x 450 V	Power Cons. [VA]	HSC Mode
Frequency	60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	60 Hz		
X-Band antenna unit, type GR 3040		•	•	•	•	250/460***	•
S-Band antenna unit, type GR 3041		•	•	•	•	1300/1700***	•
X/S-Band transceiver, type NG3040/41	•	•				150	

* Magnetron peak power (nominal)

** Tolerances according to IEC 60945

*** The higher consumption only applies to high speed antenna units



Bulkhead transceiver, type NG3040 (X-Band) and NG3041 (S-Band)

Operational conditions and protection (according to IEC 60945, extract): below deck units: max. -15°C to +55°C (for reasons of lifetime, a constant ambient temperature of approx. 20°C, ±5°C should be maintained) above deck units: max. -25°C to +55°C (+70°C for storage)